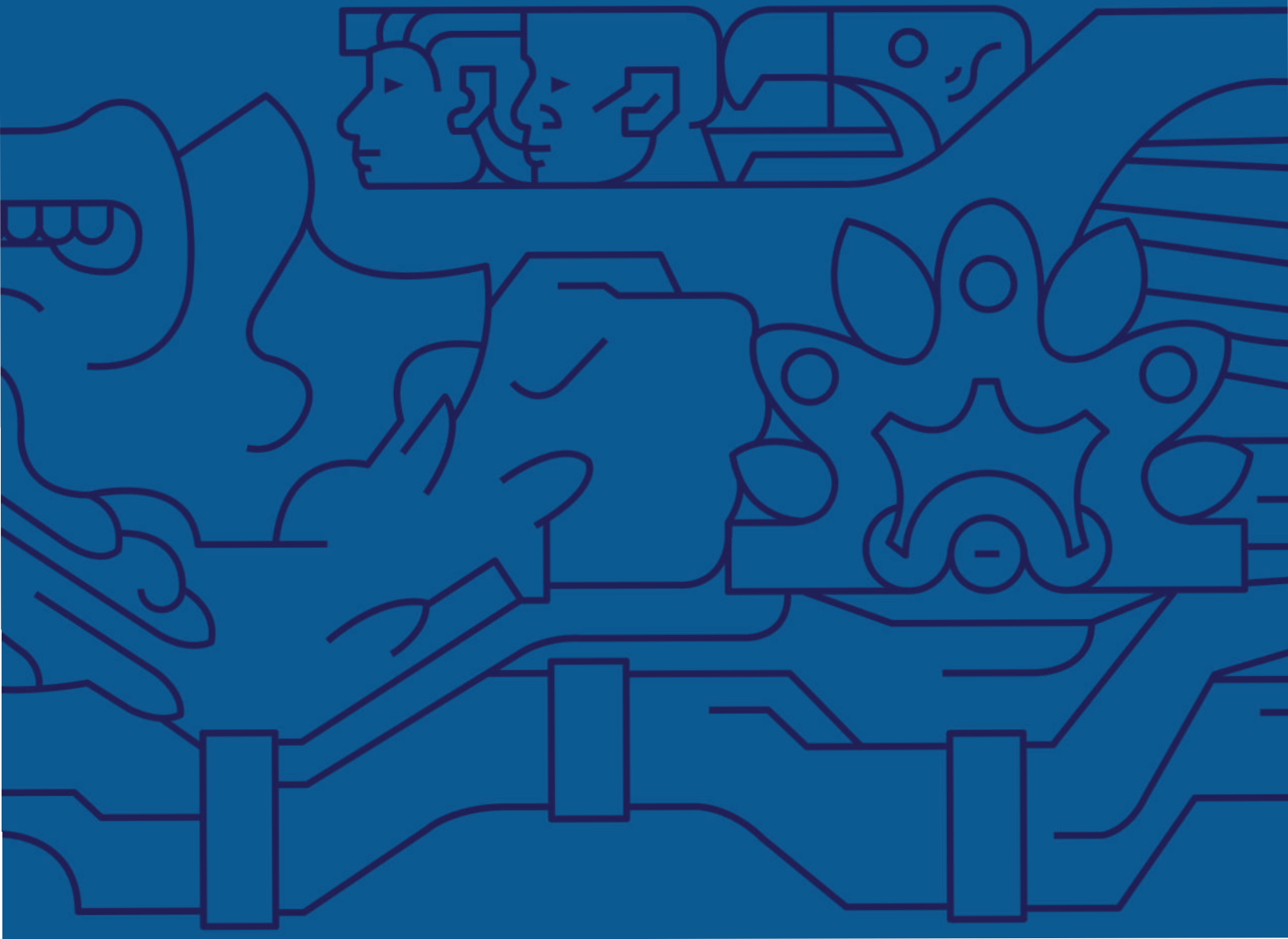


# Graduate Programs Catalogue



TECNOLÓGICO  
DE MONTERREY





# GRADUATE PROGRAMS CATALOGUE

## INSTITUTO TECNOLÓGICO Y DE ESTUDIOS SUPERIORES DE MONTERREY

Date of promulgation: Agosto 2013  
Modification. 2013, 2014, 2015, 2016, 2017

Copyright © Instituto Tecnológico y de Estudios Superiores de Monterrey Ave. Eugenio Garza Sada 2501 Sur,  
Col. Tecnológico C.P. 64849, Monterrey, N.L., Mexico.

No part of this document may be reproduced in any form or by any means without the prior express written consent of Instituto Tecnológico y de Estudios Superiores de Monterrey for any person or activity that is unrelated to the same.

The photos included in this document were obtained from the archives of Tecnológico de Monterrey



# TABLE OF CONTENTS

|                                                                    |           |
|--------------------------------------------------------------------|-----------|
| Message from the Rector of Tecnológico de Monterrey                | 5         |
| <b>I. TECNOLÓGICO DE MONTERREY</b>                                 | <b>7</b>  |
| History and Evolution                                              | 9         |
| <b>Transformation</b>                                              | <b>15</b> |
| • Multi-campus University                                          | 15        |
| • Values                                                           | 15        |
| • Vision                                                           | 16        |
| • Differentiators                                                  | 16        |
| • Code of Ethics                                                   | 16        |
| Organization of Tecnológico de Monterrey                           | 17        |
| <b>Accreditations</b>                                              | <b>18</b> |
| • Institutional Accreditations                                     | 18        |
| • Program Accreditations                                           | 18        |
| Campus Directory                                                   | 22        |
| <b>Educational Model TEC21</b>                                     | <b>25</b> |
| • Characteristics of the educational model                         | 25        |
| • Characteristics that enrich our educational model                | 25        |
| • Student Learning Development Process                             | 26        |
| - <i>Active Learning</i>                                           | 26        |
| - <i>Self-regulated Learning</i>                                   | 26        |
| - <i>Comprehensive Education</i>                                   | 27        |
| - <i>Teaching Techniques</i>                                       | 27        |
| - <i>The Professor as a Learning Facilitator and Guide</i>         | 27        |
| • Internationalization                                             | 27        |
| • Resources and Media                                              | 28        |
| - <i>Information and Communication Technologies</i>                | 28        |
| - <i>Tecnológico de Monterrey Library Network</i>                  | 28        |
| - <i>Vice-Rectorcy in Innovative Education and Online Programs</i> | 28        |
| - <i>Student Life</i>                                              | 29        |
| - <i>Vocational Guidance</i>                                       | 29        |
| - <i>Dormitories</i>                                               | 29        |

|                                                           |           |
|-----------------------------------------------------------|-----------|
| <b>Academic Policies and Academic Regulations</b>         | <b>30</b> |
| • Admissions                                              | 30        |
| • Transfer Credit                                         | 30        |
| • Evaluation and Continuance                              | 30        |
| • General Student Rules and Regulations                   | 31        |
| • Financial Aid and Scholarships                          | 31        |
| • Fee Refunds                                             | 31        |
| <b>Research</b>                                           | <b>32</b> |
| <b>II. CURRICULA</b>                                      | <b>35</b> |
| • Master's programs offered at each Campus                | 37        |
| • Specialization programs offered at each Campus          | 38        |
| • Doctoral programs offered at each Campus                | 39        |
| <b>Profiles and curricula of the graduate programs</b>    | <b>41</b> |
| <b>School of Social Sciences and Government</b>           | <b>43</b> |
| • MAP Master in Public Administration and Public Policy   | 45        |
| • MDI Master in International Law                         | 48        |
| • MGP-V Master in Public Management (Online Program)      | 51        |
| • MPE Master in Prospective and Strategic Studie          | 54        |
| • MPJ Master in Transnational Legal Practice              | 57        |
| • DCS Ph. D. in Social Sciences                           | 60        |
| • DPP Ph. D. in Public Policy                             | 63        |
| <b>School of Humanities and Education</b>                 | <b>67</b> |
| • MEE-V Master in Education (Online Program)              | 69        |
| • MEH Master in Humanistics Studies                       | 72        |
| • MEH -V Master in Humanistics Studies (Online Program)   | 75        |
| • MGD-V Master in Development Management (Online Program) | 78        |
| • MTE-V Master in Educational Technology (Online Program) | 80        |
| • DEE Ph. D. in Educational Innovation                    | 83        |
| • DEH Ph. D. in Humanistic Studies                        | 86        |
| <b>School of Engineering and Sciences</b>                 |           |
| <b>Engineering</b>                                        | <b>91</b> |
| • ELS Specialization in Logistics and Supply Chain        | 93        |
| • EPY Specialization in Project Management                | 94        |
| • MBI Master of Science in Biotechnology                  | 95        |
| • MCI Master of Science in Engineering                    | 98        |
| • MEM Master in Engineering Management                    | 101       |

|                                               |                                                                                                |            |
|-----------------------------------------------|------------------------------------------------------------------------------------------------|------------|
| • MER-V                                       | Master in Energy Management and Renewable Sources (Online Program)                             | 104        |
| • MID-V                                       | Master in Innovation for Enterprise Development (Online Program)                               | 107        |
| • MIE                                         | Master of Science in Energetic Engineering                                                     | 110        |
| • MIP-V                                       | Master in Engineering with specialization in Quality Systems and Productivity (Online Program) | 113        |
| • MIR                                         | Master in Automotive Engineering                                                               | 116        |
| • MNT                                         | Master in Nanotechnology                                                                       | 119        |
| • MSM                                         | Master of Science in Manufacturing Systems                                                     | 122        |
| • DBT                                         | Ph. D. in Biotechnology                                                                        | 126        |
| • DCI                                         | Ph. D. in Engineering Sciences                                                                 | 130        |
| • DNT                                         | Ph. D. in Nanotechnology                                                                       | 137        |
| <b>Information Technology and Electronics</b> |                                                                                                | <b>141</b> |
| • EIS                                         | Specialization in Software Engineering                                                         | 143        |
| • MCC                                         | Master of Science in Computer Science                                                          | 144        |
| • MCC-I                                       | Master of Science in Computer Science                                                          | 148        |
| • MSE -E                                      | Master of Science in Electronic Engineering (Electronic Systems)                               | 151        |
| • MTI-I                                       | Master in Information Technology Management (Online Program)                                   | 154        |
| • MTI-V                                       | Master in Information Technology Management (Online Program)                                   | 156        |
| • DCC                                         | Ph. D. in Computer Sciences                                                                    | 159        |
| <b>School of Medicine and Health Science</b>  |                                                                                                | <b>163</b> |
| • RCA                                         | Residency in Health Care Quality                                                               | 165        |
| • RCR                                         | Residency in Cardiology                                                                        | 168        |
| • REA                                         | Residency in Anesthesiology                                                                    | 171        |
| • REC                                         | Residency in General Surgery                                                                   | 174        |
| • REE                                         | Residency in Critical Care Medicine                                                            | 177        |
| • REG                                         | Residency in Obstetrics and Gynecology                                                         | 180        |
| • REM                                         | Residency in Internal Medicine                                                                 | 183        |
| • REN                                         | Residency in Pediatrics                                                                        | 186        |
| • REO                                         | Residency in Ophthalmology                                                                     | 189        |
| • RER                                         | Residency in Radiology and Imaging                                                             | 192        |
| • REU                                         | Residency in Neurology                                                                         | 195        |
| • RGE                                         | Residency in Geriatrics                                                                        | 198        |
| • RNE                                         | Residency in Neonatology                                                                       | 201        |
| • RNP                                         | Residency in Pediatric Neurology                                                               | 204        |
| • RPS                                         | Residency in Psychiatry                                                                        | 207        |
| • RUR                                         | Residency in Urology                                                                           | 210        |
| • MBC                                         | Master in Biomedical Sciences                                                                  | 213        |
| • DBC                                         | Ph. D. in Biomedical Sciences                                                                  | 216        |
| • DCL                                         | Ph. D. in Program in Clinical Sciences                                                         | 219        |

|                                                               |            |
|---------------------------------------------------------------|------------|
| <b>School of Business</b>                                     | <b>221</b> |
| • EAE Specialization in Energy Management                     | 223        |
| • MAF Master in Finance                                       | 225        |
| • MAF-V Master in Finance (Online Program)                    | 228        |
| • MBA Master in Business Administration                       | 231        |
| • MBA-G MBA in Global Business Administration and Strategy    | 235        |
| • MBA-I Master in Business Administration                     | 238        |
| • MBE Master in Business Administration Executive Program     | 241        |
| • MDE Master in Business Administration                       | 243        |
| • MGN -V Master in Enterprise Administration (Online Program) | 245        |
| • DCA Ph. D. in Business Administration                       | 249        |
| • DCF Ph. D. in Financial Science                             | 254        |

### Course content by academic discipline

The description of the courses for all the graduate programs offers at Tecnológico de Monterrey is available in the Academic Vice-Rectorry official web site. ([http://sitios.itesm.mx.mx/va/planes\\_de\\_estudio/catalogos.htm](http://sitios.itesm.mx.mx/va/planes_de_estudio/catalogos.htm))



## Message from the Rector of Tecnológico de Monterrey



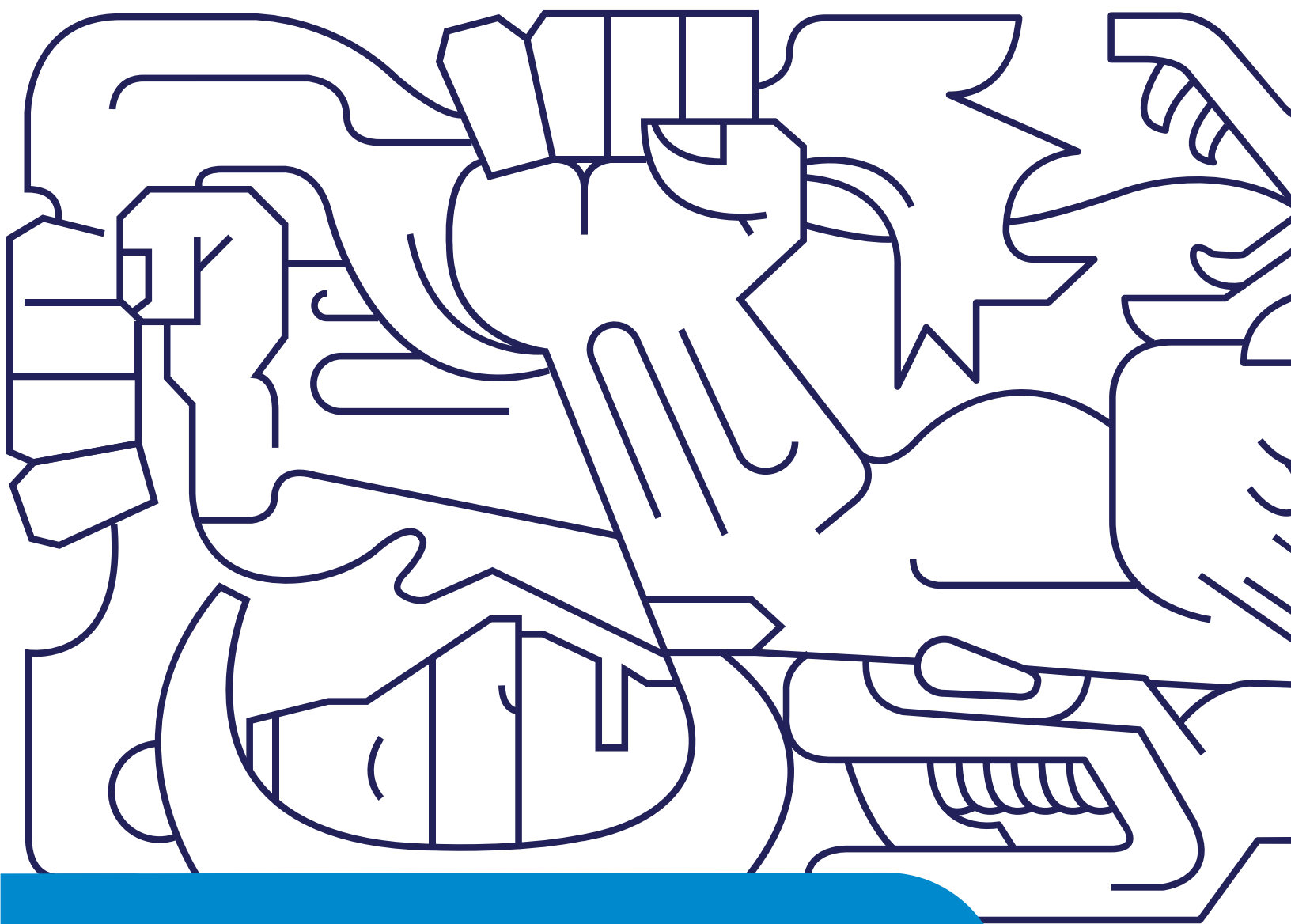
It gives me great pleasure to present the **Graduate Programs Catalogue of Tecnológico de Monterrey**. This document describes the extensive range of academic programs offered by the Institute in the Graduate Schools.

A brief description is included of our Educational Model, the structure of the curricula, the resources and media available to all our students, student life, the academic policies and regulations including the admissions process, and financial aid and scholarships.

The catalogue also contains a brief description of the areas of excellence and specialization topics in which faculty and students conduct research with the objective of educating, transforming, innovating and transcending.

David Noel Ramírez Padilla  
Rector of Tecnológico de Monterrey  
March 2017





# I. TECNOLÓGICO DE MONTERREY



# I. TECNOLÓGICO DE MONTERREY

## History and Evolution

Tecnológico de Monterrey was founded in 1943 thanks to the vision of Don Eugenio Garza Sada and a group of entrepreneurs who formed a non-profit association called Enseñanza e Investigación Superior, A. C.

Tecnológico de Monterrey is a private, non-profit, independent institution with no political and religious affiliations.

The work of Tecnológico de Monterrey and all its campuses is supported by civil associations comprised of a numerous group of outstanding leaders from all over the country who are committed to quality in higher education.

Every year, the board members of these associations meet to define the goals that will guide the

major decisions which will help Tecnológico de Monterrey to meet its objective of driving the development of communities and the nation.

Tecnológico de Monterrey has the support of the national community, which participates in the raffles organized by the institution to expand its scholarship program and investment in infrastructure.

Tecnológico de Monterrey enjoys the status of Free University School, which enables it to function as an educational institution.

These are some of the main events that distinguish our Institution 70 years after the foundation of Tecnológico de Monterrey:



## Beginning

- 1944** The number of students enrolled at Tecnológico de Monterrey increases from 350 to 452, while the total number of faculty members, all full-time, grows from 14 to 33. This year sees the initiation of extracurricular activities: the first student association is formed, the first basketball and soccer teams are created, and "Onda", the institution's first magazine, is published.
- 1945** The students adopt "El Borrego" (The Ram) as their mascot.
- 1947** The Monterrey Campus is inaugurated and has one thousand students this year. The first undergraduate degrees are awarded to eight students from the BS in Chemical Engineering program. The first raffle, known as Sorteo Tec, is held.
- 1950** Tecnológico de Monterrey is accredited by the Southern Association of Colleges and Schools (SACS), a US accrediting agency.
- 1954** Tecnológico de Monterrey. This mural represents the triumph of culture and work with motifs taken from pre-Cortés mythology. Later on, the Library building will become the Offices of the Presidency of Tecnológico de Monterrey.

## Growth

- 1960** Tecnológico de Monterrey has 4,458 students from 19 countries in America and all the states of Mexico.
- 1963** At the beginning of this year, the first master's degree is awarded in Chemical Sciences. Twenty years after its foundation, Tecnológico de Monterrey begins to delve into two educational facets that will be of paramount importance: the use of electronic computers and educational television.
- 1967** The first campus outside the city of Monterrey is founded: the Guaymas Campus.
- 1968** This year sees the launch of the first doctoral program: the PhD in Chemistry, specializing in Organic Chemistry.
- 1973** Two new campuses open in other Mexican cities: the Mexico City Campus and the Ciudad Obregón Campus.
- 1974** The Saltillo Campus is founded.
- 1975** Operations start at the Eugenio Garza Sada Campus in Monterrey; and the Laguna, Querétaro and San Luis Potosí Campuses.
- 1976** The Chihuahua, Estado de México and Irapuato Campuses are inaugurated.
- 1978** Tecnológico de Monterrey now has more than 25 thousand students in 14 units throughout Mexico. The Ignacio A. Santos School of Medicine is opened next to the Hospital San José building. The León Campus becomes operational.

- 1980** Personal computers are introduced as a higher education tool in Mexico. The Colima, Chiapas, Guadalajara, Hidalgo and Morelos (nowadays called Cuernavaca) Campuses are opened.
- 1981** The Central de Veracruz and Tampico Campuses are inaugurated.
- 1982** The Toluca Campus begins operating.
- 1983** The Ciudad Juárez, Mazatlán, Sinaloa and Sonora Norte Campuses begin operating.
- 1985** The Zacatecas Campus is inaugurated.

## Consolidation

- 1986** The mission “to prepare professionals with levels of excellence in their area of specialization” is defined, together with the general statutes. Tecnológico de Monterrey is formally incorporated as a multi-campus university with a new organizational structure.
- Tecnológico de Monterrey is connected to the international inter-university communication network known as BITNET. The satellite telecommunications network is launched.
- 1989** The Center for Advanced Technology for Production (CETEC) is opened on the Monterrey Campus. Satellite transmissions are used to teach the Master’s in Education with diverse specializations.
- 1990** The Center for Strategic Studies (CEE) is created. Courses from the master’s degrees in Business Administration and Computer Studies are transmitted by satellite for Tecnológico de Monterrey faculty members, as well as three core courses, related to sociocultural values and professional practice.

## Transformation

- 1996** Tecnológico de Monterrey defines its Mission toward 2005: To prepare individuals who are committed to the development of their communities; who are internationally competitive in their area of knowledge; and who conduct relevant research and extension studies for the development of Mexico.
- 1997** Universidad Virtual is created. Tecnológico de Monterrey offers its academic and continuing education programs in Mexico and Latin America. The teaching-learning redesign process begins.
- 1998** The Aguascalientes Campus is inaugurated. The rule was laid down that undergraduate students’ social service must benefit the community.
- 2001** Tecnológico de Monterrey, in conjunction with diverse national and international organizations and foundations, creates the Community Learning Centers. Two new campuses begin their activities: the Cumbres Campus, in Monterrey; and the Santa Fe Campus, in Mexico City.



**2002** The Morelia Campus is inaugurated.

**2003** The Puebla Campus is inaugurated. The Graduate School for Public Administration and Public Policy (EGAP) is opened with sites on the Mexico City, Estado de México and Monterrey Campuses. Tecnológico de Monterrey receives the Andrew Heiskell Award 2003-2004, bestowed by the United Nations Institute of International Education, in the Outstanding Faculty Program Category.

**2004** The Council for the Accreditation of Higher Education (COPAES) of the Mexican Ministry of Education recognizes Tecnológico de Monterrey as the institution of higher education with the highest number of academic programs accredited or recognized by national and international organizations. By this year, Tecnológico de Monterrey has a network consisting of 27 Business Incubators. Prepanet activities are launched to offer online high school with a few face-to-face activities to people who need to earn their high school diploma, but who for diverse reasons were unable to do so. Two new high schools are opened: one in Matamoros, Tamaulipas, and the other in Metepec, Estado de México. The Alumni and Friends Philanthropic Network begins operating in Monterrey.

**2005** A new Tecnológico de Monterrey Vision is defined to be fulfilled in 2015, together with the Mission and strategies that will contribute to the realization of this new vision. Tecnológico de Monterrey is awarded the accolade given by the Ministry of the Economy to institutions who provide outstanding support to the consolidation of the National System of Business Incubation. The Family Business Institute is created and developed through an agreement between the Spanish Enterprise Institute and Tecnológico de Monterrey. The Valle Alto High School begins operating in Monterrey.





**2007**

The Business Accelerator Network began operations. It was created by the Institute for Sustainable Social Development to support society in the areas of education and business creation and development; academic programs in health, nutrition and housing; and professional consulting services.

**2008**

At the initiative of Tecnológico de Monterrey alumni, the ENLACE E+E Network was created to drive Tecnológico de Monterrey's business incubators and accelerators. The FEMSA Biotechnology Center was opened at the Monterrey Campus, focusing on three areas: Bioprocess Engineering, Food Biotechnology and Pharmaceutical Biotechnology.

**2009**

With FEMSA's support, the Strategic Technology Observatory opened its doors to promote business innovation and a spirit of research. Community Learning Centers were created to take quality education to underprivileged and geographically remote communities.

**2010**

After serving as President of the Tecnológico de Monterrey for just over 25 years, in June 2010, Dr. Rafael Rangel Sostmann tendered his resignation as President to the Board of Directors.

The EGADE programs at the Mexico City, Monterrey and Santa Fe campuses merged to form a single national school known as EGADE Business School.

**2011**

As of October 3, Salvador Alva Gómez took over as the new Chancellor of the Tecnológico de Monterrey. On January 1, David Noel Ramírez Padilla was appointed President of Tecnológico de Monterrey.

**2012**

The Zambrano Hellion Medical Center was opened in January. This new hospital center seeks to transform private medical practice in Mexico.

The Board of Directors of the Tecnológico de Monterrey announced the appointment of José Antonio Fernández Carbajal as the new Chairman of the Board, replacing Mr. Lorenzo H. Zambrano Treviño as of February 14. Mr. Fernández Carbajal became the fourth Chairman of the Board, succeeding Eugenio Garza Sada (1943-1973), Eugenio Garza Lagüera (1973-1997) and Lorenzo H. Zambrano Treviño (1997-2012).

The Monterrey Regional Presidency established the Distinguished Professor Emeritus Prize to be awarded on May 15 every year (Teachers' Day in Mexico). The first professor to receive this honor was the architect José Luis Pineda.

The Latin American Citizenship Institute was created with the aim of replicating the best civic practices of Mexico and Latin America and orientating the entrepreneurial and humanistic capacity of Tecnológico de Monterrey.

Tecnológico de Monterrey initiates a transformation to generate cultural change and a process-based approach.

The values that govern the institution's operations are defined:

- Innovation
- Global outlook
- Teamwork
- Ethics and citizenship
- Integrity

**2012** As Tecnológico de Monterrey collaborators, we are committed to complying with the guidelines contained in the Code of Ethics and to making them part of our lives and daily activities.

**2013** The Institution announced the new Educational Model Tec21, which will enable the development in future generations of competencies for the leaders of the 21st century. The Model is based on innovative, challenging experiences, spaces for active learning, and faculty who inspire and innovate.

The following changes were announced in the institution; Salvador Alva is now President of Tecnológico de Monterrey; there are now three instead of five regional presidencies: Northern Zone, Central-Southern Zone and Western Zone; three Vice Presidencies were created: High School, Undergraduate, and Research, Graduate and Continuing Education.

The Protein Development Research Center was created.

The Eugenio Garza Sada Institute for Entrepreneurship was founded.

**2014** The Federal Government of Mexico honored Tecnológico de Monterrey with the National Entrepreneurship Award.

**2016** The new organizational structure of Tecnológico de Monterrey includes the Campus Vice Presidency, which will enhance the academic and student experience processes.

The scope of the Schools has been expanded to integrate undergraduate programs as well.

## Education that Transforms Lives

### Multi-campus University

Nowadays, Tecnológico de Monterrey is a multi-campus university with academic sites in the diverse regions of Mexico.

The prestige enjoyed by Tecnológico de Monterrey since its foundation, stemming from the culture of entrepreneurship, work, efficiency and responsibility that it fosters its students, motivated its graduates, who come from diverse regions of Mexico, to promote the presence of Tecnológico de Monterrey in their hometowns.

This gave the Institution significant insight into the different needs of each region in order to prepare professionals, without uprooting them from their hometowns, with the capacity to address them. Moreover, as a nationwide, multicampus university, Tecnológico de Monterrey accepts its responsibility to provide a valid response to the country's foremost challenges.

Some of Tecnológico de Monterrey's alumni are now directors in successful companies in Mexico and Latin America, while the presence of its graduates in key government and public administration positions is constantly growing.

### Values

At Tecnológico de Monterrey, we are governed by the values of the Tecnológico de Monterrey:



#### Innovation

We generate and realize ideas, break paradigms, take risks and learn from our mistakes.



#### Global Vision

We leave our global culture and foster our diversity.



#### Teamwork

We foster collaborative work and seek collective success above that of the individual.



#### Sense of humanity

We respect the dignity of people and act with solidarity.



#### Integrity

We behave in an ethical manner, and are honest, austere and congruent.



## Vision

Tecnológico de Monterrey:  
We educate leaders with an entrepreneurial spirit, committed to ethics and citizenship, and who are internationally competitive.

## Differentiators

The relevant characteristics that distinguish Tecnológico de Monterrey are:

- A state-of-the-art educational model, focused on developing a spirit of entrepreneurship
- Education with a sense of humanity
- The institution's prestige built on the basis of the actions of our graduates
- Relationships with alumni, companies and institutions

With these three major components (Values, Vision and Differentiators), at Tecnológico de Monterrey we recognize the need to undertake actions that will lead us toward change, to a transition targeting a better lifestyle emerging from the academic preparation of young people who care deeply about their country.

## Code of Ethics

This Code of Ethics is based on the purpose of the Tecnológico de Monterrey: Education that transforms lives, and on the visions of its institutions. It is grounded in our institutional values and, in particular, a sense of humanity and integrity.

It is not, nor does it seek to be, exhaustive in relation to the ethical dilemmas that arise in the setting of our activities; therefore, it will be enriched when the requirements of daily practice so require.

As members of the organization, we are committed to channeling our actions toward the common



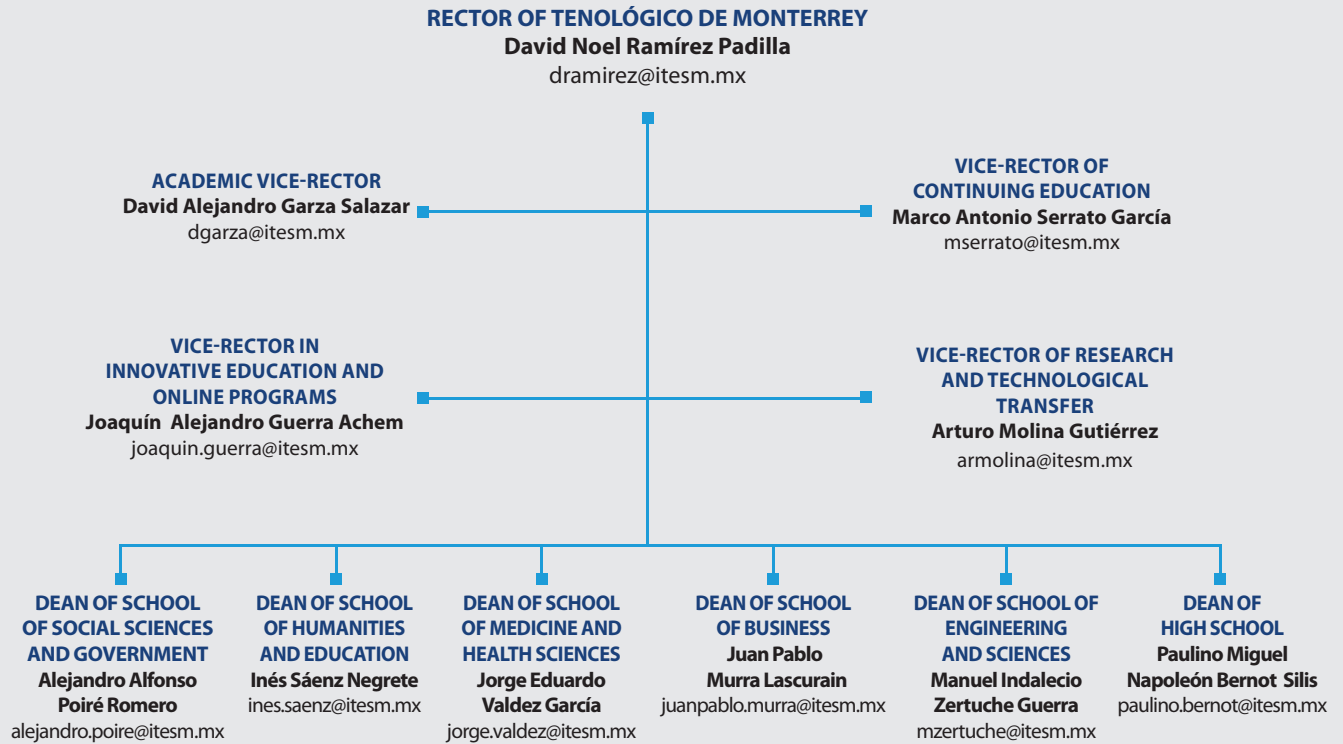
good and the transformation of our society. Thus, all the board members, directors, faculty, doctors and employees of the Tecnológico de Monterrey:

1. Acknowledge the dignity of people and treat them with respect and justice.
2. Treat everybody equally and shun discrimination in every form.
3. Act with integrity, honesty, responsibility, objectiveness, congruence and impartiality.
4. Recognize and respect intellectual property and others' merit.
5. Avoid any type of conflict of interest and, if any conflicts should arise, report them to the corresponding authorities.
6. Assume data transparency as a commitment and respect the confidentiality of issues as determined by the Institution.
7. Use resources in a responsible, austere and efficient manner.
8. Protect the environment.
9. Seek the benefit of the Institution above personal benefit.
10. Comply with the laws, regulations and policies that govern our activities at institutional, national and international levels.

As Tecnológico de Monterrey collaborators, we undertake to fulfill the guidelines contained in the Code of Ethics and make them part of our lives and daily actions.



# Organization of Tecnológico de Monterrey



## Accreditations

The national and international academic program and institutional accreditations reflect the quality of the academic services offered and are one of the means employed by Tecnológico de Monterrey to assure and enhance its academic quality, thus consolidating its leadership position in Mexico's higher education.

### Institutional Accreditations

#### a) International

Tecnológico de Monterrey is accredited by the Southern Association of Colleges and Schools (SACS COC, <http://www.sacscoc.org>) to award undergraduate, master's and doctorate degrees.

For further information on Tecnológico de Monterrey's accreditation, please contact:

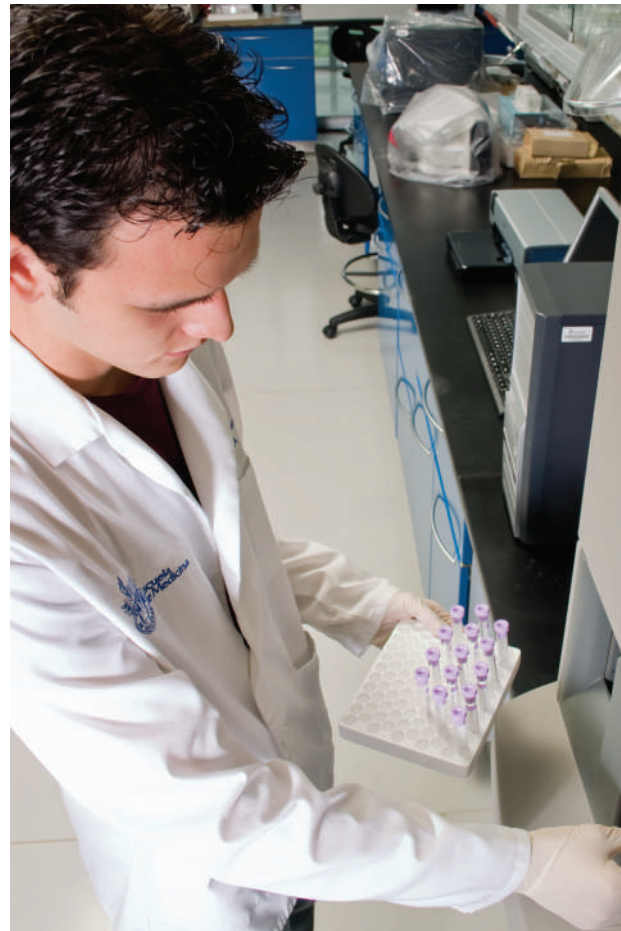
**Southern Association of Colleges and Schools**  
Comission of Colleges  
1866 Southern Lane  
Decatur, GA. 30033-4097  
Telephone: (+1) 404-679-4500

#### b) National

Tecnológico de Monterrey is accredited by the Federation of Mexican Private Higher Education Institutions (FIMPES, <http://www.fimpes.org.mx>).

For further information on Tecnológico de Monterrey's accreditation, please contact:

**Federación de Instituciones Mexicanas Particulares de Educación Superior**  
Río Guadalquivir No. 50 - 4° piso, Col. Cuauhtémoc Delegación. Cuauhtémoc. C.P. 06500 México, D.F.  
Telephone: (+52) (55) 55145514



### Program Accreditations

#### a) National

Diverse academic graduate programs of Tecnológico de Monterrey have been recognized in the National Registry of Quality Graduate Programs (PNPC), of the National Council of Science and Technology (CONACYT), and/or evaluated at Level 1 –the highest– by the Interinstitutional Committees for the Evaluation of Higher Education (CIEES).

The following tables show the graduate programs by campus that have been evaluated and/or recognized by national agencies, during 2016 year.

## Graduate Programs Recognized by PNPC or Evaluated at Level 1 by CIEES

| School                         | Program                                                      | Description                                                                                    | Agency       |
|--------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------|
| Social Sciences and Government | DCS                                                          | Ph. D. in Social Sciences                                                                      | PNPC         |
|                                | DPP                                                          | Ph. D. in Public Policy                                                                        | PNPC         |
|                                | MAP                                                          | Master in Public Administration and Public Policy                                              | PNPC         |
|                                | MPE                                                          | Master in Prospective and Strategic Studies                                                    | PNPC         |
| Humanities and Education       | MGP-V                                                        | Master in Public Management (Online Program)                                                   | CIEES        |
|                                | DEE                                                          | Ph. D. in Educational Innovation                                                               | PNPC         |
|                                | DEE-V                                                        | Ph. D. in Educational Innovation (Online Program)                                              | CIEES        |
|                                | DEH                                                          | Ph. D. in Humanistic Studies                                                                   | PNPC         |
|                                | MAD-V                                                        | Maestría en Administración de Instituciones Educativas (en línea)                              | CIEES        |
|                                | MEE-V                                                        | Master in Education (On line Program)                                                          | PNPC / CIEES |
|                                | MEH                                                          | Master in Humanistics Studies                                                                  | PNPC         |
|                                | MEH-V                                                        | Master in Humanistics Studies (Online Program)                                                 | CIEES        |
| MTE-V                          | Master in Educational Technology (Online Program)            | PNPC                                                                                           |              |
| Engineering and Sciences       | MIE                                                          | Master of Science in Energetic Engineering                                                     | PNPC         |
|                                | DBT                                                          | Ph. D. in Biotechnology                                                                        | PNPC         |
|                                | DCC                                                          | Ph. D. in Computer Sciences                                                                    | PNPC         |
|                                | DCI                                                          | Ph. D. in Engineering Sciences                                                                 | PNPC         |
|                                | ENT                                                          | Specialization in Business Services Based on Information Technology                            | PNPC         |
|                                | MBI                                                          | Master of Science in Biotechnology                                                             | PNPC         |
|                                | MCC-I                                                        | Master of Science in Computer Science                                                          | PNPC         |
|                                | MCP                                                          | Master of Science in Quality Systems and Productivity                                          | PNPC         |
|                                | MID-V                                                        | Master in Innovation for Enterprise Development (Online Program)                               | CIEES        |
|                                | MIP-V                                                        | Master in Engineering with Specialization in Quality Systems and Productivity (Online Program) | PNPC / CIEES |
|                                | MIR                                                          | Master in Automotive Engineering                                                               | PNPC         |
|                                | MIT                                                          | Master of Science in Intelligent Systems                                                       | PNPC         |
|                                | MMS                                                          | Master in Manufacturing Systems                                                                | PNPC         |
|                                | MSE-E                                                        | Master of Science in Electronic Engineering (Electronic Systems)                               | PNPC         |
|                                | MSM                                                          | Master of Science in Manufacturing Systems                                                     | PNPC         |
| MTI-V                          | Master in Information Technology Management (Online Program) | CIEES                                                                                          |              |

| School                      | Programa             | Descripción                                          | Agencia      |
|-----------------------------|----------------------|------------------------------------------------------|--------------|
| Medicine and Health Science | DCL                  | Ph. D. in Program in Clinical Sciences               | PNPC         |
|                             | RCR                  | Residency in Cardiology                              | PNPC         |
|                             | REA                  | Residency in Anesthesiology                          | PNPC         |
|                             | REC                  | Residency in General Surgery                         | PNPC         |
|                             | REE                  | Residency in Critical Care Medicine                  | PNPC         |
|                             | REG                  | Residency in Obstetrics and Gynecology               | PNPC         |
|                             | REM                  | Residency in Internal Medicine                       | PNPC         |
|                             | REN                  | Residency in Pediatrics                              | PNPC         |
|                             | REO                  | Residency in Ophthalmology                           | PNPC         |
|                             | RER                  | Residency in Radiology and Imaging                   | PNPC         |
|                             | REU                  | Residency in Neurology                               | PNPC         |
|                             | RGE                  | Residency in Geriatric                               | PNPC         |
|                             | RNE                  | Residency in Neonatology                             | PNPC         |
|                             | RNP                  | Residency in Pediatric Neurology                     | PNPC         |
|                             | RPS                  | Residency in Psychiatry                              | PNPC         |
| RUR                         | Residency in Urology | PNPC                                                 |              |
| Business                    | DCA                  | Ph. D. in Business Administration                    | PNPC         |
|                             | MAF                  | Master in Finance                                    | PNPC         |
|                             | MBA                  | Master in Business Administration                    | PNPC         |
|                             | MBA-G                | MBA in Global Business Administration and Strategy   | PNPC         |
|                             | MGN-V                | Master in Enterprise Administration (Online Program) | PNPC / CIEES |

## b) International

The Graduate School of Business Administration and Leadership (EGADE), Campus Monterrey, became the first business school in Mexico to obtain the 'triple crown' of international accreditations.

This means that the most important accrediting agencies in the world for business schools and programs, the American Association of Colleges and Schools of Business (AACSB), the UK-based Association of MBAs (AMBA), and the European Quality Improvement System (EQUIS), certify the quality of EGADE Monterrey.

The following list shows Tecnológico de Monterrey's graduate programs in business administration that have been accredited by international agencies, during 2016 year.





## Graduate Programs Accredited by International Agencies

| School   | Program | Description                                         | Agency               |
|----------|---------|-----------------------------------------------------|----------------------|
| Business | DCA     | Ph. D. in Business Administration                   | AACSB / EQUIS        |
|          | DCF     | Ph. D. in Financial Science                         | AACSB                |
|          | MAF     | Master in Finance                                   | AACSB / EQUIS        |
|          | MBA     | Master in Business Administration                   | AACSB / EQUIS / AMBA |
|          | MBA-G   | MBA in Global Business Administration and Strategy  | AACSB / EQUIS / AMBA |
|          | MBE     | Master in Business Administration Executive Program | AACSB / EQUIS / AMBA |
|          | MDE     | Master in Business Administration                   | AACSB / EQUIS / AMBA |

For further information on the accreditation of Tecnológico de Monterrey's graduate programs displayed in this table, please contact:

Association to Advance Collegiate Schools of Business (AACSB)  
777 South Harbour Island Boulevard, Suite 750  
Tampa, FL. 33602-5730  
Telephone: (+1) 813 769 6500

European Quality Improvement System (EQUIS), de la European Foundation for Management Development (EFMD).

Rue Gachard 88 - box 3. 1050  
Bruselas, Bélgica.  
Telephone: (+32) 2 629 08 10

Association of MBAs (AMBA).  
25 Hosier Lane  
London  
EC1A 9LQ  
Telephone: (+44) 0 20 7246 2657

The latest information on institutional accreditations and academic programs of Tecnológico de Monterrey is available on the institution's website: <http://www.itesm.edu>, under Nosotros- Acreditaciones.



## Campus Directory

Tecnológico de Monterrey has 26 campuses nationwide, which are listed below together with their contact information

### Aguascalientes Campus

**Campus Director:**

**Lic. Agustín Mateo Arredondo Corrales**

*agustin.mateo@itesm.mx*

Av. Eugenio Garza Sada # 1500

Aguascalientes, Aguascalientes, C.P. 20328

Teléfono: +52 (449) 910-0900

<http://www.ags.itesm.mx>

### Central de Veracruz Campus

**Campus Director:**

**Lic. Mauricio García Ballinas**

*mauricio.garcia@itesm.mx*

Av. Eugenio Garza Sada # 1

Col. Las Quintas

Córdoba, Veracruz, C.P. 94500

Teléfono: +52 (271) 717-0500

<http://www.ver.itesm.mx>

### Chiapas Campus

**Campus Director:**

**C.P. Manuel de Jesús Villalobos García**

*mvillalobos@itesm.mx*

Carretera Tapanatepec Km. 149 + 746

Col. Juan Crispín

Tuxtla Gutiérrez, Chiapas, C.P. 29020

Teléfono: +52 (961) 617-6000

<http://www.chs.itesm.mx>

### Chihuahua Campus

**Campus Director:**

**Dr. Rodolfo Julio Castillo Zetina**

*rodolfo.castello@itesm.mx*

Av. Heróico Colegio Militar # 4700

Col. Nombre de Dios

Chihuahua, Chihuahua., C.P. 31300

Teléfono: +52 (614) 439 5000

<http://www.chi.itesm.mx>

### México City Campus

**Vice President and Campus Director:**

**Dr. Pedro Luis Grasa Soler**

*grasa@itesm.mx*

Calle del Puente # 222, esq. Periférico Sur

Col. Ejidos de Huipulco, Delegación Tlalpan

México, D.F., C.P. 14380

Teléfono: +52 (55) 5483-2020

<http://www.ccm.itesm.mx>

### Ciudad Juárez Campus

**Campus Director:**

**Arq. Carlos Bejos Acevo**

*cbejos@itesm.mx*

Blvd. Tomás Fernández Campos # 8945

Parque Industrial Antonio J. Bermúdez

Ciudad Juárez, Chihuahua, C.P. 32470

Teléfono: +52 (656) 629-9100

<http://www.cdj.itesm.mx>

### Ciudad Obregón Campus

**Campus Director:**

**Master Claudia Margarita Félix Sandoval**

*c.felix@itesm.mx*

California # 2100 Nte.

Col. Obregón Norte

Ciudad Obregón, Sonora, C.P. 85010

Teléfono: +52 (644) 410-5700

<http://www.cob.itesm.mx>

### Cuernavaca Campus

**Campus Director:**

**Dr. José Carlos Miranda Valenzuela**

*jmiranda@itesm.mx*

Autopista del Sol Km 104

Col. Real del Puente

Xochitepec, Morelos, C.P. 62790

Teléfono: +52 (777) 362 0800

<http://www.cva.itesm.mx>

**Estado de México Campus****Vice President and Campus Director:****Dr. Pedro Luis Grasa Soler***grasa@itesm.mx*

Carretera Lago de Guadalupe Km. 3.5

Atizapán de Zaragoza, Estado de México, C.P. 52926

Teléfono: +52 (55) 5864-5555

<http://www.cem.itesm.mx>**Guadalajara Campus****Vice President and Campus Director:****Dr. Mario Adrián Flores Castro***adrian.flores@itesm.mx*

Ave. Gral. Ramón Corona # 2514

Col. Nuevo México, Zapopan, Jalisco, C.P. 45201

Teléfono: +52 (33) 3669-3000

<http://www.gda.itesm.mx>**Hidalgo Campus****Campus Director:****C.P. Claudia Gallegos Cesaretti***cgallego@itesm.mx*

Blvd. Felipe Ángeles # 2003, Col. Venta Prieta

Pachuca, Hidalgo, C.P. 42080

Teléfono: +52 (771) 717-02-14

<http://www.hgo.itesm.mx>**Irapuato Campus****Campus Director:****Ing. Javier Benavides Ornelas***javier.benavides@itesm.mx*

Paseo Mirador del Valle # 445, Col. Villas de Irapuato

Irapuato, Guanajuato, C.P. 36670

Teléfono: +52 (462) 606-8000

<http://www.ira.itesm.mx>**Laguna Campus****Campus Director:****Ing. Martín López Méndez***lopezmendez@itesm.mx*

Paseo del Tecnológico # 751

Col. Ampliación la Rosita

Torreón, Coahuila, C.P. 27250

Teléfono: +52 (871) 729-6363

<http://www.lag.itesm.mx>**León Campus****Campus Director:****Dr. Isaac Lucatero Castañeda***isaac.lucatero@itesm.mx*

Av. Eugenio Garza Sada S/N

Col. Cerro Gordo

León, Guanajuato, C.P. 37190

Teléfono: +52 (477) 710-9000

<http://www.leo.itesm.mx>**Monterrey Campus****Campus Director:****Ing. Víctor Eduardo Gutiérrez Aladro***victor.gutierrez@itesm.mx*

Av. Eugenio Garza Sada #2501 Sur

Col. Tecnológico

Monterrey, Nuevo León, C.P. 64849

Teléfono: +52 (81) 8358-2000

<http://www.mty.itesm.mx>**Morelia Campus****Campus Director:****Dr. Edgar Montalvo Escamilla***edgar.montalvo@itesm.mx*

Camino a Jesús del Monte S/N

Col. Jesús del Monte

Morelia, Michoacán, C.P. 58350

Teléfono: +52 (443) 322-6800

<http://www.cmr.itesm.mx>**Puebla Campus****Campus Director:****Ing. Rashid Abella Yunes***rabella@itesm.mx*

Vía Atlixcayotl # 2301

Col. San Andrés, Cholula, Puebla, C.P. 72800

Teléfono: +52 (222) 303-2000

<http://www.pue.itesm.mx/>**Querétaro Campus****Campus Director:****Ing. Romeo Salvador Coutiño Audiffred***scoutino@itesm.mx*

Av. Epigmenio González # 500

Fraccionamiento San Pablo

Querétaro, Querétaro, C.P. 76130

Teléfono: +52 (442) 238-3100

<http://www.qro.itesm.mx>

**Saltillo Campus****Campus Director:****Lic. Angelberto Guardado Astorga***aguardad@itesm.mx*

Prol. Juan de la Barrera # 1241 Ote.

Col. Cumbres

Saltillo, Coahuila, C.P. 25270

Teléfono: +52 (844) 411-8000

<http://www.sal.itesm.mx>**San Luis Potosí Campus****Campus Director:****Dr. Héctor Morelos Borja***hmorelos@itesm.mx*

Av. Eugenio Garza Sada # 300

Fracc. Lomas del Tecnológico

San Luis Potosí, San Luis Potosí, C.P. 78211

Teléfono: +52 (444) 834-1000

<http://www.slp.itesm.mx>**Santa Fe Campus****Campus Director:****Dr. Pedro Luis Grasa Soler***grasa@itesm.mx*

Ave. Carlos Lazo # 100

Col. Lomas de Santa Fe,

Delegación Álvaro Obregón

México, D.F., C.P.01389

Teléfono: +52 (55) 9177-8000

<http://www.csf.itesm.mx>**Sinaloa Campus****Campus Director:****Ing. Isidro Cavazos de León***icavazos@itesm.mx*

Blvd. Pedro Infante # 3773 Pte.

Culiacán, Sinaloa, C.P. 80100

Teléfono: +52 (667) 759-1600

<http://www.sin.itesm.mx>**Sonora Norte Campus****Campus Director:****Dr. Francisco Javier Quezada Andrade***jquezada@itesm.mx*

Blvd. Enrique Mazón López # 965

Hermosillo, Sonora, C.P. 83000

Teléfono: +52 (662) 259-1000

<http://www.her.itesm.mx>**Tampico Campus****Campus Director:****Ing. Marco Edgar Vargas Herrada***marco.vargas@itesm.mx*

Blvd. Petrocel Km. 1.3 Puerto Industrial

Altamira, Tamaulipas, C.P. 89600

Teléfono: +52 (833) 229-1600

<http://www.tam.itesm.mx>**Toluca Campus****Campus Director:****Ing. Juan Carlos Arreola Rivas***juan.carlos.arreola@itesm.mx*

Eduardo Monroy Cárdenas # 2000

San Antonio Buenavista

Toluca, Estado de México, C.P. 50110

Teléfono: +52 (722) 279-9990

<http://www.tol.itesm.mx>**Zacatecas Campus****Campus Director:****Ing. Miguel Angel Burgoin Carrera***miguel.burgoin@itesm.mx*

Ave. Pedro Coronel # 16

Col. Dependencias Federales

Guadalupe, Zacatecas, C.P. 98600

Teléfono: +52 (492) 925-6820

<http://www.zac.itesm.mx>

## Educational Model TEC21

The educational model of Tecnológico de Monterrey comprises a set of structured components through which the institution fulfills its students' educational goals. It integrates the aims of the institutional Vision and the values it promotes, the pedagogical practices that make it operational, and the supporting mechanisms and resources.

### Characteristics of the Educational Model

- Academic content that encompasses an education in science, technology, humanism, ethics and citizenship.
- Use of teaching techniques that provide a practical approach to our students' education and offer them the opportunity to analyze and propose answers to complex real-world and work-environment problems. These techniques include: Collaborative Learning, Problem-based Learning, Project-oriented Learning, Case Method, Service Learning and Research-based Learning.
- Development of our students' capacity for self-directed research and learning, as a result of their active participation in the educational process. This will enable them to keep up-to-date throughout their professional lives.
- Use of the most advanced information technologies as learning support tools.
- A comprehensive educational approach complemented by co-curricular activities in student leadership, cultural diffusion and physical education.

Through the Educational Model Initiative Tec 21, our educational model adapts to the times, fulfilling its purpose of driving the skills of current generations, in order to educate leaders with an entrepreneurial spirit, ethics and citizenship and who are internationally competitive. This will enable our students to face up to the challenges of a world that has yet to be invented.

### Characteristics that Enrich Our Educational Model



**Faculty** who are innovative and up-to-date in their discipline, have experience in their professional practice (liaison) and incorporate technology in the teaching-learning process.

**Challenging, interactive learning experiences** in the new educational spaces.



**Flexibility** in how, when and where the teaching-learning process takes place.

The following is a description of the characteristics of the diverse programs through which Tecnológico de Monterrey educates its students; the academic processes that form the framework of their personal and professional development; the resources that support and facilitate these processes; and the quality assurance schemes for the Institution's overall academic operations.



## Student Learning Development Process

The main characteristic of Tecnológico de Monterrey's educational process is the active role played by students in their own education. By becoming actively involved in this process, students develop the capacity for self-directed learning, which is indispensable for innovating and staying up to date throughout their professional lives. Moreover, while studying at the Institution, students develop a series of personal competencies that enable them to attain a comprehensive education. The following is a list of the main elements that distinguish Tecnológico de Monterrey's educational process:

### ◆ Active Learning

The environment at Tecnológico de Monterrey is designed to offer students multiple opportunities to participate actively in their professional and personal preparation process. Through the institution-wide use of diverse teaching techniques, such as problem-based learning, project-oriented learning, collaborative learning, service-learning,

case method and research-based learning, among others, students play a purposeful, structured role in the construction of their knowledge and the development of the competencies described in the graduate profile and the Mission. In this context, students can discover, process and apply knowledge in a relevant, significant way both inside and outside the classroom.

### ◆ Self-regulated Learning

A key objective of Tecnológico de Monterrey's learning model is for students to develop the skills needed to achieve lifelong learning. Therefore, in their courses, they repeatedly face challenging, highly academically demanding educational situations, which motivate them to gradually develop the capacity to regulate their learning, setting goals and reflecting on their achievements.

Throughout this process, the students are constantly guided and supported by their teachers, as well as by the huge range of physical, technological and human resources offered by the Institution.



### ◆ Comprehensive Education

Comprehensive education is based on the idea of developing in students the diverse human dimensions. With this aim, the educational model contemplates the development of competencies for reflecting on, analyzing and evaluating the social, economic, political and ecological reality, from both personal and professional perspectives; respect for others and for the environment; and acting with solidarity and responsibility to enhance the quality of life of the country and the world. Tecnológico de Monterrey's comprehensive education is built on its academic programs, cross-curriculum strategies and a variety of co-curricular activities.

### ◆ Teaching Techniques

Just as the greatest care is employed when designing the programs' curricula and selecting the content, Tecnológico de Monterrey's academic activity is characterized by the use of teaching techniques that add a practical and professional approach to the students' academic training, while developing their personal competencies. Although techniques to support teaching have always been used at Tecnológico de Monterrey, the Institution formalized a faculty training program in this area to strengthen the implementation of its educational model and strongly promote its application in each of the courses offered.

There are many teaching techniques and just as many ways of classifying them. In the same way, at institutional level, the faculty select the techniques that they consider to be the most appropriate for their teaching objectives. The most commonly used techniques are:

- Collaborative Learning
- Problem-based Learning
- Project-oriented Learning
- Case Method
- Service-Learning
- Research-based Learning



### ◆ The Professor as a Learning Facilitator and Guide

The faculty profile underscores their outstanding preparation within their professional fields, as well as the intensive teacher training fomented by the Institution that enables the professors to design and guide carefully structured teaching processes in which students will achieve the maximum benefit of their participation.

### Internationalization

Students' academic preparation is broadened with internationalization experiences that enrich their academic life by offering a more global insight.

The internationalization component helps students to enrich their academic life with more global experiences, through academic, cultural and linguistic exchange, and also to take a major step towards achieving personal maturity.

Students are offered the internationalization experience through:

- Participation in academic experiences in prestigious overseas universities and academic institutions for periods of two semesters, one semester, intensive courses or a specific academic trip.

- Socializing with and meeting students from other countries who are studying at one of Tecnológico de Monterrey's campuses.
- Attendance at conferences offered by qualified scholars from foreign universities who have been invited as visiting professors to Tecnológico de Monterrey or who participate in online courses.
- Participation in projects conducted in association with groups of students from foreign universities through the facilities offered online.

## Resources and Media

### ◆ Information and Communication Technologies

In an era of major advancements in the development and use of information and communication technologies, Tecnológico de Monterrey promotes their use with the twofold aim of bringing students into contact with these tools, as a competitive advantage in their professional education and, at the same time, making the most of all the support resources available to enrich the teaching-learning process.

### ◆ Tecnológico de Monterrey Library Network

In order to support the learning, research and social development activities in which students and faculty participate, Tecnológico de Monterrey has a solid collection of printed and digital information resources made available through the 32 libraries distributed in each of its campuses and a Digital Library.

As a result of the collection development program, the Tecnológico de Monterrey Library Network collection continued to be enriched during 2016 through the acquisition of 313,883 volumes (41,765 physical and 272,118 digital), reaching a

total printed and digital bibliographic collection of 4.3 million volumes— 2,894,385 physical and 1,411,911 digital – available for the academic community. The collection includes books, eBooks, encyclopedias, discs, videos, magazines and journals that cover all the areas of knowledge in which Tecnológico de Monterrey offers academic programs. Moreover, in this year, the libraries dealt with a total of 495,770, physical book loan requests, while, through the Digital Library (biblioteca.itesm.mx), an average of 2.2 million searches were completed every month in the electronic information resources.

### ◆ Vice Rectory in Innovative Education and Online Programs

Tecnológico de Monterrey offers graduate, continuing education and social development programs in Mexico and some Latin American countries, using innovative educational models, learning networks and advanced information technologies, to contribute to the integration and development of Spanish-speaking communities.

The courses on line respond to diverse market needs. Faculty members who are experts in their fields, assisted by a team of instructional design and technology specialists, are in charge of developing these courses. Moreover, the faculty is supported by a team of tutors to manage the students' learning process.

The variety of services on line spans undergraduate courses to online literacy programs for the members of the most underprivileged communities in the country, as well as a wide range of master's degrees and continuing education programs. It also offers teacher training programs for both Tecnológico de Monterrey professors and those from other educational systems in Mexico and at least ten other Latin American countries.



### ◆ Student Life

Tecnológico de Monterrey, in its endeavor to promote the development and comprehensive education of its students, offers diverse programs, courses, workshops and student groups that provide spaces for the development of competencies, such as leadership, self-confidence, ethics and citizenship. These competencies help students to fulfill their personal and professional goals.

The formal student-life actions include sports, cultural and student leadership activities, together with prevention and psycho-pedagogic counseling, which are offered through the healthy environment promotion program.

For further information about student life at Tecnológico de Monterrey, visit: <http://dae.itesm.mx/>.

### ◆ Vocational Guidance

El Tecnológico de Monterrey ofrece, a quien lo solicite, el servicio de orientación vocacional dirigido por especialistas expertos en los campus. El objetivo de este servicio es proporcionar a los alumnos de preparatoria y de licenciatura herramientas para la toma de decisiones respecto a su plan de vida y carrera; ya sea para elegir la carrera que van a estudiar, para decidir si desean cambiar de carrera o en el caso de que tengan dudas de permanecer estudiando. En este espacio se realizan pruebas que permiten identificar las habilidades, intereses y características de la personalidad que coincidan con los perfiles profesionales de las diferentes carreras y que son elementos importantes en dicha toma de decisiones.

### ◆ Dormitories

In order to provide a comprehensive service, the Guadalajara, Monterrey, Puebla and Querétaro campuses offer dormitories that promote integration and participation in co-curricular activities, such as excursions, tournaments and trips, as well as the possibility of socializing with people from other parts of the world.



# Academic Policies and Academic Regulations

## Admissions

Tecnológico de Monterrey's admissions process focuses on selecting young people who have the potential to become internationally competitive leaders with a spirit of entrepreneurship and a sense of humanity, as well as the clear capacity and enthusiasm to enrich the academic and student life of the Tecnológico community. As a selective institution, every year there are more student applications than available places.

The Admission Committee is responsible for reviewing the profiles and academic records, since its members assign the admissions decisions through a comprehensive process of selection criteria, as follows:

- Application for admission
- Result of the Academic Aptitude Test
- Prior academic history
- Curriculum (academic, leadership, sports, cultural, personal accomplishments, etc.)
- Essay (which reflects the applicants' personal interests and displays their enthusiasm for belonging to our community)
- Letters of recommendation
- Result of the TOEFL or an alternative English language proficiency test
- Interview

For further details on the undergraduate admissions process, visit the Tecnológico de Monterrey website at <https://tec.mx>.

## Credit Transfer

The credit transfer and equivalence agreements for students enrolled in Tecnológico de Monterrey with partial studies in an academic period, completed at another educational institution, are issued by the Mexican Department of Education based on a proposal made for each particular case by Tecnológico de Monterrey.

Credit transfer applications must be completed during the admissions process for the selected undergraduate degree through the Credit and Credit Transfer Office of the corresponding campus.

The deadline for requesting credit transfer corresponds to the date specified to request a change of courses during the students' first semester at our institution.

## Evaluation and Continuance

Tecnológico de Monterrey considers that from 48 to 60 units per semester is an adequate academic load. It structures its curricula and enrollment rules around these figures.

The evaluation of the students' performance in each of their courses is carried out through partial evaluations and a final evaluation. The final evaluation is compulsory.

Grades are expressed in whole numbers, on a scale of one to one hundred. The minimum pass grade is seventy.

Regarding continuance at Tecnológico de Monterrey, the students with Academic Support standing will face permanent dismissal for unsatisfactory academic performance if:

1. They fail one or more courses from the curriculum of the specialization in which they are enrolled (or 16% or more of the total work required by the curriculum), or fail two or more courses from the curriculum of the master's degree, medical residency or doctorate in which they are enrolled.
2. Obtain final grades lower than seventy-five in two or more classes (or the equivalent) in the specialization curriculum in which they are enrolled (or in 32% or more of the total work

required by the curriculum), or in three or more classes in the case of master's, medical residency or doctoral programs.

These subsections do not take into consideration students' final grades in remedial classes.

## General Student Rules and Regulations

Since its foundation, Tecnológico de Monterrey defined the regulations that would guide its students regarding academic expectations and their conduct inside and outside the classroom.

The Institution, committed to its academic quality, informs the students and the community of the regulations that govern it within the framework of the principles and values stated in the Mission.

The General Student Rules and Regulations can be consulted at the official web site.

## Educational Support and Scholarships

In general, the types of educational support and scholarships offered by Tecnológico de Monterrey, applicable to Mexican students, are:

**Academic scholarship.** The aim of this scholarship is to attract academically outstanding students to study a graduate program.

For professionalizing master's programs, the maximum aid offered is 30% of tuition fees. In the case of science graduate programs, this type of aid covers 100% of tuition and is known as an Academic Talent Scholarship.

**Academic excellence scholarship.** The aim of this scholarship is to attract academically outstanding students who have completed an undergraduate degree at Tecnológico de Monterrey. This type of aid covers 100% of tuition.

**Online program scholarship.** The aim of this scholarship is to support academically talented students who wish to study an online master's program. The maximum aid offered is 40% of tuition fees.

**External-fund scholarship.** The aim of this scholarship is to give students the opportunity to gain experience in their field of study, linking them to strategic areas of industry and the private and public sectors, or preparing them to be future researchers by including them in an externally funded project run by a research professor. This financial aid covers a percentage of tuition, maintenance or major medical insurance.

## Fee Refunds

Students who withdraw from the courses in which they are enrolled will be refunded a percentage of the total corresponding fees in accordance with the cost of the program and the established policies, which are published on the official Tecnológico de Monterrey website (<https://tec.mx>).





## Research

For Tecnológico de Monterrey, research is a strategic activity that promotes the generation of innovative solutions for the economic, social and environmental development of Mexico. Tecnológico de Monterrey, committed to scientific and applied research oriented toward adding value to society, focuses its human, material and financial resources on priority areas, in order to drive companies' competitiveness, regional progress, the growth of technology-based businesses and its own educational model.

One of the objectives of research is to identify strategic industrial sectors in the regions of the country in which the Institution's campuses are located.

Tecnológico de Monterrey has decided to center its scientific activity on eight strategic research areas in order to foster innovation, knowledge generation and knowledge transfer, endeavoring to solve problems in Mexico and across the world. These eight strategic areas are:

### Strategic Focus Area:

I. Biotechnology

II. Mechatronics

III. Information Technologies, Electronics and communications

IV. Sustainable Technologies

V. Public Policy

VI. Business

VII. Medicine

### Transversal Area:

VIII. Education, Humanities and Social Science

The strategic focus of research in these areas seeks to:

- Accelerate the preparation of leading research professors in state-of-the-art topics.

- Access to cutting-edge knowledge through strategic ties with the top universities.
- Educate human capital in strategic areas through world-class academic programs.
- Help Mexican companies to become leaders in research, technology development and innovation.
- Develop technological solutions that will transform strategic sectors.

In order to fulfill these scientific objectives, the institution has created 38 strategic groups that support the academic and research activities of the Schools and of the research-oriented academic programs.

These groups engage in generating knowledge at the forefront of their discipline, taking into consideration global technological and social mega-trends. Each group is made up of a worldwide leader in the discipline, a national-level leader and research professors from the different schools. Doctoral students, postdoctoral researchers, master's students and undergraduate students also participate.

The 38 focus groups enjoy the participation of 59 international and national leaders, 386 professors, 481 doctoral students and 59 postdoctoral researchers.

In addition to these focus groups, there are four strategic initiatives: Nanotechnology, Energy, Education and Entrepreneurship. The leading educational institutions in the world participate in these initiatives, in which research is conducted across the diverse schools and strategic focus groups.

Research efforts concentrate on activities such as: generating innovative entrepreneurship models and systems; managing and incubating technology-based companies; and enhancing graduate programs with the support groups of researchers and research centers.

Research that transforms lives is one of the seven Strategic Initiatives of the Tecnológico de Monterrey, Plan 2020 and is the mainspring of innovative solutions for the economic, social and sustainable development of Mexico. An example of this consists of the projects that are transforming Mexico, developed by the Institution's researchers in the areas of education, engineering, social development, medicine, nanotechnology and security, in their endeavor to transform scientific knowledge into innovative solutions that benefit society, enhancing and transforming people's everyday lives. The multidisciplinary teams, on which researchers of all levels collaborate, work in alliance with national and foreign institutions.

Of the more than 1,100 faculty members who teach the master's and doctoral students at Tecnológico de Monterrey, 468 are research professors who belong to the National System of Researchers (SNI). The aim of this system is to recognize the work of people who are dedicated to producing scientific and technological knowledge in Mexico by appointing them as "National Researchers", which symbolizes the quality and prestige of their scientific contributions.

The institution offers 12 doctoral programs, 22 master's programs, 6 specializations and 16 medical residencies, 67% of which have been awarded accreditation by the National Program for Quality Graduate Studies (PNPC) of the National Council of Science and Technology (CONACyT). In addition, the 16 medical specializations have been endorsed and approved by the Inter-institutional Commission for the Education of Human Resources in Healthcare, of the Mexican Department of Health (CIFRHS).

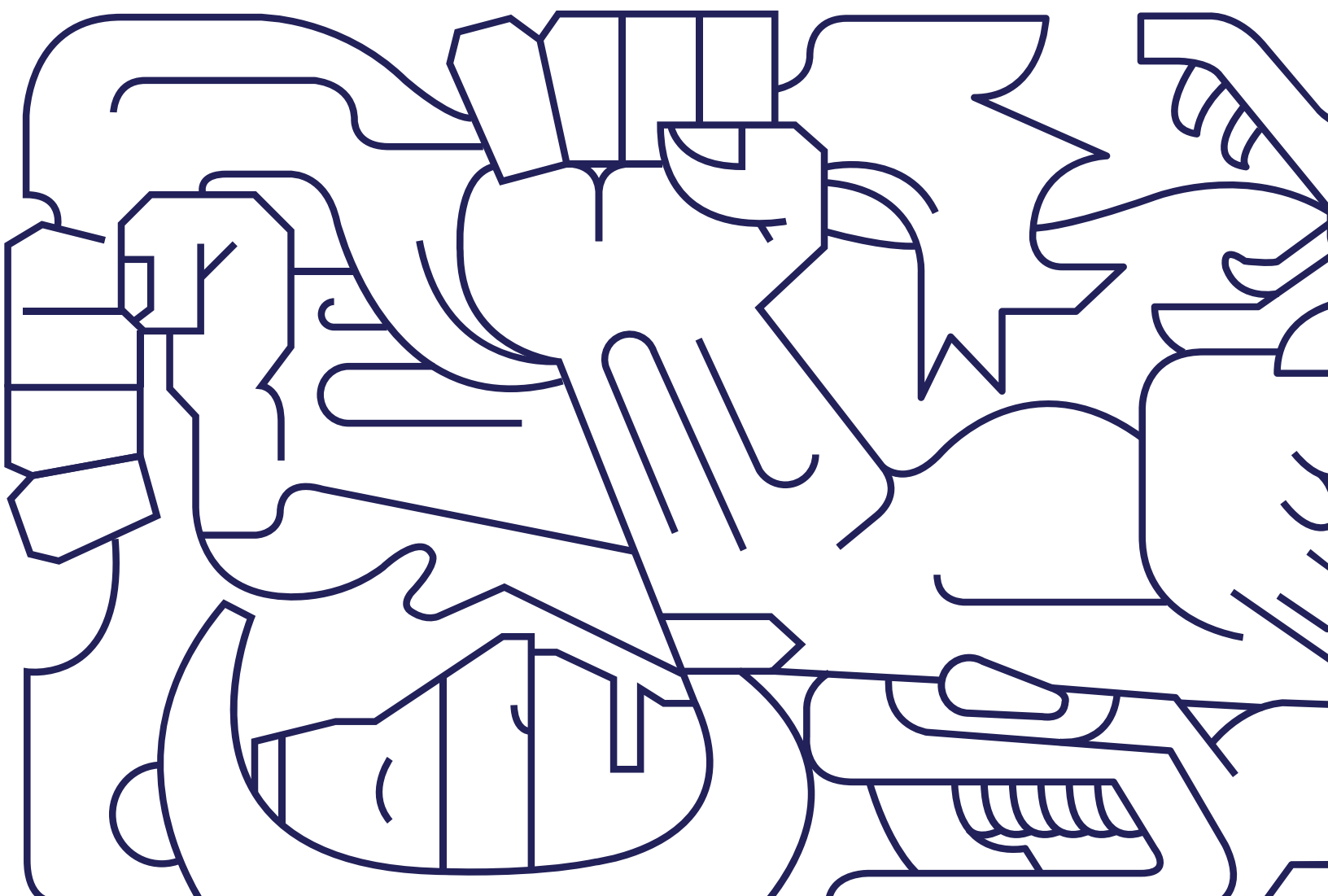
In the second period of 2016, enrollment was: 434 doctoral students, 126 specialization students, 271 medical residency students, and 7,164 face-to-face and online master's students. Approximately 1,000 graduate students enjoy a maintenance grant awarded by the National Council for Science and Technology (CONACyT).

The researchers, together with the students who participate in research projects, strengthen the Patent Program which, between 2006 and 2016, accumulated 333 patent applications in Mexico and 443 in Mexico, the United States, the European Union, Asia and the PCT. A total of 112 patents were awarded in America, 4 in the European Union and 4 in Asia. From 2006 through 2013, Tecnológico de Monterrey was the Mexican educational institution with the most patent applications per year. The Incubation Cell program has support about 30 entrepreneurship projects, 15 of which have been constituted as Technology-based Companies (Spinoffs). Tecnológico de Monterrey has 23 licensed patents and 1 franchise.

In short, research at Tecnológico de Monterrey fosters our students' learning process, supports the intellectual activities of our faculty, and generates the knowledge and innovative solutions that society demands.

As an example of the impact of these activities on our graduates, in 2016 Tecnológico de Monterrey was ranked first in Latin America and 40th worldwide on the Graduate Employability Ranking, of the British university ranking company Quacquarelli Symonds (QS), and was awarded the Gold Prize at the QS-Wharton Reimagine Education Congress for its unique research and entrepreneurship model for driving employability. Tecnológico de Monterrey is also the only university in Mexico and Latin America ranked as a 5-Star world-class university by the same British agency, QS, and is also recognized in the Employability Ranking published by the Times Higher Education, positioned in first place in Mexico.





## II. CURRICULA





## Master's Programs Offered by Each Campus Part 1

| Campus/Program          | School of Social Sciences and Government |          |          |          |          | School of Humanities and Education |          |          |          |          | TOTAL |
|-------------------------|------------------------------------------|----------|----------|----------|----------|------------------------------------|----------|----------|----------|----------|-------|
|                         | MAP                                      | MDI      | MGP-V    | MPE      | MPJ      | MEE-V                              | MEH      | MEH-V    | MGD-V    | MTE-V    |       |
| Ciudad de México        |                                          |          |          |          |          |                                    | X        |          |          |          | 1     |
| Ciudad de México - EGTP | X                                        |          |          |          |          |                                    |          |          |          |          | 1     |
| Monterrey               |                                          |          |          |          |          |                                    | X        |          |          |          | 1     |
| Monterrey - EGTP        | X                                        | X        |          | X        | X        |                                    |          |          |          |          | 4     |
| Programa en Línea       |                                          |          | X        |          |          | X                                  |          | X        | X        | X        | 5     |
| Santa Fe - EGTP         | X                                        | X        |          |          |          |                                    |          |          |          |          | 2     |
| <b>TOTAL</b>            | <b>3</b>                                 | <b>2</b> | <b>1</b> | <b>1</b> | <b>1</b> | <b>1</b>                           | <b>2</b> | <b>1</b> | <b>1</b> | <b>1</b> |       |

| Campus/Program    | School of Engineering and Sciences |          |          |          |          |          |          |          |          |          | TOTAL |
|-------------------|------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------|
|                   | Engineering                        |          |          |          |          |          |          |          |          |          |       |
|                   | MBI                                | MCI      | MEM      | MER-V    | MID-V    | MIE      | MIP-V    | MIR      | MNT      | MSM      |       |
| Ciudad de México  |                                    | X        |          |          |          |          |          |          |          |          | 1     |
| Estado de México  |                                    |          | X        |          |          |          |          |          | X        |          | 2     |
| Guadalajara       |                                    |          | X        |          |          |          |          |          |          |          | 1     |
| Monterrey         | X                                  | X        | X        |          |          | X        |          |          | X        | X        | 5     |
| Programa en Línea |                                    |          |          | X        | X        |          | X        |          |          |          | 4     |
| Puebla            |                                    |          |          |          |          |          |          |          |          |          | 0     |
| Querétaro         |                                    |          |          |          |          |          |          | X        |          |          | 1     |
| Santa Fe - EGTP   |                                    |          |          |          |          |          |          |          |          |          | 0     |
| Toluca            |                                    |          |          |          |          |          |          | X        |          |          | 1     |
| <b>TOTAL</b>      | <b>1</b>                           | <b>2</b> | <b>3</b> | <b>1</b> | <b>1</b> | <b>1</b> | <b>1</b> | <b>2</b> | <b>2</b> | <b>1</b> |       |

| Campus/Program       | School of Engineering and Sciences     |          |          |          |          | School of Medicine and Health Science | TOTAL |
|----------------------|----------------------------------------|----------|----------|----------|----------|---------------------------------------|-------|
|                      | Information Technology and Electronics |          |          |          |          |                                       |       |
|                      | MCC                                    | MCC-I    | MSE-E    | MTI-I    | MTI-V    | MBC                                   |       |
| Ciudad de México     |                                        | X        |          |          |          |                                       | 1     |
| Estado de México     | X                                      |          |          |          |          |                                       | 1     |
| Monterrey            | X                                      |          | X        |          |          |                                       | 2     |
| Programa en Línea    |                                        |          |          | X        | X        |                                       | 2     |
| Sede EGADE Monterrey |                                        |          |          |          |          | X                                     | 1     |
| Sede EGADE Santa Fe  |                                        | X        |          |          |          |                                       | 1     |
| <b>TOTAL</b>         | <b>2</b>                               | <b>2</b> | <b>1</b> | <b>1</b> | <b>1</b> | <b>1</b>                              |       |

The "x" means that the career's offered complete in that Campus. A number means that the career's offered in the Campus up to the semester that the number indicates. Its content reflects the information available in official media as of April 2017.

## Master's Programs Offered by Each Campus Part 2

| Campus/Program       | School of Business |          |          |          |          |          |          |       | TOTAL |
|----------------------|--------------------|----------|----------|----------|----------|----------|----------|-------|-------|
|                      | MAF                | MAF-V    | MBA      | MBA-G    | MBA-I    | MBE      | MDE      | MGN-V |       |
| Estado de México     |                    |          |          |          |          |          | X        |       | 1     |
| Guadalajara          |                    | X        |          |          |          | X        | X        |       | 3     |
| Monterrey            |                    |          | X        |          | X        |          | X        |       | 3     |
| Programa en Línea    | X                  |          |          |          |          |          |          |       | 1     |
| Sede EGADE Monterrey |                    | X        | X        |          |          |          |          |       | 2     |
| Sede EGADE Santa Fe  |                    | X        |          | X        |          |          |          |       | 2     |
| <b>TOTAL</b>         | <b>1</b>           | <b>3</b> | <b>2</b> | <b>1</b> | <b>1</b> | <b>1</b> | <b>3</b> |       |       |

## Specialization Programs Offered by Each Campus

| Campus/Program       | School of Engineering and Sciences |          |                                        | School of Business | TOTAL |
|----------------------|------------------------------------|----------|----------------------------------------|--------------------|-------|
|                      | Engineering                        |          | Information Technology and Electronics |                    |       |
|                      | ELS                                | EPY      | EIS                                    | EAE                |       |
| Ciudad de México     | X                                  | X        | X                                      |                    | 3     |
| Estado de México     | X                                  | X        | X                                      |                    | 3     |
| Santa Fe             | X                                  | X        | X                                      |                    | 3     |
| Sede EGADE Monterrey |                                    |          |                                        | X                  | 1     |
| Sede EGADE Santa Fe  |                                    |          |                                        | X                  | 1     |
| Toluca               | X                                  | X        | X                                      |                    | 3     |
| <b>TOTAL</b>         | <b>4</b>                           | <b>4</b> | <b>4</b>                               | <b>2</b>           |       |

The "x" means that the career's offered complete in that Campus. A number means that the career's offered in the Campus up to the semester that the number indicates. Its content reflects the information available in official media as of April 2017.

## Doctoral Programs Offered by Each Campus

| Campus/Programa  | School of Social Sciences and Government |     | School of Humanities and Education |     | School of Engineering and Sciences |     |     | TOTAL |
|------------------|------------------------------------------|-----|------------------------------------|-----|------------------------------------|-----|-----|-------|
|                  | DCS                                      | DPP | DEE                                | DEH | Engineering                        |     |     |       |
|                  |                                          |     |                                    |     | DBT                                | DCI | DNT |       |
| Ciudad de México |                                          |     |                                    | X   |                                    | X   |     | 2     |
| Estado de México |                                          |     |                                    |     |                                    | X   | X   | 2     |
| Monterrey        | X                                        |     | X                                  | X   | X                                  | X   | X   | 6     |
| Monterrey - EGTP |                                          | X   |                                    |     |                                    |     |     | 1     |
| Santa Fe - EGTP  |                                          | X   |                                    |     |                                    |     |     | 1     |
| <b>TOTAL</b>     | 1                                        | 2   | 1                                  | 2   | 1                                  | 3   | 2   |       |

| Campus/<br>Programa            | School of Engineering and Sciences        |     | School of<br>Medicine and<br>Health Science | School of Business |     | TOTAL |
|--------------------------------|-------------------------------------------|-----|---------------------------------------------|--------------------|-----|-------|
|                                | Information Technology<br>and Electronics |     |                                             | DCA                | DCF |       |
|                                | DCC                                       | DBC | DCL                                         |                    |     |       |
| Ciudad de México               |                                           |     |                                             |                    | X   | 1     |
| Estado de México               | X                                         |     |                                             |                    |     | 1     |
| Monterrey                      | X                                         | X   | X                                           |                    |     | 3     |
| Sede EGADE<br>Ciudad de México |                                           |     |                                             | X                  | X   | 2     |
| Sede EGADE<br>Monterrey        |                                           |     |                                             | X                  |     | 1     |
| <b>TOTAL</b>                   | 2                                         | 1   | 1                                           | 2                  | 2   |       |

**Campus Monterrey offers all Residency Programs**



## Profiles and Curricula of the Graduate Programs

This section contains the graduate curricula offered by Tecnológico de Monterrey.

Information on these programs and the description of the courses they include are also available at: <https://tec.mx>

Tecnológico de Monterrey reserves the right to change the programs described in this document.

The course descriptions are presented by academic discipline. The letters in the course codes indicate the discipline associated to the course and can be used to locate the description of the courses in the corresponding section of this document.

| Course code | Course              | C – L – U  |
|-------------|---------------------|------------|
| BT5006      | Genetic Engineering | 3 – 0 – 12 |

The letters of the code indicate the discipline to which the course belongs. In the example, the letters BT indicate that the course corresponds to the discipline Biotechnology. All the courses of a curriculum are described in the section Course Content by Academic Discipline.

The letter “C” indicates the number of class hours per week.

The letter “L” indicates the number of laboratory or activity hours per week.

The letter “U” indicates the number of total academic units per week of the course.

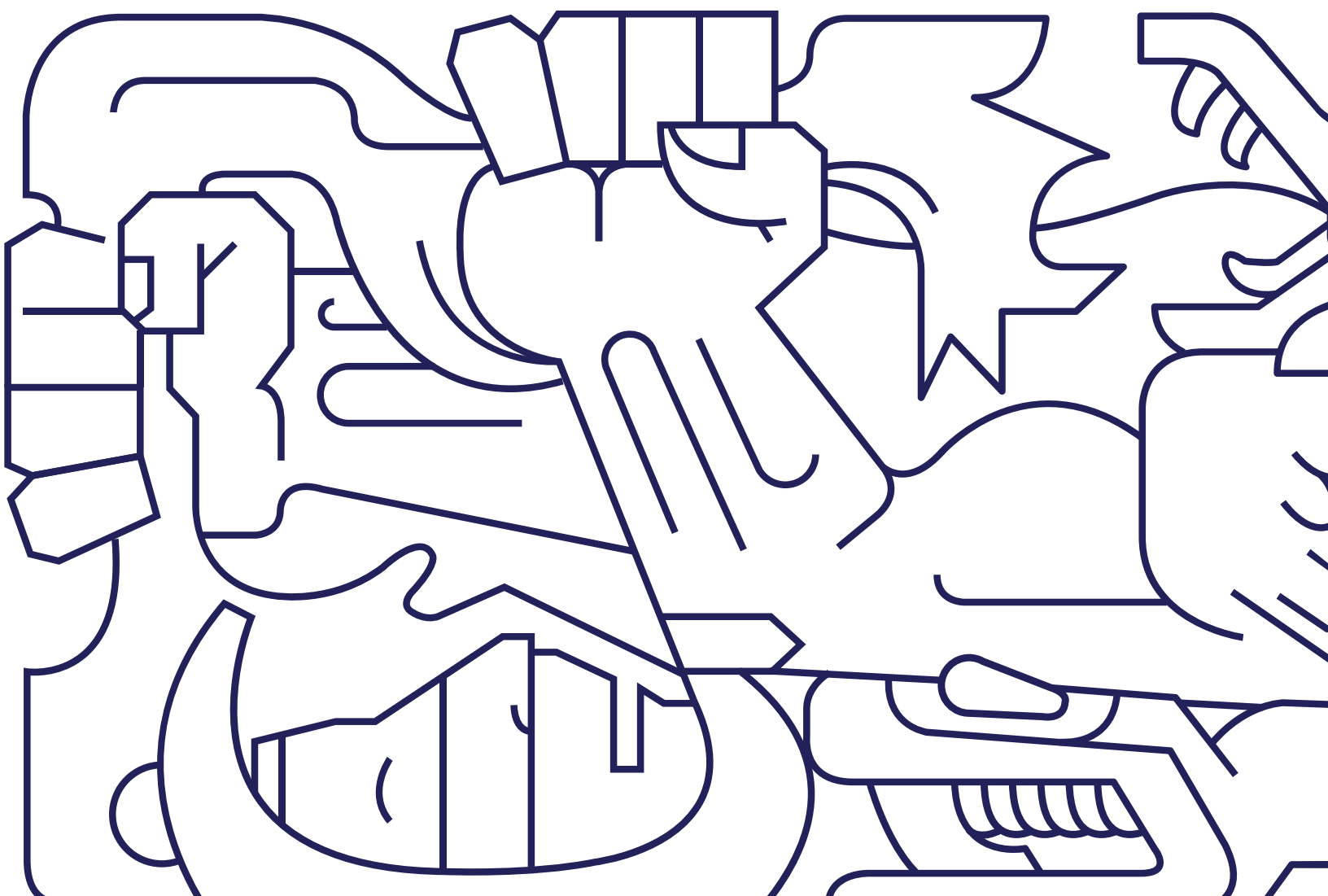


In this case, the course Genetic Engineering consists of 3 class hours per week, 0 hours of experimental and/or experiential activities and a total of 12 academic units. The academic units represent the total number of hours per week on average that students should devote to the course. The total academic units include the class hours, indicates the number of laboratory or activity hours per week and the independent work hours.

Any course requirements are listed in the course description.

One academic unit presents approximately 16 hours of work during the academic semester.





Profiles and Curricula

School of  
Social Sciences  
and Government





## Master in Public Administration and Public Policy (MAP)

### General Program Objectives

The Master's Program in Public Administration and Public Policy has a double objective:

- Develop leaders for the resolution of the public problems through innovative proposals of public policy and transformation of the government's work.
- Generate transforming agents of change focused on the solution of the most urgent challenges of society by developing strategies for the successful implementation of public policies.

### Learning Outcomes

On completing the program, students will be able to:

- Design, implement and evaluate public policies with the highest technical requirements using analytical and methodological tools.
- Use analytical frameworks in formulating and evaluating public policies, as well as conduct empirical analyses in public policy applications.

- Have the basic tools of public administration that allow the understanding and/or performing in the public service.
- Significantly influence the decision-making process that affects public policies
- Analyze, lead, organize and promote processes of change in public institutions.
- Ethically commit to the sustainability and accountability of public policies.
- Have the skills to become a great transformer of the public.

### Target Audience

- Professionals from the private sector who want to become more conversant with handling government-enterprise relationships.
- Researchers and professionals in the social area interested in creating cutting-edge knowledge in the fields of public administration, management and public management.
- Public entrepreneurs interested in creating and transforming the way of doing things.

## MAP Master in Public Administration and Public Policy

### Edition 2017

| <b>First Trimester</b>  |                                              | <b>C</b>    | <b>L</b> | <b>U</b>  |
|-------------------------|----------------------------------------------|-------------|----------|-----------|
| AP4028                  | Political Science for Public Policy          | 3.5         | 0        | 12        |
| AP4029                  | Analysis and Implementation of Public Policy | 3.5         | 0        | 12        |
| NB4008                  | Quantitative Methods in Social Sciences      | 3.5         | 0        | 12        |
|                         |                                              | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Trimester</b> |                                              | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AP4030                  | Public Finance and Budgeting                 | 3.5         | 0        | 12        |
| EO4002                  | Microeconomics                               | 3.5         | 0        | 12        |
| NB4007                  | Leadership and Ethics for Civil Service      | 3.5         | 0        | 12        |
|                         |                                              | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Third Trimester</b>  |                                              | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AP4031                  | Law Applied to Public Policy                 | 3.5         | 0        | 12        |
| EO4015                  | Macroeconomics                               | 3.5         | 0        | 12        |
| OP5053                  | Elective I                                   | 3.5         | 0        | 12        |
|                         |                                              | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Trimester</b> |                                              | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AP4032                  | Strategic Management of Public Organization  | 3.5         | 0        | 12        |
| AP5018                  | Integrative Project I                        | 3.5         | 0        | 12        |
| OP5054                  | Elective II                                  | 3.5         | 0        | 12        |
|                         |                                              | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fifth Trimester</b>  |                                              | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AP5019                  | Integrative Project II                       | 3.5         | 0        | 12        |
| OP5055                  | Elective III                                 | 3.5         | 0        | 12        |
|                         |                                              | <b>7</b>    | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is five trimesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

| <b>Code</b> | <b>Name</b>                              | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|------------------------------------------|----------|----------|----------|
| AP5020      | Evaluation of Public Policies            | 3.5      | 0        | 12       |
| AP5021      | Accountability and Public Transparency   | 3.5      | 0        | 12       |
| AP5022      | Emergent Issues in Public Policy         | 3.5      | 0        | 12       |
| AP5023      | Public Entrepreneurship                  | 3.5      | 0        | 12       |
| AP5024      | Negotiation and Conflict                 | 3.5      | 0        | 12       |
| AP5025      | Emergent Issues in Government Innovation | 3.5      | 0        | 12       |

## Master in International Law (MDI)

### General Program Objectives:

The practice of law has become increasingly global. Law professionals need to speak diverse legal languages to communicate with clients and colleagues from other latitudes when carrying out complex business transactions or participating in conflict resolution involving parties in different jurisdictions in the world. The aim of the program is to prepare globally competitive law professionals who can speak and understand diverse languages.

### Learning Outcomes

On completing the program, students will be able to:

- Perform legal analyses of international issues.
- Interpret the diverse existing national and international regulations, applying the comparative law method.
- Participate in strategic decision making and formulating contracts and other transnational transactions.
- Perform law-related international political and administrative activities.
- Comprehend Mexico's role in the new international context.

### Target Audience

- Graduates from Law, Economics, International Relations, International Commerce and Political Science degrees, who are interested in international transactions and their governing laws.
- Lawyers from public institutions and private enterprise.
- Specialists in international logistics and imports and exports.
- Partners or associates in consulting offices or firms.
- Company executives involved in international transactions.
- Mid- and upper-level federal, state and municipal public officials.
- Individuals who are interested in serving in international organizations.
- Legal advisors and analysts.
- Private-sector professionals seeking to improve their proficiency in government-enterprise relations management.
- Professors related to the area of Law.

## MDI Master in International Law

### Edition 2009

| <b>First Semester</b>  |                                                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|-----------------------------------------------------------------|----------|----------|-----------|
| DI4021                 | International Regulation of Trade                               | 3        | 0        | 12        |
| NB4001                 | Leadership and Ethics in the Exercise of Public Service         | 3        | 0        | 12        |
| NB4005                 | Legal Research and Writing in English                           | 3        | 0        | 12        |
|                        |                                                                 | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Second Semester</b> |                                                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
| DI4022                 | Principles of International Public Law and Conflicts Resolution | 3        | 0        | 12        |
| DI4023                 | International Law of Human Rights                               | 3        | 0        | 12        |
| OP5042                 | Elective I                                                      | 3        | 0        | 12        |
|                        |                                                                 | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>  |                                                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
| DI4024                 | International Contractual Law                                   | 3        | 0        | 12        |
| DI4025                 | International Arbitration and Litigation                        | 3        | 0        | 12        |
| OP5043                 | Elective II                                                     | 3        | 0        | 12        |
|                        |                                                                 | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b> |                                                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
| DI4026                 | Advanced Topics of International Law                            | 3        | 0        | 12        |
| DI5001                 | Applied Research Project                                        | 3        | 0        | 12        |
| OP5044                 | Elective III                                                    | 3        | 0        | 12        |
|                        |                                                                 | <b>9</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

| <b>Code</b> | <b>Name</b>                                                 | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|-------------------------------------------------------------|----------|----------|----------|
| DI4027      | Comparative Customs Law                                     | 3        | 0        | 12       |
| DI4028      | European Union Law                                          | 3        | 0        | 12       |
| DI5000      | International and Compared Tax Law                          | 3        | 0        | 12       |
| DI5005      | Compared Law of the Intellectual Property                   | 3        | 0        | 12       |
| DI5006      | Theory and Practice for Conflict Negotiation and Resolution | 3        | 0        | 12       |
| DP4014      | Antitrust Law                                               | 3        | 0        | 12       |
| DP5019      | Corporate Compared Law                                      | 3        | 0        | 12       |

## Master in Public Management (MGP-V)

### General Program Objectives

Graduates from the Master in Public Management will be able to practice efficiently, applying state-of-the-art methodologies oriented toward the enhancement of society. They will also be able to generate, design and implement reforms to drive institutional change processes at state and municipal levels; influence government decision-making processes positively; direct the efficient management of financial, material and human resources in public management; and use analytical frameworks and empirical methods to formulate and evaluate effective public management.

### Learning Outcomes

On completing the program, students will be able to:

- Practice efficiently, applying state-of-the-art methodologies oriented toward the enhancement of society.
- Generate, design and implement reforms to drive institutional change processes at state and municipal levels and influence government decision-making processes positively.
- Direct the efficient management of financial, material and human resources in public administration, and use analytical frameworks and empirical methods to formulate and evaluate effective public management.

### Target Audience

- Mid- and upper-level federal, state and municipal public officials.
- Students and specialists who want to improve their analytical skills and decision-making capacities regarding local public administration issues.
- Individuals who are interested in participating in elected office positions in the different spheres of government within the executive and legislative branches.
- Leaders and collaborators of political parties and non-governmental organizations who wish to strengthen their planning and decision-making processes.
- Professionals involved in analyzing government actions.
- Private-sector professionals seeking to enhance their knowledge of public administration.



## MGP-V Master in Public Management

### Edition 2009

| <b>First Trimester</b>  |                                                | <b>C</b>    | <b>L</b> | <b>U</b>  |
|-------------------------|------------------------------------------------|-------------|----------|-----------|
| AP4014                  | Public Administration Law                      | 3.5         | 0        | 12        |
| AP4026                  | Public Finance                                 | 3.5         | 0        | 12        |
| NB4006                  | Leadership and Ethics in Public Administration | 3.5         | 0        | 12        |
| OP5049                  | Elective I                                     | 3.5         | 0        | 12        |
|                         |                                                | <b>14</b>   | <b>0</b> | <b>48</b> |
| <b>Second Trimester</b> |                                                | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AP4013                  | Quantitative Applied Methods                   | 3.5         | 0        | 12        |
| AP4015                  | Federalism and Inter-governmental Relations    | 3.5         | 0        | 12        |
| AP5003                  | Government and Citizenship Participation       | 3.5         | 0        | 12        |
| OP5050                  | Elective II                                    | 3.5         | 0        | 12        |
|                         |                                                | <b>14</b>   | <b>0</b> | <b>48</b> |
| <b>Third Trimester</b>  |                                                | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AP4016                  | Public Administration Planning and Management  | 3.5         | 0        | 12        |
| AP4017                  | Municipal and State Law                        | 3.5         | 0        | 12        |
| OP5051                  | Elective III                                   | 3.5         | 0        | 12        |
|                         |                                                | 10.5        | 0        | 36        |
| <b>Fourth Trimester</b> |                                                | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AP5002                  | Applied Research Project                       | 3.5         | 0        | 12        |
| AP5017                  | Evaluation and Financing of Social Projects    | 3.5         | 0        | 12        |
| OP5052                  | Elective IV                                    | 3.5         | 0        | 12        |
|                         |                                                | <b>10.5</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is four trimesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

| Code   | Name                                                  | C   | L | U  |
|--------|-------------------------------------------------------|-----|---|----|
| AP4019 | Public Security of States and Municipalities          | 3.5 | 0 | 12 |
| AP4020 | Urban Management of Local Governments                 | 3.5 | 0 | 12 |
| AP4021 | Natural Resources and Environment Management          | 3.5 | 0 | 12 |
| AP4022 | Social Programs Management                            | 3.5 | 0 | 12 |
| AP5006 | Scenarios and development of an electronic government | 3.5 | 0 | 12 |
| MI5007 | Political Marketing                                   | 3.5 | 0 | 12 |
| RE5006 | Introduction to Strategic Prospective                 | 3.5 | 0 | 12 |
| RE5007 | Global Vision and Mundial Trends                      | 3.5 | 0 | 12 |
| RE5008 | Prospective Methods                                   | 3.5 | 0 | 12 |
| RE5009 | Technologic Innovation Prospective                    | 3.5 | 0 | 12 |

## Master in Prospective and Strategic Studie (MPE)

### General Objective Program

Graduates will be leading public, private, and social organizations, exploring multiple possible, likely, and desirable futures that guide decision making and the design of robust strategic plans. Implementing systemic-analysis processes within public, private, and social organizations that allow them to visualize complex problems, which implies a greater comprehension of the organization's challenges and guides their strategy. Also they will be a reference point in Latin America in the study and implementation of the prospective and futures studies and will contribute to strengthening the prospective abilities in the region, given the pronounced increase in interest in this type of studies for government, businesses, civil society organizations, and international organisms.

### Learning Outcomes

On completing the program, students will be able to:

- Analyze systematically complex problems, taking into account the local, national, and international economic and sociopolitical environment.

- Identify early warnings in the local, regional, and global context that allow them to forecast changes.
- Design strategic plans that help the organization to design its future, taking as a base the traits of its surroundings.
- Use rigorous methodologies to analyze the future and offer plausible scenarios to help with decision-making and propose innovative solutions.

### Target Audience

- People involved in management processes such as strategic planning and innovation.
- Public administrators related to the design of public policies.
- Consultants and strategists of the public sector and the private sector.
- Analysts of industry perspectives at a regional and global level.
- Company executives that wish to strengthen their decision-making processes.
- Leaders and collaborators of non-governmental organizations that seek to strengthen their planning and decision-making processes.
- Directors of civil society organizations.

## MPE Master in Prospective and Strategic Studie

### Edition 2017

| <b>First Trimester</b>  |                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
|-------------------------|-----------------------------------------|-------------|----------|-----------|
| EO4002                  | Microeconomics                          | 3.5         | 0        | 12        |
| NB4007                  | Leadership and Ethics for Civil Service | 3.5         | 0        | 12        |
| NB4008                  | Quantitative Methods in Social Sciences | 3.5         | 0        | 12        |
|                         |                                         | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Trimester</b> |                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| OP5053                  | Elective I                              | 3.5         | 0        | 12        |
| RE4015                  | Scenario Modeling                       | 3.5         | 0        | 12        |
| RE4016                  | History of Social Transformations       | 3.5         | 0        | 12        |
|                         |                                         | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Third Trimester</b>  |                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| OP5054                  | Elective II                             | 3.5         | 0        | 12        |
| RE4017                  | Prospective Methods                     | 3.5         | 0        | 12        |
| RE4018                  | Forecast Models for Time Series         | 3.5         | 0        | 12        |
|                         |                                         | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Trimester</b> |                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| OP5055                  | Elective III                            | 3.5         | 0        | 12        |
| RE4019                  | Strategic Planning                      | 3.5         | 0        | 12        |
| RE5010                  | Integrative Project I                   | 3.5         | 0        | 12        |
|                         |                                         | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fifth Trimester</b>  |                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| OP5056                  | Elective IV                             | 3.5         | 0        | 12        |
| RE5011                  | Integrative Project II                  | 3.5         | 0        | 12        |
|                         |                                         | <b>7</b>    | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is five trimesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

| Code   | Name                                                     | C   | L | U  |
|--------|----------------------------------------------------------|-----|---|----|
| RE5012 | Technology Innovation Foresight                          | 3.5 | 0 | 12 |
| RE5013 | Advanced Strategic Prospective Models and Future Studies | 3.5 | 0 | 12 |
| RE5014 | Global Vision and Megatrends Seminar                     | 3.5 | 0 | 12 |
| RE5015 | Cooperation, Coordination and Negotiation by Game Theory | 3.5 | 0 | 12 |
| RE5016 | Foresight for Public Policy                              | 3.5 | 0 | 12 |
| RE5017 | Emerging topics on strategic foresight I                 | 3.5 | 0 | 12 |
| RE5018 | Emerging Topics in Strategic Foresight II                | 3.5 | 0 | 12 |

## Master in Transnational Legal Practice (MPJ)

### General Program Objectives

Law-related education should train professionals to compete in a global environment. Latin America's proximity to the United States of America creates the need to understand the bases of American law, as well as to comprehend and handle international law topics. The vast diversity of topics encompassed in contemporary international law, which derive from globalization processes, require a solid preparation with a transnational-focused legal education as its core. Therefore, this program is designed for professionals who:

- Are legal experts in international organizations.
- Are international law consultants in the USA and Latin American countries.
- Serve as international arbitrators for dispute resolution.
- Lead complex legal transactions in public and private settings.

### Learning Outcomes

On completing their studies, graduates will be able to:

- Participate in solving transnational legal disputes as an arbitrator or litigator.

- Understand diverse legal systems and traditions.
- Lead negotiations in key international law issues.
- Be fluent in legal English.
- Litigate complex cases in transnational settings.
- Lead legal processes against international organizations.

### Target Audience

The program is designed for professionals who work as:

- Practicing independent lawyers who have earned an undergraduate degree in Law in Mexico and Latin America.
- Lawyers from public institutions and private enterprise.
- Partners or associates in consulting offices and firms.
- Company executives involved in international transactions.
- Mid- and upper-level federal, state and municipal public officials.
- Legal advisers and analysts.



## MPJ Master in Transnational Legal Practice

### Edition 2014

| <b>First Bimester</b>  |                                                         | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|---------------------------------------------------------|-----------|----------|-----------|
| DI4029                 | Civil Procedure in the United States of America         | 6         | 0        | 24        |
| OP5081                 | Elective I                                              | 6         | 0        | 24        |
|                        |                                                         | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Bimester</b> |                                                         | <b>C</b>  | <b>L</b> | <b>U</b>  |
| DI4030                 | Contracts in the United States of America               | 6         | 0        | 24        |
| OP5082                 | Elective II                                             | 6         | 0        | 24        |
|                        |                                                         | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Third Bimester</b>  |                                                         | <b>C</b>  | <b>L</b> | <b>U</b>  |
| DI5007                 | Professional Responsibility                             | 6         | 0        | 24        |
| DI5008                 | Negotiation                                             | 4         | 0        | 16        |
|                        |                                                         | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Fourth Bimester</b> |                                                         | <b>C</b>  | <b>L</b> | <b>U</b>  |
| DI5009                 | Regulación internacional del comercio                   | 6         | 0        | 24        |
| OP5083                 | Optativo III                                            | 6         | 0        | 24        |
|                        |                                                         | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Fifth Bimester</b>  |                                                         | <b>C</b>  | <b>L</b> | <b>U</b>  |
| DI4031                 | International Contractual Law                           | 6         | 0        | 24        |
| OP5084                 | Elective IV                                             | 6         | 0        | 24        |
|                        |                                                         | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Sixth Bimester</b>  |                                                         | <b>C</b>  | <b>L</b> | <b>U</b>  |
| DI4032                 | Leadership and Ethics in the Exercise of Public Service | 6         | 0        | 24        |
| DI5010                 | International Arbitration and Litigation                | 6         | 0        | 24        |
|                        |                                                         | <b>12</b> | <b>0</b> | <b>48</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in bimestral periods and the expected completion timeframe is six bimestres.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

| <b>Code</b> | <b>Name</b>                                                    | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|----------------------------------------------------------------|----------|----------|----------|
| DI5011      | Legal System and Legal Writing in the United States of America | 6        | 0        | 24       |
| DI5012      | Business Associations in the United States of America          | 6        | 0        | 24       |
| DI5013      | Intellectual Property                                          | 6        | 0        | 24       |
| DI5014      | International Law of Human Rights                              | 6        | 0        | 24       |

## Ph. D. in Social Sciences (DCS)

### General Program Objectives

- Prepare researchers with the capacity to apply the leading trends of thought in social sciences by means of command of methodological and analytical tools.
- Produce scientific knowledge that contributes to explaining contemporary social phenomena, particularly in the areas of Social Development and Regional and International Studies.
- Participate, through the generation of relevant, significant knowledge, in the design of projects that will have a positive impact on society in academia, civil organizations and(or) government settings.
- Promote the implementation and consolidation of social science research in northeastern Mexico by training human resources in teaching and research.
- Analyze the impact of social dynamics and of regionalization processes within the framework of globalization, and disseminate this knowledge to the academic community and to society in general. Support the design of social projects and programs that promote regional and national development.
- A reflexive attitude and critical spirit to rethink the social reality.
- The pursuit of dialogue and intra- and interdisciplinary meeting points by through projects.
- Commitment to the dissemination of knowledge to society.
- Contribution to the development of civic responsibility, based on higher education, and increasing the awareness of the new generations.

### Learning Outcomes

On completing the program, students will be able to:

- Theoretical frameworks and methods specific to Social Sciences that enable them to participate and play a major role in interdisciplinary debates.
- Methods and techniques that deliver scientific rigor to social research.
- Manage issues related to development and regional and globalization studies.
- Generate new knowledge through an analysis resulting from original research.
- Show an interest in studying social phenomena linked to social development, regional studies and globalization.
- Have an academic background (bachelor's and/or master's degree) in disciplines related to the program.
- Demonstrate experience in research through published works or a thesis.
- Possess the capacities for analysis and critical thinking.
- Have verbal and logic and mathematics skills.
- Demonstrate oral and written proficiency in English.
- Express their exclusive dedication to the program.
- Possess teamwork skills.

### Target Audience

The PhD in Social Science is designed for applicants who:

**DCS Ph. D. in Social Sciences****Edition 2011**

| <b>First Semester</b>  |                                           | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|-------------------------------------------|-----------|----------|-----------|
| CO4004                 | Quantitative Research in Social Sciences  | 3         | 0        | 12        |
| DS4001                 | Leadership for Sustainable Development    | 3         | 0        | 12        |
| EC5009                 | International Economic Politic            | 3         | 0        | 12        |
| SO5019                 | Classical Theory and Social Thought       | 3         | 0        | 12        |
|                        |                                           | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b> |                                           | <b>C</b>  | <b>L</b> | <b>U</b>  |
| H4005                  | Discourse Analysis                        | 3         | 0        | 12        |
| SO5001                 | Qualitative Methods in Social Research    | 3         | 0        | 12        |
| SO5017                 | Theory and Contemporary Social Thinking   | 3         | 0        | 12        |
| SO5023                 | Research Proposal I                       | 3         | 0        | 12        |
|                        |                                           | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Third Semester</b>  |                                           | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GO5003                 | Assisted Research I                       | 3         | 0        | 12        |
| H4003                  | Theory of Knowledge                       | 3         | 0        | 12        |
| SO5012                 | Development and Social Change             | 3         | 0        | 12        |
|                        |                                           | <b>9</b>  | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b> |                                           | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GO5000                 | Research Seminar I                        | 1         | 0        | 4         |
| GO5004                 | Assisted Research II                      | 3         | 0        | 12        |
| SO5018                 | Political and Social Organizations Theory | 3         | 0        | 12        |
| SO5024                 | Research Proposal II                      | 3         | 0        | 12        |
|                        |                                           | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Fifth Semester</b>  |                                           | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GO5001                 | Research Seminar II                       | 1         | 0        | 4         |
| GO5005                 | Assisted Research III                     | 3         | 0        | 12        |
| GO6016                 | Doctoral Research I                       | 3         | 0        | 12        |
| GO6017                 | Doctoral Research II                      | 3         | 0        | 12        |
| GO6031                 | Thesis Seminar I                          | 3         | 0        | 12        |
|                        |                                           | <b>13</b> | <b>0</b> | <b>52</b> |
| <b>Sixth Semester</b>  |                                           | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GO6018                 | Doctoral Research III                     | 3         | 0        | 12        |
| GO6019                 | Doctoral Research IV                      | 3         | 0        | 12        |
| GO6020                 | Doctoral Research V                       | 3         | 0        | 12        |
| GO6032                 | Thesis Seminar II                         | 3         | 0        | 12        |
|                        |                                           | <b>12</b> | <b>0</b> | <b>48</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

| <b>Seventh Semester</b> |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
|-------------------------|------------------------|-----------|----------|-----------|
| GO6021                  | Doctoral Research VI   | 3         | 0        | 12        |
| GO6022                  | Doctoral Research VII  | 3         | 0        | 12        |
| GO6023                  | Doctoral Research VIII | 3         | 0        | 12        |
| GO6033                  | Thesis Seminar III     | 3         | 0        | 12        |
|                         |                        | <b>12</b> | <b>0</b> | <b>48</b> |

| <b>Eighth Semester</b> |                      | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|----------------------|-----------|----------|-----------|
| GO5002                 | Research Seminar III | 1         | 0        | 4         |
| GO6024                 | Doctoral Research IX | 3         | 0        | 12        |
| GO6025                 | Doctoral Research X  | 3         | 0        | 12        |
| GO6034                 | Thesis Seminar IV    | 3         | 0        | 12        |
|                        |                      | <b>10</b> | <b>0</b> | <b>40</b> |

| <b>Ninth Semester</b> |                        | <b>C</b> | <b>L</b> | <b>U</b>  |
|-----------------------|------------------------|----------|----------|-----------|
| GO6026                | Doctoral Research XI   | 3        | 0        | 12        |
| GO6027                | Doctoral Research XII  | 3        | 0        | 12        |
| GO6028                | Doctoral Research XIII | 3        | 0        | 12        |
| GO6030                | Doctoral Defense       | 0        | 0        | 1         |
|                       |                        | <b>9</b> | <b>0</b> | <b>37</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is nine semesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Ph. D. in Public Policy (DPP)

### General Program Objectives

- Train specialized human capital in public policies with a high level of technical rigor in economic analysis and the sophistication of organizational and institutional analysis.
- Prepare world-class specialists who contribute to the democratization and effectiveness of public administration processes and foster the State-Society relationship.
- Prepare leaders who will participate in international civil society organizations and autonomous bodies that support institutional processes of change.
- Prepare researchers who will generate cutting-edge knowledge in the field of public policy.

### Learning Outcomes

On completing the program, students will be able to:

- Design, implement and evaluate public policies in the diverse government branches and areas.

- Propose government-civil society-enterprise liaison strategies.
- Propose and execute leadership in research related to the field of public policy based on their theoretical, analytical and instrumental grounding in public policy processes, with a multidisciplinary approach underpinned by legal, economic and public administration insights.

### Target Audience

This program is aimed at:

- Public officials from different government branches and levels who are interested in deepening their knowledge in the areas of public administration and public policy.
- Private sector professionals who wish to specialize in government-enterprise relations.
- Researchers and professionals from the area of social studies who are interested in generating cutting-edge knowledge in the fields of public administration and policy.



**DPP Ph. D. in Public Policy****Edition 2011**

| <b>First Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
|-------------------------|-------------------------------------------------------------|-----------|----------|-----------|
| GP6000                  | Theory of Public Organizations and of Public Administration | 3         | 0        | 12        |
| GP6001                  | Analytical Processes of Public Policy                       | 3         | 0        | 12        |
| GP6003                  | Public Administration System of Competencies                | 3         | 0        | 12        |
| GP6035                  | Research Methodology                                        | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b>  |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GP5000                  | Research Proposal I                                         | 3         | 0        | 12        |
| OP4037                  | Quality Development Course                                  | 3         | 0        | 12        |
| OP5062                  | Elective I                                                  | 3         | 0        | 12        |
| OP5063                  | Elective II                                                 | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Third Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GP5001                  | Research Proposal II                                        | 3         | 0        | 12        |
| GP5002                  | Research Proposal III                                       | 3         | 0        | 12        |
| GP5003                  | Research Seminar I                                          | 1         | 0        | 4         |
| OP5064                  | Elective III                                                | 3         | 0        | 12        |
|                         |                                                             | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Fourth Semester</b>  |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GP6021                  | Doctoral Research I                                         | 3         | 0        | 12        |
| GP6022                  | Doctoral Research II                                        | 3         | 0        | 12        |
| GP6023                  | Doctoral Research III                                       | 3         | 0        | 12        |
| GP6024                  | Doctoral Research IV                                        | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Fifth Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GP5004                  | Research Seminar II                                         | 1         | 0        | 4         |
| GP6025                  | Doctoral Research V                                         | 3         | 0        | 12        |
| GP6026                  | Doctoral Research VI                                        | 3         | 0        | 12        |
| GP6027                  | Doctoral Research VII                                       | 3         | 0        | 12        |
|                         |                                                             | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Sixth Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GP6028                  | Doctoral Research VIII                                      | 3         | 0        | 12        |
| GP6029                  | Doctoral Research IX                                        | 3         | 0        | 12        |
| GP6030                  | Doctoral Research X                                         | 3         | 0        | 12        |
|                         |                                                             | <b>9</b>  | <b>0</b> | <b>36</b> |
| <b>Seventh Semester</b> |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GP5005                  | Research Seminar III                                        | 1         | 0        | 4         |
| GP6031                  | Doctoral Research XI                                        | 3         | 0        | 12        |
| GP6032                  | Doctoral Research XII                                       | 3         | 0        | 12        |
| GP6033                  | Doctoral Research XIII                                      | 3         | 0        | 12        |
| GP6034                  | Doctoral Defense                                            | 0         | 0        | 1         |
|                         |                                                             | <b>10</b> | <b>0</b> | <b>41</b> |

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is seven semesters.*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

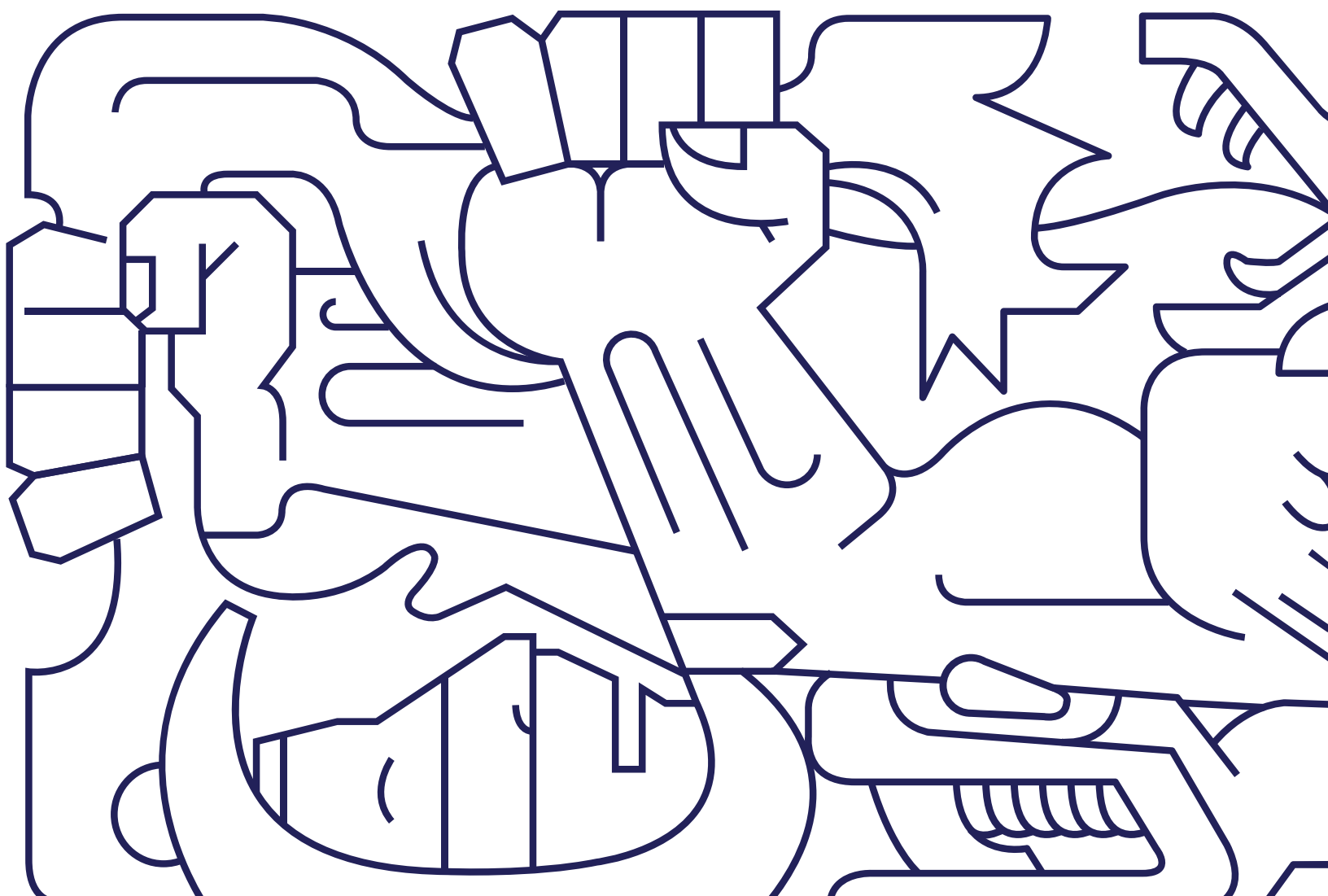
### Quality Development Courses

| Code   | Name                                                    | C | L | U  |
|--------|---------------------------------------------------------|---|---|----|
| DS4001 | Leadership for Sustainable Development                  | 3 | 0 | 12 |
| NB4001 | Leadership and Ethics in the Exercise of Public Service | 3 | 0 | 12 |

### Elective Courses

| Code   | Name                                     | C | L | U  |
|--------|------------------------------------------|---|---|----|
| AP5007 | Public Policy Evaluation                 | 3 | 0 | 12 |
| AP5008 | Governance Innovation                    | 3 | 0 | 12 |
| AP5009 | Quantitative Methods for Public Policy   | 3 | 0 | 12 |
| AP5010 | Comparative Public Policy                | 3 | 0 | 12 |
| AP5011 | Policy, Democracy and Public Policy      | 3 | 0 | 12 |
| EO5008 | Public Economy                           | 3 | 0 | 12 |
| EO5009 | Macroeconomic Policy                     | 3 | 0 | 12 |
| EO5014 | Public Policies for Regional Development | 3 | 0 | 12 |





Profiles and Curricula

School of  
Humanities and  
Education



## Master in Education (MEE-V)

### General Program Objectives

The objective of the Master of Education is to:

- Prepare leaders in the area of education who propose and execute innovative educational projects and programs that will contribute to the improvement of their institution's services and show, through their teaching practice, respect for the dignity of students, parents and colleagues, regardless of whether they are members of the educational community or the community at large.
- Prepare professionals who use teaching-learning strategies to meet the curricular objectives efficiently and effectively.
- Prepare professionals who apply their research skills to solve current educational problems.

### Learning Outcomes

On completing the program, students will be able to:

- Express a vision regarding the contemporary, local, regional and global educational reality, enabling them to contribute to processes of educational change.

- Base their teaching practice on their knowledge of educational science.
- Conduct research as a professional practice tool in educational settings.
- Generate new ideas, methods and techniques in order to identify opportunities and implement solutions in conjunction with various stakeholders.
- Incorporate their concept of education into the specific areas of concentration.

### Target Audience

Candidates for the Master in Education program must have completed a bachelor's degree in an area related to education, administration or similar, and, preferably, have reading comprehension skills in the English language. Moreover, applicants should, if possible, have some work experience involving school management scenarios in the diverse academic levels or work in private enterprise, focusing on the respective business training programs.

## MEE-V Master in Education

### Edition 2013

| <b>First Semester</b>  |                                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|--------------------------------------------------------|----------|----------|-----------|
| ED4022                 | Technology and Innovation in Education                 | 3        | 0        | 12        |
| ED4033                 | Learning Theories in the Educational Context           | 3        | 0        | 12        |
|                        |                                                        | <b>6</b> | <b>0</b> | <b>24</b> |
| <b>Second Semester</b> |                                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| OP4006                 | Elective Course I                                      | 3        | 0        | 12        |
| OP5042                 | Elective I                                             | 3        | 0        | 12        |
|                        |                                                        | <b>6</b> | <b>0</b> | <b>24</b> |
| <b>Third Semester</b>  |                                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| ED4034                 | Applied Research Project I: Identifying Study-Problems | 3        | 0        | 12        |
| OP5043                 | Elective II                                            | 3        | 0        | 12        |
|                        |                                                        | <b>6</b> | <b>0</b> | <b>24</b> |
| <b>Fourth Semester</b> |                                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| ED4035                 | Applied-Research Project II: Methodological Approaches | 3        | 0        | 12        |
| OP5044                 | Elective III                                           | 3        | 0        | 12        |
|                        |                                                        | <b>6</b> | <b>0</b> | <b>24</b> |
| <b>Fifth Semester</b>  |                                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| ED4032                 | Comparative Education                                  | 3        | 0        | 12        |
| ED5084                 | Applied-Research Project III: Analysis of Results      | 3        | 0        | 12        |
|                        |                                                        | <b>6</b> | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is five semesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)



## Elective Courses

### Concentration Mandatory Course

| Cognitive Development Accentuation           |                                                |   |   |    |  |
|----------------------------------------------|------------------------------------------------|---|---|----|--|
| Code                                         | Name                                           | C | L | U  |  |
| ED4038                                       | Cognitive Psychology                           | 3 | 0 | 12 |  |
| Sciences Teaching Accentuation               |                                                |   |   |    |  |
| Code                                         | Name                                           | C | L | U  |  |
| ED4036                                       | Building Scientific Thinking                   | 3 | 0 | 12 |  |
| High School Teaching Accentuation            |                                                |   |   |    |  |
| Code                                         | Name                                           | C | L | U  |  |
| ED5092                                       | Psychology of Adolescence                      | 3 | 0 | 12 |  |
| Learning and Teaching Processes Accentuation |                                                |   |   |    |  |
| Code                                         | Name                                           | C | L | U  |  |
| ED4026                                       | Teaching Theory and Practice of the Curriculum | 3 | 0 | 12 |  |

### Concentration Elective Courses (Choose three)

| Cognitive Development Accentuation           |                                                            |   |   |    |  |
|----------------------------------------------|------------------------------------------------------------|---|---|----|--|
| Code                                         | Name                                                       | C | L | U  |  |
| ED5050                                       | Thinking Psychology                                        | 3 | 0 | 12 |  |
| ED5052                                       | Theoretical Approaches to Emotion and Intelligence         | 3 | 0 | 12 |  |
| ED5087                                       | Cognitive and Learning Styles                              | 3 | 0 | 12 |  |
| ED5091                                       | Programs Designed to Teach how to Think                    | 3 | 0 | 12 |  |
| Sciences Teaching Accentuation               |                                                            |   |   |    |  |
| Code                                         | Name                                                       | C | L | U  |  |
| ED4037                                       | Educational Projects Design for Natural and Exact Sciences | 3 | 0 | 12 |  |
| ED4039                                       | Teaching of Natural Sciences                               | 3 | 0 | 12 |  |
| ED5048                                       | Evaluation of Learning                                     | 3 | 0 | 12 |  |
| ED5085                                       | Curriculum Content for Natural Sciences                    | 3 | 0 | 12 |  |
| High School Teaching Accentuation            |                                                            |   |   |    |  |
| Code                                         | Name                                                       | C | L | U  |  |
| ED4026                                       | Teaching Theory and Practice of the Curriculum             | 3 | 0 | 12 |  |
| ED5034                                       | Design of Educational Programs Based on Competitions       | 3 | 0 | 12 |  |
| ED5086                                       | Moral Development in Teenagers                             | 3 | 0 | 12 |  |
| ED5090                                       | Orientation for Life and Career Development                | 3 | 0 | 12 |  |
| Learning and Teaching Processes Accentuation |                                                            |   |   |    |  |
| Code                                         | Name                                                       | C | L | U  |  |
| ED5034                                       | Design of Educational Programs Based on Competitions       | 3 | 0 | 12 |  |
| ED5048                                       | Evaluation of Learning                                     | 3 | 0 | 12 |  |
| ED5088                                       | Educational Innovation in the Classroom                    | 3 | 0 | 12 |  |
| ED5089                                       | Learning-Management Models                                 | 3 | 0 | 12 |  |

## Master in Humanistics Studies (MEH)

### General Program Objectives

The new world order and democratic society require a strong, proactive, committed and articulate civil society, in which a dialogue can be held among the diversity of voices, mentalities and stances. Therefore, the program's objective is to educate social subjects who are committed to an analytical vision drawn from the bases of philosophy and who adopt interpretive methodologies that enable them to analyze their own and others' discourse clearly.

### Learning Outcomes

On completing the program, students will be able to:

- Design an innovative response to educational demands in the areas of History, Ethics, Literature and Discourse, and Science and Culture.
- Manage humanistic projects in public and private institutions.
- Be a social subject with the necessary critical judgment to participate in the construction of possible solutions to human issues, such as poverty, war and environmental deterioration.
- Direct the implementation of codes of ethics in the academic, public, business and government arenas.
- Include respect and tolerance for differences in codes of ethics.
- Problematize current moral action, reflect on it, interpret and legitimize rationally another moral action proposal so as not to neglect its purposes and functions of safeguarding social wellbeing, equity and justice.
- Instrument community-oriented projects that go beyond economic and personal fulfillment interests.
- Complete consulting projects in the public, private and academic sectors, as well as in civil society, on topics related to organizational ethics, the growth and professionalization of civil society, public policy, and science and technology, among others.
- Explore and/or formulate proposals for consideration with a view to achieving a critical understanding of the present day reality and in the areas of specialization offered by the program.
- Offer an innovative teaching response to educational demands in the areas of Ethics, History, Literature and Discourse, and Science and Culture.

### Target Audience

This program is intended for:

- Public and private sector human resource managers.
- Academics and teachers within the humanistic area.
- CEOs who wish to expand and renew their company's social responsibility constantly.
- Consultants, strategists and politicians who are committed to constructing a national project with the purest, most updated knowledge of humanity, philosophy, ethics, and world and Mexican literature and history.
- Experts in the organizational climates of companies.
- Company executives who wish to recover the humanistic dimension in an environment that favors production and productivity.
- Young people who are interested in research and in developing the capacity to explore and/or put forward reflective proposals, in order to attain a critical understanding of the current reality and in the specialization areas offered by the program.
- NGO leaders and collaborators who promote the understanding of humans in relation to technological and productive processes.
- Humanists who seek to reconsider their paradigm from new perspectives.
- Humanists who promote a transdisciplinary exchange and wish to practice, within an academic framework, the reality they must face outside this context.

**MEH Master in Humanistics Studies****Edition 2009**

| <b>First Semester</b>  |                            | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|----------------------------|-----------|----------|-----------|
| H4012                  | Research Methods           | 3         | 0        | 12        |
| OP4002                 | Basic Course I             | 3         | 0        | 12        |
| OP4037                 | Quality Development Course | 3         | 0        | 12        |
| OP5042                 | Elective I                 | 3         | 0        | 12        |
|                        |                            | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b> |                            | <b>C</b>  | <b>L</b> | <b>U</b>  |
| H5022                  | Research Seminar           | 3         | 0        | 12        |
| OP4003                 | Basic Course II            | 3         | 0        | 12        |
| OP4004                 | Basic Course III           | 3         | 0        | 12        |
| OP5043                 | Elective II                | 3         | 0        | 12        |
|                        |                            | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Third Semester</b>  |                            | <b>C</b>  | <b>L</b> | <b>U</b>  |
| OP4005                 | Basic Course IV            | 3         | 0        | 12        |
| OP4018                 | Basic Course V             | 3         | 0        | 12        |
| OP5044                 | Elective III               | 3         | 0        | 12        |
| OP5045                 | Elective IV                | 3         | 0        | 12        |
|                        |                            | <b>12</b> | <b>0</b> | <b>48</b> |

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is three semesters.*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C | L | U  |
|--------|----------------------------------------|---|---|----|
| DS4001 | Leadership for Sustainable Development | 3 | 0 | 12 |
| H4018  | Ethics, Humanistic Thought and Society | 3 | 0 | 12 |

### Concentration Elective Courses

| Science and Culture (Campus: Monterrey, Ciudad de México) |                                                                                     |   |   |    |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------|---|---|----|
| Code                                                      | Name                                                                                | C | L | U  |
| H5006                                                     | Knowledge Society                                                                   | 3 | 0 | 12 |
| H5017                                                     | Social Studies of Science                                                           | 3 | 0 | 12 |
| H5028                                                     | Philosophy of Science and Technology                                                | 3 | 0 | 12 |
| H5030                                                     | Advanced Topics in Humanistics Studies                                              | 3 | 0 | 12 |
| Communication and Digital Media (Campus: Monterrey)       |                                                                                     |   |   |    |
| Code                                                      | Name                                                                                | C | L | U  |
| AV5004                                                    | Semiotics of the Narrative                                                          | 3 | 0 | 12 |
| CO4002                                                    | International Communication Seminar                                                 | 3 | 0 | 12 |
| CO5001                                                    | Communication, Culture and Globalization                                            | 3 | 0 | 12 |
| CO5012                                                    | The Public Sphere in the Information Age:<br>Digital Individuals and Global Village | 3 | 0 | 12 |
| H5030                                                     | Advanced Topics in Humanistics Studies                                              | 3 | 0 | 12 |
| Ethics (Campus: Monterrey, Ciudad de México)              |                                                                                     |   |   |    |
| Code                                                      | Name                                                                                | C | L | U  |
| H5002                                                     | Classics of Ethical Thinking                                                        | 3 | 0 | 12 |
| H5003                                                     | Contemporary Ethical Discourses                                                     | 3 | 0 | 12 |
| H5004                                                     | Contemporary Philosophy and Political Theory                                        | 3 | 0 | 12 |
| H5030                                                     | Advanced Topics in Humanistics Studies                                              | 3 | 0 | 12 |
| Literature and Discourse (Campus: Monterrey)              |                                                                                     |   |   |    |
| Code                                                      | Name                                                                                | C | L | U  |
| H5011                                                     | Approaches to Literary Phenomenon                                                   | 3 | 0 | 12 |
| H5012                                                     | Poststructuralism and Contemporary Fiction Theories                                 | 3 | 0 | 12 |
| H5013                                                     | Novel and Discourse: Approaches to Narrative Theory                                 | 3 | 0 | 12 |
| H5030                                                     | Advanced Topics in Humanistics Studies                                              | 3 | 0 | 12 |
| Basic Elective Courses (choose five)                      |                                                                                     |   |   |    |
| Code                                                      | Name                                                                                | C | L | U  |
| H4003                                                     | Theory of Knowledge                                                                 | 3 | 0 | 12 |
| H4004                                                     | Hermeneutics                                                                        | 3 | 0 | 12 |
| H4005                                                     | Discourse Analysis                                                                  | 3 | 0 | 12 |
| H4006                                                     | Critical Theory and Postmodernity                                                   | 3 | 0 | 12 |
| H4008                                                     | Philosophical Anthropology                                                          | 3 | 0 | 12 |
| H4009                                                     | Philosophy of Culture                                                               | 3 | 0 | 12 |
| H4010                                                     | History of Science                                                                  | 3 | 0 | 12 |

## Master in Humanistics Studies (MEH-V)

### General Program Objectives

The new world order and democratic society require a strong, proactive, committed and articulate civil society, in which a dialogue can be held among the diversity of voices, mentalities and stances. Therefore, the program's objective is to educate social subjects who are committed to an analytical vision drawn from the bases of philosophy and who adopt interpretive methodologies that enable them to analyze their own and others' discourse clearly.

### Learning Outcomes

On completing the program, students will be able to:

- Design an innovative response to educational demands in the areas of History, Ethics, Literature and Discourse, and Science and Culture.
- Manage humanistic projects in public and private institutions.
- Be a social subject with the necessary critical judgment to participate in the construction of possible solutions to human issues, such as poverty, war and environmental deterioration.
- Direct the implementation of codes of ethics in the academic, public, business and government arenas.
- Include respect and tolerance for differences in codes of ethics.
- Problematize current moral action, reflect on it, interpret and legitimize rationally another moral action proposal so as not to neglect its purposes and functions of safeguarding social wellbeing, equity and justice.
- Instrument community-oriented projects that go beyond economic and personal fulfillment interests.
- Complete consulting projects in the public, private and academic sectors, as well as in civil society, on topics related to organizational ethics, the growth and professionalization of civil society, public policy, and science and technology, among others.
- Explore and/or formulate proposals for consideration with a view to achieving a critical understanding of the present day reality and in the areas of specialization offered by the program.
- Offer an innovative teaching response to educational demands in the areas of Ethics, History, Literature and Discourse, and Science and Culture.

### Target Audience

This program is intended for:

- Public and private sector human resource managers.
- Academics and teachers within the humanistic area.
- CEOs who wish to expand and renew their company's social responsibility constantly.
- Consultants, strategists and politicians who are committed to constructing a national project with the purest, most updated knowledge of humanity, philosophy, ethics, and world and Mexican literature and history.
- Experts in the organizational climates of companies.
- Company executives who wish to recover the humanistic dimension in an environment that favors production and productivity.
- Young people who are interested in research and in developing the capacity to explore and/or put forward reflective proposals, in order to attain a critical understanding of the current reality and in the specialization areas offered by the program.
- NGO leaders and collaborators who promote the understanding of humans in relation to technological and productive processes.
- Humanists who seek to reconsider their paradigm from new perspectives.
- Humanists who promote a transdisciplinary exchange and wish to practice, within an academic framework, the reality they must face outside this context.

## MEH-V Master in Humanistics Studies

Edition 2009

| First Semester  |                            | C         | L        | U         |
|-----------------|----------------------------|-----------|----------|-----------|
| H4012           | Research Methods           | 3         | 0        | 12        |
| OP4002          | Basic Course I             | 3         | 0        | 12        |
| OP4037          | Quality Development Course | 3         | 0        | 12        |
| OP5042          | Elective I                 | 3         | 0        | 12        |
|                 |                            | <b>12</b> | <b>0</b> | <b>48</b> |
| Second Semester |                            | C         | L        | U         |
| H5022           | Research Seminar           | 3         | 0        | 12        |
| OP4003          | Basic Course II            | 3         | 0        | 12        |
| OP4004          | Basic Course III           | 3         | 0        | 12        |
| OP5043          | Elective II                | 3         | 0        | 12        |
|                 |                            | <b>12</b> | <b>0</b> | <b>48</b> |
| Third Semester  |                            | C         | L        | U         |
| OP4005          | Basic Course IV            | 3         | 0        | 12        |
| OP4018          | Basic Course V             | 3         | 0        | 12        |
| OP5044          | Elective III               | 3         | 0        | 12        |
| OP5045          | Elective IV                | 3         | 0        | 12        |
|                 |                            | <b>12</b> | <b>0</b> | <b>48</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is three semesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C | L | U  |
|--------|----------------------------------------|---|---|----|
| DS4001 | Leadership for Sustainable Development | 3 | 0 | 12 |
| H4018  | Ethics, Humanistic Thought and Society | 3 | 0 | 12 |

### Concentration Elective Courses (1)

| Ethics (Campus: Ciudad Juárez, Universidad Virtual en Línea)                   |                                                     |   |   |    |
|--------------------------------------------------------------------------------|-----------------------------------------------------|---|---|----|
| Code                                                                           | Name                                                | C | L | U  |
| H5002                                                                          | Classics of Ethical Thinking                        | 3 | 0 | 12 |
| H5003                                                                          | Contemporary Ethical Discourses                     | 3 | 0 | 12 |
| H5004                                                                          | Contemporary Philosophy and Political Theory        | 3 | 0 | 12 |
| H5030                                                                          | Advanced Topics in Humanistics Studies              | 3 | 0 | 12 |
| History (Campus: Ciudad Juárez, Universidad Virtual en Línea)                  |                                                     |   |   |    |
| Code                                                                           | Name                                                | C | L | U  |
| H5008                                                                          | The Craft of Historical Discourse                   | 3 | 0 | 12 |
| H5009                                                                          | History and Interdisciplinary                       | 3 | 0 | 12 |
| H5010                                                                          | Historiographic Currents of the Twentieth Century   | 3 | 0 | 12 |
| H5030                                                                          | Advanced Topics in Humanistics Studies              | 3 | 0 | 12 |
| Literature and Discourse (Campus: Ciudad Juárez, Universidad Virtual en Línea) |                                                     |   |   |    |
| Code                                                                           | Name                                                | C | L | U  |
| H5011                                                                          | Approaches to Literary Phenomenon                   | 3 | 0 | 12 |
| H5012                                                                          | Poststructuralism and Contemporary Fiction Theories | 3 | 0 | 12 |
| H5013                                                                          | Novel and Discourse: Approaches to Narrative Theory | 3 | 0 | 12 |
| H5030                                                                          | Advanced Topics in Humanistics Studies              | 3 | 0 | 12 |

### Basic Elective Courses (choose five)

| Code  | Name                              | C | L | U  |
|-------|-----------------------------------|---|---|----|
| H4003 | Theory of Knowledge               | 3 | 0 | 12 |
| H4004 | Hermeneutics                      | 3 | 0 | 12 |
| H4005 | Discourse Analysis                | 3 | 0 | 12 |
| H4006 | Critical Theory and Postmodernity | 3 | 0 | 12 |
| H4008 | Philosophical Anthropology        | 3 | 0 | 12 |
| H4009 | Philosophy of Culture             | 3 | 0 | 12 |
| H4010 | History of Science                | 3 | 0 | 12 |

(1)To register Elective Courses, the students must have accredited the Quality Development Courses and five Core Courses. Also, to register H5030 Elective Course, the students must have accredited three Concentration Elective Courses.



## Master in Development Management (MGD-V)

### General Program Objectives

The program has the objective of training professionals, who will be agents of change, able to contribute to the transformation of their communities, focusing on changing aspects in their social and economic environments.

- Ability to work collaboratively in multiple fields in order to design optimal solutions that contribute to social transformation and enhancement.
- Designing projects that evidence a clear sense of social responsibility and promote social and economic development for the regions or contexts for which they are intended.

### Learning Outcomes

On completing the program, students will be able to:

- Planning, managing, and evaluating projects in general, and educational institutions in particular.
- Take decisions for planning and evaluating, both socially and economically, projects for the development of their communities, based on analytical and empirical frameworks.
- Applying effective and efficient material and financial human resource strategies, for the implementation of projects for community development.
- Applying critical thinking skills in the analysis of his/her professional context, incorporating multiple points of view, concepts, theories, and explanations.

### Target Audience

The Master in Master in Development Management program has been created in response to the need expressed by the Teach for Mexico Organization (OEM) (<http://ensenapormexico.org>) to offer its collaborators a training program that contributes to the improvement of competencies aligned with social development and transformation. OEM requires that new members should be professionals who have recently graduated from universities in diverse regions of Mexico, with specific characteristics, such as having been outstanding undergraduate students and being potential agents of change, and having been selected by OEM to work for two years teaching classes or organizing academic support workshops for students from state schools in underprivileged areas.

## MGD-V Master in Development Management

### Edition 2016

| <b>First Trimester</b>  |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
|-------------------------|---------------------------------------------------------|-------------|----------|-----------|
| AP4026                  | Public Finance                                          | 3.5         | 0        | 12        |
| AP5003                  | Government and Citizenship Participation                | 3.5         | 0        | 12        |
| NB4006                  | Leadership and Ethics in Public Administration          | 3.5         | 0        | 12        |
|                         |                                                         | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Trimester</b> |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5105                  | Human Resources Development                             | 3.5         | 0        | 12        |
| AP4013                  | Quantitative Applied Methods                            | 3.5         | 0        | 12        |
| ED5105                  | Educational Leadership                                  | 3.5         | 0        | 12        |
|                         |                                                         | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Third Trimester</b>  |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| ED5106                  | Design and Planning Educational Institutions            | 3.5         | 0        | 12        |
| ED5107                  | Information Systematization for Decision Making         | 3.5         | 0        | 12        |
| FZ5052                  | Financial Issues in Educational Institutions            | 3.5         | 0        | 12        |
|                         |                                                         | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Trimester</b> |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AP4016                  | Public Administration Planning and Management           | 3.5         | 0        | 12        |
| AP5017                  | Evaluation and Financing of Social Projects             | 3.5         | 0        | 12        |
| ED5108                  | Linking Educational Institutions with Their Environment | 3.5         | 0        | 12        |
|                         |                                                         | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fifth Trimester</b>  |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AP4022                  | Social Programs Management                              | 3.5         | 0        | 12        |
| ED5109                  | Educational Projects Consulting                         | 3.5         | 0        | 12        |
|                         |                                                         | <b>7</b>    | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is five trimesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Master in Educational Technology (MTE-V)

### General program objective

The objective of the Master of Educational Technology (MTE) program is to:

- Develop the potential of education professionals through digital learning environments.
- Professionalize the didactic practice of teachers and training professionals based on innovative pedagogical, technological and management models that will enhance their educational environments.
- Prepare leaders in the field of education who will propose and execute innovative educational and technological programs that contribute to improving the service provided.

### Learning Outcomes

Al término del programa el alumno será capaz de:

- Design learning environments with appropriate technologies.
- Apply educational technology in their courses as professors of basic, intermediate or higher education or as trainers.

- Manage educational technology projects applied to education from its introduction to evaluation.
- Design training programs using technology.
- Be a team leader in educational technology projects.
- Design curricula based on current teaching paradigms.
- Select the most appropriate technology for a learning objective.
- Evaluate technology-based educational models.
- Research in technology-supported education.

### Perfil del aspirante

Candidates for the Master in Educational Technology program must have completed a bachelor's degree in an area related to education, administration or similar, and, preferably, have reading comprehension skills in the English language. Moreover, applicants should, if possible, have some work experience involving school management scenarios in the diverse academic levels.

## MTE-V Master in Educational Technology

### Edition 2013

| <b>First Semester</b>  |                                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|--------------------------------------------------------|----------|----------|-----------|
| ED4022                 | Technology and Innovation in Education                 | 3        | 0        | 12        |
| ED4033                 | Learning Theories in the Educational Context           | 3        | 0        | 12        |
|                        |                                                        | <b>6</b> | <b>0</b> | <b>24</b> |
| <b>Second Semester</b> |                                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| OP4006                 | Elective Course I                                      | 3        | 0        | 12        |
| OP5042                 | Elective I                                             | 3        | 0        | 12        |
|                        |                                                        | <b>6</b> | <b>0</b> | <b>24</b> |
| <b>Third Semester</b>  |                                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| ED4034                 | Applied Research Project I: Identifying Study-Problems | 3        | 0        | 12        |
| OP5043                 | Elective II                                            | 3        | 0        | 12        |
|                        |                                                        | <b>6</b> | <b>0</b> | <b>24</b> |
| <b>Fourth Semester</b> |                                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| ED4035                 | Applied-Research Project II: Methodological Approaches | 3        | 0        | 12        |
| OP5044                 | Elective III                                           | 3        | 0        | 12        |
|                        |                                                        | <b>6</b> | <b>0</b> | <b>24</b> |
| <b>Fifth Semester</b>  |                                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| ED4032                 | Comparative Education                                  | 3        | 0        | 12        |
| ED5084                 | Applied-Research Project III: Analysis of Results      | 3        | 0        | 12        |
|                        |                                                        | <b>6</b> | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is five semesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Concentration Mandatory Course

| Training and Professional Development Accentuation |                                                              |   |   |    |
|----------------------------------------------------|--------------------------------------------------------------|---|---|----|
| Code                                               | Name                                                         | C | L | U  |
| ED5095                                             | Instructional Design and Technology-based Educational Models | 3 | 0 | 12 |

| Innovative Media for Education Accentuation |                        |   |   |    |
|---------------------------------------------|------------------------|---|---|----|
| Code                                        | Name                   | C | L | U  |
| ED5048                                      | Evaluation of Learning | 3 | 0 | 12 |

### Concentration Elective Courses (Choose three)

| Training and Professional Development Accentuation |                                                                            |   |   |    |
|----------------------------------------------------|----------------------------------------------------------------------------|---|---|----|
| Code                                               | Name                                                                       | C | L | U  |
| ED5093                                             | Management of Training Projects Based on the Use of Educational Technology | 3 | 0 | 12 |
| ED5094                                             | Development of Multimedia Learning Resources                               | 3 | 0 | 12 |
| ED5096                                             | Evaluation of Technology Integration in Educational Models                 | 3 | 0 | 12 |
| ED5097                                             | Production of Technology Based Educational Resources                       | 3 | 0 | 12 |

| Innovative Media for Education Accentuation |                                                                     |   |   |    |
|---------------------------------------------|---------------------------------------------------------------------|---|---|----|
| Code                                        | Name                                                                | C | L | U  |
| ED5095                                      | Instructional Design and Technology-based Educational Models        | 3 | 0 | 12 |
| ED5097                                      | Production of Technology Based Educational Resources                | 3 | 0 | 12 |
| ED5098                                      | Integration of Emerging Technologies in Educational Processes       | 3 | 0 | 12 |
| ED5099                                      | Pedagogical Theories and Educational Practice in Distance Education | 3 | 0 | 12 |

## Ph. D. in Educational Innovation (DEE)

### General Program Objective

- The preparation of individuals who are capable of contributing, through research, to the theoretical-practical knowledge of education; and of increasing the efficiency and effectiveness of educational projects, seeking to innovate and achieve positive change in organizations.
- The preparation of leaders and agents of change who examine today's society, from individual, organizational, systemic and social perspectives, in order to examine, define, reformulate, plan and facilitate the process of educational change.

### Learning Outcomes

- Present the necessary credentials in terms of research undertaken, papers published a specialization in an area of knowledge and training in research in order to aspire to a position of professor at any Mexican or foreign university.
- Undertake research that contributes to the theoretical-practical knowledge of education (in various contexts).
- Design, implement and evaluate educational projects that contribute to educational institutions and other organizations responding to social development, the politics and the economy of the community, and with the care for the nearby environment.
- Identify the necessities of educational institutions and other educational organizations, planning and executing the necessary actions to satisfy them.
- Make use of modern informational technology and communication that gives rise to collaborative work amongst networks of people both nationally and internationally.
- Lead in different types of organizations that accomplish educational activities where they work, designing and proposing projects of educational innovation that result in concrete and sustainable advances in the long term.

### Target Audience

This program's target audience consists of graduate level academics who are interested in a career as researchers in a public or private higher education institution and/or educational or social science

research centers, and, to a lesser degree, as educational managers in higher education institutions that require administrators who hold a doctoral degree. At present, and at least in the immediate future (the next 50 years), the number of professors with a doctorate in the area of education that Mexico and other Latin American countries will need simply to assure the minimum accreditation of institutions that offer graduate programs in education is so vast that the demand is more than 15 times greater than the supply. If all the current doctoral programs in education were to accept students at full capacity, the institutional requirements in the nation's faculties for doctors in education would not be met even over the next 25 years.

Participants in this program should have the following characteristics:

- The commitment to be an academic researcher, working in an educational institution and performing scientific teaching, research and dissemination activities in their local community.
- A critical-strategic spirit, with the desire to innovate in their field, focusing on achieving the ongoing enhancement of the educational environment.
- An interest in conducting research in one of the areas currently offered by the program: a) Administration and management of educational change; b). The student as a learner; c). The role of the professor and of learning in the educational process; d) The social impact of innovative educational models; e) Education in physics and mathematics
- A commitment to improving the social and political environment of Latin American countries and enhancing the quality of life of its inhabitants through education across all its aspects.
- The openness for internationalization, to know what is being done in other countries and to learn from them, sharing what their own country is doing, seeing the world as a whole, all nations with the same principal goals of providing a quality education for its people.
- The ability to receive and produce influential information in Spanish and English; to read research reports and papers from scientific publications; and profit from texts and articles in both languages.
- The desire to act as an agent of change by examining, redefining and motivating people to act.

**DEE Ph. D. in Educational Innovation****Edition 2015**

| <b>First Semester</b>  |                                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|----------------------------------------|-----------|----------|-----------|
| ED4022                 | Technology and Innovation in Education | 3         | 0        | 12        |
| ED5075                 | Research Proposal I                    | 3         | 0        | 12        |
| OP5062                 | Elective I                             | 3         | 0        | 12        |
| OP5063                 | Elective II                            | 3         | 0        | 12        |
|                        |                                        | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b> |                                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ED5076                 | Research Proposal II                   | 3         | 0        | 12        |
| OP5064                 | Elective III                           | 3         | 0        | 12        |
| OP5065                 | Elective IV                            | 3         | 0        | 12        |
| OP5066                 | Elective V                             | 3         | 0        | 12        |
|                        |                                        | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Third Semester</b>  |                                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ED5077                 | Research Proposal III                  | 3         | 0        | 12        |
| ED5078                 | Research Seminar I                     | 1         | 0        | 4         |
| OP5067                 | Elective VI                            | 3         | 0        | 12        |
| OP5068                 | Elective VII                           | 3         | 0        | 12        |
| OP5069                 | Elective VIII                          | 3         | 0        | 12        |
|                        |                                        | <b>13</b> | <b>0</b> | <b>52</b> |
| <b>Fourth Semester</b> |                                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ED5081                 | Assisted Research I                    | 3         | 0        | 12        |
| ED5082                 | Assisted Research II                   | 3         | 0        | 12        |
| OP5070                 | Elective IX                            | 3         | 0        | 12        |
| OP5071                 | Elective X                             | 3         | 0        | 12        |
|                        |                                        | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Fifth Semester</b>  |                                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ED5079                 | Research Seminar II                    | 1         | 0        | 4         |
| ED5083                 | Assisted Research III                  | 3         | 0        | 12        |
| ED6033                 | Doctoral Research I                    | 3         | 0        | 12        |
| ED6034                 | Doctoral Research II                   | 3         | 0        | 12        |
| OP5072                 | Elective XI                            | 3         | 0        | 12        |
|                        |                                        | <b>13</b> | <b>0</b> | <b>52</b> |
| <b>Sixth Semester</b>  |                                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ED6035                 | Doctoral Research III                  | 3         | 0        | 12        |
| ED6036                 | Doctoral Research IV                   | 3         | 0        | 12        |
| ED6037                 | Doctoral Research V                    | 3         | 0        | 12        |
| ED6038                 | Doctoral Research VI                   | 3         | 0        | 12        |
|                        |                                        | <b>12</b> | <b>0</b> | <b>48</b> |

| <b>Seventh Semester</b> |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
|-------------------------|------------------------|-----------|----------|-----------|
| ED5080                  | Research Seminar III   | 1         | 0        | 4         |
| ED6039                  | Doctoral Research VII  | 3         | 0        | 12        |
| ED6040                  | Doctoral Research VIII | 3         | 0        | 12        |
| ED6041                  | Doctoral Research IX   | 3         | 0        | 12        |
| ED6042                  | Doctoral Research X    | 3         | 0        | 12        |
|                         |                        | <b>12</b> | <b>0</b> | <b>48</b> |

| <b>Octavo Semestre</b> |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|------------------------|-----------|----------|-----------|
| ED6000                 | Doctoral Defense       | 0         | 0        | 1         |
| ED6043                 | Doctoral Research XI   | 3         | 0        | 12        |
| ED6044                 | Doctoral Research XII  | 3         | 0        | 12        |
| ED6045                 | Doctoral Research XIII | 3         | 0        | 12        |
| ED6046                 | Doctoral Research XIV  | 3         | 0        | 12        |
|                        |                        | <b>12</b> | <b>0</b> | <b>49</b> |

## Elective Courses

| <b>Code</b> | <b>Name</b>                                           | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|-------------------------------------------------------|----------|----------|----------|
| ED4025      | Learning Psychology                                   | 3        | 0        | 12       |
| ED4026      | Teaching Theory and Practice of the Curriculum        | 3        | 0        | 12       |
| ED4027      | Model and Strategies of Teaching                      | 3        | 0        | 12       |
| ED5048      | Evaluation of Learning                                | 3        | 0        | 12       |
| ED5060      | Theory and Practice of Distance Education             | 3        | 0        | 12       |
| ED5068      | Management and Educational Leadership                 | 3        | 0        | 12       |
| ED5072      | Intellectual and Social Capital Development           | 3        | 0        | 12       |
| ED5074      | Economic and Financial Issues in Higher Education     | 3        | 0        | 12       |
| ED6010      | Scientific Knowledge and Educational Research Methods | 3        | 0        | 12       |
| ED6011      | Quantitative Research Methods I                       | 3        | 0        | 12       |
| ED6012      | Quantitative Research Methods II                      | 3        | 0        | 12       |
| ED6013      | Qualitative Research Methods I                        | 3        | 0        | 12       |
| ED6014      | Qualitative Research Methods II                       | 3        | 0        | 12       |
| ED6025      | Participatory Research Methods                        | 3        | 0        | 12       |

*This doctoral program is required to have completed a professional career.*

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is eight semesters.*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)



## Ph. D. in Humanistic Studies (DEH)

### General Program Objectives

- Prepare researchers with a state-of-the-art vision in the field of the humanities who can respond to the challenges of contemporary society in the field of the humanities.
- Prepare experts who are capable of relating research to teaching, in the area of humanistic studies.
- Train people who are able to conduct interdisciplinary research that will be published in indexed and international spectrum journals.
- Develop in academics the knowledge and skills to design and implement solutions to the complex problems of contemporary society using analytical methods in conjunction with a sense of commitment, leadership, determination and duty, together with ethical reasoning.
- Foment in students the capacity to lead processes of social change and transformation in diverse contexts in relation to the humanities.
- Foment the capacity for reflection in current debates on the area of the humanities by means of a solid grounding in their area of specialization.
- Have the theoretical-methodological bases for working as academics and researchers in undergraduate and graduate programs and research centers in the areas of specialization included in this doctorate.
- Work in institutions of higher education and consulting centers.
- Analyze and research the diverse manifestations of social and cultural phenomena.

### Moreover:

### Learning Outcomes

On completing the program, students will be able to:

- Conduct applied research in the areas of Ethics, Literature and Discourse, Science, Technology and Society, and Communication, from the perspective of cultural studies.
- Graduates from the science, technology and culture concentration will be able to analyze the relationships between science, technology and culture, and their contribution to the development of society.
- Graduates from the communication and cultural studies concentration will be trained to identify the implications of the content and the reception processes of the mass media and the digital media for audiences, focusing on the transformation of society.
- Graduates from the ethics concentration will be trained to analyze and diagnose the characteristics of contemporary society and generate proposals that contribute to the development of society.
- Literature and discourse graduates will have the conceptual tools required to formulate a critical analysis of the diverse forms of discourse, using the discipline's most recent theoretical and methodological proposals.

**DEH Ph. D. in Humanistic Studies****Edition 2011**

| <b>First Semester</b>   |                                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
|-------------------------|-------------------------------------------------|-----------|----------|-----------|
| H4012                   | Research Methods                                | 3         | 0        | 12        |
| H6012                   | Argumentation Theory                            | 3         | 0        | 12        |
| H6018                   | Research Project I                              | 3         | 0        | 12        |
| OP4037                  | Quality Development Course                      | 3         | 0        | 12        |
|                         |                                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b>  |                                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| H6013                   | Humanistic Debates                              | 3         | 0        | 12        |
| H6015                   | Research Seminar I                              | 1         | 0        | 4         |
| H6019                   | Research Project II                             | 3         | 0        | 12        |
| OP5062                  | Elective I                                      | 3         | 0        | 12        |
|                         |                                                 | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Third Semester</b>   |                                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| H6014                   | Cultural Studies                                | 3         | 0        | 12        |
| H6016                   | Research Seminar II                             | 1         | 0        | 4         |
| H6020                   | Research Project III                            | 3         | 0        | 12        |
| OP5063                  | Elective II                                     | 3         | 0        | 12        |
|                         |                                                 | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Fourth Semester</b>  |                                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| H6017                   | Research Seminar III                            | 1         | 0        | 4         |
| H6024                   | Doctoral Research I                             | 3         | 0        | 12        |
| H6025                   | Doctoral Research II                            | 3         | 0        | 12        |
| OP5064                  | Elective III                                    | 3         | 0        | 12        |
|                         |                                                 | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Fifth Semester</b>   |                                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| H6021                   | Thesis Seminar I                                | 3         | 0        | 12        |
| H6026                   | Doctoral Research III                           | 3         | 0        | 12        |
| H6027                   | Doctoral Research IV                            | 3         | 0        | 12        |
| H6028                   | Doctoral Research V                             | 3         | 0        | 12        |
|                         |                                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Sixth Semester</b>   |                                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| H6022                   | Thesis Seminar II                               | 3         | 0        | 12        |
| H6029                   | Doctoral Research VI                            | 3         | 0        | 12        |
| H6030                   | Doctoral Research VII                           | 3         | 0        | 12        |
| H6031                   | Doctoral Research VIII                          | 3         | 0        | 12        |
|                         |                                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Seventh Semester</b> |                                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| H6023                   | Thesis Seminar III                              | 3         | 0        | 12        |
| H6032                   | Doctoral Research IX                            | 3         | 0        | 12        |
| H6033                   | Doctoral Research X                             | 3         | 0        | 12        |
| H6034                   | Doctoral Dissertation: Defense Research Seminar | 0         | 0        | 1         |
|                         |                                                 | <b>9</b>  | <b>0</b> | <b>37</b> |

*This doctoral program is required to have completed a professional career.*

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is seven semesters.*

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C | L | U  |
|--------|----------------------------------------|---|---|----|
| DS4001 | Leadership for Sustainable Development | 3 | 0 | 12 |
| H4018  | Ethics, Humanistic Thought and Society | 3 | 0 | 12 |

### Elective Courses

| Science, Technology and Society    |                                                                                   |   |   |    |
|------------------------------------|-----------------------------------------------------------------------------------|---|---|----|
| Code                               | Name                                                                              | C | L | U  |
| CO5003                             | Implications and Impact of the Information and Communication Technologies         | 3 | 0 | 12 |
| CO5012                             | The Public Sphere in the Information Age: Digital Individuals and Global Village  | 3 | 0 | 12 |
| ED5055                             | Historical Development of Scientific Reasoning                                    | 3 | 0 | 12 |
| H4016                              | Mexican Civil Society through case study: methodology and practice                | 3 | 0 | 12 |
| H5006                              | Knowledge Society                                                                 | 3 | 0 | 12 |
| H5017                              | Social Studies of Science                                                         | 3 | 0 | 12 |
| H5028                              | Philosophy of Science and Technology                                              | 3 | 0 | 12 |
| H5030                              | Advanced Topics in Humanistics Studies                                            | 3 | 0 | 12 |
| Communication and Cultural Studies |                                                                                   |   |   |    |
| Code                               | Name                                                                              | C | L | U  |
| AV5002                             | Media Aesthetics                                                                  | 3 | 0 | 12 |
| AV5004                             | Semiotics of the Narrative                                                        | 3 | 0 | 12 |
| CO4001                             | Mass Communication                                                                | 3 | 0 | 12 |
| CO4002                             | International Communication Seminar                                               | 3 | 0 | 12 |
| CO5001                             | Communication, Culture and Globalization                                          | 3 | 0 | 12 |
| CO5002                             | Communication Flows in the American Continent                                     | 3 | 0 | 12 |
| CO5003                             | Implications and Impact of the Information and Communication Technologies         | 3 | 0 | 12 |
| CO5007                             | Topics on International Communication, Information and Communication Technologies | 3 | 0 | 12 |
| CO5011                             | Seminar in Communication and Cultural Studies                                     | 3 | 0 | 12 |
| CO5012                             | The Public Sphere in the Information Age: Digital Individuals and Global Village  | 3 | 0 | 12 |
| CO5013                             | Latin American Tendencies in the Study of Media Audiences                         | 3 | 0 | 12 |
| H5030                              | Advanced Topics in Humanistics Studies                                            | 3 | 0 | 12 |
| MI5006                             | Political Communication and Journalism Topics                                     | 3 | 0 | 12 |
| MP5003                             | Social Development and New Informational Technologies                             | 3 | 0 | 12 |
| MP5007                             | Journalism and Development                                                        | 3 | 0 | 12 |

**Common courses to all areas**

| <b>Code</b> | <b>Name</b>                            | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|----------------------------------------|----------|----------|----------|
| CO4005      | Qualitative Research in Communication  | 3        | 0        | 12       |
| CO4006      | Quantitative Research in Communication | 3        | 0        | 12       |
| H4003       | Theory of Knowledge                    | 3        | 0        | 12       |
| H4004       | Hermeneutics                           | 3        | 0        | 12       |
| H4005       | Discourse Analysis                     | 3        | 0        | 12       |
| H4006       | Critical Theory and Postmodernity      | 3        | 0        | 12       |
| H4008       | Philosophical Anthropology             | 3        | 0        | 12       |
| H4009       | Philosophy of Culture                  | 3        | 0        | 12       |
| H4015       | Landscape of Mexican Civil Society     | 3        | 0        | 12       |

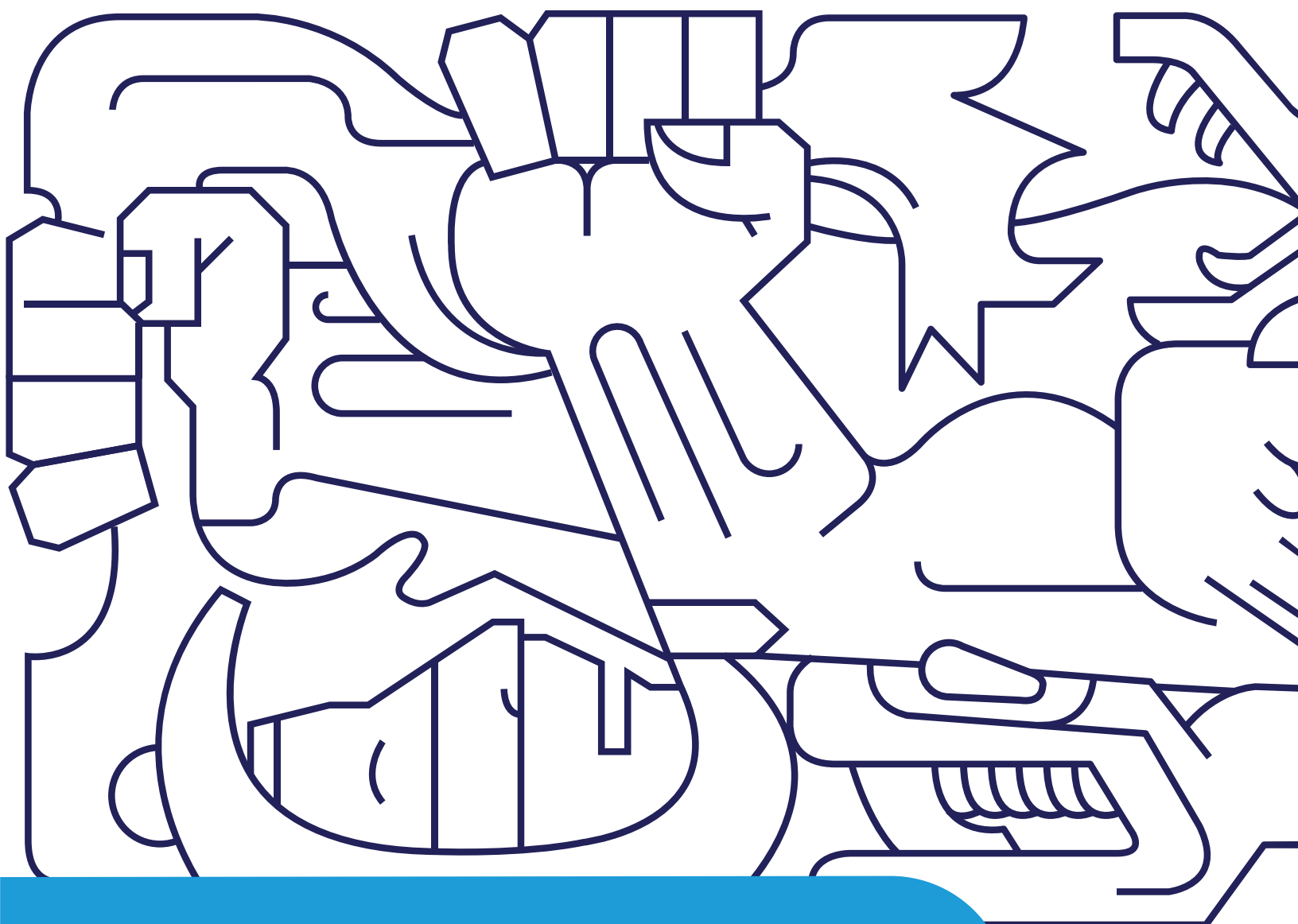
**Ethics**

| <b>Code</b> | <b>Name</b>                                             | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|---------------------------------------------------------|----------|----------|----------|
| GP6002      | Theories and Perspectives of Collective Action          | 3        | 0        | 12       |
| H5002       | Classics of Ethical Thinking                            | 3        | 0        | 12       |
| H5003       | Contemporary Ethical Discourses                         | 3        | 0        | 12       |
| H5004       | Contemporary Philosophy and Political Theory            | 3        | 0        | 12       |
| H5023       | Ethics and Globalization                                | 3        | 0        | 12       |
| H5024       | Ethics in Multicultural Contexts                        | 3        | 0        | 12       |
| H5030       | Advanced Topics in Humanistics Studies                  | 3        | 0        | 12       |
| NB4001      | Leadership and Ethics in the Exercise of Public Service | 3        | 0        | 12       |
| NB4002      | Civil Society and Government                            | 3        | 0        | 12       |
| NB4003      | Political System and Public Administration in Mexico    | 3        | 0        | 12       |
| NB4004      | Quantitative Methods Applied to Social Sciences         | 3        | 0        | 12       |
| SO5000      | Social and Politic Anthropology                         | 3        | 0        | 12       |

**Literature and Discourse**

| <b>Code</b> | <b>Name</b>                                                                         | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|-------------------------------------------------------------------------------------|----------|----------|----------|
| AV5002      | Media Aesthetics                                                                    | 3        | 0        | 12       |
| AV5004      | Semiotics of the Narrative                                                          | 3        | 0        | 12       |
| CO5001      | Communication, Culture and Globalization                                            | 3        | 0        | 12       |
| CO5011      | Seminar in Communication and Cultural Studies                                       | 3        | 0        | 12       |
| CO5012      | The Public Sphere in the Information Age:<br>Digital Individuals and Global Village | 3        | 0        | 12       |
| H5011       | Approaches to Literary Phenomenon                                                   | 3        | 0        | 12       |
| H5012       | Poststructuralism and Contemporary Fiction Theories                                 | 3        | 0        | 12       |
| H5013       | Novel and Discourse: Approaches to Narrative Theory                                 | 3        | 0        | 12       |
| H5030       | Advanced Topics in Humanistics Studies                                              | 3        | 0        | 12       |





Profiles and Curricula

# School of Engineering and Sciences

Engineering



## Specialization in Software Engineering (ELS)

### General Program Objectives

The Logistics and Supply Chain Specialization program aims to prepare specialists who use their leadership in an organization to:

- Improve an organization's competitiveness through innovations in supply chain management.
- Optimize an organization's logistics and supply chain processes through technological and administrative innovations.

### Learning Outcomes

On completing the program, students will be able to:

- Design supply chains, addressing the issues related to the location of facilities, transportation of goods, routing and inventory management.
- Strategically and efficiently manage the organizational and technological resources in the supply chain.
- Diagnose and solve supply chain management problems.
- Design efficient return flow collection models to collaborate with environmental conservation.

### Target Audience

Graduates from engineering or B.A. undergraduate degrees who are conversant with probability and statistics and operations research. Decision makers in the areas of logistics, such as transportation, routing and purchasing, among others.

## ELS Specialization in Logistics and Supply Chain

### Edition 2011

| First Trimester  |                                             | C           | L        | U         |
|------------------|---------------------------------------------|-------------|----------|-----------|
| AD4001           | Statistical Analysis in Organizations       | 3.5         | 0        | 12        |
| AD5003           | Value Creation, Business and Network Models | 3.5         | 0        | 12        |
|                  |                                             | <b>7</b>    | <b>0</b> | <b>24</b> |
| Second Trimester |                                             | C           | L        | U         |
| IN5096           | Transportation and Third Party Logistics    | 3.5         | 0        | 12        |
| OP5053           | Elective I                                  | 3.5         | 0        | 12        |
| OP5054           | Elective II                                 | 3.5         | 0        | 12        |
|                  |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |
| Third Trimester  |                                             | C           | L        | U         |
| GI5021           | Professional Certification                  | 3.5         | 0        | 12        |
| OP5055           | Elective III                                | 3.5         | 0        | 12        |
|                  |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |

### Elective Courses

| Code   | Name                                  | C   | L | U  |
|--------|---------------------------------------|-----|---|----|
| IN5097 | Storage and Inventory Control Systems | 3.5 | 0 | 12 |
| IN5098 | Distribution Logistics                | 3.5 | 0 | 12 |
| IN5099 | Reverse Logistics                     | 3.5 | 0 | 12 |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is three trimesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)



## Specialization in Project Management (EPY)

### General Program Objectives

The Specialization in Project Management aims to prepare specialists who use their leadership in an organization to plan, execute, control, close and evaluate projects, managing human and material resources efficiently.

### Learning Outcomes

On completing the program, students will be able to:

- Initiate, plan, execute, control and close projects correctly.

- Make the best project leadership decisions according to the circumstances.
- Form, integrate and develop effective project management work teams.

### Target Audience

Graduates from engineering or B.A. undergraduate degrees who are conversant with this area. People who are in charge of areas that require the creation, design, implementation and monitoring of objective-oriented activities, in particular under a project-management system.

## EPY Specialization in Project Management

### Edition 2011

| First Trimester  |                                          | C           | L        | U         |
|------------------|------------------------------------------|-------------|----------|-----------|
| AD4004           | Competitive Strategy and Business Design | 3.5         | 0        | 12        |
| AD5034           | Project Management                       | 3.5         | 0        | 12        |
|                  |                                          | <b>7</b>    | <b>0</b> | <b>24</b> |
| Second Trimester |                                          | C           | L        | U         |
| FZ5011           | Economic Engineering                     | 3.5         | 0        | 12        |
| OP5053           | Elective I                               | 3.5         | 0        | 12        |
| OP5054           | Elective II                              | 3.5         | 0        | 12        |
|                  |                                          | <b>10.5</b> | <b>0</b> | <b>36</b> |
| Third Trimester  |                                          | C           | L        | U         |
| GI5023           | Professional Certification               | 3.5         | 0        | 12        |
| OP5055           | Elective III                             | 3.5         | 0        | 12        |
|                  |                                          | <b>7</b>    | <b>0</b> | <b>24</b> |

### Elective Courses

| Code   | Name                           | C   | L | U  |
|--------|--------------------------------|-----|---|----|
| AD5031 | Project Portfolio Management   | 3.5 | 0 | 12 |
| AD5032 | Project Performance Management | 3.5 | 0 | 12 |
| IN4026 | Project Management Methodology | 3.5 | 0 | 12 |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is three trimesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Master of Science in Biotechnology (MBI)

### General Program Objectives

The program's objective is to educate professionals who will practice in the agricultural, health and industrial sectors, incorporating biotechnological techniques into the production and manufacture of satisfiers; who are committed to their communities, on social, ethical and economic levels; aware of the need to create new sustainable technologies; and with an outstanding entrepreneurial and innovative spirit.

### Learning Outcomes

On completing the program, students will be able to:

- Work in the areas of new biotechnological product and process research and development.

- Serve in academic or business settings, participating actively in the development of biotechnological processes at laboratory level and their implementation at industrial level, thus acquiring a competitive advantage in the professional environment.

### Target Audience

This master's degree is designed for graduates from areas related to biology, agronomy, chemistry, biochemistry, food industries, medicine and biochemical engineering, among others.

## MBI Master of Science in Biotechnology

### Edition 2009

| <b>First Semester</b>  |                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|----------------------------------------|----------|----------|-----------|
| BT4005                 | Cell Biology and Physiology            | 3        | 0        | 12        |
| BT5006                 | Genetic Engineering                    | 3        | 0        | 12        |
| GI5000                 | Research and Innovation Methods        | 1.5      | 0        | 6         |
| OP4000                 | Quality Development Course             | 1.5      | 0        | 6         |
|                        |                                        | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Second Semester</b> |                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| BT4004                 | Instrumental Analysis in Biotechnology | 3        | 0        | 12        |
| BT5005                 | Selected Topics in Biotechnology       | 3        | 0        | 12        |
| IN5058                 | Design and Analysis of Experiments     | 3        | 0        | 12        |
|                        |                                        | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>  |                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5007                 | Thesis I                               | 3        | 0        | 12        |
| OP5042                 | Elective I                             | 3        | 0        | 12        |
| OP5043                 | Elective II                            | 3        | 0        | 12        |
|                        |                                        | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b> |                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5008                 | Thesis II                              | 3        | 0        | 12        |
| OP5044                 | Elective III                           | 3        | 0        | 12        |
| OP5045                 | Elective IV                            | 3        | 0        | 12        |
|                        |                                        | <b>9</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Elective Courses

| Code   | Name                                                                 | C | L | U  |
|--------|----------------------------------------------------------------------|---|---|----|
| BT4000 | Mathematical Modeling of Biological Systems                          | 3 | 0 | 12 |
| BT4006 | Biotechnological Processes Engineering                               | 3 | 0 | 12 |
| BT4007 | Bioinformatics                                                       | 3 | 0 | 12 |
| BT4008 | Environmental Physiology                                             | 3 | 0 | 12 |
| BT5000 | Biochemistry and Physiology of Nutraceuticals                        | 3 | 0 | 12 |
| BT5007 | Enzymology and Bio-catalysis                                         | 3 | 0 | 12 |
| BT5008 | Bioreaction and Bioreactors Engineering                              | 3 | 0 | 12 |
| BT5009 | Bioseparations Engineering                                           | 3 | 0 | 12 |
| BT5010 | Research Microbiology                                                | 3 | 0 | 12 |
| BT5011 | Engineering Properties of Foods and Bioproducts                      | 3 | 0 | 12 |
| BT5012 | Techniques for the Analysis and Discovery of Nutraceutical Compounds | 3 | 0 | 12 |
| BT5013 | Advanced Engineering for Emerging Processes Applied to Food          | 3 | 0 | 12 |
| BT5014 | Advanced Topics in Agro-biotechnology                                | 3 | 0 | 12 |
| BT5015 | Advanced Topics in Bioprocesses                                      | 3 | 0 | 12 |
| BT5016 | Advanced Topics in Nutrigenomics and Food Science                    | 3 | 0 | 12 |
| GI5009 | Thesis III                                                           | 3 | 0 | 12 |
| Q5002  | Techniques for Characterization in Biological Chemistry              | 3 | 0 | 12 |

## Master of Science in Engineering (MCI)

### General Program Objectives

The general objective of this program is to train professionals as agents of change for the industrial and academic sectors who are capable of doing applied research, technological development and technology transfer, in the areas of engineering sciences.

### Learning Outcomes

During the duration of the program, students will have the opportunity, not only to interact with distinguished professors in the lines of research of the program and to have a wide research preparation, but also to interact with students from the different research lines and students of other graduate programs of Tecnológico de Monterrey. This abundance of interactions is one of the great strengths of this master program. This program is designed to provide the student with the preparation and skills necessary to become a leading researcher in Engineering Science. Therefore, the student upon graduation from the program will be able to:

- Demonstrate a high level of basic knowledge in fundamental engineering areas including, but not limited to, mathematics, statistics and computing.
- Dominate the theoretical and methodological knowledge of the Engineering Sciences in any professional situation.
- Model engineering problems using an appropriate mathematical language.

- Accomplish research in his/her area of specialization that contributes with relevant new knowledge for the advancement of Engineering Sciences under the supervision of the direct advisor and the thesis committee.
- Develop solutions to engineering problems using technological tools.
- Communicate results of their professional work in a clear, effective and efficient manner.
- Work in the professional community in their area of specialty with leadership in an efficient, collaborative and ethical way.
- Have a proactive and creative attitude to undocumented problems, being able to generate innovations to the extent that the problem requires it.

### Target Audience

Graduates from areas of engineering and exact sciences interested in conducting high-impact research to contribute to the knowledge of one of the specialty areas of Engineering Science. Students entering this program should have excellent academic background, vocation in the generation of knowledge and fluency in communication. Moreover, this program is for those who professionally work under strict ethical standards, who are open to new ways of assimilation of knowledge and professional practice and who are intellectually curious.

## MCI Master of Science in Engineering

### Edition 2017

| <b>First Semester</b>  |                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|----------------------------------------|----------|----------|-----------|
| CS4015                 | Applied Computing                      | 3        | 0        | 12        |
| F4005                  | Mathematical Physical Modeling         | 3        | 0        | 12        |
| GI5000                 | Research and Innovation Methods        | 1.5      | 0        | 6         |
| OP4000                 | Quality Development Course             | 1.5      | 0        | 6         |
|                        |                                        | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Second Semester</b> |                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5025                 | Thesis I                               | 3        | 0        | 12        |
| IN4027                 | Data Science and Statistical Inference | 3        | 0        | 12        |
| OP5042                 | Elective I                             | 3        | 0        | 12        |
|                        |                                        | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>  |                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5026                 | Thesis II                              | 3        | 0        | 12        |
| OP5043                 | Elective II                            | 3        | 0        | 12        |
| OP5044                 | Elective III                           | 3        | 0        | 12        |
|                        |                                        | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b> |                                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5027                 | Thesis III                             | 3        | 0        | 12        |
| OP5045                 | Elective IV                            | 3        | 0        | 12        |
| OP5046                 | Elective V                             | 3        | 0        | 12        |
|                        |                                        | <b>9</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Elective Courses

| Code   | Name                                         | C | L | U  |
|--------|----------------------------------------------|---|---|----|
| AM4003 | Environmental Modeling and Climate Change    | 3 | 0 | 12 |
| AM5013 | Integrated Water Resources Management        | 3 | 0 | 12 |
| CV5016 | Water Quality Analysis and Evaluation        | 3 | 0 | 12 |
| E5054  | Information and Encoding Theory              | 3 | 0 | 12 |
| F4002  | Computer Simulations                         | 3 | 0 | 12 |
| F5009  | Fundamentals and Applications of Wind Energy | 3 | 0 | 12 |
| IN4017 | Production Engineering                       | 3 | 0 | 12 |
| IN5051 | Computer Optimization                        | 3 | 0 | 12 |
| IN5058 | Design and Analysis of Experiments           | 3 | 0 | 12 |
| IN5059 | Forecasting and Regression Analysis          | 3 | 0 | 12 |
| IQ5010 | Environmental Process Engineering            | 3 | 0 | 12 |
| M5041  | Advanced Fluid Mechanics                     | 3 | 0 | 12 |
| M5049  | Computational Fluid Dynamics                 | 3 | 0 | 12 |
| MR5018 | Intelligent Control                          | 3 | 0 | 12 |
| MR5020 | Diagnosis and Fault Tolerant Control         | 3 | 0 | 12 |
| MR5036 | Adaptive and Nonlinear Control               | 3 | 0 | 12 |
| MR5037 | Applied Robotics                             | 3 | 0 | 12 |
| TE4001 | Instrumentation                              | 3 | 0 | 12 |

## Master in Engineering Management (MEM)

### General Program Objectives

The aim of the Master in Management Engineering is to develop leaders and project managers, specialists in their area of expertise.

### Learning Outcomes

During the duration of the program students will have the opportunity not only to interact with distinguished professors in the specialty areas of the program, and also have extensive experience in solving engineering problems in industry, but also to interact with students from different areas of expertise, who work or have worked in small or multinational companies from different regions of the country. This interaction is one of the great strengths of this master's program. This program is designed to give students the necessary preparation and to make a person a leader in their engineering professional skills.

It is expected that after a few years of practice, a graduate of this program will have achievements such as:

- Having led high impact engineering projects
- Being leader of technical or engineering area of multinational companies
- Having led consulting projects in administration and management of engineering projects in their area of specialty.

In addition, after graduation of the program students will be able to:

- Demonstrate and use a high level of theoretical and methodological knowledge of engineering management solution for engineering projects.
- Analyze, manage and lead improvement processes that can be applied to areas such as information technology, process optimization, statistical engineering, supply chain, logistics, among others.
- Communicate results of their professional work in a clear, effective and efficient manner.
- Work in the professional community of their area of expertise with leadership, in an efficient, collaborative and ethical manner.

### Target Audience

The Master of Engineering Management is directed to graduates of a bachelor degree in science or engineering, who have a keen interest in the development of engineering skills in project management and key business processes in management technology or entrepreneurship. Similarly, it is aimed at future technological leaders in industrial management, high technology management, R & D or business management with high technology and startup companies.

Likewise, this program is aimed at professionals in engineering who require, in their work areas, identify critical issues, generate solutions, evaluate alternatives, make decisions, and implement actions, leading multidisciplinary teams.



**MEM Master in Engineering Management****Edition 2016**

| <b>First Trimester</b>  |                                                           | <b>C</b>    | <b>L</b> | <b>U</b>  |
|-------------------------|-----------------------------------------------------------|-------------|----------|-----------|
| IN4029                  | Engineering Project Management                            | 3.5         | 0        | 12        |
| IN4030                  | Financial Analysis for Innovation and Technology Projects | 1.5         | 0        | 6         |
| IN5111                  | Project Design I                                          | 1.5         | 0        | 6         |
| OP4036                  | Quality Development Course                                | 3.5         | 0        | 12        |
|                         |                                                           | <b>1.5</b>  | <b>0</b> | <b>6</b>  |
| <b>Second Trimester</b> |                                                           | <b>C</b>    | <b>L</b> | <b>U</b>  |
| IN4028                  | Statistical Methods and Visualization                     | 3.5         | 0        | 12        |
| IN4031                  | Economic Analysis for Business                            | 1.5         | 0        | 6         |
| IN4032                  | Risk Analysis Project Management                          | 1.5         | 0        | 6         |
| IN4033                  | Innovation and Product Development                        | 1.5         | 0        | 6         |
| IN5112                  | Project Design II                                         | 1.5         | 0        | 6         |
|                         |                                                           | <b>9.5</b>  | <b>0</b> | <b>36</b> |
| <b>Third Trimester</b>  |                                                           | <b>C</b>    | <b>L</b> | <b>U</b>  |
| IN4034                  | Legal Aspects in Managing Engineering                     | 1.5         | 0        | 6         |
| IN5121                  | Business Innovation Project I                             | 2           | 0        | 6         |
| OP5053                  | Elective I                                                | 3.5         | 0        | 12        |
| OP5054                  | Elective II                                               | 3.5         | 0        | 12        |
|                         |                                                           | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Trimester</b> |                                                           | <b>C</b>    | <b>L</b> | <b>U</b>  |
| IN5122                  | Business Innovation Project II                            | 2           | 0        | 6         |
| IN5123                  | Business Innovation Project III                           | 2           | 0        | 6         |
| IN5124                  | Business Innovation Project IV                            | 2           | 0        | 6         |
| IN5125                  | Business Innovation Project V                             | 2           | 0        | 6         |
| OP5055                  | Elective III                                              | 3.5         | 0        | 12        |
|                         |                                                           | <b>11.5</b> | <b>0</b> | <b>36</b> |
| <b>Fifth Trimester</b>  |                                                           | <b>C</b>    | <b>L</b> | <b>U</b>  |
| IN5126                  | Business Innovation Project VI                            | 2           | 0        | 6         |
| IN5127                  | Business Innovation Project VII                           | 2           | 0        | 6         |
| OP5056                  | Elective IV                                               | 3.5         | 0        | 12        |
|                         |                                                           | <b>7.5</b>  | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is five trimesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                                        | C   | L | U  |
|--------|-------------------------------------------------------------|-----|---|----|
| AD4003 | Business Policy, Ethics and Corporate Social Responsibility | 3.5 | 0 | 12 |
| DS4002 | Leadership for Sustainable Development                      | 3.5 | 0 | 12 |

### Elective Courses

| Code   | Name                                                      | C   | L | U  |
|--------|-----------------------------------------------------------|-----|---|----|
| IN5102 | Systemic Administration by Information Technologies       | 3.5 | 0 | 12 |
| IN5103 | Analysis and Data Mining for Decision-Making              | 3.5 | 0 | 12 |
| IN5104 | Informatics Management Function                           | 3.5 | 0 | 12 |
| IN5105 | Social Network Analysis Applied to Organizations          | 3.5 | 0 | 12 |
| IN5106 | Engineering Projects                                      | 3.5 | 0 | 12 |
| IN5107 | Analysis and Evaluation of Industrial Projects            | 3.5 | 0 | 12 |
| IN5108 | Analysis and Design of Lean Systems                       | 3.5 | 0 | 12 |
| IN5109 | Manufacturing Systems Analysis And Modeling               | 3.5 | 0 | 12 |
| IN5110 | Design and Analysis of Experiments                        | 3.5 | 0 | 12 |
| IN5113 | Statistical Process Control                               | 3.5 | 0 | 12 |
| IN5114 | Forecasting and Regression Analysis                       | 3.5 | 0 | 12 |
| IN5115 | Design for Six Sigma                                      | 3.5 | 0 | 12 |
| IN5116 | Supply Chain Design                                       | 3.5 | 0 | 12 |
| IN5117 | Storage and Inventory Control Systems                     | 3.5 | 0 | 12 |
| IN5118 | Reverse Logistics                                         | 3.5 | 0 | 12 |
| IN5119 | Transportation, Third Party Logistics and Routing Systems | 3.5 | 0 | 12 |

## Master in Energy Management and Renewable Sources (MER-V)

### General Program Objectives

- Educate professionals able to optimize energy use, both in private and public sector.
- Educate skilled professionals for energy management including the use of alternative and conventional sources.

### Target Audience

Professionals with responsibilities in energy planning and management processes, and in the development, implementation and assessment of energy management policies.

### Learning Outcomes

On completing the program, students will be able to:

- Solve optimization problems in energy use
- Innovate in planning and energy management
- Evaluate alternatives to the use of renewable sources of energy
- Generate strategic plans of energy that ensure sustainable development.

## MER-V Master in Energy Management and Renewable Sources

### Edition 2011

| <b>Remedial Semester</b> |                                                   | <b>C</b> | <b>L</b> | <b>U</b>  |
|--------------------------|---------------------------------------------------|----------|----------|-----------|
| IQ4002                   | Fundamentals for Energy Analysis                  | 3        | 0        | 12        |
|                          |                                                   | <b>3</b> | <b>0</b> | <b>12</b> |
| <b>First Semester</b>    |                                                   | <b>C</b> | <b>L</b> | <b>U</b>  |
| EC4010                   | Environmental Economics                           | 3        | 0        | 12        |
| OP4037                   | Quality Development Course                        | 3        | 0        | 12        |
|                          |                                                   | <b>6</b> | <b>0</b> | <b>24</b> |
| <b>Second Semester</b>   |                                                   | <b>C</b> | <b>L</b> | <b>U</b>  |
| OP5042                   | Elective I                                        | 3        | 0        | 12        |
| TE4014                   | Industrial Applications of Renewable Energy       | 3        | 0        | 12        |
| TE4015                   | Management and Efficient Use of Electrical Energy | 3        | 0        | 12        |
|                          |                                                   | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>    |                                                   | <b>C</b> | <b>L</b> | <b>U</b>  |
| OP5043                   | Elective II                                       | 3        | 0        | 12        |
| TE4011                   | Cogeneration and Alternate Sources of Energy      | 3        | 0        | 12        |
| TE4016                   | Legislation and Funding of Energy Resources       | 3        | 0        | 12        |
|                          |                                                   | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b>   |                                                   | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5010                   | Research and Innovation Methods                   | 3        | 0        | 12        |
| OP5044                   | Elective III                                      | 3        | 0        | 12        |
|                          |                                                   | <b>6</b> | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                     | C | L | U  |
|--------|------------------------------------------|---|---|----|
| DS4003 | Liderazgo para el desarrollo sostenible  | 3 | 0 | 12 |
| GI4001 | Liderazgo para la innovación empresarial | 3 | 0 | 12 |

### Elective Courses (1)

| Code   | Name                                                         | C   | L | U  |
|--------|--------------------------------------------------------------|-----|---|----|
| F5010  | Principles and Uses of Wind Energy                           | 1.5 | 0 | 6  |
| M5057  | Energy Management in Buildings                               | 1.5 | 0 | 6  |
| M5058  | Energy Efficiency in Transportation                          | 1.5 | 0 | 6  |
| M5059  | Principles and Uses of Solar Energy                          | 1.5 | 0 | 6  |
| TE5020 | Energy Optimization Project                                  | 3   | 0 | 12 |
| TE5021 | General Energy Management                                    | 1.5 | 0 | 6  |
| TE5022 | Energy Management and Audit                                  | 1.5 | 0 | 6  |
| TE5023 | Energy Efficiency in Production Processes                    | 1.5 | 0 | 6  |
| TE5024 | Processes and Techniques for Innovation in Energy Management | 1.5 | 0 | 6  |

(1)For each Elective course, it's necessary to credit 12 units.

## Master in Innovation for Enterprise Development (MID-V)

### General Program Objectives

- To prepare entrepreneurial leaders with a culture of innovation, through practical methodologies, in order to develop high-value businesses and create value within established organizations, targeting professionals and entrepreneurs.
- To prepare professionals who promote a culture of innovation to generate sustainable competitive advantages.
- Disseminate innovations internally in an organization and market them if necessary.
- Use information technology as a means to develop and promote innovations.
- Manage the organization's internal and external knowledge to promote innovation.
- Know and apply intellectual property as a means to generate and protect innovations. Evaluate the impact of innovation across the organization.

### Learning Outcomes

On completing the program, students will be able to:

- Promote and develop innovation in their area of knowledge.
- Design strategies and processes to develop successful innovation and generate value in existing companies.

### Target Audience

Professionals from the areas of Administration, Technology, Engineering, Health, Humanities and Social Science who are interested in acquiring the knowledge required to drive innovation within their organizations.

Consultants who offer services in the area of innovation.

## MID-V Master in Innovation for Enterprise Development

### Edition 2009

| <b>Remedial Trimester</b> |                                                   | <b>C</b>    | <b>L</b> | <b>U</b>  |
|---------------------------|---------------------------------------------------|-------------|----------|-----------|
| AD4016                    | Administration                                    | 3.5         | 0        | 12        |
|                           |                                                   | <b>3.5</b>  | <b>0</b> | <b>12</b> |
| <b>First Trimester</b>    |                                                   | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4013                    | Financial Impact of Innovation in Organizations   | 3.5         | 0        | 12        |
| AD4014                    | Management and Evaluation of Innovation Projects  | 3.5         | 0        | 12        |
| DS4002                    | Leadership for Sustainable Development            | 3.5         | 0        | 12        |
|                           |                                                   | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Trimester</b>   |                                                   | <b>C</b>    | <b>L</b> | <b>U</b>  |
| TI4000                    | Legal Aspects of Technology                       | 3.5         | 0        | 12        |
| TI4004                    | Mental Models and Innovation Methodologies        | 3.5         | 0        | 12        |
| TI4005                    | Innovation Process and Techniques                 | 3.5         | 0        | 12        |
| TI4006                    | Design of Technological Products and Services     | 3.5         | 0        | 12        |
|                           |                                                   | <b>14</b>   | <b>0</b> | <b>48</b> |
| <b>Third Trimester</b>    |                                                   | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4015                    | Culture and Innovation Management in Corporations | 3.5         | 0        | 12        |
| OP5053                    | Elective I                                        | 3.5         | 0        | 12        |
| OP5054                    | Elective II                                       | 3.5         | 0        | 12        |
| OP5055                    | Elective III                                      | 3.5         | 0        | 12        |
|                           |                                                   | <b>14</b>   | <b>0</b> | <b>48</b> |
| <b>Fourth Trimester</b>   |                                                   | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5036                    | Innovation and Creativity Seminar                 | 3.5         | 0        | 12        |
| AD5037                    | Innovation Project                                | 3.5         | 0        | 12        |
| OP5056                    | Elective IV                                       | 3.5         | 0        | 12        |
|                           |                                                   | <b>10.5</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is four trimesters.

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

| Code   | Name                                                             | C   | L | U  |
|--------|------------------------------------------------------------------|-----|---|----|
| AD5009 | Development of Top Management and Leaderships Skills             | 3.5 | 0 | 12 |
| AD5010 | Cross-Cultural Management                                        | 3.5 | 0 | 12 |
| AD5038 | Stages in the Organizational Life-Cycle                          | 3.5 | 0 | 12 |
| AD5039 | Corporate Entrepreneurship                                       | 3.5 | 0 | 12 |
| AD5040 | Generating Value in Enterprises                                  | 3.5 | 0 | 12 |
| AD5041 | Development of Products and Services Using Six-Sigma Methodology | 3.5 | 0 | 12 |
| AD5042 | Rapid Product Development                                        | 3.5 | 0 | 12 |
| AD5043 | Analysis and Innovation in the Value Chain                       | 3.5 | 0 | 12 |
| AD5044 | Globalization and the Challenge of the XXI Century               | 3.5 | 0 | 12 |
| AD5045 | Intellectual Property Strategies for Organizations               | 3.5 | 0 | 12 |
| AD5046 | Creation of Competitive Advantage for Organizations              | 3.5 | 0 | 12 |
| AD5047 | Supplier-Product Chain Management                                | 3.5 | 0 | 12 |
| RH4000 | Leadership and Organizational Behavior                           | 3.5 | 0 | 12 |
| TI4007 | Technology, Innovation and Knowledge                             | 3.5 | 0 | 12 |
| TI4009 | Strategies for Technological Competitiveness                     | 3.5 | 0 | 12 |
| TI5004 | Technology Management Principles                                 | 3.5 | 0 | 12 |
| TI5005 | E-Business Management                                            | 3.5 | 0 | 12 |
| TI5006 | Organizational Architecture for the New Economy                  | 3.5 | 0 | 12 |
| TI5007 | Strategic Alliances and Redesigned Processes                     | 3.5 | 0 | 12 |



## Master of Science in Energetic Engineering (MIE)

### General Program Objectives

- To prepare highly qualified professionals in relevant topics for the conversion, transmission, distribution, storage, conservation and efficient use of energy, including clean and renewable sources.
- To develop professionals with capacities in the technical aspects of the area and motivated to keep up to date permanently in order to resolve current problems and apply engineering to any problems that might arise in the future.
- To train professionals who are interested in applied research and technological development activities, solving relevant problems in the field of energy by means of courses with up-to-date content and a strategic vision of the evolution of energy-related technologies.

### Learning Outcomes

On completing the program, students will be able to:

- Solve problems related to the efficient use of energy in relation to both thermal and electrical engineering.

- Evaluate the different alternative sources of energy and assure the proper management of energy resources needed to achieve sustainable development.
- Understand the impacts produced by energy-sector technologies on the environment.
- Explore promising new alternatives in the area of energy, considering economic limitations and current regulations, and with an awareness of the country's sustainable development requirements.

### Target Audience

Energy Engineers, Chemical Engineers, Electrical Engineers, Mechanical Engineers or Physics Engineers. In special cases, students from other areas of engineering can be admitted if they can demonstrate sufficient knowledge or otherwise are willing to study additional courses.

## MIE Master of Science in Energetic Engineering

### Edition 2009

| <b>First Semester</b>  |                                               | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|-----------------------------------------------|----------|----------|-----------|
| GI5000                 | Research and Innovation Methods               | 1.5      | 0        | 6         |
| OP4000                 | Quality Development Course                    | 1.5      | 0        | 6         |
| OP4006                 | Elective Course I                             | 3        | 0        | 12        |
| TE4010                 | Efficient Use of Electric Energy              | 3        | 0        | 12        |
|                        |                                               | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Second Semester</b> |                                               | <b>C</b> | <b>L</b> | <b>U</b>  |
| OP4007                 | Elective Course II                            | 3        | 0        | 12        |
| OP5042                 | Elective I                                    | 3        | 0        | 12        |
| TE4011                 | Cogeneration and Alternate Sources of Energy  | 3        | 0        | 12        |
|                        |                                               | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>  |                                               | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5007                 | Thesis I                                      | 3        | 0        | 12        |
| OP5043                 | Elective II                                   | 3        | 0        | 12        |
| TE4012                 | Regulations and Financing of Energy Resources | 3        | 0        | 12        |
|                        |                                               | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b> |                                               | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5008                 | Thesis II                                     | 3        | 0        | 12        |
| OP5044                 | Elective III                                  | 3        | 0        | 12        |
| OP5045                 | Elective IV                                   | 3        | 0        | 12        |
|                        |                                               | <b>9</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Basic Elective Courses

| Code   | Name                            | C | L | U  |
|--------|---------------------------------|---|---|----|
| F4002  | Computer Simulations            | 3 | 0 | 12 |
| MA4001 | Matrix Algebra and Optimization | 3 | 0 | 12 |
| MA4004 | Advanced Mathematics            | 3 | 0 | 12 |
| MA4005 | Applied Statistics              | 3 | 0 | 12 |
| MA4007 | Partial Differential Equations  | 3 | 0 | 12 |
| TE4005 | Computer Methods in Engineering | 3 | 0 | 12 |

### Concentration Elective Courses

| Renewable Energies (Campus: Monterrey) |                                                    |   |   |    |
|----------------------------------------|----------------------------------------------------|---|---|----|
| Code                                   | Name                                               | C | L | U  |
| F5009                                  | Fundamentals and Applications of Wind Energy       | 3 | 0 | 12 |
| GI5009                                 | Thesis III                                         | 3 | 0 | 12 |
| IQ5014                                 | Biorefineries and Sustainable Use of Biomass       | 3 | 0 | 12 |
| IQ5015                                 | Technologies for the Reuse of Materials and Energy | 3 | 0 | 12 |
| M5056                                  | Solar Energy Applications                          | 3 | 0 | 12 |
| TE5014                                 | Select Topics of Renewable Energies                | 3 | 0 | 12 |

| Electrical Engineering (Campus: Monterrey) |                                      |   |   |    |
|--------------------------------------------|--------------------------------------|---|---|----|
| Code                                       | Name                                 | C | L | U  |
| E5005                                      | Electronic Control of Power          | 3 | 0 | 12 |
| E5014                                      | Electrical Machine Control           | 3 | 0 | 12 |
| GI5009                                     | Thesis III                           | 3 | 0 | 12 |
| TE4001                                     | Instrumentation                      | 3 | 0 | 12 |
| TE4013                                     | Electric Power Quality               | 3 | 0 | 12 |
| TE5010                                     | Industrial Electric Systems          | 3 | 0 | 12 |
| TE5011                                     | Advanced Energy Conversion           | 3 | 0 | 12 |
| TE5012                                     | Electric Transients in Power Systems | 3 | 0 | 12 |
| TE5013                                     | Electric Equipment Design Elements   | 3 | 0 | 12 |

| Thermal Engineering (Campus: Monterrey) |                                           |   |   |    |
|-----------------------------------------|-------------------------------------------|---|---|----|
| Code                                    | Name                                      | C | L | U  |
| GI5009                                  | Thesis III                                | 3 | 0 | 12 |
| IQ5012                                  | Advanced Thermodynamics                   | 3 | 0 | 12 |
| IQ5013                                  | Combustion Fundamentals and Energy Audits | 3 | 0 | 12 |
| M5041                                   | Advanced Fluid Mechanics                  | 3 | 0 | 12 |
| M5042                                   | Internal Combustion Engines               | 3 | 0 | 12 |
| M5049                                   | Computational Fluid Dynamics              | 3 | 0 | 12 |
| M5054                                   | Efficient Energy Use in Buildings         | 3 | 0 | 12 |
| M5055                                   | Advanced Heat Transfer                    | 3 | 0 | 12 |

## Master in Engineering with specialization in Quality Systems and Productivity (MIP-V)

### General Program Objectives

- To develop highly specialized talent, capable of designing, implementing and leading high-impact initiatives in the generation of added value in the operations of a manufacturing and/or service organization.
- To train experts who organize the participation of the human resource an use, and even create, new approaches in administrative and social sciences that enhance quality and comprehensive productivity in manufacturing and service organizations. They will also promote the strategic, efficient participation of organizational and technological resources.
- To prepare professionals who contribute to their company's competitiveness and innovation in terms of market share growth, increase in earnings before taxes, decrease in costs and improvement in user perception.
- To prepare leaders who will apply new methodologies, and comprehensively improve existing systems as well as the enhancement and innovation processes of a company's productive systems in order to drive its competitiveness.

### Learning Outcomes

On completing the program, students will be able to:

- Design, evaluate and improve management systems for the service and production areas, on the basis of the principles and philosophies of quality, innovation and competitiveness.
- Design, execute and evaluate experimental processes that generate tangible solutions for operational optimization.
- Design, evaluate and improve production systems, on the basis of contemporary production and manufacturing principles and philosophies, supported by the use of statistical and process optimization tools.
- Design rules, procedures and methodologies for the efficient integration of the supply chain.
- Integrate the participation of the human resource as a key component in the operation of organizational management and production processes, as well as the efficient administration of organizational and technological resources.

### Target Audience

Graduates from the Bachelor of Arts or Bachelor of Science degrees who are familiar with probability and statistics and operations research. If they do not meet these requirements, candidates can complete remedial courses.

## MIP-V Master in Engineering with specialization in Quality Systems and Productivity

Edition 2013

| First Semester  |                                        | C         | L        | U         |
|-----------------|----------------------------------------|-----------|----------|-----------|
| OP4006          | Elective Course I                      | 3         | 0        | 12        |
| OP4007          | Elective Course II                     | 3         | 0        | 12        |
| OP4037          | Quality Development Course             | 3         | 0        | 12        |
|                 |                                        | <b>9</b>  | <b>0</b> | <b>36</b> |
| Second Semester |                                        | C         | L        | U         |
| IN4017          | Production Engineering                 | 3         | 0        | 12        |
| IN4018          | Supply Chain Management                | 3         | 0        | 12        |
| IN4019          | Quality Management and Competitiveness | 3         | 0        | 12        |
| OP5042          | Elective I                             | 3         | 0        | 12        |
|                 |                                        | <b>12</b> | <b>0</b> | <b>48</b> |
| Third Semester  |                                        | C         | L        | U         |
| GI5010          | Research and Innovation Methods        | 3         | 0        | 12        |
| OP5043          | Elective II                            | 3         | 0        | 12        |
| OP5044          | Elective III                           | 3         | 0        | 12        |
|                 |                                        | <b>9</b>  | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is three semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C | L | U  |
|--------|----------------------------------------|---|---|----|
| DS4003 | Leadership for Sustainable Development | 3 | 0 | 12 |
| GI4001 | Leadership for Innovation              | 3 | 0 | 12 |

### Basic Elective Courses

| Code   | Name                                     | C | L | U  |
|--------|------------------------------------------|---|---|----|
| IN4016 | Optimization Methods for Decision Making | 3 | 0 | 12 |
| IN5060 | Statistical Process Control              | 3 | 0 | 12 |
| MA4009 | Statistical Methods                      | 3 | 0 | 12 |

### Cursos optativos

| Code   | Name                                                          | C | L | U  |
|--------|---------------------------------------------------------------|---|---|----|
| IN5058 | Design and Analysis of Experiments                            | 3 | 0 | 12 |
| IN5059 | Forecasting and Regression Analysis                           | 3 | 0 | 12 |
| IN5060 | Statistical Process Control                                   | 3 | 0 | 12 |
| IN5061 | Six Sigma Seminar                                             | 3 | 0 | 12 |
| IN5062 | Design for Six Sigma                                          | 3 | 0 | 12 |
| IN5063 | Quality in the Innovation of Products, Processes and Services | 3 | 0 | 12 |
| IN5064 | Strategic Planning of Technological Innovation                | 3 | 0 | 12 |
| IN5066 | Project Engineering                                           | 3 | 0 | 12 |
| IN5067 | Quality in Service                                            | 3 | 0 | 12 |
| IN5068 | Participative Decision-Making Processes                       | 3 | 0 | 12 |
| IN5070 | Analysis and Design of Lean Systems                           | 3 | 0 | 12 |
| IN5071 | Manufacturing Systems Analysis and Modeling                   | 3 | 0 | 12 |
| IN5072 | Productivity Engineering                                      | 3 | 0 | 12 |
| IN5073 | Supply Chain Design                                           | 3 | 0 | 12 |
| IN5081 | Six Sigma Project                                             | 3 | 0 | 12 |
| IN5082 | ISO:9000 Quality Management System                            | 3 | 0 | 12 |
| IN5093 | Management for Lean Operation                                 | 3 | 0 | 12 |
| IN5094 | Competitiveness and Sustainability Measurement                | 3 | 0 | 12 |

## Master in Automotive Engineering (MIR)

### General Program Objectives

- Prepare leaders in the design and enhancement of automotive systems, contributing to the technological development in the mechanical aspects of design and manufacturing, electronics and automotive vehicle power systems.
- Train professionals who carry out engineering and research projects that lead to the development of technology and/or knowledge in the areas of automotive engineering.
- Through the development of its graduates, drive the creation of service, manufacturing or technical consulting businesses related to the automotive industry.
- Train professionals who are in a position to successfully complete subsequent studies in specific areas of knowledge in relation to mechanical design, advanced manufacturing, electronics and power systems.

### Learning Outcomes

On completing the program, students will be able to:

- Develop multidisciplinary engineering projects to solve industrial problems through the generation, integration or innovation of technologies in the areas of automotive design and manufacturing, vehicle instrumentation systems, production media optimization and performance in vehicle power systems.
- Participate actively in industrial or research work in collaborative national and international networks.
- Design strategies and processes focused on increasing the competitiveness of existing companies by optimizing production systems, instrumentation, logistics and product lifecycles.

### Target Audience

This program is designed for mechanical, mechatronics, electronic and industrial engineers.

## MIR Master in Automotive Engineering

### Edition 2009

| <b>Remedial Semester</b> |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
|--------------------------|---------------------------------|-----------|----------|-----------|
| M1002                    | Computerized Drawing            | 2         | 2        | 8         |
|                          |                                 | <b>2</b>  | <b>2</b> | <b>8</b>  |
| <b>First Semester</b>    |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5000                   | Research and Innovation Methods | 1.5       | 0        | 6         |
| M4008                    | Product Design                  | 3         | 0        | 12        |
| OP4000                   | Quality Development Course      | 1.5       | 0        | 6         |
| OP4006                   | Elective Course I               | 3         | 0        | 12        |
| TE4001                   | Instrumentation                 | 3         | 0        | 12        |
|                          |                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b>   |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| M4011                    | Internal Combustion Engines     | 3         | 1        | 12        |
| M5047                    | Integration Project I           | 3         | 0        | 12        |
| OP5042                   | Elective I                      | 3         | 0        | 12        |
| OP5043                   | Elective II                     | 3         | 0        | 12        |
|                          |                                 | <b>12</b> | <b>1</b> | <b>48</b> |
| <b>Third Semester</b>    |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| M5048                    | Integration Project II          | 3         | 0        | 12        |
| OP5044                   | Elective III                    | 3         | 0        | 12        |
| OP5045                   | Elective IV                     | 3         | 0        | 12        |
| OP5046                   | Elective V                      | 3         | 0        | 12        |
|                          |                                 | <b>12</b> | <b>0</b> | <b>48</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is three semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)



## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Basic Elective Courses

| Code   | Name                               | C | L | U  |
|--------|------------------------------------|---|---|----|
| F4002  | Computer Simulations               | 3 | 0 | 12 |
| MA4007 | Partial Differential Equations     | 3 | 0 | 12 |
| MA4009 | Statistical Methods                | 3 | 0 | 12 |
| MA4015 | Applied Mathematics in Engineering | 3 | 0 | 12 |
| TE4005 | Computer Methods in Engineering    | 3 | 0 | 12 |

### Concentration Elective Courses

| Manufacturing Management (Campus: Toluca y Querétaro)             |                                                |   |   |    |
|-------------------------------------------------------------------|------------------------------------------------|---|---|----|
| Code                                                              | Name                                           | C | L | U  |
| IN4017                                                            | Production Engineering                         | 3 | 0 | 12 |
| IN4018                                                            | Supply Chain Management                        | 3 | 0 | 12 |
| IN5062                                                            | Design for Six Sigma                           | 3 | 0 | 12 |
| IN5065                                                            | Analysis and Evaluation of Industrial Projects | 3 | 0 | 12 |
| IN5070                                                            | Analysis and Design of Lean Systems            | 3 | 0 | 12 |
| M5032                                                             | Concurrent Engineering                         | 3 | 0 | 12 |
| M5040                                                             | Selected Topics in Mechanical Engineering      | 3 | 0 | 12 |
| Automotive Design and Manufacturing (Campus: Puebla y Toluca)     |                                                |   |   |    |
| Code                                                              | Name                                           | C | L | U  |
| M4009                                                             | Advanced Materials in Manufacturing            | 3 | 1 | 12 |
| M5022                                                             | Tool Engineering                               | 3 | 0 | 12 |
| M5023                                                             | Virtual Modeling                               | 3 | 0 | 12 |
| M5024                                                             | Computer-aided Engineering                     | 3 | 0 | 12 |
| M5036                                                             | Plastics and Composites Engineering            | 3 | 0 | 12 |
| M5040                                                             | Selected Topics in Mechanical Engineering      | 3 | 0 | 12 |
| M5043                                                             | Automotive Manufacturing                       | 3 | 1 | 12 |
| M5044                                                             | Mold and Plastic Components Engineering        | 3 | 0 | 12 |
| Power Generation and Control (Campus: Puebla, Toluca y Querétaro) |                                                |   |   |    |
| Code                                                              | Name                                           | C | L | U  |
| M5027                                                             | Vehicle Dynamics                               | 3 | 1 | 12 |
| M5045                                                             | Fundamental of Combustion Processes            | 3 | 0 | 12 |
| M5046                                                             | Hybrid and Electric Vehicles                   | 3 | 0 | 12 |
| MR4009                                                            | Automotive Electronics and Control             | 3 | 0 | 12 |
| MR5018                                                            | Intelligent Control                            | 3 | 0 | 12 |
| TE4003                                                            | Embedded and Real Time Systems                 | 3 | 0 | 12 |
| TE4004                                                            | Electronic Control of Power                    | 3 | 0 | 12 |
| TE5016                                                            | Selected Topics of Electronics and Optics      | 3 | 0 | 12 |

## Master in Nanotechnology (MNT )

### General Program Objectives

Train professionals for industry and academia, who, as agents of change, be able to do applied research, technological development, innovation, and technology transfer in the areas of nanotechnology.

### Learning Outcomes

At the end of the program students will be able to:

- Demonstrate a high level of theoretical and methodological knowledge of Nanotechnology in any professional situation.
- Perform research in their area of expertise to provide knowledge relevant to the advancement of nanotechnology.
- Communicate their professional work results in a clear, effective and efficient manner.
- Work in their professional community of their area of expertise with efficient leadership, collaborative and ethical manner.

### Target Audience

The master's program in Nanotechnology is aimed at professionals in areas of engineering and natural sciences mainly interested in conducting high-impact research to contribute to the knowledge of any of the specialty areas of Nanotechnology. Students entering this program should have excellent academic background, vocation in the generation of knowledge, fluency of communication, working professionally under strict ethical standards who are open to new ways of assimilation of knowledge and professional practice and intellectually curious.

## MNT Master in Nanotechnology

### Edition 2016

| <b>First Semester</b>  |                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|---------------------------------|----------|----------|-----------|
| F4002                  | Computer Simulations            | 3        | 0        | 12        |
| GI5000                 | Research and Innovation Methods | 1.5      | 0        | 6         |
| MA4007                 | Partial Differential Equations  | 3        | 0        | 12        |
| OP4000                 | Quality Development Course      | 1.5      | 0        | 6         |
|                        |                                 | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Second Semester</b> |                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
| MA4009                 | Statistical Methods             | 3        | 0        | 12        |
| NT5011                 | Thesis I                        | 3        | 0        | 12        |
| Q4001                  | Thermodynamics of Materials     | 3        | 0        | 12        |
|                        |                                 | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>  |                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
| NT5012                 | Thesis II                       | 3        | 0        | 12        |
| OP5042                 | Elective I                      | 3        | 0        | 12        |
| OP5043                 | Elective II                     | 3        | 0        | 12        |
|                        |                                 | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b> |                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
| NT5013                 | Thesis III                      | 3        | 0        | 12        |
| OP5044                 | Elective III                    | 3        | 0        | 12        |
| OP5045                 | Elective IV                     | 3        | 0        | 12        |
|                        |                                 | <b>9</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Elective Courses

| Code   | Name                           | C | L | U  |
|--------|--------------------------------|---|---|----|
| F5011  | Quantum Optics                 | 3 | 0 | 12 |
| F5012  | Quantum Computation            | 3 | 0 | 12 |
| F5013  | Spintronics                    | 3 | 0 | 12 |
| F5014  | Nanophotonics                  | 3 | 0 | 12 |
| M5031  | Smart Materials                | 3 | 0 | 12 |
| M5034  | Biomaterials                   | 3 | 0 | 12 |
| M5037  | Computational Materials Design | 3 | 0 | 12 |
| M5051  | Surface Engineering            | 3 | 0 | 12 |
| NT5001 | Microfluidics                  | 3 | 0 | 12 |
| NT5002 | Nanobiotechnology              | 3 | 0 | 12 |
| NT5003 | Nanobiocatalysis               | 3 | 0 | 12 |
| NT5004 | Nanobiomaterials               | 3 | 0 | 12 |

## Master of Science in Manufacturing Systems (MSM)

### General Program Objectives

The objective of this program is to train professionals for industry, who, as agents of change, will be capable of technological development, innovation and technology transfer, in new product, manufacturing materials and productive process design settings.

### Learning Outcomes

On completing the program, students will be able to:

- Consolidate companies' competitiveness through the development and integration of design and manufacturing technology in order to increase productivity, enhance quality, reduce costs and ensure their reliability.

- Plan, manage and execute technological development projects in the area of high added-value product design and manufacturing, taking into consideration their technical, economic and social impact.
- Interact with national and international multi-disciplinary working groups for research, development and innovation in relation to new products and manufacturing processes.
- Independently update their knowledge in order to continue to be an agent of technological change and development in the manufacturing industry.

### Target Audience

This program is aimed at engineers from all disciplines. Given its interdisciplinary nature, for the development and technological enhancement of manufacturing systems, the interaction of multiple areas of knowledge is required.

## MSM Master of Science in Manufacturing Systems

### Edition 2009

| <b>Remedial Semester</b> |                                              | <b>C</b> | <b>L</b> | <b>U</b>  |
|--------------------------|----------------------------------------------|----------|----------|-----------|
| M1002                    | Computerized Drawing                         | 2        | 2        | 8         |
| M2010                    | Materials Behavior                           | 3        | 1        | 8         |
| M4000                    | Analysis and Synthesis of Mechanical Systems | 3        | 0        | 12        |
|                          |                                              | <b>8</b> | <b>3</b> | <b>28</b> |
| <b>First Semester</b>    |                                              | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5000                   | Research and Innovation Methods              | 1.5      | 0        | 6         |
| M4009                    | Advanced Materials in Manufacturing          | 3        | 1        | 12        |
| OP4000                   | Quality Development Course                   | 1.5      | 0        | 6         |
| OP4006                   | Elective Course I                            | 3        | 0        | 12        |
|                          |                                              | <b>9</b> | <b>1</b> | <b>36</b> |
| <b>Second Semester</b>   |                                              | <b>C</b> | <b>L</b> | <b>U</b>  |
| M4008                    | Product Design                               | 3        | 0        | 12        |
| M4010                    | Automation in Manufacturing Systems          | 3        | 1        | 12        |
| OP5042                   | Elective I                                   | 3        | 0        | 12        |
|                          |                                              | <b>9</b> | <b>1</b> | <b>36</b> |
| <b>Third Semester</b>    |                                              | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5007                   | Thesis I                                     | 3        | 0        | 12        |
| OP5043                   | Elective II                                  | 3        | 0        | 12        |
| OP5044                   | Elective III                                 | 3        | 0        | 12        |
|                          |                                              | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b>   |                                              | <b>C</b> | <b>L</b> | <b>U</b>  |
| GI5008                   | Thesis II                                    | 3        | 0        | 12        |
| OP5045                   | Elective IV                                  | 3        | 0        | 12        |
| OP5046                   | Elective V                                   | 3        | 0        | 12        |
|                          |                                              | <b>9</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Basic Elective Courses

| Code   | Name                               | C | L | U  |
|--------|------------------------------------|---|---|----|
| F4002  | Computer Simulations               | 3 | 0 | 12 |
| MA4007 | Partial Differential Equations     | 3 | 0 | 12 |
| MA4009 | Statistical Methods                | 3 | 0 | 12 |
| MA4015 | Applied Mathematics in Engineering | 3 | 0 | 12 |
| TE4005 | Computer Methods in Engineering    | 3 | 0 | 12 |

### Concentration Elective Courses

#### Automation and Mechatronics for Manufacturing (Campus: Monterrey)

| Code   | Name                                      | C | L | U  |
|--------|-------------------------------------------|---|---|----|
| E5009  | Microsystems                              | 3 | 0 | 12 |
| GI5009 | Thesis III                                | 3 | 0 | 12 |
| M5021  | Precision Engineering                     | 3 | 0 | 12 |
| M5028  | High Performance Machine Tools            | 3 | 0 | 12 |
| M5029  | Integrated Robotics in Manufacturing      | 3 | 0 | 12 |
| M5030  | Advanced Dynamics                         | 3 | 0 | 12 |
| M5031  | Smart Materials                           | 3 | 0 | 12 |
| M5040  | Selected Topics in Mechanical Engineering | 3 | 0 | 12 |

#### Product Design and Innovation (Campus: Monterrey)

| Code   | Name                                      | C | L | U  |
|--------|-------------------------------------------|---|---|----|
| GI5009 | Thesis III                                | 3 | 0 | 12 |
| M5022  | Tool Engineering                          | 3 | 0 | 12 |
| M5023  | Virtual Modeling                          | 3 | 0 | 12 |
| M5024  | Computer-aided Engineering                | 3 | 0 | 12 |
| M5025  | Computational Mechanics                   | 3 | 0 | 12 |
| M5026  | Aerodynamics                              | 3 | 0 | 12 |
| M5027  | Vehicle Dynamics                          | 3 | 1 | 12 |
| M5040  | Selected Topics in Mechanical Engineering | 3 | 0 | 12 |

## Production Engineering (Campus: Monterrey)

| <b>Code</b> | <b>Name</b>                                 | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|---------------------------------------------|----------|----------|----------|
| GI5009      | Thesis III                                  | 3        | 0        | 12       |
| IN4017      | Production Engineering                      | 3        | 0        | 12       |
| IN4018      | Supply Chain Management                     | 3        | 0        | 12       |
| IN5066      | Project Engineering                         | 3        | 0        | 12       |
| IN5071      | Manufacturing Systems Analysis and Modeling | 3        | 0        | 12       |
| M5032       | Concurrent Engineering                      | 3        | 0        | 12       |
| M5033       | Metrology and Non-destructive Testing       | 3        | 0        | 12       |
| M5040       | Selected Topics in Mechanical Engineering   | 3        | 0        | 12       |

## Advanced Materials (Campus: Monterrey)

| <b>Code</b> | <b>Name</b>                                 | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|---------------------------------------------|----------|----------|----------|
| GI5009      | Thesis III                                  | 3        | 0        | 12       |
| M5034       | Biomaterials                                | 3        | 0        | 12       |
| M5035       | Nanostructured Materials                    | 3        | 0        | 12       |
| M5036       | Plastics and Composites Engineering         | 3        | 0        | 12       |
| M5037       | Computational Materials Design              | 3        | 0        | 12       |
| M5038       | Failure Analysis and Prevention             | 3        | 0        | 12       |
| M5039       | Experimental Analysis of Mechanical Systems | 3        | 0        | 12       |
| M5040       | Selected Topics in Mechanical Engineering   | 3        | 0        | 12       |



## Ph. D. in Biotechnology (DBT)

### General Program Objectives

- Educate scientists who produce innovative biological knowledge to - generate state-of-the-art technologies that are relevant for the food and pharmaceutical sectors, and understand basic phenomena within the field of life science.
- Prepare leaders who will participate in national and international research groups related to areas such as nutraceuticals, biopharmaceuticals, bioinformatics, bioprocesses, cancer, cardiovascular sciences, stem cell biology, biomedical devices, biophysics, immunology and metabolism, among others.
- Design experiments from the identification of the problems to the interpretation of results.
- Analyze critically results and data with advanced statistics tools, such as bioinformatics and data mining.
- Communicate effectively orally and in writing with their peers: mentors, research community, society and grantsmanship.
- Make decisions with scientific judgment and critical thinking in their practice as researchers following legal, ethical and official government regulations.

### Target Audience

Participants will have earned a bachelor's degree from Tecnológico de Monterrey, or any other prestigious universities, in areas related to the program. They have a vocation for science and wish to train as scientists in the areas of biotechnology or health.

### Learning Outcomes

On completing the program, students will be able to:

- Understand the application of basic sciences and research methodology techniques on areas of cell biology, physiology, biochemistry and bioprocesses engineering.
- Use research skills including translational research, critical evaluation, laboratory safety and experimental planning.

**DBT Ph. D. in Biotechnology****Edition 2011**

| <b>First Semester</b>  |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|---------------------------------|-----------|----------|-----------|
| GI5000                 | Research and Innovation Methods | 1.5       | 0        | 6         |
| OP4000                 | Quality Development Course      | 1.5       | 0        | 6         |
| OP5062                 | Elective I                      | 3         | 0        | 12        |
| OP5063                 | Elective II                     | 3         | 0        | 12        |
| OP5064                 | Elective III                    | 3         | 0        | 12        |
|                        |                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b> |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5011                 | Research Proposal I             | 3         | 0        | 12        |
| OP5065                 | Elective IV                     | 3         | 0        | 12        |
| OP5066                 | Elective V                      | 3         | 0        | 12        |
| OP5067                 | Elective VI                     | 3         | 0        | 12        |
|                        |                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Third Semester</b>  |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5012                 | Research Proposal II            | 3         | 0        | 12        |
| GI5014                 | Research Seminar I              | 1         | 0        | 4         |
| OP5068                 | Elective VII                    | 3         | 0        | 12        |
| OP5069                 | Elective VIII                   | 3         | 0        | 12        |
| OP5070                 | Elective IX                     | 3         | 0        | 12        |
|                        |                                 | <b>13</b> | <b>0</b> | <b>52</b> |
| <b>Fourth Semester</b> |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5013                 | Research Proposal III           | 3         | 0        | 12        |
| GI5017                 | Assisted Research I             | 3         | 0        | 12        |
| OP5071                 | Elective X                      | 3         | 0        | 12        |
| OP5072                 | Elective XI                     | 3         | 0        | 12        |
|                        |                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Fifth Semester</b>  |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5018                 | Assisted Research II            | 3         | 0        | 12        |
| GI5019                 | Assisted Research III           | 3         | 0        | 12        |
| GI6021                 | Doctoral Research I             | 3         | 0        | 12        |
| GI6022                 | Doctoral Research II            | 3         | 0        | 12        |
|                        |                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Sixth Semester</b>  |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5015                 | Research Seminar II             | 1         | 0        | 4         |
| GI6023                 | Doctoral Research III           | 3         | 0        | 12        |
| GI6024                 | Doctoral Research IV            | 3         | 0        | 12        |
| GI6025                 | Doctoral Research V             | 3         | 0        | 12        |
|                        |                                 | <b>10</b> | <b>0</b> | <b>40</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

| <b>Seventh Semester</b> |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
|-------------------------|------------------------|-----------|----------|-----------|
| GI6026                  | Doctoral Research VI   | 3         | 0        | 12        |
| GI6027                  | Doctoral Research VII  | 3         | 0        | 12        |
| GI6028                  | Doctoral Research VIII | 3         | 0        | 12        |
|                         |                        | <b>9</b>  | <b>0</b> | <b>36</b> |
| <b>Eighth Semester</b>  |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5016                  | Research Seminar III   | 1         | 0        | 4         |
| GI6029                  | Doctoral Research IX   | 3         | 0        | 12        |
| GI6030                  | Doctoral Research X    | 3         | 0        | 12        |
| GI6031                  | Doctoral Research XI   | 3         | 0        | 12        |
|                         |                        | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Ninth Semester</b>   |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI6000                  | Doctoral Defense       | 0         | 0        | 1         |
| GI6032                  | Doctoral Research XII  | 3         | 0        | 12        |
| GI6033                  | Doctoral Research XIII | 3         | 0        | 12        |
| GI6034                  | Doctoral Research XIV  | 3         | 0        | 12        |
|                         |                        | <b>9</b>  | <b>0</b> | <b>37</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is nine semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Elective Courses

| Code   | Name                                                                           | C | L | U  |
|--------|--------------------------------------------------------------------------------|---|---|----|
| BT4000 | Mathematical Modeling of Biological Systems                                    | 3 | 0 | 12 |
| BT4004 | Instrumental Analysis in Biotechnology                                         | 3 | 0 | 12 |
| BT4005 | Cell Biology and Physiology                                                    | 3 | 0 | 12 |
| BT4006 | Biotechnological Processes Engineering                                         | 3 | 0 | 12 |
| BT4007 | Bioinformatics                                                                 | 3 | 0 | 12 |
| BT4008 | Environmental Physiology                                                       | 3 | 0 | 12 |
| BT5000 | Biochemistry and Physiology of Nutraceuticals                                  | 3 | 0 | 12 |
| BT5005 | Selected Topics in Biotechnology                                               | 3 | 0 | 12 |
| BT5006 | Genetic Engineering                                                            | 3 | 0 | 12 |
| BT5007 | Enzymology and Bio-catalysis                                                   | 3 | 0 | 12 |
| BT5008 | Bioreaction and Bioreactors Engineering                                        | 3 | 0 | 12 |
| BT5009 | Bioseparations Engineering                                                     | 3 | 0 | 12 |
| BT5010 | Research Microbiology                                                          | 3 | 0 | 12 |
| BT5011 | Engineering Properties of Foods and Bioproducts                                | 3 | 0 | 12 |
| BT5012 | Techniques for the Analysis and Discovery of<br>Nutraceutical Compounds        | 3 | 0 | 12 |
| BT5013 | Advanced Engineering for Emerging Processes Applied to Food                    | 3 | 0 | 12 |
| BT5014 | Advanced Topics in Agro-biotechnology                                          | 3 | 0 | 12 |
| BT5015 | Advanced Topics in Bioprocesses                                                | 3 | 0 | 12 |
| BT5016 | Advanced Topics in Nutrigenomics and Food Science                              | 3 | 0 | 12 |
| IN5058 | Design and Analysis of Experiments                                             | 3 | 0 | 12 |
| MA4001 | Matrix Algebra and Optimization                                                | 3 | 0 | 12 |
| MA4004 | Advanced Mathematics                                                           | 3 | 0 | 12 |
| MA4005 | Applied Statistics                                                             | 3 | 0 | 12 |
| MA4007 | Partial Differential Equations                                                 | 3 | 0 | 12 |
| MA4009 | Statistical Methods                                                            | 3 | 0 | 12 |
| ME4095 | Diagnostic Tools                                                               | 0 | 6 | 12 |
| ME4098 | Biomolecules I (Biokinetics)                                                   | 3 | 0 | 12 |
| ME5091 | Cellular and Molecular Pharmacology                                            | 3 | 0 | 12 |
| ME5094 | Cardiac Physiology                                                             | 3 | 0 | 12 |
| ME5095 | Receptor's Theory                                                              | 3 | 0 | 12 |
| ME6000 | Bioethics and Regulations in Research                                          | 3 | 0 | 12 |
| ME6001 | Methodological Structure and Statistics in Biomedical<br>and Clinical Research | 3 | 0 | 12 |
| ME6002 | Epidemiological Research                                                       | 3 | 0 | 12 |

## Ph. D. in Engineering Sciences (DCI)

### General Program Objectives

- Prepare independent researchers with the knowledge and skills to identify opportunities, and develop and direct original research projects on the frontier of knowledge.
- Develop people's talent to work in research, teaching, and technology development and management.
- Prepare experts who can innovate, develop and apply new technologies in industrial and service processes.
- Disseminate the findings of this research and apply the knowledge generated to the country's technological development. Be recognized as a high-impact engineering program in the productive, educational academic and social sectors of the country.

### Target Audience

Participants in this program will have the proven academic capacity, creativity, motivation and potential to conduct research in the form of original work that contributes to enriching the field of technology.

DCI's mechanism for selecting candidates considers the relevant aspects for identifying the academic and research profile necessary for achieving an outstanding performance.

**DCI Ph. D. in Engineering Sciences****Edition 2011**

| <b>First Semester</b>  |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|---------------------------------|-----------|----------|-----------|
| GI5000                 | Research and Innovation Methods | 1.5       | 0        | 6         |
| OP4000                 | Quality Development Course      | 1.5       | 0        | 6         |
| OP5062                 | Elective I                      | 3         | 0        | 12        |
| OP5063                 | Elective II                     | 3         | 0        | 12        |
| OP5064                 | Elective III                    | 3         | 0        | 12        |
|                        |                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b> |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5011                 | Research Proposal I             | 3         | 0        | 12        |
| OP5065                 | Elective IV                     | 3         | 0        | 12        |
| OP5066                 | Elective V                      | 3         | 0        | 12        |
| OP5067                 | Elective VI                     | 3         | 0        | 12        |
|                        |                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Third Semester</b>  |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5012                 | Research Proposal II            | 3         | 0        | 12        |
| GI5014                 | Research Seminar I              | 1         | 0        | 4         |
| OP5068                 | Elective VII                    | 3         | 0        | 12        |
| OP5069                 | Elective VIII                   | 3         | 0        | 12        |
| OP5070                 | Elective IX                     | 3         | 0        | 12        |
|                        |                                 | <b>13</b> | <b>0</b> | <b>52</b> |
| <b>Fourth Semester</b> |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5013                 | Research Proposal III           | 3         | 0        | 12        |
| GI5017                 | Assisted Research I             | 3         | 0        | 12        |
| OP5071                 | Elective X                      | 3         | 0        | 12        |
| OP5072                 | Elective XI                     | 3         | 0        | 12        |
|                        |                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Fifth Semester</b>  |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5018                 | Assisted Research II            | 3         | 0        | 12        |
| GI5019                 | Assisted Research III           | 3         | 0        | 12        |
| GI6021                 | Doctoral Research I             | 3         | 0        | 12        |
| GI6022                 | Doctoral Research II            | 3         | 0        | 12        |
|                        |                                 | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Sixth Semester</b>  |                                 | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5015                 | Research Seminar II             | 1         | 0        | 4         |
| GI6023                 | Doctoral Research III           | 3         | 0        | 12        |
| GI6024                 | Doctoral Research IV            | 3         | 0        | 12        |
| GI6025                 | Doctoral Research V             | 3         | 0        | 12        |
|                        |                                 | <b>10</b> | <b>0</b> | <b>40</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

| <b>Seventh Semester</b> |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
|-------------------------|------------------------|-----------|----------|-----------|
| GI6026                  | Doctoral Research VI   | 3         | 0        | 12        |
| GI6027                  | Doctoral Research VII  | 3         | 0        | 12        |
| GI6028                  | Doctoral Research VIII | 3         | 0        | 12        |
|                         |                        | <b>9</b>  | <b>0</b> | <b>36</b> |
| <b>Eighth Semester</b>  |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI5016                  | Research Seminar III   | 1         | 0        | 4         |
| GI6029                  | Doctoral Research IX   | 3         | 0        | 12        |
| GI6030                  | Doctoral Research X    | 3         | 0        | 12        |
| GI6031                  | Doctoral Research XI   | 3         | 0        | 12        |
|                         |                        | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Ninth Semester</b>   |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GI6000                  | Doctoral Defense       | 0         | 0        | 1         |
| GI6032                  | Doctoral Research XII  | 3         | 0        | 12        |
| GI6033                  | Doctoral Research XIII | 3         | 0        | 12        |
| GI6034                  | Doctoral Research XIV  | 3         | 0        | 12        |
|                         |                        | <b>9</b>  | <b>0</b> | <b>37</b> |

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is nine semesters*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Concentration Elective Courses

| Biotechnology          |                                                               |   |   |    |
|------------------------|---------------------------------------------------------------|---|---|----|
| Code                   | Name                                                          | C | L | U  |
| BT4000                 | Mathematical Modeling of Biological Systems                   | 3 | 0 | 12 |
| BT4004                 | Instrumental Analysis in Biotechnology                        | 3 | 0 | 12 |
| BT4005                 | Cell Biology and Physiology                                   | 3 | 0 | 12 |
| BT4006                 | Biotechnological Processes Engineering                        | 3 | 0 | 12 |
| BT4007                 | Bioinformatics                                                | 3 | 0 | 12 |
| BT5000                 | Biochemistry and Physiology of Nutraceuticals                 | 3 | 0 | 12 |
| BT5005                 | Selected Topics in Biotechnology                              | 3 | 0 | 12 |
| BT5006                 | Genetic Engineering                                           | 3 | 0 | 12 |
| BT5007                 | Enzymology and Bio-catalysis                                  | 3 | 0 | 12 |
| BT5008                 | Bioreaction and Bioreactors Engineering                       | 3 | 0 | 12 |
| BT5009                 | Bioseparations Engineering                                    | 3 | 0 | 12 |
| BT5010                 | Research Microbiology                                         | 3 | 0 | 12 |
| IN5058                 | Design and Analysis of Experiments                            | 3 | 0 | 12 |
| MA4001                 | Matrix Algebra and Optimization                               | 3 | 0 | 12 |
| MA4004                 | Advanced Mathematics                                          | 3 | 0 | 12 |
| MA4005                 | Applied Statistics                                            | 3 | 0 | 12 |
| MA4007                 | Partial Differential Equations                                | 3 | 0 | 12 |
| MA4009                 | Statistical Methods                                           | 3 | 0 | 12 |
| Q5002                  | Techniques for Characterization in Biological Chemistry       | 3 | 0 | 12 |
| Industrial Engineering |                                                               |   |   |    |
| Code                   | Name                                                          | C | L | U  |
| IN4003                 | Linear Programming                                            | 3 | 0 | 12 |
| IN5051                 | Computer Optimization                                         | 3 | 0 | 12 |
| IN5058                 | Design and Analysis of Experiments                            | 3 | 0 | 12 |
| IN5059                 | Forecasting and Regression Analysis                           | 3 | 0 | 12 |
| IN5060                 | Statistical Process Control                                   | 3 | 0 | 12 |
| IN5061                 | Six Sigma Seminar                                             | 3 | 0 | 12 |
| IN5062                 | Design for Six Sigma                                          | 3 | 0 | 12 |
| IN5063                 | Quality in the Innovation of Products, Processes and Services | 3 | 0 | 12 |
| IN5064                 | Strategic Planning of Technological Innovation                | 3 | 0 | 12 |
| IN5065                 | Analysis and Evaluation of Industrial Projects                | 3 | 0 | 12 |
| IN5066                 | Project Engineering                                           | 3 | 0 | 12 |
| IN5067                 | Quality in Service                                            | 3 | 0 | 12 |
| IN5068                 | Participative Decision-Making Processes                       | 3 | 0 | 12 |
| IN5069                 | System Theory and Methodology                                 | 3 | 0 | 12 |
| IN5070                 | Analysis and Design of Lean Systems                           | 3 | 0 | 12 |



|        |                                                           |   |   |    |
|--------|-----------------------------------------------------------|---|---|----|
| IN5071 | Manufacturing Systems Analysis and Modeling               | 3 | 0 | 12 |
| IN5072 | Productivity Engineering                                  | 3 | 0 | 12 |
| IN5073 | Supply Chain Design                                       | 3 | 0 | 12 |
| IN5074 | Reverse Logistics                                         | 3 | 0 | 12 |
| IN5075 | Transportation, Third Party Logistics and Routing Systems | 3 | 0 | 12 |
| IN5076 | Storage and Inventory Control Systems                     | 3 | 0 | 12 |
| IN5080 | Stochastic Processes                                      | 3 | 0 | 12 |
| MA4013 | Distribution Theory                                       | 3 | 0 | 12 |
| MA4016 | Calculus and Linear Algebra                               | 3 | 0 | 12 |
| MA5000 | Statistical Inference                                     | 3 | 0 | 12 |
| MA5008 | Sampling                                                  | 3 | 0 | 12 |
| MA5009 | Reliability                                               | 3 | 0 | 12 |
| MA5010 | Statistical Process Control                               | 3 | 0 | 12 |
| MA5011 | Linear Regression Models                                  | 3 | 0 | 12 |
| MA5012 | Nonparametric Statistics                                  | 3 | 0 | 12 |
| MA5013 | Time Series                                               | 3 | 0 | 12 |
| MA5014 | Multivariate Statistical Methods II                       | 3 | 0 | 12 |
| MA5015 | Models of Statistical Optimization                        | 3 | 0 | 12 |
| MA5016 | Statistical Data Mining                                   | 3 | 0 | 12 |

#### Mechatronics and Advanced Materials

| <b>Code</b> | <b>Name</b>                          | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|--------------------------------------|----------|----------|----------|
| E5009       | Microsystems                         | 3        | 0        | 12       |
| F4002       | Computer Simulations                 | 3        | 0        | 12       |
| IA5003      | Fuzzy Systems                        | 3        | 0        | 12       |
| IA5009      | Evolutionary Computation             | 3        | 0        | 12       |
| IN4017      | Production Engineering               | 3        | 0        | 12       |
| IN4018      | Supply Chain Management              | 3        | 0        | 12       |
| IN5066      | Project Engineering                  | 3        | 0        | 12       |
| IN5080      | Stochastic Processes                 | 3        | 0        | 12       |
| M4008       | Product Design                       | 3        | 0        | 12       |
| M4009       | Advanced Materials in Manufacturing  | 3        | 1        | 12       |
| M4010       | Automation in Manufacturing Systems  | 3        | 1        | 12       |
| M5021       | Precision Engineering                | 3        | 0        | 12       |
| M5022       | Tool Engineering                     | 3        | 0        | 12       |
| M5023       | Virtual Modeling                     | 3        | 0        | 12       |
| M5024       | Computer-aided Engineering           | 3        | 0        | 12       |
| M5025       | Computational Mechanics              | 3        | 0        | 12       |
| M5026       | Aerodynamics                         | 3        | 0        | 12       |
| M5027       | Vehicle Dynamics                     | 3        | 1        | 12       |
| M5028       | High Performance Machine Tools       | 3        | 0        | 12       |
| M5029       | Integrated Robotics in Manufacturing | 3        | 0        | 12       |
| M5030       | Advanced Dynamics                    | 3        | 0        | 12       |
| M5031       | Smart Materials                      | 3        | 0        | 12       |
| M5032       | Concurrent Engineering               | 3        | 0        | 12       |

|        |                                              |   |   |    |
|--------|----------------------------------------------|---|---|----|
| M5033  | Metrology and Non-destructive Testing        | 3 | 0 | 12 |
| M5034  | Biomaterials                                 | 3 | 0 | 12 |
| M5035  | Nanostructured Materials                     | 3 | 0 | 12 |
| M5036  | Plastics and Composites Engineering          | 3 | 0 | 12 |
| M5037  | Computational Materials Design               | 3 | 0 | 12 |
| M5038  | Failure Analysis and Prevention              | 3 | 0 | 12 |
| M5039  | Experimental Analysis of Mechanical Systems  | 3 | 0 | 12 |
| M5040  | Selected Topics in Mechanical Engineering    | 3 | 0 | 12 |
| MA4007 | Partial Differential Equations               | 3 | 0 | 12 |
| MA4009 | Statistical Methods                          | 3 | 0 | 12 |
| MA4011 | Matrix Algebra and Optimization              | 3 | 0 | 12 |
| MA4015 | Applied Mathematics in Engineering           | 3 | 0 | 12 |
| MA5011 | Linear Regression Models                     | 3 | 0 | 12 |
| MA5012 | Nonparametric Statistics                     | 3 | 0 | 12 |
| MA5014 | Multivariate Statistical Methods II          | 3 | 0 | 12 |
| MR4000 | Process Identification                       | 3 | 0 | 12 |
| MR4006 | Advanced Digital Control                     | 3 | 0 | 12 |
| MR5000 | Mechatronics Systems Design                  | 3 | 0 | 12 |
| MR5018 | Intelligent Control                          | 3 | 0 | 12 |
| MR5020 | Diagnosis and Fault Tolerant Control         | 3 | 0 | 12 |
| MR5034 | Discrete Events Systems Analysis and Control | 3 | 0 | 12 |
| MR5035 | Selected Topics in Control                   | 3 | 0 | 12 |
| MR5036 | Adaptive and Nonlinear Control               | 3 | 0 | 12 |
| MR5037 | Applied Robotics                             | 3 | 0 | 12 |
| MR5038 | Perception in Robotics                       | 3 | 0 | 12 |
| TE4001 | Instrumentation                              | 3 | 0 | 12 |
| TE4005 | Computer Methods in Engineering              | 3 | 0 | 12 |

#### Environmental Systems and Energy

| <b>Code</b> | <b>Name</b>                                             | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|---------------------------------------------------------|----------|----------|----------|
| AM4001      | Geographical information systems                        | 3        | 0        | 12       |
| AM4002      | Fundamentals in Environmental Science                   | 3        | 0        | 12       |
| AM4003      | Environmental Modeling and Climate Change               | 3        | 0        | 12       |
| AM5009      | Risk and Vulnerability                                  | 3        | 0        | 12       |
| AM5010      | Sustainable Management of Ecosystems                    | 3        | 0        | 12       |
| AM5011      | Environmental Impact                                    | 3        | 0        | 12       |
| AM5012      | Biological Conservation                                 | 3        | 0        | 12       |
| AM5013      | Integrated Water Resources Management                   | 3        | 0        | 12       |
| AR5005      | Urban Hidrology                                         | 3        | 0        | 12       |
| CV5016      | Water Quality Analysis and Evaluation                   | 3        | 0        | 12       |
| CV5017      | Water Purification and Conditioning of Industrial Water | 3        | 0        | 12       |
| CV5018      | Wastewater Treatment and Reuse                          | 3        | 0        | 12       |
| DS5012      | Advanced Topics in Sustainable Development              | 3        | 0        | 12       |
| E5005       | Electronic Control of Power                             | 3        | 0        | 12       |
| E5014       | Electrical Machine Control                              | 3        | 0        | 12       |
| EC4010      | Environmental Economics                                 | 3        | 0        | 12       |

|        |                                                    |   |   |    |
|--------|----------------------------------------------------|---|---|----|
| F4002  | Computer Simulations                               | 3 | 0 | 12 |
| F5009  | Fundamentals and Applications of Wind Energy       | 3 | 0 | 12 |
| IA5009 | Evolutionary Computation                           | 3 | 0 | 12 |
| IQ5008 | Process Risk Analysis and Evaluation               | 3 | 0 | 12 |
| IQ5009 | Green Engineering and Life Cycle Analysis          | 3 | 0 | 12 |
| IQ5010 | Environmental Process Engineering                  | 3 | 0 | 12 |
| IQ5011 | Process Optimization and Intensification           | 3 | 0 | 12 |
| IQ5012 | Advanced Thermodynamics                            | 3 | 0 | 12 |
| IQ5013 | Combustion Fundamentals and Energy Audits          | 3 | 0 | 12 |
| IQ5014 | Biorefineries and Sustainable Use of Biomass       | 3 | 0 | 12 |
| IQ5015 | Technologies for the Reuse of Materials and Energy | 3 | 0 | 12 |
| M5020  | Nonlinear Computational Mechanics                  | 3 | 0 | 12 |
| M5041  | Advanced Fluid Mechanics                           | 3 | 0 | 12 |
| M5042  | Internal Combustion Engines                        | 3 | 0 | 12 |
| M5049  | Computational Fluid Dynamics                       | 3 | 0 | 12 |
| M5054  | Efficient Energy Use in Buildings                  | 3 | 0 | 12 |
| M5055  | Advanced Heat Transfer                             | 3 | 0 | 12 |
| M5056  | Solar Energy Applications                          | 3 | 0 | 12 |
| MA5005 | Statistical Design of Experiments                  | 3 | 0 | 12 |
| TE4001 | Instrumentation                                    | 3 | 0 | 12 |
| TE4005 | Computer Methods in Engineering                    | 3 | 0 | 12 |
| TE4010 | Efficient Use of Electric Energy                   | 3 | 0 | 12 |
| TE4011 | Cogeneration and Alternate Sources of Energy       | 3 | 0 | 12 |
| TE4012 | Regulations and Financing of Energy Resources      | 3 | 0 | 12 |
| TE4013 | Electric Power Quality                             | 3 | 0 | 12 |
| TE5010 | Industrial Electric Systems                        | 3 | 0 | 12 |
| TE5011 | Advanced Energy Conversion                         | 3 | 0 | 12 |
| TE5012 | Electric Transients in Power Systems               | 3 | 0 | 12 |
| TE5013 | Electric Equipment Design Elements                 | 3 | 0 | 12 |
| TE5014 | Select Topics of Renewable Energies                | 3 | 0 | 12 |

## Ph. D. in Nanotechnology (DNT)

### General Program Objective

Graduates from the Ph.D. in Nanotechnology are scientists who create knowledge to establish novel and innovative technologies that are relevant for the materials and manufacturing sectors, and understand basic phenomena within the field of Nano sciences. They work as leaders or as collaborators within national and international research groups, on areas such as Nano materials, Nano sensors and Nano photonics, among others.

The findings of their discoveries are important outcomes which should be submitted for peer-reviewed and academic publication, patents or conference proceedings. This knowledge transference as well as all of their professional activities follows legal, ethical and official norms.

### Learning Outcomes

At the completion of the program, students will be able to:

- Understand the application of basic sciences and research methodology techniques on areas of Nano materials, Nano sensors and Nano photonics.
- Use research skills including materials preparation, characterization, critical evaluation, laboratory safety and experimental planning.
- Design experiments from the identification of the problems to the interpretation of results.
- Communicate effectively orally and in writing with their peers: mentors, research community, society and grant proposals.
- Make decisions with scientific judgment and critical thinking in their practice as researchers following legal, ethical and government regulations.

### Target Audience

The PhD program in Nanotechnology is designed for candidates with proven academic ability, creativity, motivation and potential to carry out investigations revealed in original works that contribute to enrich the field of nanotechnology.

In the case of DNT, it has an adequate mechanism for selecting applicants who considered the relevant aspects to identify the academic profile, as the research necessary for outstanding performance.

The candidate for a Doctorate must have excellent academic background, and have vocation for research in any field of knowledge that promotes the doctoral program. The admission process is designed to ensure this, emphasizing the need for the skills and potential for research. During the admission process financial support needed by the student and the research topic is reviewed. All this with the purpose of raising the chances of student success in the research.

## DNT Ph. D. in Nanotechnology

Edition 2016

| <b>First Semester</b>  |                           | <b>C</b>   | <b>L</b> | <b>U</b>   |
|------------------------|---------------------------|------------|----------|------------|
| GI6041                 | Research Seminar I        | 1          | 0        | 2          |
| GI6051                 | Research Workshop I       | 1          | 0        | 4          |
| NT6021                 | Guided Research I         | 3          | 0        | 12         |
| NT6022                 | Guided Research II        | 3          | 0        | 12         |
| NT6025                 | Integrated Exam           | 1.5        | 0        | 6          |
|                        |                           | <b>33</b>  | <b>0</b> | <b>132</b> |
| <b>Second Semester</b> |                           | <b>C</b>   | <b>L</b> | <b>U</b>   |
| GI6042                 | Research Seminar II       | 1          | 0        | 2          |
| GI6052                 | Research Workshop II      | 1          | 0        | 4          |
| NT6031                 | Research Proposal I       | 3          | 0        | 12         |
| NT6032                 | Research Proposal II      | 3          | 0        | 12         |
| NT6035                 | Research Proposal Defense | 1.5        | 0        | 6          |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b>  |
| <b>Third Semester</b>  |                           | <b>C</b>   | <b>L</b> | <b>U</b>   |
| GI6043                 | Research Seminar III      | 1          | 0        | 2          |
| GI6053                 | Research Workshop III     | 1          | 0        | 4          |
| NT6041                 | Research Integration I    | 1.5        | 0        | 6          |
| NT6101                 | Doctoral Research I       | 3          | 0        | 12         |
| NT6102                 | Doctoral Research II      | 3          | 0        | 12         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b>  |
| <b>Fourth Semester</b> |                           | <b>C</b>   | <b>L</b> | <b>U</b>   |
| GI6044                 | Research Seminar IV       | 1          | 0        | 2          |
| GI6054                 | Research Workshop IV      | 1          | 0        | 4          |
| GI6061                 | Scientific Product I      | 1.5        | 0        | 6          |
| NT6103                 | Doctoral Research III     | 3          | 0        | 12         |
| NT6104                 | Doctoral Research IV      | 3          | 0        | 12         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b>  |
| <b>Fifth Semester</b>  |                           | <b>C</b>   | <b>L</b> | <b>U</b>   |
| GI6045                 | Research Seminar V        | 1          | 0        | 2          |
| GI6055                 | Research Workshop V       | 1          | 0        | 4          |
| NT6042                 | Research Integration II   | 1.5        | 0        | 6          |
| NT6105                 | Doctoral Research V       | 3          | 0        | 12         |
| NT6106                 | Doctoral Research VI      | 3          | 0        | 12         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b>  |
| <b>Sixth Semester</b>  |                           | <b>C</b>   | <b>L</b> | <b>U</b>   |
| GI6046                 | Research Seminar VI       | 1          | 0        | 2          |
| GI6056                 | Research Workshop VI      | 1          | 0        | 4          |
| GI6062                 | Scientific Product II     | 1.5        | 0        | 6          |
| NT6107                 | Doctoral Research VII     | 3          | 0        | 12         |
| NT6108                 | Doctoral Research VIII    | 3          | 0        | 12         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

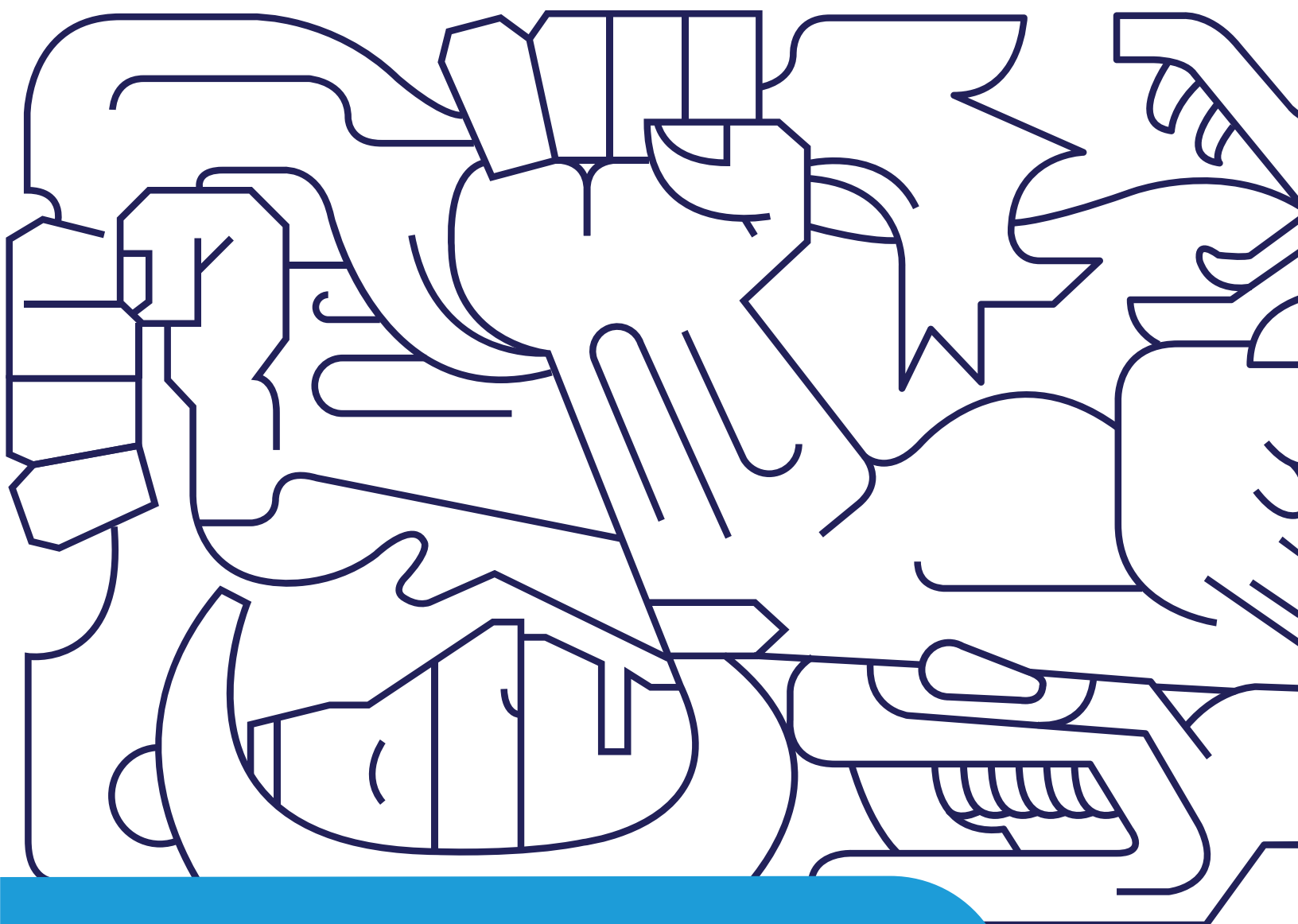
| <b>Seventh Semester</b> |                        | <b>C</b> | <b>L</b> | <b>U</b>  |
|-------------------------|------------------------|----------|----------|-----------|
| NT6109                  | Doctoral Research IX   | 3        | 0        | 12        |
| NT6110                  | Doctoral Research X    | 3        | 0        | 12        |
| NT6111                  | Doctoral Research XI   | 3        | 0        | 12        |
|                         |                        | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Eighth Semester</b>  |                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| NT6112                  | Doctoral Research XII  | 3        | 0        | 12        |
| NT6113                  | Doctoral Research XIII | 3        | 0        | 12        |
| NT6114                  | Doctoral Research XIV  | 3        | 0        | 12        |
| NT6120                  | Doctoral Defense       | 0        | 0        | 1         |
|                         |                        | <b>9</b> | <b>0</b> | <b>37</b> |

*This Doctoral program requires a completed Master's Degree program.*

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is eight semesters*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)





Profiles and Curricula

# School of Engineering and Sciences

Information Technology  
and Electronics





## Specialization in Software Engineering (EIS)

### General Program Objectives

The objective of the specialization in Software Engineering is to prepare specialists who in their careers will become leaders in the conceptualization and development of software applications that will increase organizations' competitiveness, according to the technological changes of the environment.

### Learning Outcomes

On completing the program, students will be able to:

- Design, develop and evaluate software in organizations using modern analysis and develop-

ment methodologies together with advanced programming languages.

- Select software platforms, prioritizing requirements and quality features.
- Pursue lifelong learning and adapt to new software engineering environments.
- Work collaboratively in multidisciplinary teams to develop complex software systems.

### Target Audience

Graduates from engineering degrees, related to computer science and information systems, who wish to join the productive sector providing technological solutions, covering the conceptualization, development and release stages.

## EIS Specialization in Software Engineering

### Edition 2011

| First Trimester  |                                            | C           | L        | U         |
|------------------|--------------------------------------------|-------------|----------|-----------|
| TC4016           | Software Analysis, Design and Construction | 3.5         | 0        | 12        |
| TC4017           | Software Testing and Quality Assurance     | 3.5         | 0        | 12        |
|                  |                                            | <b>7</b>    | <b>0</b> | <b>24</b> |
| Second Trimester |                                            | C           | L        | U         |
| OP5053           | Elective I                                 | 3.5         | 0        | 12        |
| OP5054           | Elective II                                | 3.5         | 0        | 12        |
| TC4018           | Managing Software Development              | 3.5         | 0        | 12        |
|                  |                                            | <b>10.5</b> | <b>0</b> | <b>36</b> |
| Third Trimester  |                                            | C           | L        | U         |
| GI5020           | Professional Certification                 | 3.5         | 0        | 12        |
| OP5055           | Elective III                               | 3.5         | 0        | 12        |
|                  |                                            | <b>7</b>    | <b>0</b> | <b>24</b> |

### Elective Courses

| Code   | Name                                      | C   | L | U  |
|--------|-------------------------------------------|-----|---|----|
| TC4019 | Software Architectures                    | 3.5 | 0 | 12 |
| TC5025 | Aspect Oriented Programming               | 3.5 | 0 | 12 |
| TC5026 | Distributed Databases and NoSQL Databases | 3.5 | 0 | 12 |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is three trimesters.

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

## Master of Science in Computer Science (MCC)

### General Program Objectives

- To prepare successful Computer Science specialists who will contribute to solving problems in productive and/or research settings.
- To prepare leaders who will act as agents of change in their field of work.
- To prepare innovative, entrepreneurial professionals who generate patents, products and technology-based companies.

### Learning Outcomes

On completing the program, students will be able to:

- Be literate in cuttingedge computer science technologies and methodologies.
- Fulfill lifelong selfdirected learning and adapt to new environments.
- Generate scientific practical computer science research projects in multidisciplinary teams.
- Depending on the selected area of specialization, students will also be able to:
- Analyze, model and develop computer systems that have the capacity to represent real agents in virtual worlds. They will be experts in creating computer images applied to the entertainment, modeling, videogame and exploration industries, among others.

- Develop intelligent computer systems that can be used to solve diverse problems, such as: process optimization, intelligent data searches, and the development of control, diagnostic and monitoring.
- Analyze, model, design and maintain computer networks, using state of the art technologies. They will be experts in the design and exploitation of distributed systems, high performance computing and security.
- Design, develop and evaluate software for industries, using modern software development methodologies and advanced programming languages.

### Target Audience

Computer scientists, consultants, instructors or researchers who wish to deepen or update their knowledge of the theory and techniques of this field.

Professionals from related areas (electronics, electricity, communications, mathematics, and physics, among others, who can demonstrate they have the basic knowledge required for the successful completion of this program) who wish to complement their education with studies in the area of computer science.

## MCC Master of Science in Computer Science

### Edition 2009

| <b>First Semester</b>  |                                            | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|--------------------------------------------|-----------|----------|-----------|
| TC4000                 | Programming Techniques                     | 3         | 0        | 12        |
|                        |                                            | <b>3</b>  | <b>0</b> | <b>12</b> |
| <b>First Semester</b>  |                                            | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GT4000                 | Research and Innovation Methods            | 1.5       | 0        | 6         |
| IA4000                 | Intelligent Systems                        | 3         | 0        | 12        |
| OP4000                 | Quality Development Course                 | 1.5       | 0        | 6         |
| TC4001                 | Computing Fundamentals                     | 3         | 0        | 12        |
| TC4002                 | Software Analysis, Design and Construction | 3         | 0        | 12        |
|                        |                                            | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b> |                                            | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GT5000                 | Thesis I                                   | 3         | 0        | 12        |
| OP5042                 | Elective I                                 | 3         | 0        | 12        |
| OP5043                 | Elective II                                | 3         | 0        | 12        |
| TC4003                 | Distributed Systems                        | 3         | 0        | 12        |
|                        |                                            | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Third Semester</b>  |                                            | <b>L</b>  | <b>U</b> |           |
| GT5001                 | Thesis II                                  | 3         | 0        | 12        |
| OP5044                 | Elective III                               | 3         | 0        | 12        |
| OP5045                 | Elective IV                                | 3         | 0        | 12        |
| OP5046                 | Elective V                                 | 3         | 0        | 12        |
|                        |                                            | <b>12</b> | <b>0</b> | <b>48</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is three semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Concentration Elective Courses

#### Computer Graphics and Animation (Campus: Ciudad de México, Estado de México, Cuernavaca, Guadalajara)

| Code   | Name                                | C | L | U  |
|--------|-------------------------------------|---|---|----|
| TC4004 | Computer Graphics                   | 3 | 0 | 12 |
| TC4005 | 3D Animation                        | 3 | 0 | 12 |
| TC4006 | Videogame Design and Development    | 3 | 0 | 12 |
| TC5000 | Graphics Modelling                  | 3 | 0 | 12 |
| TC5001 | Image Synthesis                     | 3 | 0 | 12 |
| TC5002 | Dual Reality                        | 3 | 0 | 12 |
| TC5009 | Selected Topics in Computer Science | 3 | 0 | 12 |

#### Software Engineering (Campus: Ciudad de México, Estado de México, Cuernavaca, Guadalajara)

| Code   | Name                                   | C | L | U  |
|--------|----------------------------------------|---|---|----|
| TC4010 | Software Architectures                 | 3 | 0 | 12 |
| TC4011 | Software Testing and Quality Assurance | 3 | 0 | 12 |
| TC4012 | Managing Software Development          | 3 | 0 | 12 |
| TC5006 | Aspect Oriented Programming            | 3 | 0 | 12 |
| TC5007 | Formal Methods in Software Engineering | 3 | 0 | 12 |
| TC5008 | Distributed Databases                  | 3 | 0 | 12 |
| TC5009 | Selected Topics in Computer Science    | 3 | 0 | 12 |

#### Computer Networks and Security (Campus: Ciudad de México, Estado de México, Cuernavaca, Guadalajara)

| Code   | Name                                | C | L | U  |
|--------|-------------------------------------|---|---|----|
| TC4007 | Wireless and Mobile Networks        | 3 | 0 | 12 |
| TC4008 | High Performance Computing          | 3 | 0 | 12 |
| TC4009 | Computer Security I                 | 3 | 0 | 12 |
| TC5003 | High-speed Networks                 | 3 | 0 | 12 |
| TC5004 | Multi-core Programming              | 3 | 0 | 12 |
| TC5005 | Computer Security II                | 3 | 0 | 12 |
| TC5009 | Selected Topics in Computer Science | 3 | 0 | 12 |

## Intelligent Systems (Campus: Ciudad de México, Estado de México, Cuernavaca, Guadalajara)

| <b>Code</b> | <b>Name</b>                            | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|----------------------------------------|----------|----------|----------|
| IA4009      | Uncertainty Systems                    | 3        | 0        | 12       |
| IA4010      | Connectionist and Evolutionary Systems | 3        | 0        | 12       |
| IA4011      | Multi-agent Systems                    | 3        | 0        | 12       |
| IA5000      | Knowledge Discovery and Data Mining    | 3        | 0        | 12       |
| IA5003      | Fuzzy Systems                          | 3        | 0        | 12       |
| IA5009      | Evolutionary Computation               | 3        | 0        | 12       |
| IA5011      | Advanced Robotics                      | 3        | 0        | 12       |
| IA5012      | Computer Vision                        | 3        | 0        | 12       |
| IA5021      | Robotics and Computer Vision           | 3        | 0        | 12       |
| TC5009      | Selected Topics in Computer Science    | 3        | 0        | 12       |

## Master of Science in Computer Science (MCC-I)

### General Program Objectives

Prepare professionals for industry and academia who, as agents of change, are able to do applied research, technological development, innovation, and technology transfer in the areas of computer science.

### Learning Outcomes

At the end of the program, students will be able to:

- Demonstrate a high level of theoretical and methodological knowledge of Computer Science in any professional situation.
- Conduct research in their area of expertise to provide knowledge relevant to the advancement of Computer Science.
- Communicate results of their professional work in a clear, effective and efficient manner.
- Work in the professional community in their area of specialty with leadership in an efficient, collaborative and ethical way.

### Target Audience

Graduates from areas of computer science, engineering and exact sciences, interested in conducting high-impact research to contribute to the knowledge of one of the specialty areas of Computer Science. Students entering this program should have excellent academic background, vocation in the generation of knowledge and fluency of communication. Moreover, this program is for those who professionally work under strict ethical standards, who are open to new ways of assimilation of knowledge and professional practice and who are intellectually curious.

## MCC-I Master of Science in Computer Science

### Edition 2016

| <b>First Semester</b>  |                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|---------------------------------|----------|----------|-----------|
| CS4000                 | Intelligent Systems             | 3        | 0        | 12        |
| CS4012                 | Computing Fundamentals          | 3        | 0        | 12        |
| GI5000                 | Research and Innovation Methods | 1.5      | 0        | 6         |
| OP4000                 | Quality Development Course      | 1.5      | 0        | 6         |
|                        |                                 | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Second Semester</b> |                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
| CS4013                 | Machine Learning                | 3        | 0        | 12        |
| CS4014                 | Applied Mathematics             | 3        | 0        | 12        |
| CS5058                 | Thesis I                        | 3        | 0        | 12        |
|                        |                                 | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>  |                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
| CS5059                 | Thesis II                       | 3        | 0        | 12        |
| OP5042                 | Elective I                      | 3        | 0        | 12        |
| OP5043                 | Elective II                     | 3        | 0        | 12        |
|                        |                                 | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b> |                                 | <b>C</b> | <b>L</b> | <b>U</b>  |
| CS5060                 | Thesis III                      | 3        | 0        | 12        |
| OP5044                 | Elective III                    | 3        | 0        | 12        |
| OP5045                 | Elective IV                     | 3        | 0        | 12        |
|                        |                                 | <b>9</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)



## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Elective Courses

| Code   | Name                                                           | C | L | U  |
|--------|----------------------------------------------------------------|---|---|----|
| CS5000 | Computational Intelligence                                     | 3 | 0 | 12 |
| CS5048 | Evolutionary Computation                                       | 3 | 0 | 12 |
| CS5049 | Bioinformatics                                                 | 3 | 0 | 12 |
| CS5050 | Computer Vision                                                | 3 | 0 | 12 |
| CS5051 | Computational Techniques for Machine Learning                  | 3 | 0 | 12 |
| CS5052 | Probabilistic Graphical Models                                 | 3 | 0 | 12 |
| CS5053 | Agent-Based Systems                                            | 3 | 0 | 12 |
| CS5054 | Based Simulation for Engineering and Sciences                  | 3 | 0 | 12 |
| CS5055 | Data Science Research Methods                                  | 3 | 0 | 12 |
| CS5056 | Data Analytics                                                 | 3 | 0 | 12 |
| CS5057 | Data Analysis and Visualization Techniques for Decision-making | 3 | 0 | 12 |

## Master in Science in Electronic Engineering (Electronic Systems)(MSE-E)

### General Program Objectives

- To equip competent, capable telecommunications professionals to generate the knowledge-based technological development of society.
- To prepare professionals who are capable of supporting the development and acquisition of technology to detonate, with telecommunications applications and services, the productive sectors that use them.
- To train professionals to design and operate these applications and services, together with the infrastructure that delivers them, evolving in accordance with international technological advancements.

### Learning Outcomes

On completing the program, students will be able to:

- Analyze design and evaluate communications systems using measurement instruments and equipment, and computer tools to support appropriate decision-making.
- Manage, plan and operate communications systems and networks using analytical and computer tools to streamline the services of organizations that use such systems.
- Digitally process information to integrate user applications such as services based on localization and online multimedia, voice, audio and video applications, among others.

### Target Audience

This program targets professionals from the areas of electronic engineering, control, electronic systems, biomedical engineering, industrial physics and related areas. It is also designed for professionals who wish to contribute to the advancement of electronic and computer technologies and acquire in-depth knowledge of current technologies and their trends, in order to create innovative solutions that will benefit society and the country's industry.

## MSE-E Master in Science in Electronic Engineering (Electronic Systems)

Edition 2009

| <b>First Semester</b>  |                                                  | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|--------------------------------------------------|----------|----------|-----------|
| OP5042                 | Elective I                                       | 3        | 0        | 12        |
| TE4000                 | Advanced Mathematics for Electronics Engineering | 3        | 0        | 12        |
| TE4002                 | Stochastic and Random Processes                  | 3        | 0        | 12        |
|                        |                                                  | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Second Semester</b> |                                                  | <b>C</b> | <b>L</b> | <b>U</b>  |
| F4002                  | Computer Simulations                             | 3        | 0        | 12        |
| GT4000                 | Research and Innovation Methods                  | 1.5      | 0        | 6         |
| OP4000                 | Quality Development Course                       | 1.5      | 0        | 6         |
| TE4001                 | Instrumentation                                  | 3        | 0        | 12        |
|                        |                                                  | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>  |                                                  | <b>C</b> | <b>L</b> | <b>U</b>  |
| GT5000                 | Thesis I                                         | 3        | 0        | 12        |
| OP5043                 | Elective II                                      | 3        | 0        | 12        |
| OP5044                 | Elective III                                     | 3        | 0        | 12        |
|                        |                                                  | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b> |                                                  | <b>C</b> | <b>L</b> | <b>U</b>  |
| GT5001                 | Thesis II                                        | 3        | 0        | 12        |
| OP5045                 | Elective IV                                      | 3        | 0        | 12        |
| OP5046                 | Elective V                                       | 3        | 0        | 12        |
|                        |                                                  | <b>9</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                   | C   | L | U |
|--------|----------------------------------------|-----|---|---|
| DS4000 | Leadership for Sustainable Development | 1.5 | 0 | 6 |
| GI4000 | Leadership for Business Innovation     | 1.5 | 0 | 6 |

### Concentration Elective Courses

| Optical Engineering (Campus: Monterrey, Guadalajara, Toluca)               |                                      |   |   |    |
|----------------------------------------------------------------------------|--------------------------------------|---|---|----|
| Code                                                                       | Name                                 | C | L | U  |
| F4003                                                                      | Propagation and Fiber Optics         | 3 | 0 | 12 |
| F4004                                                                      | Image Processing                     | 3 | 0 | 12 |
| F5000                                                                      | Non Linear Optics                    | 3 | 0 | 12 |
| F5007                                                                      | Lasers                               | 3 | 0 | 12 |
| F5008                                                                      | Industrial Optics                    | 3 | 0 | 12 |
| Microelectronics and Microsystems (Campus: Monterrey, Guadalajara, Toluca) |                                      |   |   |    |
| Code                                                                       | Name                                 | C | L | U  |
| TE4004                                                                     | Electronic Control of Power          | 3 | 0 | 12 |
| TE4008                                                                     | Advanced Digital Integrated Circuits | 3 | 0 | 12 |
| TE5000                                                                     | Advanced Microsystems                | 3 | 0 | 12 |
| TE5002                                                                     | CMOS Analog Microelectronics         | 3 | 0 | 12 |
| TE5006                                                                     | Electric Machinery Control           | 3 | 0 | 12 |
| Embedded Systems (Campus: Monterrey, Guadalajara, Toluca)                  |                                      |   |   |    |
| Code                                                                       | Name                                 | C | L | U  |
| TE4003                                                                     | Embedded and Real Time Systems       | 3 | 0 | 12 |
| TE4009                                                                     | Advanced Digital Signal Processing   | 3 | 0 | 12 |
| TE5007                                                                     | Advanced Computer Architecture       | 3 | 0 | 12 |
| TE5008                                                                     | Heterogeneous Embedded Systems       | 3 | 0 | 12 |
| TE5009                                                                     | Embedded Software                    | 3 | 0 | 12 |

## Master in Information Technology Management (MTI-I)

### General Program Objectives

The objective of the Master in Information Technology Management is to prepare professionals who are capable of driving, with a strategic organizational vision, the generation of value through information and communication technologies (ICTs).

### Learning Outcomes

On completing the program, students will be able to:

- Design and manage technological projects, including the ethical aspects of handling information.
- Model and optimize business processes in which human capital and information technologies interact.
- Propose the alignment of technological strategy with business strategy.
- Generate innovative initiatives based on business opportunities and technological solutions focused on organizational competitiveness.

### Target Audience

The MTI program targets people from majors in three different disciplines: Information Technologies, Business Administration or Engineering. The program enables graduates from ICT majors to specialize in technology management, understanding the value of technologies for organizations and becoming proficient in the necessary techniques for their management and the search for business opportunities. The program enables engineering specialists to delve into information and communications technologies as a tool for transforming an organization's processes and activities. MTI offers business or business administration specialists the opportunity to understand the complexity of technology and become proficient in company management techniques in the new paradigm implied by the knowledge society. r services in the area of innovation.

**MTI-I Master in Information Technology Management****Edition 2012**

| <b>Remedial Trimester</b> |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
|---------------------------|---------------------------------------------|-------------|----------|-----------|
| AD4016                    | Administration                              | 3.5         | 0        | 12        |
| TI4011                    | Introduction to Information Technology      | 3.5         | 0        | 12        |
|                           |                                             | <b>7</b>    | <b>0</b> | <b>24</b> |
| <b>First Trimester</b>    |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| OP4036                    | Quality Development Course                  | 3.5         | 0        | 12        |
| TI4016                    | Information Technology Governance           | 3.5         | 0        | 12        |
| TI4017                    | Strategic Enterprise Performance Management | 3.5         | 0        | 12        |
|                           |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Trimester</b>   |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4022                    | Project, Program and Portfolio Management   | 3.5         | 0        | 12        |
| OP5053                    | Elective I                                  | 3.5         | 0        | 12        |
| TI5024                    | Dynamic Systems Modeling                    | 3.5         | 0        | 12        |
|                           |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Third Trimester</b>    |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5036                    | Innovation and Creativity Seminar           | 3.5         | 0        | 12        |
| RH4002                    | Human Capital Management                    | 3.5         | 0        | 12        |
| TI4015                    | Business Technology Architecture            | 3.5         | 0        | 12        |
|                           |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Trimester</b>   |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| OP5054                    | Elective II                                 | 3.5         | 0        | 12        |
| OP5055                    | Elective III                                | 3.5         | 0        | 12        |
| OP5059                    | Degree Course I                             | 3.5         | 0        | 12        |
|                           |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fifth Trimester C</b>  |                                             | <b>L</b>    | <b>U</b> |           |
| OP5056                    | Elective IV                                 | 3.5         | 0        | 12        |
| OP5060                    | Degree Course II                            | 3.5         | 0        | 12        |
|                           |                                             | <b>7</b>    | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is five trimesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Master in Information Technology Management (MTI-V)

### General Program Objectives

The objective of the Master in Information Technology Management is to prepare professionals who are capable of driving, with a strategic organizational vision, the generation of value through information and communication technologies (ICTs).

### Learning Outcomes

On completing the program, students will be able to:

- Design and manage technological projects, including the ethical aspects of handling information.
- Model and optimize business processes in which human capital and information technologies interact.
- Propose the alignment of technological strategy with business strategy.
- Generate innovative initiatives based on business opportunities and technological solutions focused on organizational competitiveness.

### Target Audience

The MTI program targets people from majors in three different disciplines: Information Technologies, Business Administration or Engineering. The program enables graduates from ICT majors to specialize in technology management, understanding the value of technologies for organizations and becoming proficient in the necessary techniques for their management and the search for business opportunities. The program enables engineering specialists to delve into information and communications technologies as a tool for transforming an organization's processes and activities. MTI offers business or business administration specialists the opportunity to understand the complexity of technology and become proficient in company management techniques in the new paradigm implied by the knowledge society. r services in the area of innovation.

## MTI-V Master in Information Technology Management

### Edition 2012

| <b>Remedial Trimester</b> |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
|---------------------------|---------------------------------------------|-------------|----------|-----------|
| AD4016                    | Administration                              | 3.5         | 0        | 12        |
| TI4011                    | Introduction to Information Technology      | 3.5         | 0        | 12        |
|                           |                                             | <b>7</b>    | <b>0</b> | <b>24</b> |
| <b>First Trimester</b>    |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| OP4036                    | Quality Development Course                  | 3.5         | 0        | 12        |
| TI4016                    | Information Technology Governance           | 3.5         | 0        | 12        |
| TI4017                    | Strategic Enterprise Performance Management | 3.5         | 0        | 12        |
|                           |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Trimester</b>   |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4022                    | Project, Program and Portfolio Management   | 3.5         | 0        | 12        |
| OP5053                    | Elective I                                  | 3.5         | 0        | 12        |
| TI5024                    | Dynamic Systems Modeling                    | 3.5         | 0        | 12        |
|                           |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Third Trimester</b>    |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5036                    | Innovation and Creativity Seminar           | 3.5         | 0        | 12        |
| RH4002                    | Human Capital Management                    | 3.5         | 0        | 12        |
| TI4015                    | Business Technology Architecture            | 3.5         | 0        | 12        |
|                           |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Trimester</b>   |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| OP5054                    | Elective II                                 | 3.5         | 0        | 12        |
| OP5055                    | Elective III                                | 3.5         | 0        | 12        |
| OP5059                    | Degree Course I                             | 3.5         | 0        | 12        |
|                           |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fifth Trimester</b>    |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| OP5056                    | Elective IV                                 | 3.5         | 0        | 12        |
| OP5060                    | Degree Course II                            | 3.5         | 0        | 12        |
|                           |                                             | <b>7</b>    | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is five trimesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)



## Elective Courses

### Quality Development Courses

| Code   | Name                                                        | C   | L | U  |
|--------|-------------------------------------------------------------|-----|---|----|
| AD4003 | Business Policy, Ethics and Corporate Social Responsibility | 3.5 | 0 | 12 |
| DS4002 | Leadership for Sustainable Development                      | 3.5 | 0 | 12 |

### Concentration Elective Courses

| Concentration in Projects Management (Campus: Universidad Virtual en Línea) |                                                      |     |   |    |
|-----------------------------------------------------------------------------|------------------------------------------------------|-----|---|----|
| Code                                                                        | Name                                                 | C   | L | U  |
| AD4032                                                                      | Executing Complex Programs                           | 3.5 | 0 | 12 |
| AD4033                                                                      | Managing Without Authority                           | 3.5 | 0 | 12 |
| AD4034                                                                      | Project Innovation Through Design Thinking           | 3.5 | 0 | 12 |
| AD5050                                                                      | Mastering the Project Portfolio                      | 3.5 | 0 | 12 |
| AD5051                                                                      | Converting Strategy into Action                      | 3.5 | 0 | 12 |
| AD5052                                                                      | Designing the Organization for Execution             | 3.5 | 0 | 12 |
| AD5053                                                                      | Managing Global Initiatives                          | 3.5 | 0 | 12 |
| AD5054                                                                      | Leadership for Strategic Execution                   | 3.5 | 0 | 12 |
| AD5055                                                                      | Leading Change from the Middle                       | 3.5 | 0 | 12 |
| Code                                                                        | Name                                                 | C   | L | U  |
| AD5043                                                                      | Analysis and Innovation in the Value Chain           | 3.5 | 0 | 12 |
| AD5076                                                                      | Capital Systems                                      | 3.5 | 0 | 12 |
| SC5009                                                                      | Knowledge Bases and Systems                          | 3.5 | 0 | 12 |
| TC5022                                                                      | Enterprise Networks                                  | 3.5 | 0 | 12 |
| TI4013                                                                      | Management of Information Systems in Organizations   | 3.5 | 0 | 12 |
| TI4014                                                                      | Business Intelligence                                | 3.5 | 0 | 12 |
| TI5004                                                                      | Technology Management Principles                     | 3.5 | 0 | 12 |
| TI5011                                                                      | Technological Infrastructure for the Digital Economy | 3.5 | 0 | 12 |
| TI5014                                                                      | IT Service Strategies                                | 3.5 | 0 | 12 |
| TI5015                                                                      | IT Design Services                                   | 3.5 | 0 | 12 |
| TI5022                                                                      | Technology for Organizational Transformation         | 3.5 | 0 | 12 |
| TI5027                                                                      | Technology Based Business Development                | 3.5 | 0 | 12 |
| TI5028                                                                      | Business Process Management                          | 3.5 | 0 | 12 |
| TI5029                                                                      | Emerging Technologies                                | 3.5 | 0 | 12 |
| TI5030                                                                      | Change Management                                    | 3.5 | 0 | 12 |
| TI5031                                                                      | Knowledge Management                                 | 3.5 | 0 | 12 |
| TI5033                                                                      | Consulting Services                                  | 3.5 | 0 | 12 |

## PH. D. in Computer Sciences (DCC)

### General Program Objectives

Prepare independent researchers with competences, knowledge and skills to identify opportunities, develop and conduct original research projects at the frontier of knowledge.

Disseminate the results of research and apply the generated knowledge in the technological development of the country. To be recognized as a Computer Science program with high impact on the productive, educational/academic and social sectors of the country.

### Learning Outcomes

At the completion of the program, students will be able to:

- Generate new knowledge, contributing to the development of the state of the art in their respective areas.
- Work in research, teaching, development and technology management.
- Explore the border of the state of the art of their specialty.

### Target Audience

The PhD program in Computer Science is designed for candidates with proven academic ability, creativity, motivation and potential to carry out research projects that culminate in original works that contribute to enrich the field of information technology and computer science.

In the case of DCC, there is an adequate mechanism for selecting applicants that considers the relevant aspects to identify the academic and research profile, necessary for an outstanding performance.

**DCC PH. D. in Computer Sciences****Edition 2016**

| <b>First Semester</b>  |                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
|------------------------|---------------------------|------------|----------|-----------|
| CS6021                 | Guided Research I         | 3          | 0        | 12        |
| CS6022                 | Guided Research II        | 3          | 0        | 12        |
| CS6025                 | Integrated Exam           | 1.5        | 0        | 6         |
| GI6041                 | Research Seminar I        | 1          | 0        | 2         |
| GI6051                 | Research Workshop I       | 1          | 0        | 4         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Semester</b> |                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| CS6031                 | Research Proposal I       | 3          | 0        | 12        |
| CS6032                 | Research Proposal II      | 3          | 0        | 12        |
| CS6035                 | Research Proposal Defense | 1.5        | 0        | 6         |
| GI6042                 | Research Seminar II       | 1          | 0        | 2         |
| GI6052                 | Research Workshop II      | 1          | 0        | 4         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>  |                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| CS6041                 | Research Integration I    | 1.5        | 0        | 6         |
| CS6101                 | Doctoral Research I       | 3          | 0        | 12        |
| CS6102                 | Doctoral Research II      | 3          | 0        | 12        |
| GI6043                 | Research Seminar III      | 1          | 0        | 2         |
| GI6053                 | Research Workshop III     | 1          | 0        | 4         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b> |                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| CS6103                 | Doctoral Research III     | 3          | 0        | 12        |
| CS6104                 | Doctoral Research IV      | 3          | 0        | 12        |
| GI6044                 | Research Seminar IV       | 1          | 0        | 2         |
| GI6054                 | Research Workshop IV      | 1          | 0        | 4         |
| GI6061                 | Scientific Product I      | 1.5        | 0        | 6         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b> |
| <b>Fifth Semester</b>  |                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| CS6042                 | Research Integration II   | 1.5        | 0        | 6         |
| CS6105                 | Doctoral Research V       | 3          | 0        | 12        |
| CS6106                 | Doctoral Research VI      | 3          | 0        | 12        |
| GI6045                 | Research Seminar V        | 1          | 0        | 2         |
| GI6055                 | Research Workshop V       | 1          | 0        | 4         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b> |

| <b>Sixth Semester</b> |                        | <b>C</b>   | <b>L</b> | <b>U</b>  |
|-----------------------|------------------------|------------|----------|-----------|
| CS6107                | Doctoral Research VII  | 3          | 0        | 12        |
| CS6108                | Doctoral Research VIII | 3          | 0        | 12        |
| GI6046                | Research Seminar VI    | 1          | 0        | 2         |
| GI6056                | Research Workshop VI   | 1          | 0        | 4         |
| GI6062                | Scientific Product II  | 1.5        | 0        | 6         |
|                       |                        | <b>9.5</b> | <b>0</b> | <b>36</b> |

| <b>Seventh Semester</b> |                      | <b>C</b> | <b>L</b> | <b>U</b>  |
|-------------------------|----------------------|----------|----------|-----------|
| CS6109                  | Doctoral Research IX | 3        | 0        | 12        |
| CS6110                  | Doctoral Research X  | 3        | 0        | 12        |
| CS6111                  | Doctoral Research XI | 3        | 0        | 12        |
|                         |                      | <b>9</b> | <b>0</b> | <b>36</b> |

| <b>Eighth Semester</b> |                        | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|------------------------|----------|----------|-----------|
| CS6112                 | Doctoral Research XII  | 3        | 0        | 12        |
| CS6113                 | Doctoral Research XIII | 3        | 0        | 12        |
| CS6114                 | Doctoral Research XIV  | 3        | 0        | 12        |
| CS6120                 | Doctoral Defense       | 0        | 0        | 1         |
|                        |                        | <b>9</b> | <b>0</b> | <b>36</b> |

*This Doctoral program requires a completed Master's Degree program.*

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is eight semesters*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)







## Residency in Health Care Quality (RCA)

### General Program Objectives

The aim of the Residency in Health Care Quality of Tecnológico de Monterrey is to train exceptional specialist practitioners who apply their knowledge and innovative, practices at the macro and micro healthcare levels, according to the highest quality and safety standards. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Health Care Quality Residents who graduate from this institution are outstanding leaders in local and international settings who design, implement and evaluate effective operating strategies in organizations belonging to the healthcare sector, based on investigation processes and innovation, bringing about organizational change in this sector.

### Learning Outcomes

On completing the program, students will be able to:

- Drive and direct organizational change and innovation through resource and health service infrastructure management, in order to construct, transform and operate clinical and administrative healthcare processes that are centered on the patient and his/her family, constantly seeking quality, safety and self-sustainability in healthcare services.

- Develop and transform their community through the collaborative construction of knowledge; the lifelong development of their abilities and skills; professional development founded on ethical values; relevant scientific research in the clinical-systemic interface; and the ongoing consolidation of their capacity to perform in national and international settings

### Target Audience

This program is aimed at physicians who have passed the national Medical Residency Applicant Examination and who have an interest and vocation in this specialty; the skills and attitudes for evaluating the quality and safety of healthcare processes and for leading improvement efforts within the framework of health organizations and services; a sense of commitment to patient safety and the provision of quality first-contact healthcare services; the capacity to read and comprehend medical literature in English. They must also be available full time to cover academic and healthcare activities in compliance with the regulations in effect.

In order to be admitted to the Residency in Healthcare Quality of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.



## RCA Residency in Health Care Quality Plan 2013 (By Areas)

| <b>Core Courses</b>              |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |  |
|----------------------------------|---------------------------------|------------|------------|-----------|------------|--|
| ME4177                           | Management in Clinical Care I   | 3          | 0          | 12        | 12         |  |
| ME4179                           | Management in Clinical Care II  | 3          | 0          | 12        | 12         |  |
| ME4181                           | Management in Clinical Care III | 3          | 0          | 12        | 12         |  |
| ME5225                           | Management in Clinical Care IV  | 3          | 0          | 12        | 12         |  |
| ME5227                           | Management in Clinical Care V   | 3          | 0          | 12        | 12         |  |
| ME5229                           | Management in Clinical Care VI  | 3          | 0          | 12        | 12         |  |
|                                  |                                 | <b>18</b>  | <b>0</b>   | <b>72</b> | <b>72</b>  |  |
| <b>Hospital Practice Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |  |
| ME4178                           | Hospital Practice I             | 0          | 60         | 12        | 60         |  |
| ME4180                           | Hospital Practice II            | 0          | 60         | 12        | 60         |  |
| ME4182                           | Hospital Practice III           | 0          | 60         | 12        | 60         |  |
| ME5226                           | Hospital Practice IV            | 0          | 60         | 12        | 60         |  |
| ME5228                           | Hospital Practice V             | 0          | 30         | 6         | 30         |  |
| ME5230                           | Hospital Practice VI            | 0          | 30         | 6         | 30         |  |
|                                  |                                 | <b>0</b>   | <b>300</b> | <b>60</b> | <b>300</b> |  |
| <b>Research Courses</b>          |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |  |
| ME4143                           | Research and Innovation Methods | 1.5        | 0          | 6         | 6          |  |
| ME4144                           | Thesis Project I                | 3          | 0          | 12        | 12         |  |
| ME5190                           | Thesis Project II               | 3          | 0          | 12        | 12         |  |
| ME5266                           | Thesis Defense                  | 0          | 0          | 1         | 0          |  |
|                                  |                                 | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |  |
| <b>Basic Courses C</b>           |                                 | <b>L</b>   | <b>U</b>   | <b>H</b>  |            |  |
| ME4140                           | Clinical Ethics                 | 1.5        | 0          | 6         | 6          |  |
| ME4141                           | Health Sciences Education       | 1.5        | 0          | 6         | 6          |  |
| ME4142                           | Quality Health Care             | 1.5        | 0          | 6         | 6          |  |
|                                  |                                 | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |  |
| <b>Elective Courses</b>          |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |  |
| ME5191                           | Elective Specialty I            | 0          | 30         | 6         | 30         |  |
| ME5192                           | Elective Specialty II           | 0          | 30         | 6         | 30         |  |
|                                  |                                 | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## RCA Residency in Health Care Quality Plan 2013 (By Periods)

| <b>First Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|------------------------|---------------------------------|----------|-----------|-----------|-----------|
| ME4140                 | Clinical Ethics                 | 1.5      | 0         | 6         | 6         |
| ME4142                 | Quality Health Care             | 1.5      | 0         | 6         | 6         |
| ME4177                 | Management in Clinical Care I   | 3        | 0         | 12        | 12        |
| ME4178                 | Hospital Practice I             | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b> |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                 | Health Sciences Education       | 1.5      | 0         | 6         | 6         |
| ME4143                 | Research and Innovation Methods | 1.5      | 0         | 6         | 6         |
| ME4179                 | Management in Clinical Care II  | 3        | 0         | 12        | 12        |
| ME4180                 | Hospital Practice II            | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                 | Thesis Project I                | 3        | 0         | 12        | 12        |
| ME4181                 | Management in Clinical Care III | 3        | 0         | 12        | 12        |
| ME4182                 | Hospital Practice III           | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b> |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5190                 | Thesis Project II               | 3        | 0         | 12        | 12        |
| ME5225                 | Management in Clinical Care IV  | 3        | 0         | 12        | 12        |
| ME5226                 | Hospital Practice IV            | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                 | Elective Specialty I            | 0        | 30        | 6         | 30        |
| ME5227                 | Management in Clinical Care V   | 3        | 0         | 12        | 12        |
| ME5228                 | Hospital Practice V             | 0        | 30        | 6         | 30        |
|                        |                                 | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                 | Elective Specialty II           | 0        | 30        | 6         | 30        |
| ME5229                 | Management in Clinical Care VI  | 3        | 0         | 12        | 12        |
| ME5230                 | Hospital Practice VI            | 0        | 30        | 6         | 30        |
| ME5266                 | Thesis Defense                  | 0        | 0         | 1         | 0         |
|                        |                                 | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Cardiology (RCR)

### General program objectives

The aim of the Residency in Cardiology of Tecnológico de Monterrey is to train exceptional Cardiologists who contribute to the prevention, detection, treatment and rehabilitation of cardiovascular diseases, according to the highest quality and safety standards, in both inpatient and outpatient settings. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Cardiologists who graduate from this program are outstanding, internationally competitive leaders in their field. They conduct research in the basic areas of cardiology, clinical cardiology, cardiovascular imaging, electrocardiography, hemodynamics, interventional cardiology and endovascular treatment.

### Learning Outcomes

On completing the program, students will be able to:

- Deliver medical attention and care to patients with cardiovascular problems and diseases.
- Analyze, investigate and assess the results of the clinical guides and medical protocols used for patients with cardiovascular problems and diseases.

- Communicate effectively with patients, family members, faculty, colleagues and other members of the healthcare team.
- Execute their professional duties with commitment and responsibility, adhering strictly to the ethical principles of the profession.
- Know and take into consideration the characteristics of the diverse health systems and their influence on the medical attention of patients with cardiovascular problems and diseases.

### Target Audience

Applicants to the Residency in Cardiology of Tecnológico de Monterrey are graduates from the Physician and Surgeon program who have earned credit for at least two years in the Residency in Internal Medicine at hospital and university institutions belonging to the National System of Residencies in Medical Specialties. Doctors who have completed the Residency in Internal Medicine in other countries at universities that are recognized by the Tecnológico de Monterrey System can also apply to participate in this program.

In order to be admitted to the Residency in Cardiology of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

## RCR Residency in Cardiology

### Edition 2013 (By Areas)

| <b>Core Courses</b>     |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
|-------------------------|---------------------------------|------------|------------|-----------|------------|
| ME4228                  | Cardiology I                    | 3          | 0          | 12        | 12         |
| ME4230                  | Cardiology II                   | 3          | 0          | 12        | 12         |
| ME4232                  | Cardiology III                  | 3          | 0          | 12        | 12         |
| ME5281                  | Cardiology IV                   | 3          | 0          | 12        | 12         |
| ME5283                  | Cardiology V                    | 3          | 0          | 12        | 12         |
| ME5285                  | Cardiology VI                   | 3          | 0          | 12        | 12         |
|                         |                                 | <b>18</b>  | <b>0</b>   | <b>72</b> | <b>72</b>  |
| <b>Clinical Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4229                  | Medical Care in Cardiology I    | 0          | 60         | 12        | 60         |
| ME4231                  | Medical Care in Cardiology II   | 0          | 60         | 12        | 60         |
| ME4233                  | Medical Care in Cardiology III  | 0          | 60         | 12        | 60         |
| ME5282                  | Medical Care in Cardiology IV   | 0          | 60         | 12        | 60         |
| ME5284                  | Medical Care in Cardiology V    | 0          | 30         | 6         | 30         |
| ME5286                  | Medical Care in Cardiology VI   | 0          | 30         | 6         | 30         |
|                         |                                 | <b>0</b>   | <b>300</b> | <b>60</b> | <b>300</b> |
| <b>Research Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4143                  | Research and Innovation Methods | 1.5        | 0          | 6         | 6          |
| ME4144                  | Thesis Project I                | 3          | 0          | 12        | 12         |
| ME5190                  | Thesis Project II               | 3          | 0          | 12        | 12         |
| ME5266                  | Thesis Defense                  | 0          | 0          | 1         | 0          |
|                         |                                 | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| <b>Basic Courses</b>    |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4140                  | Clinical Ethics                 | 1.5        | 0          | 6         | 6          |
| ME4141                  | Health Sciences Education       | 1.5        | 0          | 6         | 6          |
| ME4142                  | Quality Health Care             | 1.5        | 0          | 6         | 6          |
|                         |                                 | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| <b>Elective Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME5191                  | Elective Specialty I            | 0          | 30         | 6         | 30         |
| ME5192                  | Elective Specialty II           | 0          | 30         | 6         | 30         |
|                         |                                 | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## RCR Residency in Cardiology

### Edition 2013 (By Periods)

| <b>First Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|------------------------|---------------------------------|----------|-----------|-----------|-----------|
| ME4140                 | Clinical Ethics                 | 1.5      | 0         | 6         | 6         |
| ME4142                 | Quality Health Care             | 1.5      | 0         | 6         | 6         |
| ME4228                 | Cardiology I                    | 3        | 0         | 12        | 12        |
| ME4229                 | Medical Care in Cardiology I    | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b> |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                 | Health Sciences Education       | 1.5      | 0         | 6         | 6         |
| ME4143                 | Research and Innovation Methods | 1.5      | 0         | 6         | 6         |
| ME4230                 | Cardiology II                   | 3        | 0         | 12        | 12        |
| ME4231                 | Medical Care in Cardiology II   | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                 | Thesis Project I                | 3        | 0         | 12        | 12        |
| ME4232                 | Cardiology III                  | 3        | 0         | 12        | 12        |
| ME4233                 | Medical Care in Cardiology III  | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b> |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5190                 | Thesis Project II               | 3        | 0         | 12        | 12        |
| ME5281                 | Cardiology IV                   | 3        | 0         | 12        | 12        |
| ME5282                 | Medical Care in Cardiology IV   | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                 | Elective Specialty I            | 0        | 30        | 6         | 30        |
| ME5283                 | Cardiology V                    | 3        | 0         | 12        | 12        |
| ME5284                 | Medical Care in Cardiology V    | 0        | 30        | 6         | 30        |
|                        |                                 | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                 | Elective Specialty II           | 0        | 30        | 6         | 30        |
| ME5266                 | Thesis Defense                  | 0        | 0         | 1         | 0         |
| ME5285                 | Cardiology VI                   | 3        | 0         | 12        | 12        |
| ME5286                 | Medical Care in Cardiology VI   | 0        | 30        | 6         | 30        |
|                        |                                 | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

- 
- C Number of class hours per week  
 L Number of laboratory hours or activities per week  
 U Study hours that must be dedicated to the course (class hours included)  
 H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Anesthesiology (REA)

### General program objectives

The aim of the Residency in Anesthesiology of Tecnológico de Monterrey is to train exceptional Anesthesiologists who apply anesthesia and analgesia techniques, according to the highest quality and safety standards, in both inpatient and outpatient settings. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice, outstanding leaders at local and international levels, who contribute through clinical research to generating innovations in the techniques and procedures of this specialization that will benefit patients, their families, specialists, the healthcare team and medical institutions.

### Learning Outcomes

On completing the program, students will be able to:

- Applying their knowledge, abilities and skills in a collaborative, multidisciplinary manner, within a framework of safe, comprehensive patient care.

- Be creative and innovative, conducting relevant clinical research and able to perform with quality in national and international settings, consolidating their professional competency activities with solid attitudes and values.

### Target Audience

Applicants must be qualified physicians in compliance with all the official regulations of the Ministry of Education and the Ministry of Health. They should display high moral values, be ethical and congruent with the profession they have chosen to practice. They must also be willing to work in multidisciplinary teams, interested in conducting quality research, proficient in their native language as well as a foreign language, have a neat and tidy appearance, and show respect for patients, staff and the institution in which they work.

In order to be admitted to the Residency in Anesthesiology of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

## REA Residency in Anesthesiology

### Edition 2013 (By Areas)

| Core Courses     |                                     | C          | L          | U         | H          |
|------------------|-------------------------------------|------------|------------|-----------|------------|
| ME4234           | Anesthesiology I                    | 3          | 0          | 12        | 12         |
| ME4236           | Anesthesiology II                   | 3          | 0          | 12        | 12         |
| ME4238           | Anesthesiology III                  | 3          | 0          | 12        | 12         |
| ME4240           | Anesthesiology IV                   | 3          | 0          | 12        | 12         |
| ME5287           | Anesthesiology V                    | 3          | 0          | 12        | 12         |
| ME5289           | Anesthesiology VI                   | 3          | 0          | 12        | 12         |
| ME5291           | Anesthesiology VII                  | 3          | 0          | 12        | 12         |
| ME5293           | Anesthesiology VIII                 | 3          | 0          | 12        | 12         |
|                  |                                     | <b>24</b>  | <b>0</b>   | <b>96</b> | <b>96</b>  |
| Clinical Courses |                                     | C          | L          | U         | H          |
| ME4235           | Medical Care in Anesthesiology I    | 0          | 60         | 12        | 60         |
| ME4237           | Medical Care in Anesthesiology II   | 0          | 60         | 12        | 60         |
| ME4239           | Medical Care in Anesthesiology III  | 0          | 60         | 12        | 60         |
| ME4241           | Medical Care in Anesthesiology IV   | 0          | 60         | 12        | 60         |
| ME5288           | Medical Care in Anesthesiology V    | 0          | 30         | 6         | 30         |
| ME5290           | Medical Care in Anesthesiology VI   | 0          | 30         | 6         | 30         |
| ME5292           | Medical Care in Anesthesiology VII  | 0          | 60         | 12        | 60         |
| ME5294           | Medical Care in Anesthesiology VIII | 0          | 60         | 12        | 60         |
|                  |                                     | <b>0</b>   | <b>420</b> | <b>84</b> | <b>420</b> |
| Research Courses |                                     | C          | L          | U         | H          |
| ME4143           | Research and Innovation Methods     | 1.5        | 0          | 6         | 6          |
| ME4144           | Thesis Project I                    | 3          | 0          | 12        | 12         |
| ME5190           | Thesis Project II                   | 3          | 0          | 12        | 12         |
| ME5266           | Thesis Defense                      | 0          | 0          | 1         | 0          |
|                  |                                     | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| Basic Courses    |                                     | C          | L          | U         | H          |
| ME4140           | Clinical Ethics                     | 1.5        | 0          | 6         | 6          |
| ME4141           | Health Sciences Education           | 1.5        | 0          | 6         | 6          |
| ME4142           | Quality Health Care                 | 1.5        | 0          | 6         | 6          |
|                  |                                     | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| Elective Courses |                                     | C          | L          | U         | H          |
| ME5191           | Elective Specialty I                | 0          | 30         | 6         | 30         |
| ME5192           | Elective Specialty II               | 0          | 30         | 6         | 30         |
|                  |                                     | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## REA Residency in Anesthesiology

### Edition 2013 (By Periods)

| <b>First Semester</b>   |                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|-------------------------|-------------------------------------|----------|-----------|-----------|-----------|
| ME4140                  | Clinical Ethics                     | 1.5      | 0         | 6         | 6         |
| ME4142                  | Quality Health Care                 | 1.5      | 0         | 6         | 6         |
| ME4234                  | Anesthesiology I                    | 3        | 0         | 12        | 12        |
| ME4235                  | Medical Care in Anesthesiology I    | 0        | 60        | 12        | 60        |
|                         |                                     | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b>  |                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                  | Health Sciences Education           | 1.5      | 0         | 6         | 6         |
| ME4143                  | Research and Innovation Methods     | 1.5      | 0         | 6         | 6         |
| ME4236                  | Anesthesiology II                   | 3        | 0         | 12        | 12        |
| ME4237                  | Medical Care in Anesthesiology II   | 0        | 60        | 12        | 60        |
|                         |                                     | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>   |                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                  | Thesis Project I                    | 3        | 0         | 12        | 12        |
| ME4238                  | Anesthesiology III                  | 3        | 0         | 12        | 12        |
| ME4239                  | Medical Care in Anesthesiology III  | 0        | 60        | 12        | 60        |
|                         |                                     | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b>  |                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4240                  | Anesthesiology IV                   | 3        | 0         | 12        | 12        |
| ME4241                  | Medical Care in Anesthesiology IV   | 0        | 60        | 12        | 60        |
| ME5190                  | Thesis Project II                   | 3        | 0         | 12        | 12        |
|                         |                                     | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>   |                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                  | Elective Specialty I                | 0        | 30        | 6         | 30        |
| ME5287                  | Anesthesiology V                    | 3        | 0         | 12        | 12        |
| ME5288                  | Medical Care in Anesthesiology V    | 0        | 30        | 6         | 30        |
|                         |                                     | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>   |                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                  | Elective Specialty II               | 0        | 30        | 6         | 30        |
| ME5289                  | Anesthesiology VI                   | 3        | 0         | 12        | 12        |
| ME5290                  | Medical Care in Anesthesiology VI   | 0        | 30        | 6         | 30        |
|                         |                                     | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Seventh Semester</b> |                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5291                  | Anesthesiology VII                  | 3        | 0         | 12        | 12        |
| ME5292                  | Medical Care in Anesthesiology VII  | 0        | 60        | 12        | 60        |
|                         |                                     | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Eighth Semester</b>  |                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5266                  | Thesis Defense                      | 0        | 0         | 1         | 0         |
| ME5293                  | Anesthesiology VIII                 | 3        | 0         | 12        | 12        |
| ME5294                  | Medical Care in Anesthesiology VIII | 0        | 60        | 12        | 60        |
|                         |                                     | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation



## Residency in General Surgery (REC)

### General program objectives

The aim of the Residency in Surgery of Tecnológico de Monterrey is to train exceptional surgeons who deliver clinical care to patients with a surgical pathology, according to the highest quality and safety standards. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Surgeons who graduate from this institution are outstanding leaders at national and international levels, who contribute through research to generating innovations in surgical procedures, in healthcare models and in the development of the discipline itself.

### Learning Outcomes

On completing the program, students will be able to:

- Perform as experts in the comprehensive, ongoing care of surgical patients in relation to diagnoses, selection, and preoperative, operative and postoperative care, including managing the pathology and complications in the gastrointestinal tract; abdomen and its contents; mammary glands and soft tissue; head and neck; endocrine system; surgical oncology; polytraumatized patients and severely ill patients in the ER or ICU.
- Provide preoperative, operative and postoperative care for pediatric, plastic, peripheral vascular, general thoracic and transplant surgery, and also handle the most common problems in cardiac, gynecological, neurological, orthopedic and urological surgery, as well as in the administering of anesthetic agents.

- Use endoscopic techniques, in particular laparoscopy and minimally invasive surgical techniques, as well as other relevant diagnostic and therapeutic techniques.
- Act with professionalism within a framework of honesty and professional ethics, with a profound sense of respect and sensitivity toward patients and the medical community.
- Communicate effectively with the patient, family members and other members of multidisciplinary healthcare teams, orally and in writing.
- Apply the analytical skills of reasoning, medical judgment and decision making to solve problems in their specialty, and use scientific method to conduct research projects that will have an impact on improving healthcare.

### Target Audience

This program is aimed at Mexican and foreign physicians who seek a highly competitive training program that will drive their leadership capacity in General Surgery; who are proficient in English, computer literate and have research skills. They must demonstrate their concern for social commitment, professionalism, leadership and entrepreneurial capability.

In order to be admitted to the Residency in General Surgery of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

**REC Residency in General Surgery****Edition 2013 (By Areas)**

| <b>Core Courses</b>     |                                      | <b>C</b>   | <b>L</b>   | <b>U</b>   | <b>H</b>   |
|-------------------------|--------------------------------------|------------|------------|------------|------------|
| ME4250                  | General Surgery I                    | 3          | 0          | 12         | 12         |
| ME4252                  | General Surgery II                   | 3          | 0          | 12         | 12         |
| ME4254                  | General Surgery III                  | 3          | 0          | 12         | 12         |
| ME4256                  | General Surgery IV                   | 3          | 0          | 12         | 12         |
| ME4258                  | General Surgery V                    | 3          | 0          | 12         | 12         |
| ME5302                  | General Surgery VI                   | 3          | 0          | 12         | 12         |
| ME5304                  | General Surgery VII                  | 3          | 0          | 12         | 12         |
| ME5306                  | General Surgery VIII                 | 3          | 0          | 12         | 12         |
| ME5308                  | General Surgery IX                   | 3          | 0          | 12         | 12         |
| ME5310                  | General Surgery X                    | 3          | 0          | 12         | 12         |
|                         |                                      | <b>30</b>  | <b>0</b>   | <b>120</b> | <b>120</b> |
| <b>Clinical Courses</b> |                                      | <b>C</b>   | <b>L</b>   | <b>U</b>   | <b>H</b>   |
| ME4251                  | Medical Care in General Surgery I    | 0          | 60         | 12         | 60         |
| ME4253                  | Medical Care in General Surgery II   | 0          | 60         | 12         | 60         |
| ME4255                  | Medical Care in General Surgery III  | 0          | 60         | 12         | 60         |
| ME4257                  | Medical Care in General Surgery IV   | 0          | 60         | 12         | 60         |
| ME4259                  | Medical Care in General Surgery V    | 0          | 60         | 12         | 60         |
| ME5303                  | Medical Care in General Surgery VI   | 0          | 60         | 12         | 60         |
| ME5305                  | Medical Care in General Surgery VII  | 0          | 60         | 12         | 60         |
| ME5307                  | Medical Care in General Surgery VIII | 0          | 60         | 12         | 60         |
| ME5309                  | Medical Care in General Surgery IX   | 0          | 30         | 6          | 30         |
| ME5311                  | Medical Care in General Surgery X    | 0          | 30         | 6          | 30         |
|                         |                                      | <b>0</b>   | <b>540</b> | <b>108</b> | <b>540</b> |
| <b>Research Courses</b> |                                      | <b>C</b>   | <b>L</b>   | <b>U</b>   | <b>H</b>   |
| ME4143                  | Research and Innovation Methods      | 1.5        | 0          | 6          | 6          |
| ME4144                  | Thesis Project I                     | 3          | 0          | 12         | 12         |
| ME5190                  | Thesis Project II                    | 3          | 0          | 12         | 12         |
| ME5266                  | Thesis Defense                       | 0          | 0          | 1          | 0          |
|                         |                                      | <b>7.5</b> | <b>0</b>   | <b>31</b>  | <b>30</b>  |
| <b>Basic Courses</b>    |                                      | <b>C</b>   | <b>L</b>   | <b>U</b>   | <b>H</b>   |
| ME4140                  | Clinical Ethics                      | 1.5        | 0          | 6          | 6          |
| ME4141                  | Health Sciences Education            | 1.5        | 0          | 6          | 6          |
| ME4142                  | Quality Health Care                  | 1.5        | 0          | 6          | 6          |
|                         |                                      | <b>4.5</b> | <b>0</b>   | <b>18</b>  | <b>18</b>  |
| <b>Elective Courses</b> |                                      | <b>C</b>   | <b>L</b>   | <b>U</b>   | <b>H</b>   |
| ME5191                  | Elective Specialty I                 | 0          | 30         | 6          | 30         |
| ME5192                  | Elective Specialty II                | 0          | 30         | 6          | 30         |
|                         |                                      | <b>0</b>   | <b>60</b>  | <b>12</b>  | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

**REC Residency in General Surgery****Edition 2013 (By Periods)**

| <b>First Semester</b>   |                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|-------------------------|--------------------------------------|----------|-----------|-----------|-----------|
| ME4140                  | Clinical Ethics                      | 1.5      | 0         | 6         | 6         |
| ME4142                  | Quality Health Care                  | 1.5      | 0         | 6         | 6         |
| ME4250                  | General Surgery I                    | 3        | 0         | 12        | 12        |
| ME4251                  | Medical Care in General Surgery I    | 0        | 60        | 12        | 60        |
|                         |                                      | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b>  |                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                  | Health Sciences Education            | 1.5      | 0         | 6         | 6         |
| ME4143                  | Research and Innovation Methods      | 1.5      | 0         | 6         | 6         |
| ME4252                  | General Surgery II                   | 3        | 0         | 12        | 12        |
| ME4253                  | Medical Care in General Surgery II   | 0        | 60        | 12        | 60        |
|                         |                                      | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>   |                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                  | Thesis Project I                     | 3        | 0         | 12        | 12        |
| ME4254                  | General Surgery III                  | 3        | 0         | 12        | 12        |
| ME4255                  | Medical Care in General Surgery III  | 0        | 60        | 12        | 60        |
|                         |                                      | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b>  |                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4256                  | General Surgery IV                   | 3        | 0         | 12        | 12        |
| ME4257                  | Medical Care in General Surgery IV   | 0        | 60        | 12        | 60        |
| ME5190                  | Thesis Project II                    | 3        | 0         | 12        | 12        |
|                         |                                      | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>   |                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4258                  | General Surgery V                    | 3        | 0         | 12        | 12        |
| ME4259                  | Medical Care in General Surgery V    | 0        | 60        | 12        | 60        |
|                         |                                      | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>   |                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5302                  | General Surgery VI                   | 3        | 0         | 12        | 12        |
| ME5303                  | Medical Care in General Surgery VI   | 0        | 60        | 12        | 60        |
|                         |                                      | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Seventh Semester</b> |                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5304                  | General Surgery VII                  | 3        | 0         | 12        | 12        |
| ME5305                  | Medical Care in General Surgery VII  | 0        | 60        | 12        | 60        |
|                         |                                      | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Eighth Semester</b>  |                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5306                  | General Surgery VIII                 | 3        | 0         | 12        | 12        |
| ME5307                  | Medical Care in General Surgery VIII | 0        | 60        | 12        | 60        |
|                         |                                      | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Ninth Semester</b>   |                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                  | Elective Specialty I                 | 0        | 30        | 6         | 30        |
| ME5308                  | General Surgery IX                   | 3        | 0         | 12        | 12        |
| ME5309                  | Medical Care in General Surgery IX   | 0        | 30        | 6         | 30        |
|                         |                                      | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Tenth Semester</b>   |                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                  | Elective Specialty II                | 0        | 30        | 6         | 30        |
| ME5266                  | Thesis Defense                       | 0        | 0         | 1         | 0         |
| ME5310                  | General Surgery X                    | 3        | 0         | 12        | 12        |
| ME5311                  | Medical Care in General Surgery X    | 0        | 30        | 6         | 30        |
|                         |                                      | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Critical Care Medicine (REE)

### General program objectives

The aim of the Residency in Critical Care Medicine of Tecnológico de Monterrey is to train exceptional specialist practitioners who meet the health needs of critical patients, according to the highest quality and safety standards, in public and private settings. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice.

Critical Care Medicine Residents who graduate from this institution are outstanding leaders locally and internationally, who generate innovation with new diagnostic and therapeutic methodologies and technologies, as well as early disease detection programs in the population under their care.

### Learning Outcomes

On completing the program, students will be able to:

- Promote, prevent, diagnose, treat and rehabilitate critical care health issues.
- Practice Critical Care Medicine in public and private healthcare systems.
- Make medical decisions applying clinical reasoning, evidence-based medicine, the use of critical thinking, research methodology and the comprehensive use of statistics.

- Be creative and innovative and handle uncertainty.
- Interact effectively in multidisciplinary teams, in teaching and research activities, and the comprehensive management of a Critical Care Unit.
- Practice as a Critical Care specialists within the framework of Medical Ethics, with responsibility and respect for the dignity of individuals and of the community where they provide these services.

### Target Audience

The Multicentric Critical Care Medicine Program of Tecnológico de Monterrey is aimed at graduates from the Medical Residencies in Internal Medicine, Anesthesiology or Medical-Surgical Emergencies, whose academic performance has been outstanding and who have a vocation for and clear interest in this discipline, a spirit of innovation and commitment to lifelong learning, with a genuine interest in research and teaching.

In order to be admitted to the Residency in Critical Care Medicine of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

## REE Residency in Critical Care Medicine

### Edition 2013 (By Areas)

| <b>Core Courses</b>     |                                       | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
|-------------------------|---------------------------------------|------------|------------|-----------|------------|
| ME4197                  | Critical Care Medicine I              | 3          | 0          | 12        | 12         |
| ME4199                  | Critical Care Medicine II             | 3          | 0          | 12        | 12         |
| ME5245                  | Critical Care Medicine III            | 3          | 0          | 12        | 12         |
| ME5247                  | Critical Care Medicine IV             | 3          | 0          | 12        | 12         |
|                         |                                       | <b>12</b>  | <b>0</b>   | <b>48</b> | <b>48</b>  |
| <b>Clinical Courses</b> |                                       | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4198                  | Medical Care in Critical Medicine I   | 0          | 60         | 12        | 60         |
| ME4200                  | Medical Care in Critical Medicine II  | 0          | 60         | 12        | 60         |
| ME5246                  | Medical Care in Critical Medicine III | 0          | 30         | 6         | 30         |
| ME5248                  | Medical Care in Critical Medicine IV  | 0          | 30         | 6         | 30         |
|                         |                                       | <b>0</b>   | <b>180</b> | <b>36</b> | <b>180</b> |
| <b>Research Courses</b> |                                       | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4143                  | Research and Innovation Methods       | 1.5        | 0          | 6         | 6          |
| ME4144                  | Thesis Project I                      | 3          | 0          | 12        | 12         |
| ME5190                  | Thesis Project II                     | 3          | 0          | 12        | 12         |
| ME5266                  | Thesis Defense                        | 0          | 0          | 1         | 0          |
|                         |                                       | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| <b>Basic Courses</b>    |                                       | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4140                  | Clinical Ethics                       | 1.5        | 0          | 6         | 6          |
| ME4141                  | Health Sciences Education             | 1.5        | 0          | 6         | 6          |
| ME4142                  | Quality Health Care                   | 1.5        | 0          | 6         | 6          |
|                         |                                       | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| <b>Elective Courses</b> |                                       | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME5191                  | Elective Specialty I                  | 0          | 30         | 6         | 30         |
| ME5192                  | Elective Specialty II                 | 0          | 30         | 6         | 30         |
|                         |                                       | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## REE Residency in Critical Care Medicine

### Edition 2013 (By Periods)

| <b>First Semester</b>  |                                       | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|------------------------|---------------------------------------|----------|-----------|-----------|-----------|
| ME4140                 | Clinical Ethics                       | 1.5      | 0         | 6         | 6         |
| ME4142                 | Quality Health Care                   | 1.5      | 0         | 6         | 6         |
| ME4197                 | Critical Care Medicine I              | 3        | 0         | 12        | 12        |
| ME4198                 | Medical Care in Critical Medicine I   | 0        | 60        | 12        | 60        |
|                        |                                       | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b> |                                       | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                 | Health Sciences Education             | 1.5      | 0         | 6         | 6         |
| ME4143                 | Research and Innovation Methods       | 1.5      | 0         | 6         | 6         |
| ME4199                 | Critical Care Medicine II             | 3        | 0         | 12        | 12        |
| ME4200                 | Medical Care in Critical Medicine II  | 0        | 60        | 12        | 60        |
|                        |                                       | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>  |                                       | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                 | Thesis Project I                      | 3        | 0         | 12        | 12        |
| ME5191                 | Elective Specialty I                  | 0        | 30        | 6         | 30        |
| ME5245                 | Critical Care Medicine III            | 3        | 0         | 12        | 12        |
| ME5246                 | Medical Care in Critical Medicine III | 0        | 30        | 6         | 30        |
|                        |                                       | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b> |                                       | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5190                 | Thesis Project II                     | 3        | 0         | 12        | 12        |
| ME5192                 | Elective Specialty II                 | 0        | 30        | 6         | 30        |
| ME5247                 | Critical Care Medicine IV             | 3        | 0         | 12        | 12        |
| ME5248                 | Medical Care in Critical Medicine IV  | 0        | 30        | 6         | 30        |
| ME5266                 | Thesis Defense                        | 0        | 0         | 1         | 0         |
|                        |                                       | <b>6</b> | <b>60</b> | <b>37</b> | <b>84</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Obstetrics and Gynecology (REG)

### General program objectives

The aim of our Residency in Obstetrics and Gynecology program is to train exceptional Gynecologists who solve the health needs of women, according to the highest quality and safety standards, in hospital and ambulatory settings. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Gynecologists who graduate from this institution are outstanding leaders locally and internationally. They use ultrasound technology to impact their patient's health positively, by means of timely, accurate diagnoses, and also contribute to generating innovations in the use of and research on surgical techniques and the enhancement of medical and gynecological and obstetric medical treatments, ensuring a reduction in morbidity and mortality rates among the Mexican population.

### Learning Outcomes

On completing the program, students will be able to:

- Complete the prevention, diagnosis and treatment of conditions that affect the gynecological and reproductive health of women throughout their life stages, applying their knowledge, abilities and clinical judgment.
- Practice their specialty with integrity, ethics and a humanistic vision, favoring the health of women in their diverse sociocultural settings.
- Collaborate with leadership in multidisciplinary teams, acting as an agent of change for women's comprehensive healthcare.
- Develop the capacity for entrepreneurship, inquiry and innovation, to become not only identifiers of new scientific trends, but also creators of new, useful knowledge that directly benefits society.

### Target Audience

The Residency in Gynecology and Obstetrics is designed for doctors with an outstanding academic preparation in general medicine who graduated from national and international universities. They must have a basic knowledge of biomedical science; a deep sense of humanity and professionalism with the desire to fulfill the commitment of being agents of change in society; the willingness to receive and generate new knowledge; and the capacity to write and read in English.

In order to be admitted to the Residency in Gynecology and Obstetrics of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

## REG Residency in Obstetrics and Gynecology

### Edition 2013 (By Areas)

| <b>Core Courses</b>     |                                                | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
|-------------------------|------------------------------------------------|------------|------------|-----------|------------|
| ME4266                  | Fundamentals in Obstetrics and Gynecology I    | 3          | 0          | 12        | 12         |
| ME4268                  | Fundamentals in Obstetrics and Gynecology II   | 3          | 0          | 12        | 12         |
| ME4270                  | Ambulatory Care in Obstetrics and Gynecology   | 3          | 0          | 12        | 12         |
| ME4272                  | Obstetrics and Gynecology Specialties I        | 3          | 0          | 12        | 12         |
| ME5318                  | Obstetrics and Gynecology Specialties II       | 3          | 0          | 12        | 12         |
| ME5320                  | Obstetrics and Gynecology Specialties III      | 3          | 0          | 12        | 12         |
| ME5322                  | Advances in Obstetrics and Gynecology I        | 3          | 0          | 12        | 12         |
| ME5324                  | Advances in Obstetrics and Gynecology II       | 3          | 0          | 12        | 12         |
|                         |                                                | <b>24</b>  | <b>0</b>   | <b>96</b> | <b>96</b>  |
| <b>Clinical Courses</b> |                                                | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4267                  | Medical Care in Obstetrics and Gynecology I    | 0          | 60         | 12        | 60         |
| ME4269                  | Medical Care in Obstetrics and Gynecology II   | 0          | 60         | 12        | 60         |
| ME4271                  | Medical Care in Obstetrics and Gynecology III  | 0          | 60         | 12        | 60         |
| ME4273                  | Medical Care in Obstetrics and Gynecology IV   | 0          | 60         | 12        | 60         |
| ME5319                  | Medical Care in Obstetrics and Gynecology V    | 0          | 30         | 6         | 30         |
| ME5321                  | Medical Care in Obstetrics and Gynecology VI   | 0          | 30         | 6         | 30         |
| ME5323                  | Medical Care in Obstetrics and Gynecology VII  | 0          | 60         | 12        | 60         |
| ME5325                  | Medical Care in Obstetrics and Gynecology VIII | 0          | 60         | 12        | 60         |
|                         |                                                | <b>0</b>   | <b>420</b> | <b>84</b> | <b>420</b> |
| <b>Research Courses</b> |                                                | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4143                  | Research and Innovation Methods                | 1.5        | 0          | 6         | 6          |
| ME4144                  | Thesis Project I                               | 3          | 0          | 12        | 12         |
| ME5190                  | Thesis Project II                              | 3          | 0          | 12        | 12         |
| ME5266                  | Thesis Defense                                 | 0          | 0          | 1         | 0          |
|                         |                                                | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| <b>Basic Courses</b>    |                                                | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4140                  | Clinical Ethics                                | 1.5        | 0          | 6         | 6          |
| ME4141                  | Health Sciences Education                      | 1.5        | 0          | 6         | 6          |
| ME4142                  | Quality Health Care                            | 1.5        | 0          | 6         | 6          |
|                         |                                                | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| <b>Elective Courses</b> |                                                | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME5191                  | Elective Specialty I                           | 0          | 30         | 6         | 30         |
| ME5192                  | Elective Specialty II                          | 0          | 30         | 6         | 30         |
|                         |                                                | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation



**REG Residency in Obstetrics and Gynecology****Edition 2013 (By Periods)**

| <b>First Semester</b>   |                                                | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|-------------------------|------------------------------------------------|----------|-----------|-----------|-----------|
| ME4140                  | Clinical Ethics                                | 1.5      | 0         | 6         | 6         |
| ME4142                  | Quality Health Care                            | 1.5      | 0         | 6         | 6         |
| ME4266                  | Fundamentals in Obstetrics and Gynecology I    | 3        | 0         | 12        | 12        |
| ME4267                  | Medical Care in Obstetrics and Gynecology I    | 0        | 60        | 12        | 60        |
|                         |                                                | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b>  |                                                | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                  | Health Sciences Education                      | 1.5      | 0         | 6         | 6         |
| ME4143                  | Research and Innovation Methods                | 1.5      | 0         | 6         | 6         |
| ME4268                  | Fundamentals in Obstetrics and Gynecology II   | 3        | 0         | 12        | 12        |
| ME4269                  | Medical Care in Obstetrics and Gynecology II   | 0        | 60        | 12        | 60        |
|                         |                                                | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>   |                                                | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                  | Thesis Project I                               | 3        | 0         | 12        | 12        |
| ME4270                  | Ambulatory Care in Obstetrics and Gynecology   | 3        | 0         | 12        | 12        |
| ME4271                  | Medical Care in Obstetrics and Gynecology III  | 0        | 60        | 12        | 60        |
|                         |                                                | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b>  |                                                | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4272                  | Obstetrics and Gynecology Specialties I        | 3        | 0         | 12        | 12        |
| ME4273                  | Medical Care in Obstetrics and Gynecology IV   | 0        | 60        | 12        | 60        |
| ME5190                  | Thesis Project II                              | 3        | 0         | 12        | 12        |
|                         |                                                | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>   |                                                | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                  | Elective Specialty I                           | 0        | 30        | 6         | 30        |
| ME5318                  | Obstetrics and Gynecology Specialties II       | 3        | 0         | 12        | 12        |
| ME5319                  | Medical Care in Obstetrics and Gynecology V    | 0        | 30        | 6         | 30        |
|                         |                                                | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>   |                                                | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                  | Elective Specialty II                          | 0        | 30        | 6         | 30        |
| ME5320                  | Obstetrics and Gynecology Specialties III      | 3        | 0         | 12        | 12        |
| ME5321                  | Medical Care in Obstetrics and Gynecology VI   | 0        | 30        | 6         | 30        |
|                         |                                                | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Seventh Semester</b> |                                                | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5322                  | Advances in Obstetrics and Gynecology I        | 3        | 0         | 12        | 12        |
| ME5323                  | Medical Care in Obstetrics and Gynecology VII  | 0        | 60        | 12        | 60        |
|                         |                                                | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Eighth Semester</b>  |                                                | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5266                  | Thesis Defense                                 | 0        | 0         | 1         | 0         |
| ME5324                  | Advances in Obstetrics and Gynecology II       | 3        | 0         | 12        | 12        |
| ME5325                  | Medical Care in Obstetrics and Gynecology VIII | 0        | 60        | 12        | 60        |
|                         |                                                | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Internal Medicine (REM)

### General program objectives

The aim of the Residency in Internal Medicine of Tecnológico de Monterrey is to train exceptional Internists who meet the health needs of adult patients, according to the highest quality and safety standards, in both inpatient and outpatient settings. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Internists who graduate from this institution are outstanding leaders locally and internationally, who contribute to the continuous enhancement of healthcare processes and to generating innovations in the primary or secondary prevention of disorders that affect the adult population, in particular chronic-degenerative diseases.

### Learning Outcomes

On completing the program, students will be able to:

- Apply their knowledge of Internal Medicine to diagnose, treat, prevent and rehabilitate health issues in adult patients.
- Keep their knowledge of Internal Medicine and its subspecialties up to date by consulting relevant information sources in order to provide optimal healthcare.

- Formulate significant clinical questions related to their patients' care and resolve them through clinical or bibliographic research.
- Communicate their clinical care and research ideas effectively and clearly, orally and in writing.
- Deliver medical care to patients with professionalism and the highest ethical standards.

### Target Audience

The Multicentric Internal Medicine Program of Tecnológico de Monterrey is aimed at graduates from the undergraduate program in Medicine, whose academic performance has been outstanding and who have a vocation for and clear interest in this discipline, with a genuine interest in research and teaching.

In order to be admitted to the Residency in Critical Care Medicine of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

## REM Residency in Internal Medicine

### Edition 2013 (By Areas)

| Core Courses     |                                                    | C          | L          | U         | H          |
|------------------|----------------------------------------------------|------------|------------|-----------|------------|
| ME4170           | Internal Medicine I                                | 3          | 0          | 12        | 12         |
| ME4172           | Internal Medicine II                               | 3          | 0          | 12        | 12         |
| ME4174           | Internal Medicine III                              | 3          | 0          | 12        | 12         |
| ME4176           | Internal Medicine IV                               | 3          | 0          | 12        | 12         |
| ME5218           | Internal Medicine V                                | 3          | 0          | 12        | 12         |
| ME5220           | Internal Medicine VI                               | 3          | 0          | 12        | 12         |
| ME5222           | Internal Medicine VII                              | 3          | 0          | 12        | 12         |
| ME5224           | Internal Medicine Specialties                      | 3          | 0          | 12        | 12         |
|                  |                                                    | <b>24</b>  | <b>0</b>   | <b>96</b> | <b>96</b>  |
| Clinical Courses |                                                    | C          | L          | U         | H          |
| ME4169           | Clinical Practice in Internal Medicine I           | 0          | 60         | 12        | 60         |
| ME4171           | Clinical Practice in Internal Medicine II          | 0          | 60         | 12        | 60         |
| ME4173           | Clinical Practice in Internal Medicine III         | 0          | 60         | 12        | 60         |
| ME4175           | Clinical Practice in Internal Medicine IV          | 0          | 60         | 12        | 60         |
| ME5217           | Clinical Practice in Internal Medicine V           | 0          | 60         | 12        | 60         |
| ME5219           | Clinical Practice in Internal Medicine VI          | 0          | 60         | 12        | 60         |
| ME5221           | Clinical Practice in Internal Medicine VII         | 0          | 30         | 6         | 30         |
| ME5223           | Clinical Practice in Internal Medicine Specialties | 0          | 30         | 6         | 30         |
|                  |                                                    | <b>0</b>   | <b>420</b> | <b>84</b> | <b>420</b> |
| Research Courses |                                                    | C          | L          | U         | H          |
| ME4143           | Research and Innovation Methods                    | 1.5        | 0          | 6         | 6          |
| ME4144           | Thesis Project I                                   | 3          | 0          | 12        | 12         |
| ME5190           | Thesis Project II                                  | 3          | 0          | 12        | 12         |
| ME5266           | Thesis Defense                                     | 0          | 0          | 1         | 0          |
|                  |                                                    | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| Basic Courses    |                                                    | C          | L          | U         | H          |
| ME4140           | Clinical Ethics                                    | 1.5        | 0          | 6         | 6          |
| ME4141           | Health Sciences Education                          | 1.5        | 0          | 6         | 6          |
| ME4142           | Quality Health Care                                | 1.5        | 0          | 6         | 6          |
|                  |                                                    | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| Elective Courses |                                                    | C          | L          | U         | H          |
| ME5191           | Elective Specialty I                               | 0          | 30         | 6         | 30         |
| ME5192           | Elective Specialty II                              | 0          | 30         | 6         | 30         |
|                  |                                                    | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## REM Residency in Internal Medicine

### Edition 2013 (By Periods)

| <b>First Semester</b>   |                                                    | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|-------------------------|----------------------------------------------------|----------|-----------|-----------|-----------|
| ME4140                  | Clinical Ethics                                    | 1.5      | 0         | 6         | 6         |
| ME4142                  | Quality Health Care                                | 1.5      | 0         | 6         | 6         |
| ME4169                  | Clinical Practice in Internal Medicine I           | 0        | 60        | 12        | 60        |
| ME4170                  | Internal Medicine I                                | 3        | 0         | 12        | 12        |
|                         |                                                    | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b>  |                                                    | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                  | Health Sciences Education                          | 1.5      | 0         | 6         | 6         |
| ME4143                  | Research and Innovation Methods                    | 1.5      | 0         | 6         | 6         |
| ME4171                  | Clinical Practice in Internal Medicine II          | 0        | 60        | 12        | 60        |
| ME4172                  | Internal Medicine II                               | 3        | 0         | 12        | 12        |
|                         |                                                    | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>   |                                                    | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                  | Thesis Project I                                   | 3        | 0         | 12        | 12        |
| ME4173                  | Clinical Practice in Internal Medicine III         | 0        | 60        | 12        | 60        |
| ME4174                  | Internal Medicine III                              | 3        | 0         | 12        | 12        |
|                         |                                                    | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b>  |                                                    | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4175                  | Clinical Practice in Internal Medicine IV          | 0        | 60        | 12        | 60        |
| ME4176                  | Internal Medicine IV                               | 3        | 0         | 12        | 12        |
| ME5190                  | Thesis Project II                                  | 3        | 0         | 12        | 12        |
|                         |                                                    | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>   |                                                    | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5217                  | Clinical Practice in Internal Medicine V           | 0        | 60        | 12        | 60        |
| ME5218                  | Internal Medicine V                                | 3        | 0         | 12        | 12        |
|                         |                                                    | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>   |                                                    | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5219                  | Clinical Practice in Internal Medicine VI          | 0        | 60        | 12        | 60        |
| ME5220                  | Internal Medicine VI                               | 3        | 0         | 12        | 12        |
|                         |                                                    | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Seventh Semester</b> |                                                    | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                  | Elective Specialty I                               | 0        | 30        | 6         | 30        |
| ME5221                  | Clinical Practice in Internal Medicine VII         | 0        | 30        | 6         | 30        |
| ME5222                  | Internal Medicine VII                              | 3        | 0         | 12        | 12        |
|                         |                                                    | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Eighth Semester</b>  |                                                    | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                  | Elective Specialty II                              | 0        | 30        | 6         | 30        |
| ME5223                  | Clinical Practice in Internal Medicine Specialties | 0        | 30        | 6         | 30        |
| ME5224                  | Internal Medicine Specialties                      | 3        | 0         | 12        | 12        |
| ME5266                  | Thesis Defense                                     | 0        | 0         | 1         | 0         |
|                         |                                                    | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Pediatrics (REN)

### General program objectives

The aim of the Residency in Pediatrics of Tecnológico de Monterrey is to train exceptional Pediatricians who meet the healthcare needs of children and adolescents, according to the highest quality and safety standards, in both inpatient and outpatient settings. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. To prepare pediatricians outstanding leaders in both local and international settings, who contribute to generating innovative medical practices through clinical research, related to attending to the common and complex healthcare problems of the population between the ages of 0 and 21.

### Learning Outcomes

On completing the program, students will be able to:

- Apply their knowledge and skills to the attention, prevention and promotion of health in children and adolescents.
- Practice medicine with professionalism and responsibility, committing to the continuous enhancement of pediatrics.

- Participate in the development of medical practices through patient-, student- and colleague-oriented teaching.
- Communicate the results of projects and research to provide possible solutions to pediatric cases.
- Conduct clinical practices in groups of pediatric and multidisciplinary practitioners to share medical experiences.

### Target Audience

This program is aimed at all doctors who are interested in acquiring the knowledge, skills and attitudes required to preserve and improve the health of children and adolescents.

They must be committed to their work and self-directed study, with the concern and initiative to solve the serious health issues of children through ongoing progress and updating.

Entrepreneurial doctors who are willing to improve the practice and development of Pediatrics in the environment in which they work.

## REN Residency in Pediatrics

### Edition 2013 (By Areas)

| <b>Core Courses</b>     |                                                     | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
|-------------------------|-----------------------------------------------------|------------|------------|-----------|------------|
| ME4184                  | Pediatrics I                                        | 3          | 0          | 12        | 12         |
| ME4186                  | Pediatrics II                                       | 3          | 0          | 12        | 12         |
| ME4188                  | Pediatrics III                                      | 3          | 0          | 12        | 12         |
| ME4190                  | Pediatrics IV                                       | 3          | 0          | 12        | 12         |
| ME5232                  | Pediatrics V                                        | 3          | 0          | 12        | 12         |
| ME5234                  | Pediatrics VI                                       | 3          | 0          | 12        | 12         |
| ME5236                  | Pediatrics VII                                      | 3          | 0          | 12        | 12         |
| ME5238                  | Pediatrics VIII                                     | 3          | 0          | 12        | 12         |
|                         |                                                     | <b>24</b>  | <b>0</b>   | <b>96</b> | <b>96</b>  |
| <b>Clinical Courses</b> |                                                     | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4183                  | Ambulatory and Hospitalized Care in Pediatrics I    | 0          | 60         | 12        | 60         |
| ME4185                  | Ambulatory and Hospitalized Care in Pediatrics II   | 0          | 60         | 12        | 60         |
| ME4187                  | Ambulatory and Hospitalized Care in Pediatrics III  | 0          | 60         | 12        | 60         |
| ME4189                  | Ambulatory and Hospitalized Care in Pediatrics IV   | 0          | 60         | 12        | 60         |
| ME5231                  | Ambulatory and Hospitalized Care in Pediatrics V    | 0          | 60         | 12        | 60         |
| ME5233                  | Ambulatory and Hospitalized Care in Pediatrics VI   | 0          | 60         | 12        | 60         |
| ME5235                  | Ambulatory and Hospitalized Care in Pediatrics VII  | 0          | 30         | 6         | 30         |
| ME5237                  | Ambulatory and Hospitalized Care in Pediatrics VIII | 0          | 30         | 6         | 30         |
|                         |                                                     | <b>0</b>   | <b>420</b> | <b>84</b> | <b>420</b> |
| <b>Research Courses</b> |                                                     | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4143                  | Research and Innovation Methods                     | 1.5        | 0          | 6         | 6          |
| ME4144                  | Thesis Project I                                    | 3          | 0          | 12        | 12         |
| ME5190                  | Thesis Project II                                   | 3          | 0          | 12        | 12         |
| ME5266                  | Thesis Defense                                      | 0          | 0          | 1         | 0          |
|                         |                                                     | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| <b>Basic Courses</b>    |                                                     | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4140                  | Clinical Ethics                                     | 1.5        | 0          | 6         | 6          |
| ME4141                  | Health Sciences Education                           | 1.5        | 0          | 6         | 6          |
| ME4142                  | Quality Health Care                                 | 1.5        | 0          | 6         | 6          |
|                         |                                                     | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| <b>Elective Courses</b> |                                                     | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME5191                  | Elective Specialty I                                | 0          | 30         | 6         | 30         |
| ME5192                  | Elective Specialty II                               | 0          | 30         | 6         | 30         |
|                         |                                                     | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

**REN Residency in Pediatrics****Edition 2013 (By Periods)**

| <b>First Semester</b>   |                                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|-------------------------|-----------------------------------------------------|----------|-----------|-----------|-----------|
| ME4140                  | Clinical Ethics                                     | 1.5      | 0         | 6         | 6         |
| ME4142                  | Quality Health Care                                 | 1.5      | 0         | 6         | 6         |
| ME4183                  | Ambulatory and Hospitalized Care in Pediatrics I    | 0        | 60        | 12        | 60        |
| ME4184                  | Pediatrics I                                        | 3        | 0         | 12        | 12        |
|                         |                                                     | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b>  |                                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                  | Health Sciences Education                           | 1.5      | 0         | 6         | 6         |
| ME4143                  | Research and Innovation Methods                     | 1.5      | 0         | 6         | 6         |
| ME4185                  | Ambulatory and Hospitalized Care in Pediatrics II   | 0        | 60        | 12        | 60        |
| ME4186                  | Pediatrics II                                       | 3        | 0         | 12        | 12        |
|                         |                                                     | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>   |                                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                  | Thesis Project I                                    | 3        | 0         | 12        | 12        |
| ME4187                  | Ambulatory and Hospitalized Care in Pediatrics III  | 0        | 60        | 12        | 60        |
| ME4188                  | Pediatrics III                                      | 3        | 0         | 12        | 12        |
|                         |                                                     | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b>  |                                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4189                  | Ambulatory and Hospitalized Care in Pediatrics IV   | 0        | 60        | 12        | 60        |
| ME4190                  | Pediatrics IV                                       | 3        | 0         | 12        | 12        |
| ME5190                  | Thesis Project II                                   | 3        | 0         | 12        | 12        |
|                         |                                                     | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>   |                                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5231                  | Ambulatory and Hospitalized Care in Pediatrics V    | 0        | 60        | 12        | 60        |
| ME5232                  | Pediatrics V                                        | 3        | 0         | 12        | 12        |
|                         |                                                     | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>   |                                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5233                  | Ambulatory and Hospitalized Care in Pediatrics VI   | 0        | 60        | 12        | 60        |
| ME5234                  | Pediatrics VI                                       | 3        | 0         | 12        | 12        |
|                         |                                                     | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Séptimo Semestre</b> |                                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                  | Elective Specialty I                                | 0        | 30        | 6         | 30        |
| ME5235                  | Ambulatory and Hospitalized Care in Pediatrics VII  | 0        | 30        | 6         | 30        |
| ME5236                  | Pediatrics VII                                      | 3        | 0         | 12        | 12        |
|                         |                                                     | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Eighth Semester</b>  |                                                     | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                  | Elective Specialty II                               | 0        | 30        | 6         | 30        |
| ME5237                  | Ambulatory and Hospitalized Care in Pediatrics VIII | 0        | 30        | 6         | 30        |
| ME5238                  | Pediatrics VIII                                     | 3        | 0         | 12        | 12        |
| ME5266                  | Thesis Defense                                      | 0        | 0         | 1         | 0         |
|                         |                                                     | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Ophthalmology (REO)

### General program objectives

The aim of the Residency in Ophthalmology of Tecnológico de Monterrey is to train exceptional Ophthalmologists, who care for the visual health and ocular diseases of the population, according to the highest quality and safety standards, in public and private inpatient and outpatient settings. It also seeks to prepare individuals with integrity and a humanistic outlook and spirit of service in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Ophthalmologists who graduate from this institution are outstanding leaders in both local and international settings, who contribute to generating innovation in diagnostic and therapeutic methods and techniques, as well as to implementing prevention and early detection programs for ocular diseases that are relevant in the general population.

### Learning Outcomes

On completing the program, students will be able to:

- Apply the most up-to-date medical knowledge of Ophthalmology to the comprehensive care of patients with ocular problems, with ethics, professionalism and a humanistic outlook.
- Perform surgical procedures to attend to the principal ophthalmological problems prevailing in the community, such as cataracts, strabismus, refractive surgery and retinal laser surgery, assuring quality care and patient safety.
- Evaluate the ocular, systemic and external conditions of each patient and of the community, to achieve the best ocular and visual health.

- Collaborate in multidisciplinary teams in the prevention and early detection of glaucoma, diabetic retinopathy and visual problems in children, among other ocular diseases.
- Demonstrate interpersonal and communication skills that facilitate the effective exchange of information and good relations with patients and colleagues.
- Contribute to the development of Ophthalmology through the consolidation of research and teaching skills.

### Target Audience

The Ophthalmology Program is aimed at graduates from the Medicine and Physical undergraduate program whose academic performance has been outstanding and who have a specific vocation for this specialty. They must display the following characteristics: the capacity to apply an understanding of basic clinical and social sciences as the foundation for their medical practice; clinical skills; diagnostic and therapeutic resource management; health promotion and disease prevention; effective communication, printed and electronic information management; reasoning, clinical judgment and decision making; self-directed learning; fluency in the English language; personal development, incorporation of ethical attitudes and bases; vocation and the capacity for studying.

In order to be admitted to the Residency in Ophthalmology of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.



**REO Residency in Ophthalmology****Edition 2013 (By Areas)**

| <b>Core Courses</b>     |                                                      | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
|-------------------------|------------------------------------------------------|------------|------------|-----------|------------|
| ME4220                  | Fundamentals in Ophthalmology I                      | 3          | 0          | 12        | 12         |
| ME4222                  | Fundamentals in Ophthalmology II                     | 3          | 0          | 12        | 12         |
| ME4224                  | Oculoplastic, Pediatric Ophthalmology and Strabismus | 3          | 0          | 12        | 12         |
| ME4226                  | Glaucoma, Anterior Segment and Neurophthalmology     | 3          | 0          | 12        | 12         |
| ME5273                  | Cornea, External Diseases and Refractive Surgery     | 3          | 0          | 12        | 12         |
| ME5275                  | Retina and Uveitis                                   | 3          | 0          | 12        | 12         |
| ME5277                  | Ophthalmology Specialties                            | 3          | 0          | 12        | 12         |
| ME5279                  | Diagnostic Procedures in Ophthalmology               | 3          | 0          | 12        | 12         |
|                         |                                                      | <b>24</b>  | <b>0</b>   | <b>96</b> | <b>96</b>  |
| <b>Clinical Courses</b> |                                                      | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4221                  | Medical Care and Surgery in Ophthalmology I          | 0          | 60         | 12        | 60         |
| ME4223                  | Medical Care and Surgery in Ophthalmology II         | 0          | 60         | 12        | 60         |
| ME4225                  | Medical Care and Surgery in Ophthalmology III        | 0          | 60         | 12        | 60         |
| ME4227                  | Medical Care and Surgery in Ophthalmology IV         | 0          | 60         | 12        | 60         |
| ME5274                  | Medical Care and Surgery in Ophthalmology V          | 0          | 60         | 12        | 60         |
| ME5276                  | Medical Care and Surgery in Ophthalmology VI         | 0          | 30         | 6         | 30         |
| ME5278                  | Medical Care and Surgery in Ophthalmology VII        | 0          | 30         | 6         | 30         |
| ME5280                  | Medical Care and Surgery in Ophthalmology VIII       | 0          | 60         | 12        | 60         |
|                         |                                                      | <b>0</b>   | <b>420</b> | <b>84</b> | <b>420</b> |
| <b>Research Courses</b> |                                                      | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4143                  | Research and Innovation Methods                      | 1.5        | 0          | 6         | 6          |
| ME4144                  | Thesis Project I                                     | 3          | 0          | 12        | 12         |
| ME5190                  | Thesis Project II                                    | 3          | 0          | 12        | 12         |
| ME5266                  | Thesis Defense                                       | 0          | 0          | 1         | 0          |
|                         |                                                      | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| <b>Basic Courses</b>    |                                                      | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4140                  | Clinical Ethics                                      | 1.5        | 0          | 6         | 6          |
| ME4141                  | Health Sciences Education                            | 1.5        | 0          | 6         | 6          |
| ME4142                  | Quality Health Care                                  | 1.5        | 0          | 6         | 6          |
|                         |                                                      | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| <b>Elective Courses</b> |                                                      | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME5191                  | Elective Specialty I                                 | 0          | 30         | 6         | 30         |
| ME5192                  | Elective Specialty II                                | 0          | 30         | 6         | 30         |
|                         |                                                      | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## REO Residency in Ophthalmology

### Edition 2013 (By Periods)

| <b>First Semester</b>   |                                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|-------------------------|------------------------------------------------------|----------|-----------|-----------|-----------|
| ME4140                  | Clinical Ethics                                      | 1.5      | 0         | 6         | 6         |
| ME4142                  | Quality Health Care                                  | 1.5      | 0         | 6         | 6         |
| ME4220                  | Fundamentals in Ophthalmology I                      | 3        | 0         | 12        | 12        |
| ME4221                  | Medical Care and Surgery in Ophthalmology I          | 0        | 60        | 12        | 60        |
|                         |                                                      | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b>  |                                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                  | Health Sciences Education                            | 1.5      | 0         | 6         | 6         |
| ME4143                  | Research and Innovation Methods                      | 1.5      | 0         | 6         | 6         |
| ME4222                  | Fundamentals in Ophthalmology II                     | 3        | 0         | 12        | 12        |
| ME4223                  | Medical Care and Surgery in Ophthalmology II         | 0        | 60        | 12        | 60        |
|                         |                                                      | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>   |                                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                  | Thesis Project I                                     | 3        | 0         | 12        | 12        |
| ME4224                  | Oculoplastic, Pediatric Ophthalmology and Strabismus | 3        | 0         | 12        | 12        |
| ME4225                  | Medical Care and Surgery in Ophthalmology III        | 0        | 60        | 12        | 60        |
|                         |                                                      | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b>  |                                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4226                  | Glaucoma, Anterior Segment and Neurophthalmology     | 3        | 0         | 12        | 12        |
| ME4227                  | Medical Care and Surgery in Ophthalmology IV         | 0        | 60        | 12        | 60        |
| ME5190                  | Thesis Project II                                    | 3        | 0         | 12        | 12        |
|                         |                                                      | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>   |                                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5273                  | Cornea, External Diseases and Refractive Surgery     | 3        | 0         | 12        | 12        |
| ME5274                  | Medical Care and Surgery in Ophthalmology V          | 0        | 60        | 12        | 60        |
|                         |                                                      | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>   |                                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                  | Elective Specialty I                                 | 0        | 30        | 6         | 30        |
| ME5275                  | Retina and Uveitis                                   | 3        | 0         | 12        | 12        |
| ME5276                  | Medical Care and Surgery in Ophthalmology VI         | 0        | 30        | 6         | 30        |
|                         |                                                      | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Seventh Semester</b> |                                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                  | Elective Specialty II                                | 0        | 30        | 6         | 30        |
| ME5277                  | Ophthalmology Specialties                            | 3        | 0         | 12        | 12        |
| ME5278                  | Medical Care and Surgery in Ophthalmology VII        | 0        | 30        | 6         | 30        |
|                         |                                                      | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Eighth Semester</b>  |                                                      | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5266                  | Thesis Defense                                       | 0        | 0         | 1         | 0         |
| ME5279                  | Diagnostic Procedures in Ophthalmology               | 3        | 0         | 12        | 12        |
| ME5280                  | Medical Care and Surgery in Ophthalmology VIII       | 0        | 60        | 12        | 60        |
|                         |                                                      | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Radiology and Imaging (RER)

### General program objectives

The aim of the Residency in Radiology and Imaging of Tecnológico de Monterrey is to train exceptional Radiologists, who attend to the health requirements of patients, according to the highest quality and safety standards, in both inpatient and outpatient settings. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Radiologists who graduate from this institution are outstanding leaders in both local and international settings and remain at the forefront of their specialty, generating healthcare models based on research and innovation that enable them to compete in a globalized economy.

### Learning Outcomes

On completing the program, students will be able to:

- Recognize the health needs of patients, family members and society in general, as well those of medical and third-party payer institutions.
- Perform their medical practice taking into consideration the risks/benefits, costs/benefits, environmental and legal medical aspects of their professional tasks, within the framework of medical ethics.

- Investigate problems related to their professional practice in multidisciplinary teams and use the findings obtained to solve them.
- Communicate effectively and respectfully with patients, family members and other healthcare professionals.

### Target Audience

This program is aimed at graduates of the Physician and Surgeon degrees from Mexican and international universities recognized by Tecnológico de Monterrey, whose academic performance is outstanding, who display leadership skills, an interest in serving as educators and researchers, and a psychological profile that can adapt to change and innovation.

In order to be admitted to the Residency in Radiology of the School of Medicine and Health Sciences of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

## RER Residency in Radiology and Imaging

### Edition 2013 (By Areas)

| <b>Core Courses</b>     |                                          | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
|-------------------------|------------------------------------------|------------|------------|-----------|------------|
| ME4205                  | Radiology and Image I                    | 3          | 0          | 12        | 12         |
| ME4207                  | Radiology and Image II                   | 1.5        | 0          | 6         | 6          |
| ME4209                  | Advanced Physics                         | 1.5        | 0          | 6         | 6          |
| ME4210                  | Radiology and Image III                  | 3          | 0          | 12        | 12         |
| ME4212                  | Radiology and Image IV                   | 3          | 0          | 12        | 12         |
| ME5258                  | Radiology and Image V                    | 3          | 0          | 12        | 12         |
| ME5260                  | Radiology and Image VI                   | 3          | 0          | 12        | 12         |
| ME5262                  | Radiology and Image VII                  | 3          | 0          | 12        | 12         |
| ME5264                  | Radiology and Image VIII                 | 3          | 0          | 12        | 12         |
|                         |                                          | <b>24</b>  | <b>0</b>   | <b>96</b> | <b>96</b>  |
| <b>Clinical Courses</b> |                                          | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4206                  | Medical Care in Radiology and Image I    | 0          | 60         | 12        | 60         |
| ME4208                  | Medical Care in Radiology and Image II   | 0          | 60         | 12        | 60         |
| ME4211                  | Medical Care in Radiology and Image III  | 0          | 60         | 12        | 60         |
| ME4213                  | Medical Care in Radiology and Image IV   | 0          | 60         | 12        | 60         |
| ME5259                  | Medical Care in Radiology and Image V    | 0          | 60         | 12        | 60         |
| ME5261                  | Medical Care in Radiology and Image VI   | 0          | 60         | 12        | 60         |
| ME5263                  | Medical Care in Radiology and Image VII  | 0          | 30         | 6         | 30         |
| ME5265                  | Medical Care in Radiology and Image VIII | 0          | 30         | 6         | 30         |
|                         |                                          | <b>0</b>   | <b>420</b> | <b>84</b> | <b>420</b> |
| <b>Research Courses</b> |                                          | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4143                  | Research and Innovation Methods          | 1.5        | 0          | 6         | 6          |
| ME4144                  | Thesis Project I                         | 3          | 0          | 12        | 12         |
| ME5190                  | Thesis Project II                        | 3          | 0          | 12        | 12         |
| ME5266                  | Thesis Defense                           | 0          | 0          | 1         | 0          |
|                         |                                          | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| <b>Basic Courses</b>    |                                          | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4140                  | Clinical Ethics                          | 1.5        | 0          | 6         | 6          |
| ME4141                  | Health Sciences Education                | 1.5        | 0          | 6         | 6          |
| ME4142                  | Quality Health Care                      | 1.5        | 0          | 6         | 6          |
|                         |                                          | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| <b>Elective Courses</b> |                                          | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME5191                  | Elective Specialty I                     | 0          | 30         | 6         | 30         |
| ME5192                  | Elective Specialty II                    | 0          | 30         | 6         | 30         |
|                         |                                          | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## RER Residency in Radiology and Imaging

### Edition 2013 (By Periods)

| <b>First Semester</b>   |                                          | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|-------------------------|------------------------------------------|----------|-----------|-----------|-----------|
| ME4140                  | Clinical Ethics                          | 1.5      | 0         | 6         | 6         |
| ME4142                  | Quality Health Care                      | 1.5      | 0         | 6         | 6         |
| ME4205                  | Radiology and Image I                    | 3        | 0         | 12        | 12        |
| ME4206                  | Medical Care in Radiology and Image I    | 0        | 60        | 12        | 60        |
|                         |                                          | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b>  |                                          | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                  | Health Sciences Education                | 1.5      | 0         | 6         | 6         |
| ME4143                  | Research and Innovation Methods          | 1.5      | 0         | 6         | 6         |
| ME4207                  | Radiology and Image II                   | 1.5      | 0         | 6         | 6         |
| ME4208                  | Medical Care in Radiology and Image II   | 0        | 60        | 12        | 60        |
| ME4209                  | Advanced Physics                         | 1.5      | 0         | 6         | 6         |
|                         |                                          | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>   |                                          | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                  | Thesis Project I                         | 3        | 0         | 12        | 12        |
| ME4210                  | Radiology and Image III                  | 3        | 0         | 12        | 12        |
| ME4211                  | Medical Care in Radiology and Image III  | 0        | 60        | 12        | 60        |
|                         |                                          | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b>  |                                          | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4212                  | Radiology and Image IV                   | 3        | 0         | 12        | 12        |
| ME4213                  | Medical Care in Radiology and Image IV   | 0        | 60        | 12        | 60        |
| ME5190                  | Thesis Project II                        | 3        | 0         | 12        | 12        |
|                         |                                          | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>   |                                          | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5258                  | Radiology and Image V                    | 3        | 0         | 12        | 12        |
| ME5259                  | Medical Care in Radiology and Image V    | 0        | 60        | 12        | 60        |
|                         |                                          | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>   |                                          | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5260                  | Radiology and Image VI                   | 3        | 0         | 12        | 12        |
| ME5261                  | Medical Care in Radiology and Image VI   | 0        | 60        | 12        | 60        |
|                         |                                          | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Seventh Semester</b> |                                          | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                  | Elective Specialty I                     | 0        | 30        | 6         | 30        |
| ME5262                  | Radiology and Image VII                  | 3        | 0         | 12        | 12        |
| ME5263                  | Medical Care in Radiology and Image VII  | 0        | 30        | 6         | 30        |
|                         |                                          | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Eighth Semester</b>  |                                          | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                  | Elective Specialty II                    | 0        | 30        | 6         | 30        |
| ME5264                  | Radiology and Image VIII                 | 3        | 0         | 12        | 12        |
| ME5265                  | Medical Care in Radiology and Image VIII | 0        | 30        | 6         | 30        |
| ME5266                  | Thesis Defense                           | 0        | 0         | 1         | 0         |
|                         |                                          | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Neurology (REU)

### General program objectives

The aim of the Residency in Neurology of Tecnológico de Monterrey is to train exceptional Neurologists, who meet the needs of patients with neurological pathologies, according to the highest quality and safety standards, in both inpatient and outpatient settings. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practices, while strictly adhering to ethical principles and the standards of professional practice. Neurologists who graduate from this institution are internationally competitive leaders, who contribute to the generation of knowledge on the frontiers of Neurology and transfer this knowledge through teaching. They are also committed to lifelong learning in medicine.

### Learning Outcomes

On completing the program, students will be able to:

- Diagnose, treat and promote the health of patients with neurological diseases in a comprehensive, effective manner on the basis of scientific evidence, using resources appropriately, demonstrating research- and analysis-oriented thought, with knowledge and applications specific to basic and clinical neurological sciences in the face of clinical situations;
- Respect the dignity of human beings and the ethical principles of their profession as neurologists; Effectively coordinate the healthcare team that participates in the clinical, rehabilitation and palliative care of the patient with neurological disorders;

- Apply their knowledge to the planning, design, statistical analysis, discussion, conclusion and publication of clinical studies aimed at assessing diagnostic and therapeutic effectiveness in their specialization;
- Participate in the development of clinical research and basic protocols, particularly in the areas of abnormal movements, neurodegenerative diseases and neoplasia of the central nervous system;
- Communicate their knowledge effectively to patients, family members and medical colleagues, as well as to other healthcare professionals, displaying an attitude of information, listening, caring, compassion and respect toward the patient and his or her family members, including the patient's preference in the formulation of disease management plans and practicing their specialty in a cost efficient manner, without compromising the quality of the care provided.

### Target Audience

The Residency in Neurology program of Tecnológico de Monterrey is aimed at doctors who have a deep sense of social responsibility; are willing to receive new knowledge; have the capacity and the desire to acquire skills to seek knowledge in the area of neurological science and, subsequently, the capacity to generate new knowledge within this branch of neuroscience.

In order to be admitted to the Residency in Neurology of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

## REU Residency in Neurology

### Edition 2013 (By Areas)

| <b>Core Courses</b>     |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
|-------------------------|---------------------------------|------------|------------|-----------|------------|
| ME4214                  | Neurology I                     | 3          | 0          | 12        | 12         |
| ME4216                  | Neurology II                    | 3          | 0          | 12        | 12         |
| ME4218                  | Neurology III                   | 3          | 0          | 12        | 12         |
| ME5267                  | Neurology IV                    | 3          | 0          | 12        | 12         |
| ME5269                  | Neurology V                     | 3          | 0          | 12        | 12         |
| ME5271                  | Neurology VI                    | 3          | 0          | 12        | 12         |
|                         |                                 | <b>18</b>  | <b>0</b>   | <b>72</b> | <b>72</b>  |
| <b>Clinical Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4215                  | Medical Care in Neurology I     | 0          | 60         | 12        | 60         |
| ME4217                  | Medical Care in Neurology II    | 0          | 60         | 12        | 60         |
| ME4219                  | Medical Care in Neurology III   | 0          | 60         | 12        | 60         |
| ME5268                  | Medical Care in Neurology IV    | 0          | 60         | 12        | 60         |
| ME5270                  | Medical Care in Neurology V     | 0          | 30         | 6         | 30         |
| ME5272                  | Medical Care in Neurology VI    | 0          | 30         | 6         | 30         |
|                         |                                 | <b>0</b>   | <b>300</b> | <b>60</b> | <b>300</b> |
| <b>Research Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4143                  | Research and Innovation Methods | 1.5        | 0          | 6         | 6          |
| ME4144                  | Thesis Project I                | 3          | 0          | 12        | 12         |
| ME5190                  | Thesis Project II               | 3          | 0          | 12        | 12         |
| ME5266                  | Thesis Defense                  | 0          | 0          | 1         | 0          |
|                         |                                 | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| <b>Basic Courses</b>    |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4140                  | Clinical Ethics                 | 1.5        | 0          | 6         | 6          |
| ME4141                  | Health Sciences Education       | 1.5        | 0          | 6         | 6          |
| ME4142                  | Quality Health Care             | 1.5        | 0          | 6         | 6          |
|                         |                                 | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| <b>Elective Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME5191                  | Elective Specialty I            | 0          | 30         | 6         | 30         |
| ME5192                  | Elective Specialty II           | 0          | 30         | 6         | 30         |
|                         |                                 | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## REU Residency in Neurology

### Edition 2013 (By Periods)

| <b>First Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|------------------------|---------------------------------|----------|-----------|-----------|-----------|
| ME4140                 | Clinical Ethics                 | 1.5      | 0         | 6         | 6         |
| ME4142                 | Quality Health Care             | 1.5      | 0         | 6         | 6         |
| ME4214                 | Neurology I                     | 3        | 0         | 12        | 12        |
| ME4215                 | Medical Care in Neurology I     | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b> |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                 | Health Sciences Education       | 1.5      | 0         | 6         | 6         |
| ME4143                 | Research and Innovation Methods | 1.5      | 0         | 6         | 6         |
| ME4216                 | Neurology II                    | 3        | 0         | 12        | 12        |
| ME4217                 | Medical Care in Neurology II    | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                 | Thesis Project I                | 3        | 0         | 12        | 12        |
| ME4218                 | Neurology III                   | 3        | 0         | 12        | 12        |
| ME4219                 | Medical Care in Neurology III   | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b> |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5190                 | Thesis Project II               | 3        | 0         | 12        | 12        |
| ME5267                 | Neurology IV                    | 3        | 0         | 12        | 12        |
| ME5268                 | Medical Care in Neurology IV    | 0        | 60        | 12        | 60        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                 | Elective Specialty I            | 0        | 30        | 6         | 30        |
| ME5269                 | Neurology V                     | 3        | 0         | 12        | 12        |
| ME5270                 | Medical Care in Neurology V     | 0        | 30        | 6         | 30        |
|                        |                                 | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                 | Elective Specialty II           | 0        | 30        | 6         | 30        |
| ME5266                 | Thesis Defense                  | 0        | 0         | 1         | 0         |
| ME5271                 | Neurology VI                    | 3        | 0         | 12        | 12        |
| ME5272                 | Medical Care in Neurology VI    | 0        | 30        | 6         | 30        |
|                        |                                 | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation



## Residency in Geriatrics (RGE)

### General program objectives

The principal aim of the Residency in Geriatrics of Tecnológico de Monterrey is to train exceptional Geriatricians who meet the healthcare needs of the elderly, according to the highest quality and safety standards, in inpatient, outpatient and prolonged-care settings. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Geriatricians who graduate from this institution are outstanding leaders in both local and international settings, and contribute to designing strategies and generating innovations to solve problems related to the health of the elderly.

### Learning Outcomes

On completing the program, students will be able to:

- Develop geriatric care models for institutional and private environments, based on the human being and the social and family environment, within the framework of medical ethics;

- Coordinate the actions of interdisciplinary healthcare teams for the medical and gerontological care of their patients, constantly seeking to improve their quality of life;
- Conduct clinical research projects in geriatrics;
- Provide the highest quality healthcare based on state-of-the-art geriatrics within a framework of ethics and professionalism;
- Educate healthcare personnel and the community on the attention and care of elderly patients.

### Target Audience

This program is aimed at general doctors who have a deep social commitment and an interest in providing quality care for senior citizens from a holistic perspective, identifying the patient as the protagonist of this care.

In order to be admitted to the Residency in Geriatrics of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

## RGE Residency in Geriatrics

### Edition 2013 (By Areas)

| Core Course      |                                                 | C          | L          | U         | H          |
|------------------|-------------------------------------------------|------------|------------|-----------|------------|
| ME4170           | Internal Medicine I                             | 3          | 0          | 12        | 12         |
| ME4172           | Internal Medicine II                            | 3          | 0          | 12        | 12         |
| ME4174           | Internal Medicine III                           | 3          | 0          | 12        | 12         |
| ME4176           | Internal Medicine IV                            | 3          | 0          | 12        | 12         |
| ME5249           | Geriatrics and Gerontology I                    | 3          | 0          | 12        | 12         |
| ME5251           | Geriatrics and Gerontology II                   | 3          | 0          | 12        | 12         |
| ME5253           | Geriatrics and Gerontology III                  | 3          | 0          | 12        | 12         |
| ME5255           | Geriatrics and Gerontology IV                   | 3          | 0          | 12        | 12         |
|                  |                                                 | <b>24</b>  | <b>0</b>   | <b>96</b> | <b>96</b>  |
| Clinical Courses |                                                 | C          | L          | U         | H          |
| ME4201           | Medical Care in Geriatrics and Gerontology I    | 0          | 60         | 12        | 60         |
| ME4202           | Medical Care in Geriatrics and Gerontology II   | 0          | 60         | 12        | 60         |
| ME4203           | Medical Care in Geriatrics and Gerontology III  | 0          | 60         | 12        | 60         |
| ME4204           | Medical Care in Geriatrics and Gerontology IV   | 0          | 60         | 12        | 60         |
| ME5250           | Medical Care in Geriatrics and Gerontology V    | 0          | 60         | 12        | 60         |
| ME5252           | Medical Care in Geriatrics and Gerontology VI   | 0          | 30         | 6         | 30         |
| ME5254           | Medical Care in Geriatrics and Gerontology VII  | 0          | 60         | 12        | 60         |
| ME5257           | Medical Care in Geriatrics and Gerontology VIII | 0          | 30         | 6         | 30         |
|                  |                                                 | <b>0</b>   | <b>420</b> | <b>84</b> | <b>420</b> |
| Research Courses |                                                 | C          | L          | U         | H          |
| ME4143           | Research and Innovation Methods                 | 1.5        | 0          | 6         | 6          |
| ME4144           | Thesis Project I                                | 3          | 0          | 12        | 12         |
| ME5190           | Thesis Project II                               | 3          | 0          | 12        | 12         |
| ME5266           | Thesis Defense                                  | 0          | 0          | 1         | 0          |
|                  |                                                 | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| Basic Courses    |                                                 | C          | L          | U         | H          |
| ME4140           | Clinical Ethics                                 | 1.5        | 0          | 6         | 6          |
| ME4141           | Health Sciences Education                       | 1.5        | 0          | 6         | 6          |
| ME4142           | Quality Health Care                             | 1.5        | 0          | 6         | 6          |
|                  |                                                 | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| Elective Courses |                                                 | C          | L          | U         | H          |
| ME5191           | Elective Specialty I                            | 0          | 30         | 6         | 30         |
| ME5192           | Elective Specialty II                           | 0          | 30         | 6         | 30         |
|                  |                                                 | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

**RGE Residency in Geriatrics****Edition 2013 (By Periods)**

| <b>First Semester</b>   |                                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|-------------------------|-------------------------------------------------|------------|-----------|-----------|-----------|
| ME4140                  | Clinical Ethics                                 | 1.5        | 0         | 6         | 6         |
| ME4170                  | Internal Medicine I                             | 3          | 0         | 12        | 12        |
| ME4201                  | Medical Care in Geriatrics and Gerontology I    | 0          | 60        | 12        | 60        |
|                         |                                                 | <b>4.5</b> | <b>60</b> | <b>30</b> | <b>78</b> |
| <b>Second Semester</b>  |                                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4142                  | Quality Health Care                             | 1.5        | 0         | 6         | 6         |
| ME4172                  | Internal Medicine II                            | 3          | 0         | 12        | 12        |
| ME4202                  | Medical Care in Geriatrics and Gerontology II   | 0          | 60        | 12        | 60        |
|                         |                                                 | <b>4.5</b> | <b>60</b> | <b>30</b> | <b>78</b> |
| <b>Third Semester</b>   |                                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                  | Health Sciences Education                       | 1.5        | 0         | 6         | 6         |
| ME4174                  | Internal Medicine III                           | 3          | 0         | 12        | 12        |
| ME4203                  | Medical Care in Geriatrics and Gerontology III  | 0          | 60        | 12        | 60        |
|                         |                                                 | <b>4.5</b> | <b>60</b> | <b>30</b> | <b>78</b> |
| <b>Fourth Semester</b>  |                                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4143                  | Research and Innovation Methods                 | 1.5        | 0         | 6         | 6         |
| ME4176                  | Internal Medicine IV                            | 3          | 0         | 12        | 12        |
| ME4204                  | Medical Care in Geriatrics and Gerontology IV   | 0          | 60        | 12        | 60        |
|                         |                                                 | <b>4.5</b> | <b>60</b> | <b>30</b> | <b>78</b> |
| <b>Fifth Semester</b>   |                                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                  | Thesis Project I                                | 3          | 0         | 12        | 12        |
| ME5249                  | Geriatrics and Gerontology I                    | 3          | 0         | 12        | 12        |
| ME5250                  | Medical Care in Geriatrics and Gerontology V    | 0          | 60        | 12        | 60        |
|                         |                                                 | <b>6</b>   | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Sixth Semester</b>   |                                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                  | Elective Specialty I                            | 0          | 30        | 6         | 30        |
| ME5251                  | Geriatrics and Gerontology II                   | 3          | 0         | 12        | 12        |
| ME5252                  | Medical Care in Geriatrics and Gerontology VI   | 0          | 30        | 6         | 30        |
|                         |                                                 | <b>3</b>   | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Seventh Semester</b> |                                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5190                  | Thesis Project II                               | 3          | 0         | 12        | 12        |
| ME5253                  | Geriatrics and Gerontology III                  | 3          | 0         | 12        | 12        |
| ME5254                  | Medical Care in Geriatrics and Gerontology VII  | 0          | 60        | 12        | 60        |
|                         |                                                 | <b>6</b>   | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Eighth Semester</b>  |                                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                  | Elective Specialty II                           | 0          | 30        | 6         | 30        |
| ME5255                  | Geriatrics and Gerontology IV                   | 3          | 0         | 12        | 12        |
| ME5257                  | Medical Care in Geriatrics and Gerontology VIII | 0          | 30        | 6         | 30        |
| ME5266                  | Thesis Defense                                  | 0          | 0         | 1         | 0         |
|                         |                                                 | <b>3</b>   | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Neonatology (RNE)

### General program objectives

The aim of the Residency in Neonatology of Tecnológico de Monterrey is to train exceptional Neonatologists who are experts in the healthcare of newborns, meeting the highest standards of quality and patient safety, in public and private healthcare institutions. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Neonatologists who graduate from this institution are outstanding leaders able to execute superior work in national and international settings. They are committed to the development and transformation of their communities through programs and actions to enhance the healthcare of newborns. They are creative and innovative, contributing to the generation and practice of clinical research that impacts the health of newborns.

### Learning Outcomes

On completing the program, students will be able to:

- Assess, diagnose and care for the health of newborns in critical, medical or surgical conditions, with integrity, responsibility and a sense of humanity;
- Be competent in the evaluation, diagnosis, monitoring and treatment techniques used in the clinical care of the newborn in critical, medical or surgical conditions;

- Identify the psychosocial implications of disease in their patients, as well as the repercussions on the family environment and/or that of substitute caregivers;
- Identify high-risk pregnancies and their subsequent repercussions on the birth process and pathologies in the newborn, and undertake the clinical supervision and monitoring of these patients;
- Make the best use of their patients databases as a guide for making the necessary clinical decisions and understanding the administrative procedures that expedite neonatal medical care;
- Apply and transfer knowledge of the basic medical disciplines in relation to the pregnancy process, the fetus and the newborn;
- Conduct clinical research in their field of specialization and communicate the findings efficiently, both orally and in writing.

### Target Audience

This program is aimed at Pediatricians with the knowledge, skills, attitudes and values expected of a specialist in Pediatrics, whose academic performance is outstanding and who displays a vocation for and interest in Neonatology, with a genuine conviction for conducting research and who demonstrates findings efficiently, in conversational English.

In order to be admitted to the Residency in Neonatology of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

**RNE Residency in Neonatology****Edition 2013 (By Areas)**

| <b>Core Courses</b>     |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
|-------------------------|---------------------------------|------------|------------|-----------|------------|
| ME4192                  | Neonatology I                   | 3          | 0          | 12        | 12         |
| ME4194                  | Neonatology II                  | 3          | 0          | 12        | 12         |
| ME4196                  | Neonatology III                 | 3          | 0          | 12        | 12         |
| ME5240                  | Neonatology IV                  | 3          | 0          | 12        | 12         |
| ME5242                  | Neonatology V                   | 3          | 0          | 12        | 12         |
| ME5244                  | Neonatology VI                  | 3          | 0          | 12        | 12         |
|                         |                                 | <b>18</b>  | <b>0</b>   | <b>72</b> | <b>72</b>  |
| <b>Clinical Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4191                  | Medical Care in Neonatology I   | 0          | 60         | 12        | 60         |
| ME4193                  | Medical Care in Neonatology II  | 0          | 60         | 12        | 60         |
| ME4195                  | Medical Care in Neonatology III | 0          | 60         | 12        | 60         |
| ME5239                  | Medical Care in Neonatology IV  | 0          | 60         | 12        | 60         |
| ME5241                  | Medical Care in Neonatology V   | 0          | 30         | 6         | 30         |
| ME5243                  | Medical Care in Neonatology VI  | 0          | 30         | 6         | 30         |
|                         |                                 | <b>0</b>   | <b>300</b> | <b>60</b> | <b>300</b> |
| <b>Research Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4143                  | Research and Innovation Methods | 1.5        | 0          | 6         | 6          |
| ME4144                  | Thesis Project I                | 3          | 0          | 12        | 12         |
| ME5190                  | Thesis Project II               | 3          | 0          | 12        | 12         |
| ME5266                  | Thesis Defense                  | 0          | 0          | 1         | 0          |
|                         |                                 | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| <b>Basic Courses</b>    |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4140                  | Clinical Ethics                 | 1.5        | 0          | 6         | 6          |
| ME4141                  | Health Sciences Education       | 1.5        | 0          | 6         | 6          |
| ME4142                  | Quality Health Care             | 1.5        | 0          | 6         | 6          |
|                         |                                 | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| <b>Elective Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME5191                  | Elective Specialty I            | 0          | 30         | 6         | 30         |
| ME5192                  | Elective Specialty II           | 0          | 30         | 6         | 30         |
|                         |                                 | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

---

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

**RNE Residency in Neonatology****Edition 2013 (By Periods)**

| <b>First Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|------------------------|---------------------------------|----------|-----------|-----------|-----------|
| ME4140                 | Clinical Ethics                 | 1.5      | 0         | 6         | 6         |
| ME4142                 | Quality Health Care             | 1.5      | 0         | 6         | 6         |
| ME4191                 | Medical Care in Neonatology I   | 0        | 60        | 12        | 60        |
| ME4192                 | Neonatology I                   | 3        | 0         | 12        | 12        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b> |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                 | Health Sciences Education       | 1.5      | 0         | 6         | 6         |
| ME4143                 | Research and Innovation Methods | 1.5      | 0         | 6         | 6         |
| ME4193                 | Medical Care in Neonatology II  | 0        | 60        | 12        | 60        |
| ME4194                 | Neonatology II                  | 3        | 0         | 12        | 12        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                 | Thesis Project I                | 3        | 0         | 12        | 12        |
| ME4195                 | Medical Care in Neonatology III | 0        | 60        | 12        | 60        |
| ME4196                 | Neonatology III                 | 3        | 0         | 12        | 12        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b> |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5190                 | Thesis Project II               | 3        | 0         | 12        | 12        |
| ME5239                 | Medical Care in Neonatology IV  | 0        | 60        | 12        | 60        |
| ME5240                 | Neonatology IV                  | 3        | 0         | 12        | 12        |
|                        |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                 | Elective Specialty I            | 0        | 30        | 6         | 30        |
| ME5241                 | Medical Care in Neonatology V   | 0        | 30        | 6         | 30        |
| ME5242                 | Neonatology V                   | 3        | 0         | 12        | 12        |
|                        |                                 | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                 | Elective Specialty II           | 0        | 30        | 6         | 30        |
| ME5243                 | Medical Care in Neonatology VI  | 0        | 30        | 6         | 30        |
| ME5244                 | Neonatology VI                  | 3        | 0         | 12        | 12        |
| ME5266                 | Thesis Defense                  | 0        | 0         | 1         | 0         |
|                        |                                 | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

---

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Pediatric Neurology (RNP)

### General program objectives

The principal aim of the Residency in Pediatric Neurology of Tecnológico de Monterrey is to train exceptional Pediatric Neurologists, who meet the healthcare needs of children and adolescents with neurological disorders, according to the highest quality and safety standards, in public and private healthcare institutions. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Pediatric Neurologists who graduate from this institution are outstanding leaders in both local and international settings; they contribute to the development and transfer of knowledge in their specialty, through publications and active participation in academic and professional forums; and they collaborate with the training of specialists in this discipline through teaching and continuing education activities.

### Learning Outcomes

On completing the program, students will be able to:

- Plan, coordinate and execute, based on science and with a humanistic orientation, the comprehensive care of children and adolescents with neurological disorders;

- Act as a consultant to other specialists or general practitioners and, after a full, appropriate evaluation of their patient, immediately request the collaboration of other specialists if necessary;
- Design, implement or collaborate in educational programs aimed at their own professional development, the healthcare team to which they belong, and the patients and their family members;
- Apply the scientific method when researching problems in their professional practice and use the findings obtained to solve them.

### Target Audience

The Residency in Pediatric Neurology of Tecnológico de Monterrey is aimed at graduates from the residency in pediatrics, whose academic performance is outstanding and who have a vocation for and interest in the discipline, research and teaching, and who are committed to lifelong learning.

In order to be admitted to the Residency in Pediatric Neurology of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health

## RNP Residency in Pediatric Neurology

### Edition 2013 (By Areas)

| <b>Core Courses</b>     |                                         | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
|-------------------------|-----------------------------------------|------------|------------|-----------|------------|
| ME4260                  | Pediatric Neurology I                   | 3          | 0          | 12        | 12         |
| ME4262                  | Pediatric Neurology II                  | 3          | 0          | 12        | 12         |
| ME4264                  | Pediatric Neurology III                 | 3          | 0          | 12        | 12         |
| ME5312                  | Pediatric Neurology IV                  | 3          | 0          | 12        | 12         |
| ME5314                  | Pediatric Neurology V                   | 3          | 0          | 12        | 12         |
| ME5316                  | Pediatric Neurology VI                  | 3          | 0          | 12        | 12         |
|                         |                                         | <b>18</b>  | <b>0</b>   | <b>72</b> | <b>72</b>  |
| <b>Clinical Courses</b> |                                         | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4261                  | Medical Care in Pediatric Neurology I   | 0          | 60         | 12        | 60         |
| ME4263                  | Medical Care in Pediatric Neurology II  | 0          | 60         | 12        | 60         |
| ME4265                  | Medical Care in Pediatric Neurology III | 0          | 60         | 12        | 60         |
| ME5313                  | Medical Care in Pediatric Neurology IV  | 0          | 60         | 12        | 60         |
| ME5315                  | Medical Care in Pediatric Neurology V   | 0          | 30         | 6         | 30         |
| ME5317                  | Medical Care in Pediatric Neurology VI  | 0          | 30         | 6         | 30         |
|                         |                                         | <b>0</b>   | <b>300</b> | <b>60</b> | <b>300</b> |
| <b>Research Courses</b> |                                         | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4143                  | Research and Innovation Methods         | 1.5        | 0          | 6         | 6          |
| ME4144                  | Thesis Project I                        | 3          | 0          | 12        | 12         |
| ME5190                  | Thesis Project II                       | 3          | 0          | 12        | 12         |
| ME5266                  | Thesis Defense                          | 0          | 0          | 1         | 0          |
|                         |                                         | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| <b>Basic Courses</b>    |                                         | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4140                  | Clinical Ethics                         | 1.5        | 0          | 6         | 6          |
| ME4141                  | Health Sciences Education               | 1.5        | 0          | 6         | 6          |
| ME4142                  | Quality Health Care                     | 1.5        | 0          | 6         | 6          |
|                         |                                         | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| <b>Elective Courses</b> |                                         | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME5191                  | Elective Specialty I                    | 0          | 30         | 6         | 30         |
| ME5192                  | Elective Specialty II                   | 0          | 30         | 6         | 30         |
|                         |                                         | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation



## RNP Residency in Pediatric Neurology Plan 2013 (By Periods)

| <b>First Semester</b>  |                                         | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|------------------------|-----------------------------------------|----------|-----------|-----------|-----------|
| ME4140                 | Clinical Ethics                         | 1.5      | 0         | 6         | 6         |
| ME4142                 | Quality Health Care                     | 1.5      | 0         | 6         | 6         |
| ME4260                 | Pediatric Neurology I                   | 3        | 0         | 12        | 12        |
| ME4261                 | Medical Care in Pediatric Neurology I   | 0        | 60        | 12        | 60        |
|                        |                                         | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b> |                                         | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                 | Health Sciences Education               | 1.5      | 0         | 6         | 6         |
| ME4143                 | Research and Innovation Methods         | 1.5      | 0         | 6         | 6         |
| ME4262                 | Pediatric Neurology II                  | 3        | 0         | 12        | 12        |
| ME4263                 | Medical Care in Pediatric Neurology II  | 0        | 60        | 12        | 60        |
|                        |                                         | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>  |                                         | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                 | Thesis Project I                        | 3        | 0         | 12        | 12        |
| ME4264                 | Pediatric Neurology III                 | 3        | 0         | 12        | 12        |
| ME4265                 | Medical Care in Pediatric Neurology III | 0        | 60        | 12        | 60        |
|                        |                                         | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b> |                                         | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5190                 | Thesis Project II                       | 3        | 0         | 12        | 12        |
| ME5312                 | Pediatric Neurology IV                  | 3        | 0         | 12        | 12        |
| ME5313                 | Medical Care in Pediatric Neurology IV  | 0        | 60        | 12        | 60        |
|                        |                                         | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>  |                                         | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                 | Elective Specialty I                    | 0        | 30        | 6         | 30        |
| ME5314                 | Pediatric Neurology V                   | 3        | 0         | 12        | 12        |
| ME5315                 | Medical Care in Pediatric Neurology V   | 0        | 30        | 6         | 30        |
|                        |                                         | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>  |                                         | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                 | Elective Specialty II                   | 0        | 30        | 6         | 30        |
| ME5266                 | Thesis Defense                          | 0        | 0         | 1         | 0         |
| ME5316                 | Pediatric Neurology VI                  | 3        | 0         | 12        | 12        |
| ME5317                 | Medical Care in Pediatric Neurology VI  | 0        | 30        | 6         | 30        |
|                        |                                         | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Psychiatry (RPS)

### General program objectives

The aim of the Residency in Psychiatry of Tecnológico de Monterrey is to train exceptional psychiatrists who successfully meet the healthcare needs of mental health patients in the public and private sectors. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research activities, while strictly adhering to ethical principles and the standards of professional practice. Psychiatrists who graduate from this institution are outstanding leaders in both local and international settings. They are creative and innovative, promoting the development of mental health in the community and conducting relevant clinical research.

### Learning Outcomes

On completing the program, students will be able to:

- Proficiency in psychopathology, psychiatric nosology and psychiatric treatment methods; the ability to define, apply, perform and interpret diverse psychiatric diagnostic tests and therapeutic methodologies;
- Proficiency in each of the basic learning units related to the specialty, including psychopathology, neuroanatomy and neurophysiology, psychopharmacology, psychotherapies, diagnostic and treatment methodologies, and basic knowledge related to psychiatric subspecialties (children and adolescents, the elderly, addictions, eating disorders, and the oncological patient);

- The capacity to manage administrative issues, quality control and development of a mental health system (from the consulting room to the clinic), planning, organizing, coordinating and supervising the activities of the professional technical and auxiliary staff of a mental health system;
- The capacity to collaborate with practitioners from other specialties to establish the diagnosis, prognosis and treatment of patients, as well as the required preventive measures; the ability to carry out teaching and research activities applied to psychiatry;
- Decision-making skills based on ethical principles, responsibility, professionalism and citizenship.

### Target Audience

This program is aimed at doctors who have a vocation for studying Psychiatry; display the highest moral values; are committed to the ethical practice of their profession; are willing to work in multidisciplinary teams; and display an interest in the field of research.

In order to be admitted to the Residency in Psychiatry of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

## RPS Residency in Psychiatry

### Edition 2013 (By Areas)

| Core Courses     |                                 | C          | L          | U         | H          |
|------------------|---------------------------------|------------|------------|-----------|------------|
| ME4146           | Psychiatry I                    | 3          | 0          | 12        | 12         |
| ME4148           | Psychiatry II                   | 3          | 0          | 12        | 12         |
| ME4150           | Psychiatry III                  | 3          | 0          | 12        | 12         |
| ME4152           | Psychiatry IV                   | 3          | 0          | 12        | 12         |
| ME5194           | Psychiatry V                    | 3          | 0          | 12        | 12         |
| ME5196           | Psychiatry VI                   | 3          | 0          | 12        | 12         |
| ME5198           | Psychiatry VII                  | 3          | 0          | 12        | 12         |
| ME5200           | Psychiatry VIII                 | 3          | 0          | 12        | 12         |
|                  |                                 | <b>24</b>  | <b>0</b>   | <b>96</b> | <b>96</b>  |
| Clinical Courses |                                 | C          | L          | U         | H          |
| ME4145           | Medical Care in Psychiatry I    | 0          | 60         | 12        | 60         |
| ME4147           | Medical Care in Psychiatry II   | 0          | 60         | 12        | 60         |
| ME4149           | Medical Care in Psychiatry III  | 0          | 60         | 12        | 60         |
| ME4151           | Medical Care in Psychiatry IV   | 0          | 60         | 12        | 60         |
| ME5193           | Medical Care in Psychiatry V    | 0          | 60         | 12        | 60         |
| ME5195           | Medical Care in Psychiatry VI   | 0          | 60         | 12        | 60         |
| ME5197           | Medical Care in Psychiatry VII  | 0          | 30         | 6         | 30         |
| ME5199           | Medical Care in Psychiatry VIII | 0          | 30         | 6         | 30         |
|                  |                                 | <b>0</b>   | <b>420</b> | <b>84</b> | <b>420</b> |
| Research Courses |                                 | C          | L          | U         | H          |
| ME4143           | Research and Innovation Methods | 1.5        | 0          | 6         | 6          |
| ME4144           | Thesis Project I                | 3          | 0          | 12        | 12         |
| ME5190           | Thesis Project II               | 3          | 0          | 12        | 12         |
| ME5266           | Thesis Defense                  | 0          | 0          | 1         | 0          |
|                  |                                 | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| Basic Courses    |                                 | C          | L          | U         | H          |
| ME4140           | Clinical Ethics                 | 1.5        | 0          | 6         | 6          |
| ME4141           | Health Sciences Education       | 1.5        | 0          | 6         | 6          |
| ME4142           | Quality Health Care             | 1.5        | 0          | 6         | 6          |
|                  |                                 | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| Elective Courses |                                 | C          | L          | U         | H          |
| ME5191           | Elective Specialty I            | 0          | 30         | 6         | 30         |
| ME5192           | Elective Specialty II           | 0          | 30         | 6         | 30         |
|                  |                                 | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## RPS Residency in Psychiatry

### Edition 2013 (By Periods)

| <b>First Semester</b>   |                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |  |
|-------------------------|---------------------------------|------------|-----------|-----------|-----------|--|
| ME4140                  | Clinical Ethics                 | 1.5        | 0         | 6         | 6         |  |
| ME4145                  | Medical Care in Psychiatry I    | 0          | 60        | 12        | 60        |  |
| ME4146                  | Psychiatry I                    | 3          | 0         | 12        | 12        |  |
|                         |                                 | <b>4.5</b> | <b>60</b> | <b>30</b> | <b>78</b> |  |
| <b>Second Semester</b>  |                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |  |
| ME4141                  | Health Sciences Education       | 1.5        | 0         | 6         | 6         |  |
| ME4147                  | Medical Care in Psychiatry II   | 0          | 60        | 12        | 60        |  |
| ME4148                  | Psychiatry II                   | 3          | 0         | 12        | 12        |  |
|                         |                                 | <b>4.5</b> | <b>60</b> | <b>30</b> | <b>78</b> |  |
| <b>Third Semester</b>   |                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |  |
| ME4142                  | Quality Health Care             | 1.5        | 0         | 6         | 6         |  |
| ME4149                  | Medical Care in Psychiatry III  | 0          | 60        | 12        | 60        |  |
| ME4150                  | Psychiatry III                  | 3          | 0         | 12        | 12        |  |
|                         |                                 | <b>4.5</b> | <b>60</b> | <b>30</b> | <b>78</b> |  |
| <b>Fourth Semester</b>  |                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |  |
| ME4143                  | Research and Innovation Methods | 1.5        | 0         | 6         | 6         |  |
| ME4151                  | Medical Care in Psychiatry IV   | 0          | 60        | 12        | 60        |  |
| ME4152                  | Psychiatry IV                   | 3          | 0         | 12        | 12        |  |
|                         |                                 | <b>4.5</b> | <b>60</b> | <b>30</b> | <b>78</b> |  |
| <b>Fifth Semester C</b> |                                 | <b>L</b>   | <b>U</b>  | <b>H</b>  |           |  |
| ME4144                  | Thesis Project I                | 3          | 0         | 12        | 12        |  |
| ME5193                  | Medical Care in Psychiatry V    | 0          | 60        | 12        | 60        |  |
| ME5194                  | Psychiatry V                    | 3          | 0         | 12        | 12        |  |
|                         |                                 | <b>6</b>   | <b>60</b> | <b>36</b> | <b>84</b> |  |
| <b>Sixth Semester</b>   |                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |  |
| ME5190                  | Thesis Project II               | 3          | 0         | 12        | 12        |  |
| ME5195                  | Medical Care in Psychiatry VI   | 0          | 60        | 12        | 60        |  |
| ME5196                  | Psychiatry VI                   | 3          | 0         | 12        | 12        |  |
|                         |                                 | <b>6</b>   | <b>60</b> | <b>36</b> | <b>84</b> |  |
| <b>Seventh Semester</b> |                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |  |
| ME5191                  | Elective Specialty I            | 0          | 30        | 6         | 30        |  |
| ME5197                  | Medical Care in Psychiatry VII  | 0          | 30        | 6         | 30        |  |
| ME5198                  | Psychiatry VII                  | 3          | 0         | 12        | 12        |  |
|                         |                                 | <b>3</b>   | <b>60</b> | <b>24</b> | <b>72</b> |  |
| <b>Eighth Semester</b>  |                                 | <b>C</b>   | <b>L</b>  | <b>U</b>  | <b>H</b>  |  |
| ME5192                  | Elective Specialty II           | 0          | 30        | 6         | 30        |  |
| ME5199                  | Medical Care in Psychiatry VIII | 0          | 30        | 6         | 30        |  |
| ME5200                  | Psychiatry VIII                 | 3          | 0         | 12        | 12        |  |
| ME5266                  | Thesis Defense                  | 0          | 0         | 1         | 0         |  |
|                         |                                 | <b>3</b>   | <b>60</b> | <b>25</b> | <b>72</b> |  |

- 
- C Number of class hours per week
  - L Number of laboratory hours or activities per week
  - U Study hours that must be dedicated to the course (class hours included)
  - H Total hours includes also the time dedicated to the hospitable work or of consultation

## Residency in Urology (RUR)

### General program objectives

The aims of the Residency in Urology of Tecnológico de Monterrey are to train exceptional urologists who meet the needs of patients with urological disorders, according to the highest quality and safety standards, in both inpatient and outpatient settings. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional practice. Urologists who graduate from this institution are nationally and internationally competitive leaders who head the development of preventive action strategies, cost-effective diagnostic strategies, and innovative, successful treatments, in public and private institutions.

### Learning Outcomes

On completing the program, students will be able to:

- Deliver medical and surgical care for patients with urological disorders, with professionalism and in compliance with ethical principles;
- Apply their knowledge of urology, clinical judgment and the bases of contemporary scientific evidence for medical decision making;

- Communicate knowledge of this specialty effectively to patients, family members, medical colleagues and other healthcare professionals;
- Manage inpatient clinical information by integrating scientific files that will have a positive impact on healthcare in urology.

### Target Audience

The Multicentric Urology Program of Tecnológico de Monterrey is aimed at graduates from the bachelor's degree in Medicine, whose academic performance is outstanding; who are innate leaders with the capacity for growth and discovery of new frontiers in themselves, in medicine and in their profession; with a spirit of innovation and commitment to lifelong learning, hard work on a daily basis, and the strength to constantly provide top-quality care; with a genuine interest in the pursuit of research and teaching.

In order to be admitted to the Residency in Urology of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

## RUR Residency in Urology

### Edition 2013 (By Areas)

| <b>Core Courses</b>     |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
|-------------------------|---------------------------------|------------|------------|-----------|------------|
| ME4162                  | General Urology I               | 3          | 0          | 12        | 12         |
| ME4164                  | General Urology II              | 3          | 0          | 12        | 12         |
| ME4166                  | General Urology III             | 3          | 0          | 12        | 12         |
| ME4168                  | General Urology IV              | 3          | 0          | 12        | 12         |
| ME5210                  | General Urology V               | 3          | 0          | 12        | 12         |
| ME5212                  | General Urology VI              | 3          | 0          | 12        | 12         |
| ME5214                  | General Urology VII             | 3          | 0          | 12        | 12         |
| ME5216                  | General Urology VIII            | 3          | 0          | 12        | 12         |
|                         |                                 | <b>24</b>  | <b>0</b>   | <b>96</b> | <b>96</b>  |
| <b>Clinical Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4161                  | Medical Care in Urology I       | 0          | 60         | 12        | 60         |
| ME4163                  | Medical Care in Urology II      | 0          | 60         | 12        | 60         |
| ME4165                  | Medical Care in Urology III     | 0          | 60         | 12        | 60         |
| ME4167                  | Medical Care in Urology IV      | 0          | 60         | 12        | 60         |
| ME5209                  | Medical Care in Urology V       | 0          | 60         | 12        | 60         |
| ME5211                  | Medical Care in Urology VI      | 0          | 60         | 12        | 60         |
| ME5213                  | Medical Care in Urology VII     | 0          | 30         | 6         | 30         |
| ME5215                  | Medical Care in Urology VIII    | 0          | 30         | 6         | 30         |
|                         |                                 | <b>0</b>   | <b>420</b> | <b>84</b> | <b>420</b> |
| <b>Research Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4143                  | Research and Innovation Methods | 1.5        | 0          | 6         | 6          |
| ME4144                  | Thesis Project I                | 3          | 0          | 12        | 12         |
| ME5190                  | Thesis Project II               | 3          | 0          | 12        | 12         |
| ME5266                  | Thesis Defense                  | 0          | 0          | 1         | 0          |
|                         |                                 | <b>7.5</b> | <b>0</b>   | <b>31</b> | <b>30</b>  |
| <b>Basic Courses</b>    |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME4140                  | Clinical Ethics                 | 1.5        | 0          | 6         | 6          |
| ME4141                  | Health Sciences Education       | 1.5        | 0          | 6         | 6          |
| ME4142                  | Quality Health Care             | 1.5        | 0          | 6         | 6          |
|                         |                                 | <b>4.5</b> | <b>0</b>   | <b>18</b> | <b>18</b>  |
| <b>Elective Courses</b> |                                 | <b>C</b>   | <b>L</b>   | <b>U</b>  | <b>H</b>   |
| ME5191                  | Elective Specialty I            | 0          | 30         | 6         | 30         |
| ME5192                  | Elective Specialty II           | 0          | 30         | 6         | 30         |
|                         |                                 | <b>0</b>   | <b>60</b>  | <b>12</b> | <b>60</b>  |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## RUR Residency in Urology

### Edition 2013 (By Periods)

| <b>First Semester</b>   |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
|-------------------------|---------------------------------|----------|-----------|-----------|-----------|
| ME4140                  | Clinical Ethics                 | 1.5      | 0         | 6         | 6         |
| ME4142                  | Quality Health Care             | 1.5      | 0         | 6         | 6         |
| ME4161                  | Medical Care in Urology I       | 0        | 60        | 12        | 60        |
| ME4162                  | General Urology I               | 3        | 0         | 12        | 12        |
|                         |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Second Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4141                  | Health Sciences Education       | 1.5      | 0         | 6         | 6         |
| ME4143                  | Research and Innovation Methods | 1.5      | 0         | 6         | 6         |
| ME4163                  | Medical Care in Urology II      | 0        | 60        | 12        | 60        |
| ME4164                  | General Urology II              | 3        | 0         | 12        | 12        |
|                         |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Third Semester</b>   |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4144                  | Thesis Project I                | 3        | 0         | 12        | 12        |
| ME4165                  | Medical Care in Urology III     | 0        | 60        | 12        | 60        |
| ME4166                  | General Urology III             | 3        | 0         | 12        | 12        |
|                         |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fourth Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME4167                  | Medical Care in Urology IV      | 0        | 60        | 12        | 60        |
| ME4168                  | General Urology IV              | 3        | 0         | 12        | 12        |
| ME5190                  | Thesis Project II               | 3        | 0         | 12        | 12        |
|                         |                                 | <b>6</b> | <b>60</b> | <b>36</b> | <b>84</b> |
| <b>Fifth Semester</b>   |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5209                  | Medical Care in Urology V       | 0        | 60        | 12        | 60        |
| ME5210                  | General Urology V               | 3        | 0         | 12        | 12        |
|                         |                                 | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Sixth Semester</b>   |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5211                  | Medical Care in Urology VI      | 0        | 60        | 12        | 60        |
| ME5212                  | General Urology VI              | 3        | 0         | 12        | 12        |
|                         |                                 | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Seventh Semester</b> |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5191                  | Elective Specialty I            | 0        | 30        | 6         | 30        |
| ME5213                  | Medical Care in Urology VII     | 0        | 30        | 6         | 30        |
| ME5214                  | General Urology VII             | 3        | 0         | 12        | 12        |
|                         |                                 | <b>3</b> | <b>60</b> | <b>24</b> | <b>72</b> |
| <b>Eighth Semester</b>  |                                 | <b>C</b> | <b>L</b>  | <b>U</b>  | <b>H</b>  |
| ME5192                  | Elective Specialty II           | 0        | 30        | 6         | 30        |
| ME5215                  | Medical Care in Urology VIII    | 0        | 30        | 6         | 30        |
| ME5216                  | General Urology VIII            | 3        | 0         | 12        | 12        |
| ME5266                  | Thesis Defense                  | 0        | 0         | 1         | 0         |
|                         |                                 | <b>3</b> | <b>60</b> | <b>25</b> | <b>72</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

H Total hours includes also the time dedicated to the hospitable work or of consultation

## Master in Biomedical Sciences (MBC)

### General Program Objectives

The overall objective of the Master in Biomedical Sciences is train professionals, who will be agents of change, able to do applied research, technological development, innovation, and technology transfer in areas of biomedical sciences.

### Learning Outcomes

On completing the program, students will be able to:

- Demonstrate a high level of theoretical and methodological knowledge of Biomedical Sciences in any professional situation.
- Perform research in their area of expertise to provide knowledge relevant to the advancement of Biomedical Sciences.
- Communicate their professional work results in a clear, effective and efficient manner.
- Work in their professional community of their area of expertise with efficient leadership, collaborative and ethical manner.



**MBC Master in Biomedical Sciences****Edition 2017**

| <b>First Semester</b>   |                                                   | <b>C</b>  | <b>L</b> | <b>U</b>  |
|-------------------------|---------------------------------------------------|-----------|----------|-----------|
| BI4000                  | Translational Medicine and Experimental Models    | 3         | 0        | 12        |
| BI4001                  | Biostatistics                                     | 3         | 0        | 12        |
| BI5000                  | Research and Innovation Methods                   | 1.5       | 0        | 6         |
| OP4000                  | Quality Development Course                        | 1.5       | 0        | 6         |
|                         |                                                   | <b>9</b>  | <b>0</b> | <b>36</b> |
| <b>Segundo Semestre</b> |                                                   | <b>C</b>  | <b>L</b> | <b>U</b>  |
| BI4002                  | Cellular and Molecular Biology and Human Genetics | 3         | 0        | 12        |
| BI4003                  | Oxidative Stress and Inflammation                 | 3         | 0        | 12        |
| BI5001                  | Thesis I                                          | 3         | 0        | 12        |
|                         |                                                   | <b>9</b>  | <b>0</b> | <b>36</b> |
| <b>Tercer Semestre</b>  |                                                   | <b>C</b>  | <b>L</b> | <b>U</b>  |
| BI5002                  | Thesis II                                         | 3         | 0        | 12        |
| OP5042                  | Elective I                                        | 3         | 0        | 12        |
| OP5043                  | Elective II                                       | 3         | 0        | 12        |
|                         |                                                   | <b>9</b>  | <b>0</b> | <b>36</b> |
| <b>Cuarto Semestre</b>  |                                                   | <b>C</b>  | <b>L</b> | <b>U</b>  |
| BI5003                  | Thesis III                                        | 3         | 0        | 12        |
| OP5044                  | Elective III                                      | 3         | 0        | 12        |
| OP5045                  | Elective IV                                       | 3         | 0        | 12        |
|                         |                                                   | <b>19</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Course

| Code   | Name                                     | C   | L | U |
|--------|------------------------------------------|-----|---|---|
| DS4000 | Liderazgo para el desarrollo sostenible  | 1.5 | 0 | 6 |
| GI4000 | Liderazgo para la innovación empresarial | 1.5 | 0 | 6 |

### Elective Courses

| Code   | Name                                                           | C | L | U  |
|--------|----------------------------------------------------------------|---|---|----|
| BI5004 | Cellular and Molecular Pharmacology                            | 3 | 0 | 12 |
| BI5005 | Cell Therapy and Regenerative Medicine                         | 3 | 0 | 12 |
| BI5006 | Pathophysiology of Nervous System.                             | 3 | 0 | 12 |
| BI5007 | Pathophysiology of Cardiovascular System                       | 3 | 0 | 12 |
| BI5008 | Pathophysiology of Immune System                               | 3 | 0 | 12 |
| BI5009 | Pathophysiology of Cancer                                      | 3 | 0 | 12 |
| BI5010 | Pathophysiology of Hepatic and Metabolic Diseases              | 3 | 0 | 12 |
| BI5011 | Pathophysiology of the Endocrine, Renal and Respiratory System | 3 | 0 | 12 |

## PH. D. in Biomedical Sciences (DBC)

### General Program Objectives

Graduates from the Ph.D. in Biomedical Sciences are scientists who create knowledge to establish novel and innovative technologies that are relevant for the health sector, and understand basic phenomena within the field of Biomedical Sciences. They work as leaders or as collaborators within national and international research groups, on areas such as physiopathological mechanisms for discovering therapeutic targets, markers, and diagnosis, trial-running new pharmaceuticals, and designing therapeutic devices among others. The findings of their discoveries are important outcomes which should be submitted for peer-reviewed and academic publication, patents or conference proceedings. This knowledge transference as well as all of their professional activities follows legal, ethical and official norms.

### Learning Outcomes

On completion of the program, students will be able to:

- Understand the application of biomedical sciences and research methodologies on areas of physiopathological mechanisms for discovering therapeutic targets, markers, and diagnosis, trial-running new pharmaceuticals, and designing therapeutic devices.

- Use research skills for validating experimental models in vivo that reproduce an approximation of the diseases under their study or in vitro.
- Design experiments from the identification of a problem to the interpretation of results.
- Communicate effectively orally and in writing with their peers: mentors, research community, society and grant proposals.
- Make decisions with scientific judgment and critical thinking in their practice as researchers following legal, ethical and government regulations.

### Target Audience:

To be admitted into the Ph.D. and Master in Biomedical Sciences programs, applicants must meet the following requirements: A Bachelor's Degree in Medicine, Biomedicine, Biotechnology, Bioscience, Nutrition, Biomedical Engineering, Pharmacy, Biology, Nursing, Chemistry, Physics, or related fields.

**DBC PH. D. in Biomedical Sciences****Edition 2017**

| <b>First Semester</b>  |                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
|------------------------|---------------------------|------------|----------|-----------|
| BI6000                 | Guided Research I         | 3          | 0        | 12        |
| BI6001                 | Guided Research II        | 3          | 0        | 12        |
| BI6018                 | Integrated Exam           | 1.5        | 0        | 6         |
| GM6000                 | Research Seminar I        | 1          | 0        | 2         |
| GM6006                 | Research Workshop I       | 1          | 0        | 4         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Semester</b> |                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| BI6002                 | Research Proposal I       | 3          | 0        | 12        |
| BI6003                 | Research Proposal II      | 3          | 0        | 12        |
| BI6021                 | Research Proposal Defense | 1.5        | 0        | 6         |
| GM6001                 | Research Seminar II       | 1          | 0        | 2         |
| GM6007                 | Research Workshop II      | 1          | 0        | 4         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>  |                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| BI6004                 | Doctoral Research I       | 3          | 0        | 12        |
| BI6005                 | Doctoral Research II      | 3          | 0        | 12        |
| BI6019                 | Research Integration I    | 1.5        | 0        | 6         |
| GM6002                 | Research Seminar III      | 1          | 0        | 2         |
| GM6008                 | Research Workshop III     | 1          | 0        | 4         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Semester</b> |                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| BI6006                 | Doctoral Research III     | 3          | 0        | 12        |
| BI6007                 | Doctoral Research IV      | 3          | 0        | 12        |
| GM6003                 | Research Seminar IV       | 1          | 0        | 2         |
| GM6009                 | Research Workshop IV      | 1          | 0        | 4         |
| GM6013                 | Scientific Product I      | 1.5        | 0        | 6         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b> |
| <b>Fifth Semester</b>  |                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| BI6008                 | Doctoral Research V       | 3          | 0        | 12        |
| BI6009                 | Doctoral Research VI      | 3          | 0        | 12        |
| BI6020                 | Research Integration II   | 1.5        | 0        | 6         |
| GM6004                 | Research Seminar V        | 1          | 0        | 2         |
| GM6010                 | Research Workshop V       | 1          | 0        | 4         |
|                        |                           | <b>9.5</b> | <b>0</b> | <b>36</b> |

C Number of class hours per week

L Number of laboratory hours or activities per week

U Study hours that must be dedicated to the course (class hours included)

| <b>Sixth Semester</b> |                        | <b>C</b>   | <b>L</b> | <b>U</b>  |
|-----------------------|------------------------|------------|----------|-----------|
| BI6010                | Doctoral Research VII  | 3          | 0        | 12        |
| BI6011                | Doctoral Research VIII | 3          | 0        | 12        |
| GM6005                | Research Seminar VI    | 1          | 0        | 2         |
| GM6011                | Research Workshop VI   | 1          | 0        | 4         |
| GM6014                | Scientific Product II  | 1.5        | 0        | 6         |
|                       |                        | <b>9.5</b> | <b>0</b> | <b>36</b> |

| <b>Seventh Semester</b> |                      | <b>C</b> | <b>L</b> | <b>U</b>  |
|-------------------------|----------------------|----------|----------|-----------|
| BI6012                  | Doctoral Research IX | 3        | 0        | 12        |
| BI6013                  | Doctoral Research X  | 3        | 0        | 12        |
| BI6014                  | Doctoral Research XI | 3        | 0        | 12        |
|                         |                      | <b>9</b> | <b>0</b> | <b>36</b> |

| <b>Eighth Semester</b> |                        | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|------------------------|----------|----------|-----------|
| BI6015                 | Doctoral Research XII  | 3        | 0        | 12        |
| BI6016                 | Doctoral Research XIII | 3        | 0        | 12        |
| BI6017                 | Doctoral Research XIV  | 3        | 0        | 12        |
| BI6022                 | Doctoral Defense       | 0        | 0        | 1         |
|                        |                        | <b>9</b> | <b>0</b> | <b>37</b> |

*This Doctoral program requires a completed Master's Degree program.*

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is eight semesters*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## PH. D. in Program in Clinical Sciences (DCL)

### General Program Objectives

The Ph.D. Program in Clinical Sciences develops experts in clinical research that:

- Are recognized nationally and / or internationally for its ability to generate medical knowledge in three possible dimensions: individual, institution or society.
- Generate scientific production based on ethical principles, relevant to understanding human-health and disease, care systems and / or public health.
- Are leaders in prestigious organizations in the implementation of strategies to reduce inequity in health care and increase the use of resources based on best evidence.

### Learning Outcomes

On completion of the program, students will be able to:

- Apply in expert level strategies of search, selection and analysis of relevant knowledge in the area of expertise regarding aspects such as: mechanisms of disease (pathogenesis); detection, diagnosis or history of disease; therapeutic interventions, including trials with medicines or drugs; primary and secondary prevention and health promotion; human behavior; health services and epidemiology, among others.
- Use qualitative and quantitative research methods and statistical tools for the development of scientific research to provide knowledge for regional or national issues in their field of expertise.

- Obtain results of their research with critical - scientific thinking establishing clearly the potential application, as well each of its limitations and areas of opportunity.
- Transfer knowledge through scientific products such as: articles, patents or technological developments that allow reducing the gap between scientific knowledge relevant and valid and its application at the patient's bedside.
- Develop protocols or clinical trials that comply with current regulations in bioethics, quality and safety, ensuring the integrity and dignity of patients and their families as well as the intellectual property of the findings

### Target Audience:

This program is aimed at students who are graduates of a Medical Specialty of the Tecnológico de Monterrey or other prestigious universities approved by the Interinstitutional Commission for the training of Human Resources for Health in areas related to the program that are interested in continuing their academic education in the field of applied research in topics such as Cardiology, Hematology and Cancer, Ophthalmology, Neurosciences and Mental Health and, therefore, wish to be trained as scientists for the development of clinical research projects in the areas of Health.

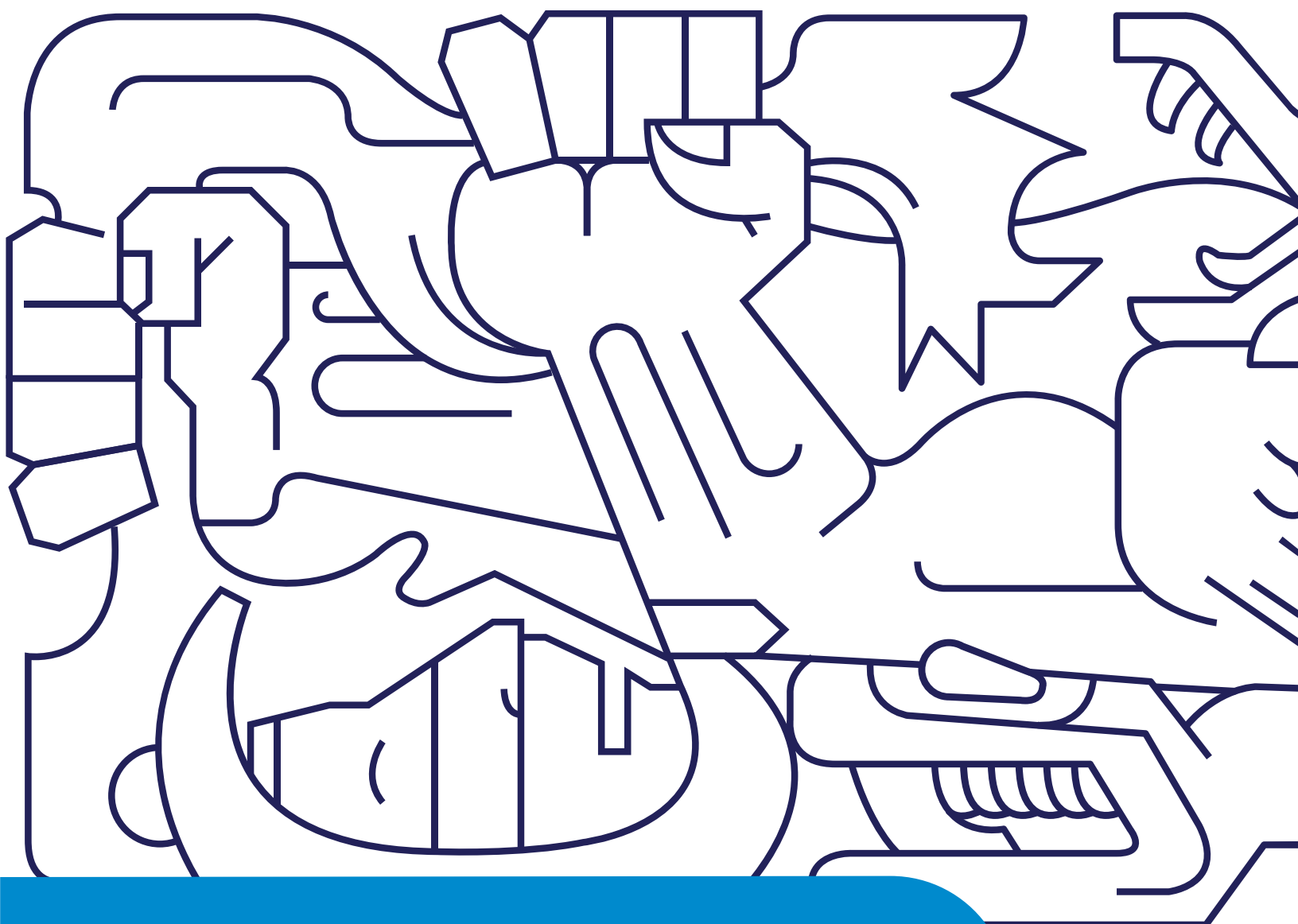
**DCL PH. D. in Program in Clinical Sciences****Edition 2012**

| <b>First Semester</b>   |                                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
|-------------------------|-----------------------------------------------------------------------------|-----------|----------|-----------|
| DS4000                  | Leadership for Sustainable Development                                      | 1.5       | 0        | 6         |
| ME5183                  | Doctoral Research Proposal I                                                | 3         | 0        | 12        |
| ME5184                  | Research and Innovation Methods                                             | 1.5       | 0        | 6         |
| ME6000                  | Bioethics and Regulations in Research                                       | 3         | 0        | 12        |
| ME6001                  | Methodological Structure and Statistics in Biomedical and Clinical Research | 3         | 0        | 12        |
|                         |                                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b>  |                                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ME5185                  | Doctoral Research Proposal II                                               | 3         | 0        | 12        |
| ME5186                  | Doctoral Research Proposal III                                              | 3         | 0        | 12        |
| ME5187                  | Research Seminar I                                                          | 1         | 0        | 4         |
| ME6002                  | Epidemiological Research                                                    | 3         | 0        | 12        |
|                         |                                                                             | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Third Semester</b>   |                                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ME6003                  | Doctoral Research I                                                         | 3         | 0        | 12        |
| ME6004                  | Doctoral Research                                                           | 3         | 0        | 12        |
| ME6005                  | Doctoral Research III                                                       | 3         | 0        | 12        |
| ME6006                  | Doctoral Research IV                                                        | 3         | 0        | 12        |
|                         |                                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Fourth Semester</b>  |                                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ME6007                  | Doctoral Research V                                                         | 3         | 0        | 12        |
| ME6008                  | Doctoral Research VI                                                        | 3         | 0        | 12        |
| ME6009                  | Doctoral Research VII                                                       | 3         | 0        | 12        |
| ME6010                  | Doctoral Research VIII                                                      | 3         | 0        | 12        |
|                         |                                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Fifth Semester</b>   |                                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ME5188                  | Research Seminar II                                                         | 1         | 0        | 4         |
| ME6011                  | Doctoral Research IX                                                        | 3         | 0        | 12        |
| ME6012                  | Doctoral Research X                                                         | 3         | 0        | 12        |
| ME6013                  | Doctoral Research XI                                                        | 3         | 0        | 12        |
|                         |                                                                             | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Sixth Semester</b>   |                                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ME5189                  | Research Seminar III                                                        | 1         | 0        | 4         |
| ME6014                  | Doctoral Research XII                                                       | 3         | 0        | 12        |
| ME6015                  | Doctoral Research XIII                                                      | 3         | 0        | 12        |
| ME6016                  | Doctoral Research XIV                                                       | 3         | 0        | 12        |
|                         |                                                                             | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Seventh Semester</b> |                                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| ME6017                  | Doctoral Research XV                                                        | 3         | 0        | 12        |
| ME6018                  | Doctoral Research XVI                                                       | 3         | 0        | 12        |
| ME6019                  | Doctoral Research XVII                                                      | 3         | 0        | 12        |
| ME6020                  | Doctoral Defense                                                            | 0         | 0        | 1         |
|                         |                                                                             | <b>9</b>  | <b>0</b> | <b>37</b> |

*This Doctoral program requires a completed Master's Degree program.*

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is seven semesters*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)



Profiles and Curricula

School of  
Business





## Specialization in Energy Management (EAE)

### General Program Objectives

The objective of this specialization is to:

- Train specialists with the knowledge and aptitudes to work in the energy sector, leading and managing energy organizations in global settings. They will be able to apply the aptitudes and knowledge acquired in this specialization regarding the energy sector, in topics such as: business administration, entrepreneurship and global markets. Their preparation extends to public and energy companies and includes all types of organizations with projects that will address the spaces derived from the Energy Reform.
- Develop outstanding professionals who will apply their skills to analyze and use assessment techniques in energy projects, in order to generate value for the organizations and their local, national and international environment.
- Prepare professionals with the skills and aptitudes to participate in jobs with project assessment groups in order to make decisions regarding their implementation and measure their impact by means of technical research, action research and field projects.
- Prepare specialists with the skills to identify and create business opportunities in the energy sector through the implementation and analysis of innovative, sustainable business models.

### Learning Outcomes

On completing the program, students will be able to:

- Analyze and apply the legal, economic and financial bases of businesses in the energy sector, in oil, gas, electricity and renewable energy resources.
- Understand the behavior of the energy sector market.

- Demonstrate their knowledge of project financing and market risk management.
- Put into practice their knowledge, aptitudes and skills for evaluating strategic projects from a multidisciplinary perspective and, in this way, identify business opportunities in the diverse areas of this field.
- Display the skills for applying the regulatory and contractual frameworks of the energy sector, in both project assessment and business model design.
- Assess the efficiency and environmental, economic and social sustainability of projects.
- Have the skills to generate information and make recommendations about business opportunities for the energy sector.
- Demonstrate skills and abilities in the creation of business proposals that consider the creation of sustainable value with social impacts.
- Act with professionalism, ethics and a humanistic vision.

### Target Audience

Professionals from the energy sector or energy dependent businesses who wish to develop competencies in this field. Applicants must have at least two years' professional experience and hold positions with perspectives for growth within the organization or be interested in developing innovative business models. They will also require work experience and the desire to develop and/or strengthen their administrative and managerial skills, as well as their consulting abilities on the topic of energy.

de crecimiento dentro de la organización o tienen interés en desarrollar modelos innovadores de negocio y además poseen experiencia laboral y desean desarrollar y/o fortalecer habilidades de administración y gerencia, así como de consultoría en el tema energético.

## EAE Specialization in Energy Management

### Edition 2015

| <b>First Trimester</b>  |                                                 | <b>C</b>    | <b>L</b> | <b>U</b>  |
|-------------------------|-------------------------------------------------|-------------|----------|-----------|
| AD5080                  | Management in Energy Markets                    | 3.5         | 0        | 12        |
| AD5081                  | Energy Law and Regulations of Energy Industries | 3.5         | 0        | 12        |
|                         |                                                 | <b>7</b>    | <b>0</b> | <b>24</b> |
| <b>Second Trimester</b> |                                                 | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5080                  | Management in Energy Markets                    | 3.5         | 0        | 12        |
| AD5081                  | Energy Law and Regulations of Energy Industries | 3.5         | 0        | 12        |
|                         |                                                 | <b>7</b>    | <b>0</b> | <b>24</b> |
| <b>Third Trimester</b>  |                                                 | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5082                  | Risk Management in Energy Industry              | 3.5         | 0        | 12        |
| AD5084                  | Evaluation of Energy Projects                   | 3.5         | 0        | 12        |
| AD5085                  | Field Project on Energy                         | 3.5         | 0        | 12        |
|                         |                                                 | <b>10.5</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is three trimesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Master in Finance (MAF)

### General Program Objectives

The general objective of the Master in Finance is to prepare professionals:

- Business leaders specialized in finance who generate value in organizations by formulating innovative financial strategies and applying them in business settings that are characteristically globalized, uncertain and complex.
- Internationally competitive and capable of interacting in multicultural organizations, negotiating in globalized market settings and making appropriate financial decisions through the combination of knowledge, application of advanced financial methodologies and intensive use of technology to increase the value of the company by optimizing its resources.
- Act according to the highest ethical standards of the profession and are socially responsible by making decisions that, apart from generating economic benefits, contribute to the sustainable development of their communities.

### Learning Outcomes

On completing the program, students will be able to:

- Analyze business information and, consistent with its relevance, detect opportunities and threats for organizations that compete in globalized markets.
- Use technology intensively as a means of improving their work and employing the company's resources more efficiently.
- Generate innovative financial models that add value to organizations and consider uncertain and complex competitive environments.
- Formulate and apply innovative financial strategies in the organization, considering business processes in globalized markets.
- Interact effectively and efficiently in multicultural organizations that operate in globalized settings.

### Target Audience

This program targets professionals who are working in:

- The accounting and finance departments of medium-sized and large enterprise in the manufacturing and service sectors.
- Companies in the financial sector.
- National and international official institutions related to the financial sector.

## MAF Master in Finance

### Edition 2015

| <b>Remedial Trimester</b> |                                               | <b>C</b>    | <b>L</b> | <b>U</b>  |
|---------------------------|-----------------------------------------------|-------------|----------|-----------|
| EC4018                    | Strategic Economics for Finance               | 1.5         | 0        | 6         |
| FZ4012                    | Managerial Analysis for Financial Information | 1.5         | 0        | 6         |
| FZ4013                    | Statistical Foundations for Finance           | 1.5         | 0        | 6         |
| MA4018                    | Mathematical Foundations for Finance          | 1.5         | 0        | 6         |
|                           |                                               | <b>6</b>    | <b>0</b> | <b>24</b> |
| <b>First Trimester</b>    |                                               | <b>C</b>    | <b>L</b> | <b>U</b>  |
| EC4009                    | Financial Econometrics                        | 3.5         | 0        | 12        |
| FZ4014                    | Macrofinance                                  | 3.5         | 0        | 12        |
| FZ4015                    | International Financial Analysis              | 3.5         | 0        | 12        |
|                           |                                               | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Trimester</b>   |                                               | <b>C</b>    | <b>L</b> | <b>U</b>  |
| FZ4016                    | Asset Valuation                               | 3.5         | 0        | 12        |
| FZ5037                    | Financial Modeling                            | 3.5         | 0        | 12        |
| FZ5038                    | Modern Corporate Finance                      | 3.5         | 0        | 12        |
|                           |                                               | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Third Trimester</b>    |                                               | <b>C</b>    | <b>L</b> | <b>U</b>  |
| FZ5039                    | Investments                                   | 3.5         | 0        | 12        |
| FZ5040                    | Derivatives and Risk Management               | 3.5         | 0        | 12        |
| OP5053                    | Elective I                                    | 3.5         | 0        | 12        |
|                           |                                               | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Fourth Trimester</b>   |                                               | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5103                    | Negotiation Skills                            | 1.5         | 0        | 6         |
| CR5000                    | Communication Skills                          | 1.5         | 0        | 6         |
| OP5054                    | Elective II                                   | 3.5         | 0        | 12        |
| OP5055                    | Elective III                                  | 3.5         | 0        | 12        |
|                           |                                               | <b>10</b>   | <b>0</b> | <b>36</b> |
| <b>Fifth Trimester</b>    |                                               | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4027                    | Corporate Governance and Ethics               | 1.5         | 0        | 6         |
| DS4005                    | Corporate Sustainability                      | 1.5         | 0        | 6         |
| FZ5004                    | Finance Project                               | 3.5         | 0        | 12        |
|                           |                                               | <b>6.5</b>  | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is five trimesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Concentration Elective Courses

| Banking and Financial Institutions  |                                      |     |   |    |  |
|-------------------------------------|--------------------------------------|-----|---|----|--|
| Code                                | Name                                 | C   | L | U  |  |
| FZ5041                              | Bank Management                      | 3.5 | 0 | 12 |  |
| FZ5042                              | Fundamentals of Credit Analysis      | 3.5 | 0 | 12 |  |
| FZ5043                              | Management of Microfinance Companies | 3.5 | 0 | 12 |  |
| Strategic Corporate Finance         |                                      |     |   |    |  |
| Code                                | Name                                 | C   | L | U  |  |
| FZ5044                              | Mergers and Acquisitions             | 3.5 | 0 | 12 |  |
| FZ5045                              | Advanced economic engineering        | 3.5 | 0 | 12 |  |
| FZ5046                              | Global Financial Strategy            | 3.5 | 0 | 12 |  |
| Risk Analysis and Financial Markets |                                      |     |   |    |  |
| Code                                | Name                                 | C   | L | U  |  |
| FZ5047                              | Fixed Income Markets                 | 3.5 | 0 | 12 |  |
| FZ5048                              | Financial Engineering                | 3.5 | 0 | 12 |  |
| FZ5049                              | Advanced Risk Management             | 3.5 | 0 | 12 |  |

## Master in Finance (MAF-V)

### General Program Objectives

The general objective of the Master in Finance is to prepare professionals:

- Business leaders specialized in finance who generate value in organizations by formulating innovative financial strategies and applying them in business settings that are characteristically globalized, uncertain and complex.
- Internationally competitive and capable of interacting in multicultural organizations, negotiating in globalized market settings and making appropriate financial decisions through the combination of knowledge, application of advanced financial methodologies and intensive use of technology to increase the value of the company by optimizing its resources.
- Act according to the highest ethical standards of the profession and are socially responsible by making decisions that, apart from generating economic benefits, contribute to the sustainable development of their communities.

### Learning Outcomes

On completing the program, students will be able to:

- Analyze business information and, consistent with its relevance, detect opportunities and threats for organizations that compete in globalized markets.
- Use technology intensively as a means of improving their work and employing the company's resources more efficiently.
- Generate innovative financial models that add value to organizations and consider uncertain and complex competitive environments.
- Formulate and apply innovative financial strategies in the organization, considering business processes in globalized markets.
- Interact effectively and efficiently in multicultural organizations that operate in globalized settings.

### Target Audience

This program targets professionals who are working in:

- The accounting and finance departments of medium-sized and large enterprise in the manufacturing and service sectors.
- Companies in the financial sector.
- National and international official institutions related to the financial sector.

## MAF-V Master in Finance

### Edition 2009

| <b>Remedial Trimester</b> |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
|---------------------------|---------------------------------------------|-------------|----------|-----------|
| CD4001                    | Introduction to Statistical Finance         | 3.5         | 0        | 12        |
| EC4008                    | Economics                                   | 3.5         | 0        | 12        |
| FZ4004                    | Financial Information Analysis              | 3.5         | 0        | 12        |
| MA4000                    | Introduction to Mathematics for Finance     | 3.5         | 0        | 12        |
|                           |                                             | <b>14</b>   | <b>0</b> | <b>48</b> |
| <b>First Trimester</b>    |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| FZ4005                    | Financial Economics                         | 3.5         | 0        | 12        |
| FZ4006                    | Introduction to Corporate Finance           | 3.5         | 0        | 12        |
| OP4036                    | Quality Development Course                  | 3.5         | 0        | 12        |
|                           |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Trimester</b>   |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| EC4009                    | Financial Econometrics                      | 3.5         | 0        | 12        |
| FZ4007                    | Advanced Corporate Finance                  | 3.5         | 0        | 12        |
| FZ4008                    | Investments                                 | 3.5         | 0        | 12        |
| FZ5000                    | International Financial Management          | 3.5         | 0        | 12        |
|                           |                                             | <b>14</b>   | <b>0</b> | <b>48</b> |
| <b>Third Trimester</b>    |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| FZ5001                    | Markets and Financial Derivatives Valuation | 3.5         | 0        | 12        |
| FZ5003                    | Capstone Seminar in Finance                 | 3.5         | 0        | 12        |
| OP5053                    | Elective I                                  | 3.5         | 0        | 12        |
| OP5054                    | Elective II                                 | 3.5         | 0        | 12        |
|                           |                                             | <b>14</b>   | <b>0</b> | <b>48</b> |
| <b>Fourth Trimester</b>   |                                             | <b>C</b>    | <b>L</b> | <b>U</b>  |
| FZ5004                    | Finance Project                             | 3.5         | 0        | 12        |
| OP5055                    | Elective III                                | 3.5         | 0        | 12        |
| OP5056                    | Elective IV                                 | 3.5         | 0        | 12        |
|                           |                                             | <b>10.5</b> | <b>0</b> | <b>36</b> |

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is four trimesters*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)



## Elective Courses

### Quality Development Courses

| Code   | Name                                                        | C   | L | U  |
|--------|-------------------------------------------------------------|-----|---|----|
| AD4003 | Business Policy, Ethics and Corporate Social Responsibility | 3.5 | 0 | 12 |
| DS4002 | Leadership for Sustainable Development                      | 3.5 | 0 | 12 |

### Concentration Elective Courses

| Banking and Financial Institutions       |                                                      |     |   |    |
|------------------------------------------|------------------------------------------------------|-----|---|----|
| Code                                     | Name                                                 | C   | L | U  |
| FZ5005                                   | Bank Management                                      | 3.5 | 0 | 12 |
| FZ5006                                   | Consumer Credit Management                           | 3.5 | 0 | 12 |
| FZ5007                                   | Corporate & Commercial Credit Management             | 3.5 | 0 | 12 |
| FZ5008                                   | Microfinance Institution Management                  | 3.5 | 0 | 12 |
| FZ5009                                   | Risk Management                                      | 3.5 | 0 | 12 |
| FZ5016                                   | Marketing for Finance Institutions                   | 3.5 | 0 | 12 |
| Strategy                                 |                                                      |     |   |    |
| Code                                     | Name                                                 | C   | L | U  |
| AD5005                                   | Services Management                                  | 3.5 | 0 | 12 |
| AD5007                                   | Creation of Business Competitive Advantage           | 3.5 | 0 | 12 |
| AD5008                                   | Strategy, Systems and Sustainability                 | 3.5 | 0 | 12 |
| AD5009                                   | Development of Top Management and Leaderships Skills | 3.5 | 0 | 12 |
| AD5010                                   | Cross-Cultural Management                            | 3.5 | 0 | 12 |
| AD5011                                   | Competitiveness and International Development        | 3.5 | 0 | 12 |
| Corporative finances                     |                                                      |     |   |    |
| Code                                     | Name                                                 | C   | L | U  |
| FZ5009                                   | Risk Management                                      | 3.5 | 0 | 12 |
| FZ5010                                   | Short-Term Financial Management                      | 3.5 | 0 | 12 |
| FZ5011                                   | Economic Engineering                                 | 3.5 | 0 | 12 |
| FZ5012                                   | Mergers and Acquisitions                             | 3.5 | 0 | 12 |
| FZ5013                                   | Funding Sources                                      | 3.5 | 0 | 12 |
| Innovation and Design of Business Models |                                                      |     |   |    |
| Code                                     | Name                                                 | C   | L | U  |
| AD5013                                   | Business Design and Implementation                   | 3.5 | 0 | 12 |
| AD5014                                   | Product/Service Design and Innovation                | 3.5 | 0 | 12 |
| AD5015                                   | Innovation and Technology Management                 | 3.5 | 0 | 12 |
| AD5016                                   | Technology-Based New Venture Creation                | 3.5 | 0 | 12 |

## Master in Business Administration (MBA)

### General Program Objectives

The objective of the Master in Business Administration is to prepare professionals that:

- Manage organizations that operate in global environments, making effective and ethical decisions supported in cutting-edge techniques and management models.
- Lead strategic projects that add value to the organization and its local, national and international environment, applying leadership skills, systemic understanding of the organization and global vision.
- Identify opportunity areas in business environment and, accordingly, design and develop innovative and sustainable business models applying analytical and financial tools.
- Contribute to the economic, social and environmental development of their community through innovative and sustainable projects.

### Learning Outcomes

On completing the program, students will be able to:

- Make business decisions based on ethical reasoning, applying concepts and ethical principles and taking their stakeholders into consideration.
- Identify and evaluate opportunities that allow them to innovate and undertake profitable business models using analytical techniques that contribute to sustainable development of their communities.
- Apply knowledge and skills for effective systemic functioning of the organization, through the application of management methodologies to explore opportunities and adaptation of environmental challenges.

- Lead effective teams, valuing diversity and being competent in management processes that enable the implementation of organizational changes
- Strengthen a global vision of business to function in international environments incorporating the cultural, political, economic and social context.

### Target Audience

Applicants are professionals with at least three years of professional experience and are interested in one of the following criteria for their professional development profile:

- Occupy leadership positions with organizational growth opportunities, considering as important the systematic understanding of the organization and the use of methodologies to support the decision making process.
- Experienced professionals with interest in developing innovative business models, seeking to increase the competitiveness of the company or create new business through the knowledge application, use of tools and cutting-edge management models.
- With work experience who wish to develop and/or strengthen consulting skills to support continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.
- With leadership potential showing passion for learning, critical thinking and professional growth to impact value creation in organizations, using leadership skills and knowledge, techniques and effective management tools.

## MBA Master in Business Administration

### Edition 2015

| <b>Remedial Trimester</b> |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
|---------------------------|---------------------------------------------------------|-------------|----------|-----------|
| AD4024                    | Business Analytics Foundations                          | 3.5         | 0        | 12        |
|                           |                                                         | <b>3.5</b>  | <b>0</b> | <b>12</b> |
| <b>First Trimester</b>    |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4025                    | Managerial Skills I                                     | 1           | 0        | 4         |
| AD4026                    | Business Intelligence                                   | 1.5         | 0        | 6         |
| AD4027                    | Corporate Governance and Ethics                         | 1.5         | 0        | 6         |
| MT4016                    | Consumer Behavior and Marketing Strategies              | 3.5         | 0        | 12        |
| RH4003                    | Leadership and Managing People in Organizations         | 3.5         | 0        | 12        |
|                           |                                                         | <b>11</b>   | <b>0</b> | <b>40</b> |
| <b>Second Trimester</b>   |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4028                    | Operations Management                                   | 3.5         | 0        | 12        |
| EC4005                    | Managerial Economics                                    | 3.5         | 0        | 12        |
| FZ4001                    | Corporate Finance                                       | 3.5         | 0        | 12        |
|                           |                                                         | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Third Trimester</b>    |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5086                    | Strategic Management                                    | 3.5         | 0        | 12        |
| AD5087                    | Strategy and Negotiations in Multicultural Environments | 3.5         | 0        | 12        |
| AD5088                    | Service Management                                      | 1.5         | 0        | 6         |
| DS4005                    | Corporate Sustainability                                | 1.5         | 0        | 6         |
|                           |                                                         | <b>10</b>   | <b>0</b> | <b>36</b> |
| <b>Fourth Trimester</b>   |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5089                    | Innovation and Entrepreneurship                         | 3.5         | 0        | 12        |
| AD5090                    | Managerial Skills II                                    | 1           | 0        | 4         |
| OP5053                    | Elective I                                              | 3.5         | 0        | 12        |
| OP5054                    | Elective II                                             | 3.5         | 0        | 12        |
|                           |                                                         | <b>11.5</b> | <b>0</b> | <b>40</b> |
| <b>Fifth Trimester</b>    |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5107                    | Applied Project (A)                                     | 3.5         | 0        | 12        |
| OP5055                    | Elective III                                            | 3.5         | 0        | 12        |
|                           |                                                         | <b>7</b>    | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is five trimesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Concentration Elective Courses

| Global Business Management |                              |     |   |    |  |
|----------------------------|------------------------------|-----|---|----|--|
| Code                       | Name                         | C   | L | U  |  |
| AD5012                     | Field Project                | 3.5 | 0 | 12 |  |
| AD5104                     | International Management     | 3.5 | 0 | 12 |  |
| FZ5046                     | Global Financial Strategy    | 3.5 | 0 | 12 |  |
| NI5008                     | Internationalization Process | 3.5 | 0 | 12 |  |

| Global Operations Management |                                              |     |   |    |  |
|------------------------------|----------------------------------------------|-----|---|----|--|
| Code                         | Name                                         | C   | L | U  |  |
| AD5012                       | Field Project                                | 3.5 | 0 | 12 |  |
| AD5091                       | Lean Thinking and Process Innovation         | 3.5 | 0 | 12 |  |
| AD5092                       | Advanced Quantitative Methods for Operations | 3.5 | 0 | 12 |  |
| AD5093                       | Technological Management of Supply Chain     | 3.5 | 0 | 12 |  |
| AD5106                       | Global Trade and Logistics Strategy          | 3.5 | 0 | 12 |  |

| Service Management |                                             |     |   |    |  |
|--------------------|---------------------------------------------|-----|---|----|--|
| Code               | Name                                        | C   | L | U  |  |
| AD5012             | Field Project                               | 3.5 | 0 | 12 |  |
| AD5099             | Service Innovation                          | 3.5 | 0 | 12 |  |
| AD5100             | Service Experience The Customer Perspective | 3.5 | 0 | 12 |  |
| AD5101             | Service Strategies                          | 3.5 | 0 | 12 |  |

| Entrepreneurship and Innovation |                                                 |     |   |    |  |
|---------------------------------|-------------------------------------------------|-----|---|----|--|
| Code                            | Name                                            | C   | L | U  |  |
| AD5012                          | Field Project                                   | 3.5 | 0 | 12 |  |
| EM5000                          | Intellectual Property for Startups              | 1.5 | 0 | 6  |  |
| EM5001                          | Business Model Design                           | 3.5 | 0 | 12 |  |
| EM5002                          | Building Entrepreneurial Team, Values & Culture | 1.5 | 0 | 6  |  |
| FZ5053                          | Entrepreneurial Finance                         | 1.5 | 0 | 6  |  |
| MT5041                          | Marketing for Entrepreneurs                     | 1.5 | 0 | 6  |  |

| Strategic Corporate Finance |                                           |     |   |    |  |
|-----------------------------|-------------------------------------------|-----|---|----|--|
| Code                        | Name                                      | C   | L | U  |  |
| AD5012                      | Field Project                             | 3.5 | 0 | 12 |  |
| FZ5044                      | Mergers and Acquisitions                  | 3.5 | 0 | 12 |  |
| FZ5046                      | Global Financial Strategy                 | 3.5 | 0 | 12 |  |
| FZ5051                      | Economic Appraisal of Investment Projects | 3.5 | 0 | 12 |  |

## Leadership and People Development

| Code   | Name                                       | C   | L | U  |
|--------|--------------------------------------------|-----|---|----|
| AD5012 | Field Project                              | 3.5 | 0 | 12 |
| RH5005 | Strategic Leadership in the Global Context | 3.5 | 0 | 12 |
| RH5006 | Strategic Talent Management                | 3.5 | 0 | 12 |
| RH5007 | Labor Context Analysis                     | 1.5 | 0 | 6  |
| RH5008 | Personal Development Planning              | 1.5 | 0 | 6  |

## Branding and Strategic Marketing

| Code   | Name                                       | C   | L | U  |
|--------|--------------------------------------------|-----|---|----|
| AD5012 | Field Project                              | 3.5 | 0 | 12 |
| RH5005 | Strategic Leadership in the Global Context | 3.5 | 0 | 12 |
| RH5006 | Strategic Talent Management                | 3.5 | 0 | 12 |
| RH5007 | Labor Context Analysis                     | 1.5 | 0 | 6  |
| RH5008 | Personal Development Planning              | 1.5 | 0 | 6  |

## Sustainability

| Code   | Name                                       | C   | L | U  |
|--------|--------------------------------------------|-----|---|----|
| AD5012 | Field Project                              | 3.5 | 0 | 12 |
| AD5095 | Business Administration for Sustainability | 3.5 | 0 | 12 |
| AD5097 | Business Strategy for Sustainability       | 3.5 | 0 | 12 |
| AD5098 | Business, Government and Sustainability    | 3.5 | 0 | 12 |

## Energy Management (EGADE Monterrey, EGADE Santa Fe)

## Mandatory courses

| Code   | Name                                            | C   | L | U  |
|--------|-------------------------------------------------|-----|---|----|
| AD5012 | Field Project                                   | 3.5 | 0 | 12 |
| AD5080 | Management in Energy Markets                    | 3.5 | 0 | 12 |
| AD5081 | Energy Law and Regulations of Energy Industries | 3.5 | 0 | 12 |

## Elective Courses

| Code   | Name                                     | C   | L | U  |
|--------|------------------------------------------|-----|---|----|
| AD5082 | Risk Management in Energy Industry       | 3.5 | 0 | 12 |
| AD5083 | Sustainability and Efficiency Strategies | 3.5 | 0 | 12 |
| AD5084 | Evaluation of Energy Projects            | 3.5 | 0 | 12 |

## MBA in Global Business Administration and Strategy (MBA-G)

### General Program Objectives

The Master in Business Administration, Concentration in Global Business Strategy, is a double degree program between the EGADE Business School of Tecnológico de Monterrey and The Belk College of Business Administration at The University of North Carolina at Charlotte. The MBA-GBS is a lock-step program and the courses are offered in English. The objective of the Master in Business Administration is to prepare professionals for:

- Direct organizational change and transformation processes.
- Generate sustainable value for the organization in the context of diverse countries and regions.
- Design and implement solutions to complex problems with analytical methods, displaying commitment, leadership, determination, a sense of duty and ethical reasoning, complemented by the use of new technologies.
- Think with creativity and innovation, this is reflected in the exposition of new ideas and knowledge, expanding the vision, leadership perspective and exposure to a multicultural setting in order to develop a collaborative work environment.
- Leadership positions in global, complex organizations with the visionary, integrative, transformative and humanitarian outlook of individuals who can interact with specialists from all of the company's functional areas to define business strategies that help to create competitive advantages.
- Apply and promote teamwork, generating interdisciplinary work, and developing their capacity for strategic thinking in order to understand the organization's systems and the industry as a whole.

### Learning Outcomes

The MBA program is conceptualized as a conversion program, to give a new direction to the professional careers of students with the knowledge and skills necessary to be successful in global business environments.

On completing the program, students will be able to:

- Act with ethical reasoning
- Design sustainable business models.
- Act in accordance with ethics and sustainable development.
- Manage new information technologies with expertise.
- Apply and promote interdisciplinary and collaborative work.
- Identify new business opportunities in order to transform their own reality and/or that of their company.
- Generate sustainable solutions to business issues through the integration of knowledge, skills, attitudes and values.
- Communicate effectively.

## MBA-G MBA in Global Business Administration and Strategy

### Edition 2009

| <b>Remedial Trimester</b> |                                                            | <b>C</b>    | <b>L</b> | <b>U</b>  |
|---------------------------|------------------------------------------------------------|-------------|----------|-----------|
| AD4001                    | Statistical Analysis in Organizations                      | 3.5         | 0        | 12        |
| AD4002                    | Economic Environment for the Organization                  | 3.5         | 0        | 12        |
| FZ4000                    | Introduction to Financial Information for Decision Making  | 3.5         | 0        | 12        |
|                           |                                                            | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>First Trimester</b>    |                                                            | <b>C</b>    | <b>L</b> | <b>U</b>  |
| EC4005                    | Managerial Economics                                       | 3.5         | 0        | 12        |
| OP4036                    | Quality Development Course                                 | 3.5         | 0        | 12        |
| RH4000                    | Leadership and Organizational Behavior                     | 3.5         | 0        | 12        |
|                           |                                                            | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Second Trimester</b>   |                                                            | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4005                    | Entrepreneurship and Intrapreneurship                      | 3.5         | 0        | 12        |
| AD5000                    | Negotiations and Decisions in Multicultural Environments   | 3.5         | 0        | 12        |
| FZ4001                    | Corporate Finance                                          | 3.5         | 0        | 12        |
| MT4001                    | Marketing Management                                       | 3.5         | 0        | 12        |
|                           |                                                            | <b>14</b>   | <b>0</b> | <b>48</b> |
| <b>Third Trimester</b>    |                                                            | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4004                    | Competitive Strategy and Business Design                   | 3.5         | 0        | 12        |
| CD4000                    | Operations Management                                      | 3.5         | 0        | 12        |
| OP5053                    | Elective I                                                 | 3.5         | 0        | 12        |
| OP5054                    | Elective II                                                | 3.5         | 0        | 12        |
|                           |                                                            | <b>14</b>   | <b>0</b> | <b>48</b> |
| <b>Fourth Trimester</b>   |                                                            | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5001                    | Seminar in Transnational Management and Corporate Strategy | 3.5         | 0        | 12        |
| OP5055                    | Elective III                                               | 3.5         | 0        | 12        |
| OP5056                    | Elective IV                                                | 3.5         | 0        | 12        |
|                           |                                                            | <b>10.5</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is four trimesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                                        | C   | L | U  |
|--------|-------------------------------------------------------------|-----|---|----|
| AD4003 | Business Policy, Ethics and Corporate Social Responsibility | 3.5 | 0 | 12 |
| DS4002 | Leadership for Sustainable Development                      | 3.5 | 0 | 12 |

### Elective Courses

| Code   | Name                                               | C   | L | U  |
|--------|----------------------------------------------------|-----|---|----|
| AD4012 | Legal Environment Seminar                          | 1   | 0 | 4  |
| AD5005 | Services Management                                | 3.5 | 0 | 12 |
| AD5007 | Creation of Business Competitive Advantage         | 3.5 | 0 | 12 |
| AD5008 | Strategy, Systems and Sustainability               | 3.5 | 0 | 12 |
| AD5010 | Cross-Cultural Management                          | 3.5 | 0 | 12 |
| AD5011 | Competitiveness and International Development      | 3.5 | 0 | 12 |
| AD5012 | Field Project                                      | 3.5 | 0 | 12 |
| AD5026 | Managerial Accounting                              | 3.5 | 0 | 12 |
| AD5027 | Technological Development for Modern Organizations | 3.5 | 0 | 12 |
| AD5028 | Strategy and Management in Latin America           | 3.5 | 0 | 12 |
| EC5007 | International Forecasting                          | 3.5 | 0 | 12 |
| FZ5015 | Multinational Finance                              | 3.5 | 0 | 12 |
| MT5016 | International Marketing                            | 3.5 | 0 | 12 |



## Master in Business Administration (MBA-I)

### General program objectives

The objective of the Master in Business Administration is to prepare professionals that:

- Manage organizations that operate in global environments, making effective and ethical decisions supported in cutting-edge techniques and management models.
- Lead strategic projects that add value to the organization and its local, national and international environment, applying leadership skills, systemic understanding of the organization and global vision.
- Identify opportunity areas in business environment and, accordingly, design and develop innovative and sustainable business models applying analytical and financial tools.
- Contribute to the economic, social and environmental development of their community through innovative and sustainable projects.

### Learning Outcomes

On completing the program, students will be able to:

- Make business decisions based on ethical reasoning, applying concepts and ethical principles and taking their stakeholders into consideration.
- Identify and evaluate opportunities that allow them to innovate and undertake profitable business models using analytical techniques that contribute to sustainable development of their communities.
- Apply knowledge and skills for effective systemic functioning of the organization, through the application of management methodologies to explore opportunities and adaptation of environmental challenges.

- Lead effective teams, valuing diversity and being competent in management processes that enable the implementation of organizational changes
- Strengthen a global vision of business to function in international environments incorporating the cultural, political, economic and social context.

### Target Audience

Applicants are professionals with at least three years of professional experience and are interested in one of the following criteria for their professional development profile:

- Occupy leadership positions with organizational growth opportunities, considering as important the systematic understanding of the organization and the use of methodologies to support the decision making process.
- Experienced professionals with interest in developing innovative business models, seeking to increase the competitiveness of the company or create new business through the knowledge application, use of tools and cutting-edge management models.
- With work experience who wish to develop and/or strengthen consulting skills to support continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.
- With leadership potential showing passion for learning, critical thinking and professional growth to impact value creation in organizations, using leadership skills and knowledge, techniques and effective management tools.

## MBA-I Master in Business Administration

### Edition 2017

| <b>Remedial Trimester</b> |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
|---------------------------|---------------------------------------------------------|-------------|----------|-----------|
| AD4024                    | Business Analytics Foundations                          | 3.5         | 0        | 12        |
|                           |                                                         | <b>3.5</b>  | <b>0</b> | <b>12</b> |
| <b>First Trimester</b>    |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4025                    | Managerial Skills I                                     | 1           | 0        | 4         |
| AD4026                    | Business Intelligence                                   | 1.5         | 0        | 6         |
| AD4027                    | Corporate Governance and Ethics                         | 1.5         | 0        | 6         |
| MT4016                    | Consumer Behavior and Marketing Strategies              | 3.5         | 0        | 12        |
| RH4003                    | Leadership and Managing People in Organizations         | 3.5         | 0        | 12        |
|                           |                                                         | <b>11</b>   | <b>0</b> | <b>40</b> |
| <b>Second Trimester</b>   |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD4028                    | Operations Management                                   | 3.5         | 0        | 12        |
| EC4005                    | Managerial Economics                                    | 3.5         | 0        | 12        |
| FZ4001                    | Corporate Finance                                       | 3.5         | 0        | 12        |
|                           |                                                         | <b>10.5</b> | <b>0</b> | <b>36</b> |
| <b>Third Trimester</b>    |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5086                    | Strategic Management                                    | 3.5         | 0        | 12        |
| AD5087                    | Strategy and Negotiations in Multicultural Environments | 3.5         | 0        | 12        |
| AD5088                    | Service Management                                      | 1.5         | 0        | 6         |
| DS4005                    | Corporate Sustainability                                | 1.5         | 0        | 6         |
|                           |                                                         | <b>10</b>   | <b>0</b> | <b>36</b> |
| <b>Fourth Trimester</b>   |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5089                    | Innovation and Entrepreneurship                         | 3.5         | 0        | 12        |
| AD5090                    | Managerial Skills II                                    | 1           | 0        | 4         |
| OP5053                    | Elective I                                              | 3.5         | 0        | 12        |
| OP5054                    | Elective II                                             | 3.5         | 0        | 12        |
|                           |                                                         | <b>11.5</b> | <b>0</b> | <b>40</b> |
| <b>Fifth Trimester</b>    |                                                         | <b>C</b>    | <b>L</b> | <b>U</b>  |
| AD5107                    | Applied Project (A)                                     | 3.5         | 0        | 12        |
| OP5055                    | Elective III                                            | 3.5         | 0        | 12        |
|                           |                                                         | <b>7</b>    | <b>0</b> | <b>24</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is five trimesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

| Innovation and Entrepreneurship |                                                 |     |   |    |
|---------------------------------|-------------------------------------------------|-----|---|----|
| Code                            | Name                                            | C   | L | U  |
| AD5012                          | Field Project                                   | 3.5 | 0 | 12 |
| EM5000                          | Intellectual Property for Startups              | 1.5 | 0 | 6  |
| EM5001                          | Business Model Design                           | 3.5 | 0 | 12 |
| EM5002                          | Building Entrepreneurial Team, Values & Culture | 1.5 | 0 | 6  |
| FZ5053                          | Entrepreneurial Finance                         | 1.5 | 0 | 6  |
| MT5041                          | Marketing for Entrepreneurs                     | 1.5 | 0 | 6  |

## Master in Business Administration Executive Program (MBE)

### General Program Objectives

The overall objective of the Executive MBA is to prepare professionals to:

- Be successful in managerial position in multinational companies.
- Identify business opportunities.
- Design and implement innovative business processes and/or models.
- Create sustainable wealth through their own company.

### Learning Outcomes

On completing the program, students will be able to:

- Establish the vision, management and allocation of resources and infrastructure, in order to meet the new demands of a global economy.
- Act as an agent of organizational change in traditional companies that wish to access international markets.
- Compete internationally and possess a solid conceptual grounding and practical knowledge of the reality of the best way to do business in national and international contexts.

## MBE Master in Business Administration Executive Program

### Plan 2002

| <b>Remedial Semester</b> |                                                                      | <b>C</b>  | <b>L</b> | <b>U</b>  |
|--------------------------|----------------------------------------------------------------------|-----------|----------|-----------|
| GA4025                   | Fundamental Administrative Environment                               | 2         | 0        | 8         |
|                          |                                                                      | <b>2</b>  | <b>0</b> | <b>8</b>  |
| <b>First Semester</b>    |                                                                      | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GA4027                   | Analytical Tools for Decision Making and Macroeconomics for Managers | 3         | 0        | 11        |
| GA4028                   | Leadership, Organization and Change                                  | 2         | 0        | 8         |
| GA4030                   | General Management and Strategy                                      | 1         | 0        | 5         |
| GA4034                   | Advanced Marketing Strategy                                          | 2         | 0        | 10        |
|                          |                                                                      | <b>8</b>  | <b>0</b> | <b>34</b> |
| <b>Second Semester</b>   |                                                                      | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GA4029                   | Global Operations Management                                         | 2         | 0        | 8         |
| GA4032                   | Financial & Managerial Accounting                                    | 2         | 0        | 10        |
| GA4033                   | Corporate Finance                                                    | 3         | 0        | 12        |
|                          |                                                                      | <b>7</b>  | <b>0</b> | <b>30</b> |
| <b>Third Semester</b>    |                                                                      | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GA4026                   | Global Business Environment                                          | 3         | 0        | 6         |
| GA4031                   | Logistics and Sustainability                                         | 3         | 0        | 6         |
| GA4035                   | Micro and Strategic Economics                                        | 2         | 0        | 9         |
| GA5028                   | International Finance and Strategic Technology                       | 2         | 0        | 9         |
|                          |                                                                      | <b>10</b> | <b>0</b> | <b>30</b> |
| <b>Fourth Semester</b>   |                                                                      | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GA5025                   | Globalization of Finance and Cultural Marketing                      | 3         | 0        | 6         |
| GA5026                   | Strategic Thinking and Change                                        | 3         | 0        | 11        |
| GA5027                   | Ethics and Business Environment                                      | 3         | 0        | 13        |
| GA5029                   | Adaptation to Dynamic Business Environments                          | 3         | 0        | 6         |
|                          |                                                                      | <b>12</b> | <b>0</b> | <b>36</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Master in Business Administration (MDE)

### General program objectives

The overall objective of the Master of Business Administration is to prepare professionals to:

- Be successful in managerial position in multinational companies.
- Identify business opportunities.
- Design and implement innovative business processes and/or models.
- Create sustainable wealth through their own company.

### Learning outcomes

- Leadership role in organizations.
- Consolidate competencies in the functional areas of the organization.
- Understand the role they play in the political, economic and social responsibility dimensions in a global setting.
- Improve the individual and group performance of the people.

**MDE Master in Business Administration**  
**Edition 2009**

| <b>First Semester</b>  |                                         | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|-----------------------------------------|-----------|----------|-----------|
| CD96302                | Managerial Data and Decision Analysis   | 3         | 0        | 12        |
| CF96300                | Financial Accounting Issues             | 3         | 0        | 12        |
| RH96301                | Interpersonal Behavior in Organizations | 3         | 0        | 12        |
|                        |                                         | <b>9</b>  | <b>0</b> | <b>36</b> |
| <b>Second Semester</b> |                                         | <b>C</b>  | <b>L</b> | <b>U</b>  |
| CF96301                | Managerial Accounting                   | 3         | 0        | 12        |
| EC96300                | Managerial Microeconomics               | 3         | 0        | 12        |
| SI96300                | Information Technology                  | 3         | 0        | 12        |
|                        |                                         | <b>9</b>  | <b>0</b> | <b>36</b> |
| <b>Third Semester</b>  |                                         | <b>C</b>  | <b>L</b> | <b>U</b>  |
| CD96303                | Operations Management                   | 3         | 0        | 12        |
| FZ96302                | Case Problems in Financial Management   | 3         | 0        | 12        |
| MT96306                | Advanced Marketing Management           | 3         | 0        | 12        |
| OR96205                | Strategic Management                    | 3         | 0        | 12        |
|                        |                                         | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Fourth Semester</b> |                                         | <b>C</b>  | <b>L</b> | <b>U</b>  |
| FZ96303                | Applications of Investment Theory       | 3         | 0        | 12        |
| OR96206                | Topics in the Legal Environment         | 3         | 0        | 12        |
| OR96207                | Corporate Diversification and Renewal   | 3         | 0        | 12        |
| OR96208                | Emerging Issues in Global Management    | 3         | 0        | 12        |
|                        |                                         | <b>12</b> | <b>0</b> | <b>48</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is four semesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Master in Enterprise Administration (MGN-V)

### General Program Objectives

- Educate professionals who will design and implement ethical, socially responsible solutions to complex business problems, through the use of analytical methods and innovative technologies.
- Prepare leaders with creative, innovative thinking who will act as agents of change in multicultural environments.
- Make students capable of designing and implementing innovative business processes and/or models that generate sustainable value for the organization and its community, with a global perspective of competitiveness.
- Apply and promote interdisciplinary and collaborative work
- Identify new business's opportunities with the goal of transforming their own reality and/ or the one of their business
- Generate sustainable solutions to business's problems through the integration of knowledge, abilities, attitudes and values
- Communicate effectively
- Establish networking
- Self-learning
- Be sensitive to multicultural environments

### Learning Outcomes

On completing the program, students will be able to:

- Act based on analytical thinking
- Design sustainable business's models
- Act ethically
- Manage and use the new information technologies

### Target Audience

Professionals and executives who want to enrich their education with a global perspective of the world of business in private and public sector companies and non-profit organizations, in order to progress in their career and hold management and executive positions.

Consultants and entrepreneurs interested in starting or consolidating their business in a creative, innovative manner.



## MGN-V Master in Enterprise Administration

### Edition 2010

| <b>First Trimester</b>  |                                                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
|-------------------------|-----------------------------------------------------------|------------|----------|-----------|
| AD4001                  | Statistical Analysis in Organizations                     | 3.5        | 0        | 12        |
| AD4002                  | Economic Environment for the Organization                 | 3.5        | 0        | 12        |
| FZ4000                  | Introduction to Financial Information for Decision Making | 3.5        | 0        | 12        |
| OP4036                  | Quality Development Course                                | 3.5        | 0        | 12        |
|                         |                                                           | <b>14</b>  | <b>0</b> | <b>48</b> |
| <b>Second Trimester</b> |                                                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| EC4014                  | Economics for Decision Making                             | 3.5        | 0        | 12        |
| FZ4009                  | Finance Management                                        | 3.5        | 0        | 12        |
| MT4013                  | Marketing Management                                      | 3.5        | 0        | 12        |
| TI5008                  | Managing the Value Chain                                  | 3.5        | 0        | 12        |
|                         |                                                           | <b>14</b>  | <b>0</b> | <b>48</b> |
| <b>Third Trimester</b>  |                                                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| AD4008                  | Management and Strategies of Entrepreneurship             | 3.5        | 0        | 12        |
| AD5059                  | Strategic Planning and Organizational Structures          | 3.5        | 0        | 12        |
| EC5008                  | Innovation and Prospective                                | 3.5        | 0        | 12        |
| RH4000                  | Leadership and Organizational Behavior                    | 3.5        | 0        | 12        |
|                         |                                                           | <b>14</b>  | <b>0</b> | <b>48</b> |
| <b>Fourth Trimester</b> |                                                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| OP5053                  | Elective I                                                | 3.5        | 0        | 12        |
| OP5054                  | Elective II                                               | 3.5        | 0        | 12        |
| OP5055                  | Elective III                                              | 3.5        | 0        | 12        |
| OP5056                  | Elective IV                                               | 3.5        | 0        | 12        |
|                         |                                                           | <b>14</b>  | <b>0</b> | <b>48</b> |
| <b>Fifth Trimester</b>  |                                                           | <b>C</b>   | <b>L</b> | <b>U</b>  |
| AD5060                  | Management and Corporate Governance Seminar               | 3.5        | 0        | 12        |
|                         |                                                           | <b>3.5</b> | <b>0</b> | <b>12</b> |

At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in trimestral periods and the expected completion timeframe is five trimesters

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Quality Development Courses

| Code   | Name                                                        | C   | L | U  |
|--------|-------------------------------------------------------------|-----|---|----|
| AD4003 | Business Policy, Ethics and Corporate Social Responsibility | 3.5 | 0 | 12 |
| DS4002 | Leadership for Sustainable Development                      | 3.5 | 0 | 12 |

### Concentration Elective Courses

| Finances |                                     |     |   |    |
|----------|-------------------------------------|-----|---|----|
| Code     | Name                                | C   | L | U  |
| AD5075   | Integrative Project (A)             | 3.5 | 0 | 12 |
| FZ5000   | International Financial Management  | 3.5 | 0 | 12 |
| FZ5005   | Bank Management                     | 3.5 | 0 | 12 |
| FZ5009   | Risk Management                     | 3.5 | 0 | 12 |
| FZ5013   | Funding Sources                     | 3.5 | 0 | 12 |
| FZ5020   | Advanced Cases in Finance Seminar   | 3.5 | 0 | 12 |
| FZ5021   | Money and Capital Market            | 3.5 | 0 | 12 |
| FZ5022   | Analysis for Financial Management   | 3.5 | 0 | 12 |
| FZ5023   | Economics for Finance               | 3.5 | 0 | 12 |
| H5031    | Citizenship and Culture of Legality | 3.5 | 0 | 12 |

| Business Start-Up |                                            |     |   |    |
|-------------------|--------------------------------------------|-----|---|----|
| Code              | Name                                       | C   | L | U  |
| AD5035            | Franchise Management and Development       | 3.5 | 0 | 12 |
| AD5040            | Generating Value in Enterprises            | 3.5 | 0 | 12 |
| AD5058            | International Marketing                    | 3.5 | 0 | 12 |
| AD5075            | Integrative Project (B)                    | 3.5 | 0 | 12 |
| AD5108            | Family Business                            | 3.5 | 0 | 12 |
| FZ5014            | Strategic Finance and New Venture Creation | 3.5 | 0 | 12 |
| H5031             | Citizenship and Culture of Legality        | 3.5 | 0 | 12 |
| TI5000            | Technology Based Business Models           | 3.5 | 0 | 12 |

| Marketing |                                                          |     |   |    |
|-----------|----------------------------------------------------------|-----|---|----|
| Code      | Name                                                     | C   | L | U  |
| AD5075    | Integrative Project (C)                                  | 3.5 | 0 | 12 |
| H5031     | Citizenship and Culture of Legality                      | 3.5 | 0 | 12 |
| MT4004    | Consumer-Client Behavior Analysis                        | 3.5 | 0 | 12 |
| MT4005    | Marketing Intelligence Systems                           | 3.5 | 0 | 12 |
| MT4006    | Pricing Strategy and Profitability                       | 3.5 | 0 | 12 |
| MT4007    | Marketing Communication                                  | 3.5 | 0 | 12 |
| MT4009    | Brands, Products and Services: Innovation and Management | 3.5 | 0 | 12 |
| MT4010    | Selling and Negotiation Systems                          | 3.5 | 0 | 12 |
| MT5005    | Strategic Marketing Planning                             | 3.5 | 0 | 12 |
| MT5021    | Corporate Image                                          | 3.5 | 0 | 12 |
| MT5022    | Social Marketing                                         | 3.5 | 0 | 12 |

| Strategy          |                                                                                 |     |   |    |
|-------------------|---------------------------------------------------------------------------------|-----|---|----|
| Code              | Name                                                                            | C   | L | U  |
| AD5025            | Doing Business in Mexico                                                        | 3.5 | 0 | 12 |
| AD5056            | Third Generation Planning for Complex Organizations:<br>The Balanced Score Card | 3.5 | 0 | 12 |
| AD5057            | Continuous Improvement Administration                                           | 3.5 | 0 | 12 |
| AD5075            | Integrative Project (D)                                                         | 3.5 | 0 | 12 |
| H5031             | Citizenship and Culture of Legality                                             | 3.5 | 0 | 12 |
| MT5005            | Strategic Marketing Planning                                                    | 3.5 | 0 | 12 |
| RH5003            | Strategic Development of Human Capital                                          | 3.5 | 0 | 12 |
| Public Management |                                                                                 |     |   |    |
| Code              | Name                                                                            | C   | L | U  |
| AD5075            | Integrative Project (E)                                                         | 3.5 | 0 | 12 |
| AP4014            | Public Administration Law                                                       | 3.5 | 0 | 12 |
| AP4015            | Federalism and Inter-governmental Relations                                     | 3.5 | 0 | 12 |
| AP4016            | Public Administration Planning and Management                                   | 3.5 | 0 | 12 |
| AP4026            | Public Finance                                                                  | 3.5 | 0 | 12 |
| AP5003            | Government and Citizenship Participation                                        | 3.5 | 0 | 12 |
| AP5004            | State and Local Government and Interior Policy                                  | 3.5 | 0 | 12 |
| H5031             | Citizenship and Culture of Legality                                             | 3.5 | 0 | 12 |
| Human Capital     |                                                                                 |     |   |    |
| Code              | Name                                                                            | C   | L | U  |
| AD5075            | Integrative Project (F)                                                         | 3.5 | 0 | 12 |
| H5031             | Citizenship and Culture of Legality                                             | 3.5 | 0 | 12 |
| RH5000            | HR Efficiency Assessment                                                        | 3.5 | 0 | 12 |
| RH5001            | Compensation Policies in High-performance Systems                               | 3.5 | 0 | 12 |
| RH5002            | Conflict Resolution in Organizations                                            | 3.5 | 0 | 12 |
| RH5003            | Strategic Development of Human Capital                                          | 3.5 | 0 | 12 |
| RH5004            | Organizational Development                                                      | 3.5 | 0 | 12 |
| E-Commerce        |                                                                                 |     |   |    |
| Code              | Name                                                                            | C   | L | U  |
| AD5075            | Integrative Project (G)                                                         | 3.5 | 0 | 12 |
| D4000             | Legal Aspects for E-Commerce                                                    | 3.5 | 0 | 12 |
| H5031             | Citizenship and Culture of Legality                                             | 3.5 | 0 | 12 |
| IN4025            | Supply Chain Management                                                         | 3.5 | 0 | 12 |
| MT5017            | New Product Development                                                         | 3.5 | 0 | 12 |
| MT5018            | Marketing Communications for Internet                                           | 3.5 | 0 | 12 |
| MT5019            | Marketing for E-Business                                                        | 3.5 | 0 | 12 |
| TI4002            | E-business Strategy                                                             | 3.5 | 0 | 12 |

A, B,C,D,E,F,G: Prerequisite for diploma

## PH. D. in Business Administration (DCA)

### General Program Objectives

- Prepare researchers who are capable of analyzing and documenting organizational issues, and contributing knowledge to further the development of competitive, innovative businesses.
- Prepare exceptional researchers in the field of business administration, who focus on research in the areas of Entrepreneurship, International Competitiveness, Leadership and Organizational Behavior, and Strategy.
- Cultivate research groups in administrative science.
- Apply in-depth knowledge of the theoretical and empirical advancements in administrative science (according to their area of specialization).
- Design and analyze measurement instruments for the identification and diagnosis of administrative science topics and issues.
- Report and publish research findings in order to design, lead and assess research projects.
- Have a positive attitude to assess and act with honesty and responsibility in highly complex and ambiguous research situations.

### Learning Outcomes

On completing the program, students will be able to:

- Generate critical original knowledge, with the ability to develop theoretical and empirical administrative science models
- Generate cutting-edge knowledge of the theoretical and empirical advancements in administrative science.

### Target Audience

- With proven skills in research and interest in the scientific development of administrative sciences.
- With an academic background in administrative sciences or related fields.
- Proficient in English.
- Focused on searching for intellectual challenges derived from an awareness of their environment and its issues.

**DCA PH. D. in Business Administration****Edition 2011**

| <b>First Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
|-------------------------|-------------------------------------------------------------|-----------|----------|-----------|
| AD4019                  | Fundamentals of Management                                  | 3         | 0        | 12        |
| H5014                   | Philosophy of Science                                       | 3         | 0        | 12        |
| MA4009                  | Statistical Methods                                         | 3         | 0        | 12        |
| MA4011                  | Matrix Algebra and Optimization                             | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Second Semester</b>  |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| AD4020                  | Research Methodology                                        | 3         | 0        | 12        |
| EC5004                  | Fundamental Economics                                       | 3         | 0        | 12        |
| MT4015                  | Multivariate Analysis                                       | 3         | 0        | 12        |
| OP5062                  | Elective I                                                  | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Third Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GD5002                  | Research Proposal I                                         | 3         | 0        | 12        |
| MT4014                  | Design of Research Measurement Instruments                  | 3         | 0        | 12        |
| OP5063                  | Elective II                                                 | 3         | 0        | 12        |
| OP5064                  | Elective III                                                | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Fourth Semester</b>  |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| AD4018                  | Business Policy, Ethics and Corporate Social Responsibility | 3         | 0        | 12        |
| GD5003                  | Research Proposal II                                        | 3         | 0        | 12        |
| GD5005                  | Research Seminar I                                          | 1         | 0        | 4         |
| OP5065                  | Elective IV                                                 | 3         | 0        | 12        |
| OP5066                  | Elective V                                                  | 3         | 0        | 12        |
|                         |                                                             | <b>13</b> | <b>0</b> | <b>52</b> |
| <b>Fifth Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GD5004                  | Research Proposal III                                       | 3         | 0        | 12        |
| GD5008                  | Assisted Research I                                         | 3         | 0        | 12        |
| GD5009                  | Assisted Research II                                        | 3         | 0        | 12        |
| GD5010                  | Assisted Research III                                       | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Sixth Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GD5006                  | Research Seminar II                                         | 1         | 0        | 4         |
| GD6017                  | Doctoral Research I                                         | 3         | 0        | 12        |
| GD6018                  | Doctoral Research II                                        | 3         | 0        | 12        |
| GD6019                  | Doctoral Research III                                       | 3         | 0        | 12        |
|                         |                                                             | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Seventh Semester</b> |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GD6020                  | Doctoral Research IV                                        | 3         | 0        | 12        |
| GD6021                  | Doctoral Research V                                         | 3         | 0        | 12        |
| GD6022                  | Doctoral Research VI                                        | 3         | 0        | 12        |
|                         |                                                             | <b>9</b>  | <b>0</b> | <b>36</b> |

| <b>Eighth Semester</b> |                        | <b>C</b> | <b>L</b> | <b>U</b>  |
|------------------------|------------------------|----------|----------|-----------|
| GD5007                 | Research Seminar III   | 1        | 0        | 4         |
| GD6023                 | Doctoral Research VII  | 3        | 0        | 12        |
| GD6024                 | Doctoral Research VIII | 3        | 0        | 12        |
| GD6025                 | Doctoral Research IX   | 3        | 0        | 12        |
|                        |                        | <b>9</b> | <b>0</b> | <b>36</b> |
| <b>Ninth Semester</b>  |                        | <b>C</b> | <b>L</b> | <b>U</b>  |
| GD6000                 | Doctoral Defense       | 0        | 0        | 1         |
| GD6026                 | Doctoral Research X    | 3        | 0        | 12        |
| GD6027                 | Doctoral Research XI   | 3        | 0        | 12        |
| GD6028                 | Doctoral Research XII  | 3        | 0        | 12        |
|                        |                        | <b>9</b> | <b>0</b> | <b>37</b> |

*This Doctoral program requires a completed Master's Degree program.*

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is nine semesters*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

### Organizational Behavior (Campus: Monterrey, Ciudad de México)

| Code   | Name                                  | C | L | U  |
|--------|---------------------------------------|---|---|----|
| AD5066 | Organizational Behavior               | 3 | 0 | 12 |
| AD5067 | Leadership and Organizational Culture | 3 | 0 | 12 |
| AD5068 | Groups and Teams                      | 3 | 0 | 12 |
| AD5069 | Negotiation and Conflict              | 3 | 0 | 12 |
| AD5070 | Organizational Communication          | 3 | 0 | 12 |
| MT5027 | Research Qualitative Methods          | 3 | 0 | 12 |

### Business Economics (Campus: Ciudad de México)

| Code   | Name                                   | C | L | U  |
|--------|----------------------------------------|---|---|----|
| EO4011 | Advanced Microeconomics                | 3 | 0 | 12 |
| EO4012 | Industrial Organization and Regulation | 3 | 0 | 12 |
| EO5011 | Microeconometrics                      | 3 | 0 | 12 |
| FZ5025 | Econometrics                           | 3 | 0 | 12 |
| FZ5027 | Corporate Finance I                    | 3 | 0 | 12 |

### Strategy (Campus: Monterrey)

| Code   | Name                                          | C | L | U  |
|--------|-----------------------------------------------|---|---|----|
| AD5061 | Organization Theory                           | 3 | 0 | 12 |
| AD5062 | Entrepreneurship and Innovation Strategies    | 3 | 0 | 12 |
| AD5063 | International Strategic Management            | 3 | 0 | 12 |
| AD5064 | Alternative Perspectives on Strategy          | 3 | 0 | 12 |
| AD5065 | Strategy and Management in Emerging Economies | 3 | 0 | 12 |
| AD5071 | Foundations of Strategy                       | 3 | 0 | 12 |
| AD5073 | Strategic Network Analysis                    | 3 | 0 | 12 |
| MT5027 | Research Qualitative Methods                  | 3 | 0 | 12 |

### Finance (Campus: Monterrey, Ciudad de México)

| Code    | Name                                      | C | L | U  |
|---------|-------------------------------------------|---|---|----|
| EEO5015 | Advanced Econometric Methods              | 3 | 0 | 12 |
| EO5020  | Time Series                               | 3 | 0 | 12 |
| FZ5002  | Financial Information and Decision Making | 3 | 0 | 12 |
| FZ5027  | Corporate Finance I                       | 3 | 0 | 12 |
| FZ5028  | Corporate Finance II                      | 3 | 0 | 12 |
| FZ5029  | Derivatives I                             | 3 | 0 | 12 |
| FZ5030  | Derivatives II                            | 3 | 0 | 12 |
| FZ5031  | Financial Risk Management I               | 3 | 0 | 12 |
| FZ5032  | Financial Risk Management II              | 3 | 0 | 12 |
| FZ5033  | Computational Finance                     | 3 | 0 | 12 |
| FZ5034  | International Finance                     | 3 | 0 | 12 |
| MT5023  | Multivariate Analysis                     | 3 | 0 | 16 |

## Marketing (Campus: Monterrey, Ciudad de México)

| <b>Code</b> | <b>Name</b>                                  | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|----------------------------------------------|----------|----------|----------|
| EC5010      | Econometrics and Forecasting Techniques      | 3        | 0        | 12       |
| MT5024      | Services Marketing                           | 3        | 0        | 12       |
| MT5025      | Advertising and Promotion                    | 3        | 0        | 12       |
| MT5026      | International Marketing                      | 3        | 0        | 12       |
| MT5027      | Research Qualitative Methods                 | 3        | 0        | 12       |
| MT5029      | Fundamentals of Marketing Theory             | 3        | 0        | 12       |
| MT5030      | Consumer Behavior                            | 3        | 0        | 12       |
| MT5031      | Strategic Marketing                          | 3        | 0        | 12       |
| MT5032      | Strategic Brand Management and Communication | 3        | 0        | 12       |
| MT5033      | Marketing Research Methods                   | 3        | 0        | 12       |



## Ph. D. in Financial Science (DCF)

### General Program Objectives

Prepare researchers who applied research in higher education teaching activities and/or consulting work, extending the limits of their financial and economic science knowledge, to solve complex problems in the areas of risk management and corporate finance in companies, organizations and institutions, as advisors or executive decision makers in the development of sustainable businesses.

### Learning Outcomes

On completing the program, students will be able to:

- Apply theoretical knowledge to generate innovative financial models that add value to organizations, markets and/or the economic system, considering the complexity and uncertainty inherent to financial activities.
- Analyze business and financial information to diagnose and propose innovative business models and financial strategies in organizations that compete in globalized marketplaces, to improve their efficiency, sustainability and competitiveness.
- Use information technologies intensively, to diagnose, simulate and generate problems that compromise or endanger the competitiveness and/or sustainable development of organizations and to improve their financial management.
- Interact effectively and efficiently with individuals who have different cultural characteristics and work in organizations that operate in globalized settings.

### Target Audience

This program is designed for people with:

- The desire and capacity for conducting research and expanding the borders of knowledge in the fields of financial science.
- The discipline and intellectual curiosity to ask fundamental questions and conduct research that will contribute to creating and disseminating original, innovative knowledge and/or practices in the context of financial theory, management and economics.
- The intention of studying a program that will position them as opinion leaders and generators of trends of thought in the areas of finance and economics.

**DCF Ph. D. in Financial Science****Edition 2011**

| <b>First Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
|-------------------------|-------------------------------------------------------------|-----------|----------|-----------|
| AD4018                  | Business Policy, Ethics and Corporate Social Responsibility | 3         | 0        | 12        |
| GF5019                  | Research Proposal I                                         | 3         | 0        | 12        |
| MA4016                  | Calculus and Linear Algebra                                 | 3         | 0        | 12        |
| OP5062                  | Elective I                                                  | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>4</b>  |
| <b>Second Semester</b>  |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| FZ5024                  | Investment Theory                                           | 3         | 0        | 12        |
| GF5020                  | Research Proposal II                                        | 3         | 0        | 12        |
| MA4017                  | Probability and Statistics                                  | 3         | 0        | 12        |
| OP5063                  | Elective II                                                 | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Third Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| EO4009                  | Open Macroeconomics                                         | 3         | 0        | 12        |
| EO4011                  | Advanced Microeconomics                                     | 3         | 0        | 12        |
| GF5021                  | Research Proposal III                                       | 3         | 0        | 12        |
| OP5064                  | Elective III                                                | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Fourth Semester</b>  |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| FZ5002                  | Financial Information and Decision Making                   | 3         | 0        | 12        |
| FZ5026                  | Mathematics for Finance                                     | 3         | 0        | 12        |
| GF5022                  | Research Seminar I                                          | 1         | 0        | 4         |
| GF6027                  | Doctoral Research I                                         | 3         | 0        | 12        |
| OP5065                  | Elective IV                                                 | 3         | 0        | 12        |
|                         |                                                             | <b>13</b> | <b>0</b> | <b>52</b> |
| <b>Fifth Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| AD4020                  | Research Methodology                                        | 3         | 0        | 12        |
| GF6028                  | Doctoral Research II                                        | 3         | 0        | 12        |
| GF6029                  | Doctoral Research III                                       | 3         | 0        | 12        |
| OP5066                  | Elective V                                                  | 3         | 0        | 12        |
|                         |                                                             | <b>12</b> | <b>0</b> | <b>48</b> |
| <b>Sixth Semester</b>   |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GF5023                  | Research Seminar II                                         | 1         | 0        | 4         |
| GF5025                  | Assisted Research I                                         | 3         | 0        | 12        |
| GF6030                  | Doctoral Research IV                                        | 3         | 0        | 12        |
| GF6031                  | Doctoral Research V                                         | 3         | 0        | 12        |
|                         |                                                             | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Seventh Semester</b> |                                                             | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GF5026                  | Assisted Research II                                        | 3         | 0        | 12        |
| GF6032                  | Doctoral Research VI                                        | 3         | 0        | 12        |
| GF6033                  | Doctoral Research VII                                       | 3         | 0        | 12        |
|                         |                                                             | <b>9</b>  | <b>0</b> | <b>36</b> |

| <b>Eighth Semester</b> |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
|------------------------|------------------------|-----------|----------|-----------|
| GF5024                 | Research Seminar III   | 1         | 0        | 4         |
| GF5027                 | Assisted Research III  | 3         | 0        | 12        |
| GF6034                 | Doctoral Research VIII | 3         | 0        | 12        |
| GF6035                 | Doctoral Research IX   | 3         | 0        | 12        |
|                        |                        | <b>10</b> | <b>0</b> | <b>40</b> |
| <b>Ninth Semester</b>  |                        | <b>C</b>  | <b>L</b> | <b>U</b>  |
| GF6000                 | Doctoral Defense       | 0         | 0        | 1         |
| GF6036                 | Doctoral Research X    | 3         | 0        | 12        |
| GF6037                 | Doctoral Research XI   | 3         | 0        | 12        |
| GF6038                 | Doctoral Research XII  | 3         | 0        | 12        |
|                        |                        | <b>9</b>  | <b>0</b> | <b>37</b> |

---

*This Doctoral program requires a completed Master's Degree program.*

*At Tecnológico de Monterrey, an academic load of between 36 and 48 units per academic period is considered adequate for full-time graduate students. This program is offered in semestral periods and the expected completion timeframe is nine semesters*

- C Number of class hours per week
- L Number of laboratory hours or activities per week
- U Study hours that must be dedicated to the course (class hours included)

## Elective Courses

| <b>Code</b> | <b>Name</b>                  | <b>C</b> | <b>L</b> | <b>U</b> |
|-------------|------------------------------|----------|----------|----------|
| EO5020      | Time Series                  | 3        | 0        | 12       |
| FZ5025      | Econometrics                 | 3        | 0        | 12       |
| FZ5027      | Corporate Finance I          | 3        | 0        | 12       |
| FZ5028      | Corporate Finance II         | 3        | 0        | 12       |
| FZ5029      | Derivatives I                | 3        | 0        | 12       |
| FZ5030      | Derivatives II               | 3        | 0        | 12       |
| FZ5031      | Financial Risk Management I  | 3        | 0        | 12       |
| FZ5032      | Financial Risk Management II | 3        | 0        | 12       |
| FZ5033      | Computational Finance        | 3        | 0        | 12       |
| FZ5034      | International Finance        | 3        | 0        | 12       |
| MT5023      | Multivariate Analysis        | 3        | 0        | 16       |



## Course content by academic discipline

---

The description of the courses for all the undergraduate programs offers at Tecnológico de Monterrey is available in the Academic Vice-Rectorry official web site.

([http://sitios.itesm.mx/va/planes\\_de\\_estudio/catalogos.htm](http://sitios.itesm.mx/va/planes_de_estudio/catalogos.htm))

This catalogue presents information on the 2017 edition of the Graduate Curricula.  
Its content reflects the information available in official media as of March 2017.

Tecnológico de Monterrey reserves the right to amend the content at any time without prior notice,  
and shall be held harmless and free from any and all declared, implied or inferred liability arising  
from the information presented herein.

The electronic version of this publication is available on the Mi Espacio website(<https://miespacio.itesm.mx>)

Publisher: Academic Vice-Rector

500 copies were published and printing was completed in August 2017.

Instituto Tecnológico y de Estudios Superiores de Monterrey.

Ac. Eugenio Garza Sada 2501 Sur. C.P. 64849,  
Monterrey, Nuevo León, México.





