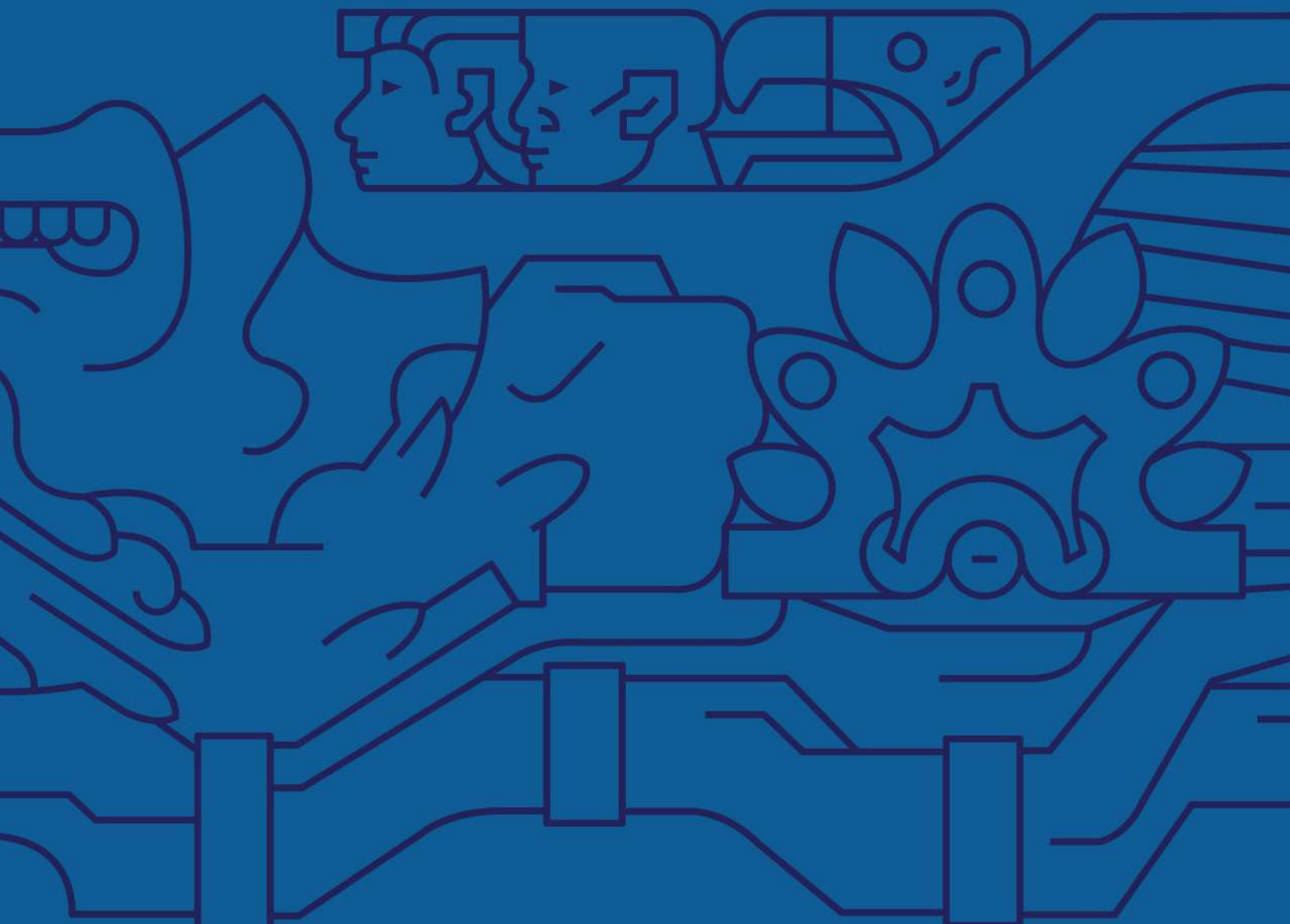


Graduate Programs Catalogue



TECNOLÓGICO
DE MONTERREY



GRADUATE PROGRAMS CATALOGUE

INSTITUTO TECNOLÓGICO Y DE ESTUDIOS SUPERIORES DE MONTERREY

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Publication by the Academic Vice-Rector.

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

Notice on the use of inclusive language

The use of the generic masculine or masculine of a collective nature seeks to simplify communication in consideration of the principle of economy of language. Grammatical gender (masculine, feminine) is normally associated with biological sex; however, grammatically there is no intention to discriminate against anybody for their biological sex or sexual identity. In the Spanish language, the use of a mixed collective of the masculine grammatical gender is not a discriminatory practice, but- its use- avoids unnecessary repetitions, permitting the employment of plain language, characterized by conciseness and clarity.

At Tecnológico de Monterrey, the prescripts contained in its regulations are formulated in generic masculine or masculine of a collective nature; consequently, they do not refer only to the masculine gender, but to all the genders that form part of the community.

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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/3_3EN.htm

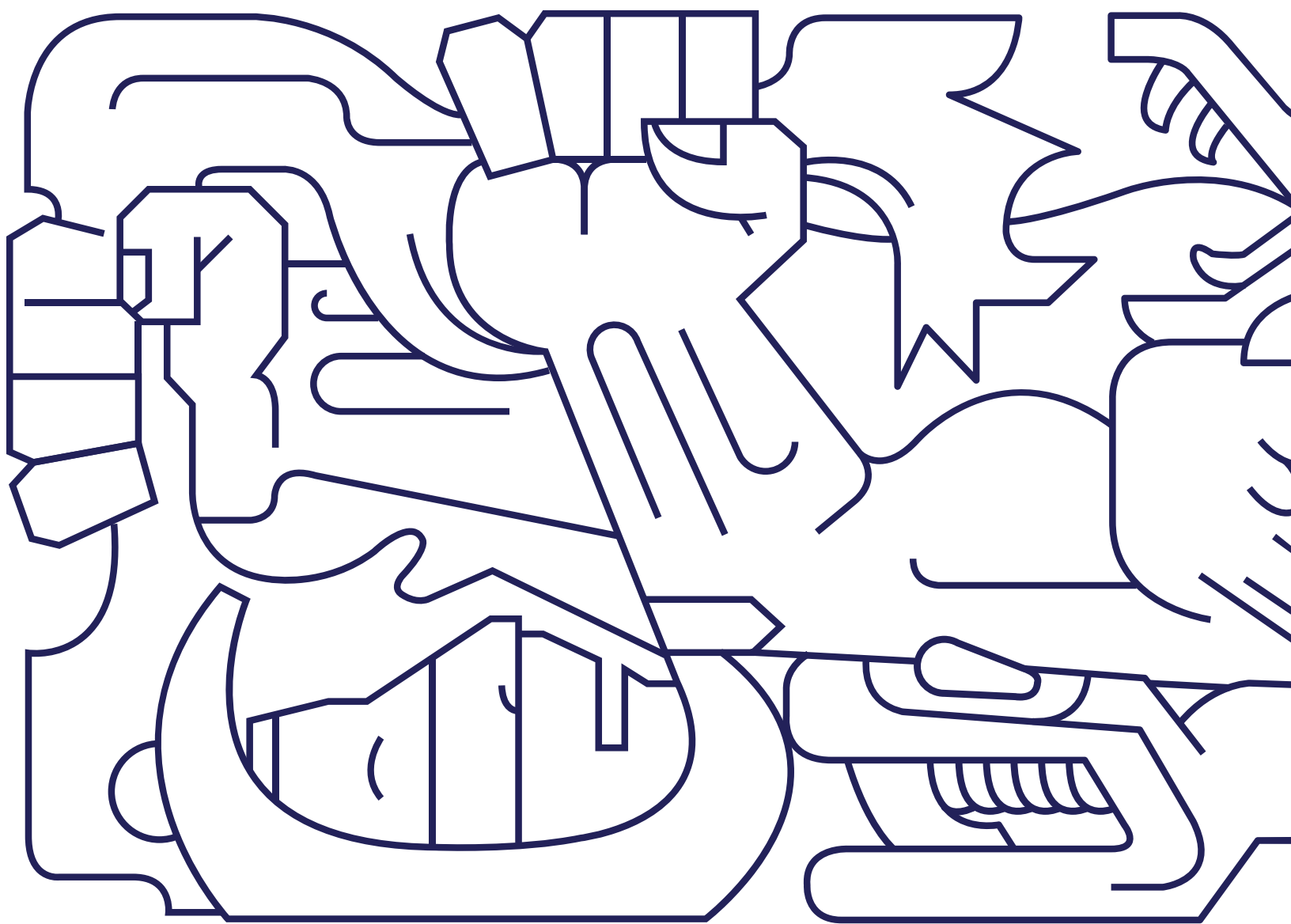
Mensaje del Rector del Tecnológico de Monterrey



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.

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 Garza Salazar
Rector del Tecnológico de Monterrey
Marzo 2019



I. EL 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

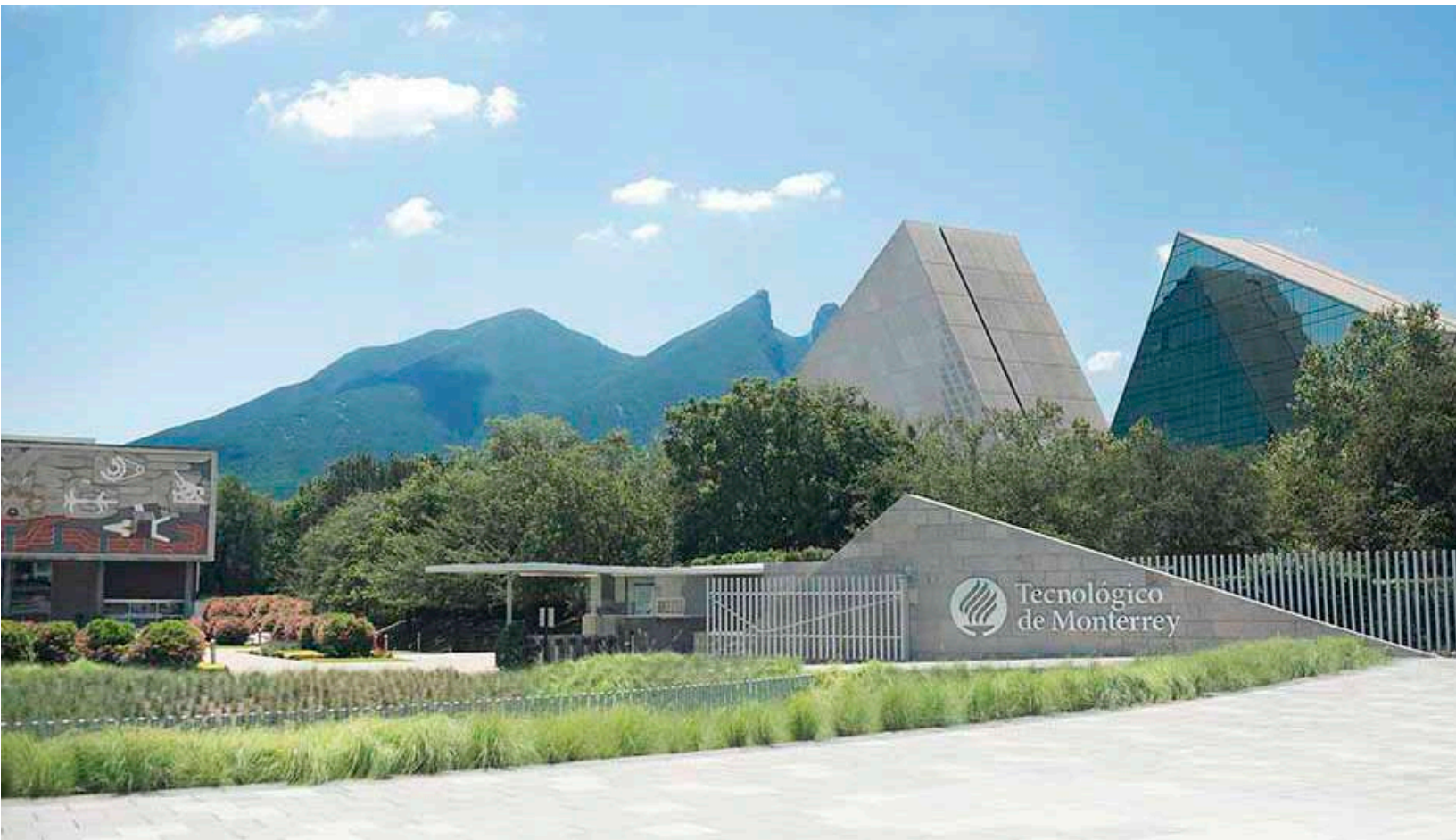
Monterrey to meet its objective of driving the development of communities and the nation.

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:

les acontecimientos históricos que distinguen a nuestra Institución.



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.

2017 David Garza Salazar, formerly the academic vice rector, was appointed as the new of Tecnológico de Monterrey, replacing David Noel Ramírez Padilla, who became Rector Emeritus.

2018 QS World University Rankings classifies Tecnológico de Monterrey as the top private university.

The progress of the fulfillment of Vision 2020 was reviewed and the five values that characterize and represent the Tecnológico de Monterrey community were identified.

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

In 2018, we identified five values that characterize and represent the Tecnológico de Monterrey community, and three behaviors for each of the values, which clarify their meaning and scope.

Tecnológico de Monterrey is guided by five values:

Innovation



We are passionate about disruption that generates value.

- We break paradigms, creating new opportunities for our publics.
- We are entrepreneurs, generating and realizing ideas that target the publics we serve.
- We support and recognize people so they can generate change, assume risks and learn from their mistakes.

Integrity



We exercise freedom with responsibility.

- We are congruent, act in good faith and reject unethical behaviors.
- We are responsible for our behaviors and our decisions are consistent with our principles and values.
- We manage the institution's resources with austerity and honesty.

Colaboration



Together, we fulfill the Vision.

- We foster and recognize collaborative, multidisciplinary work.
- We act rigorously, empowering people and eliminating the barriers that prevent us from collaborating.
- We prioritize collective over individual success-
Anteponemos el éxito colectivo por encima del individual.

Empaty and Inclusion



We always put people first.

- We take the time to listen to, understand, support and develop the members of our community.
- We respect people's dignity and value our community's diversity.
- We foment compassion and learn to live in harmony with our differences.

Global Citizenship



We work for a sustainable world.

- We are conscious citizens with a global outlook.
- We participate with solidarity to solve the problems of the world and the most vulnerable communities.
- We promote sustainable development to benefit future generations and the planet.

Visión

The world is changing at such an accelerated pace that Tecnológico de Monterrey must continue to evolve to fulfill its purpose. As a result, in 2018 the Board of Directors reviewed the progress and fulfillment of the Vision 2020 and defined the Vision 2030, as follows:

The Vision of Tecnológico de Monterrey is to drive in its community leadership, innovation and entrepreneurship for human flourishing.

Differentiators

The relevant characteristics that distinguish Tecnológico de Monterrey are:

1. The person at the center, to create a sustainable world.
2. Create research, innovation and entrepreneurship poles.
3. Be a platform for experiential and personalized learning.
4. Be a driver of the transformation of cities and communities.

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.

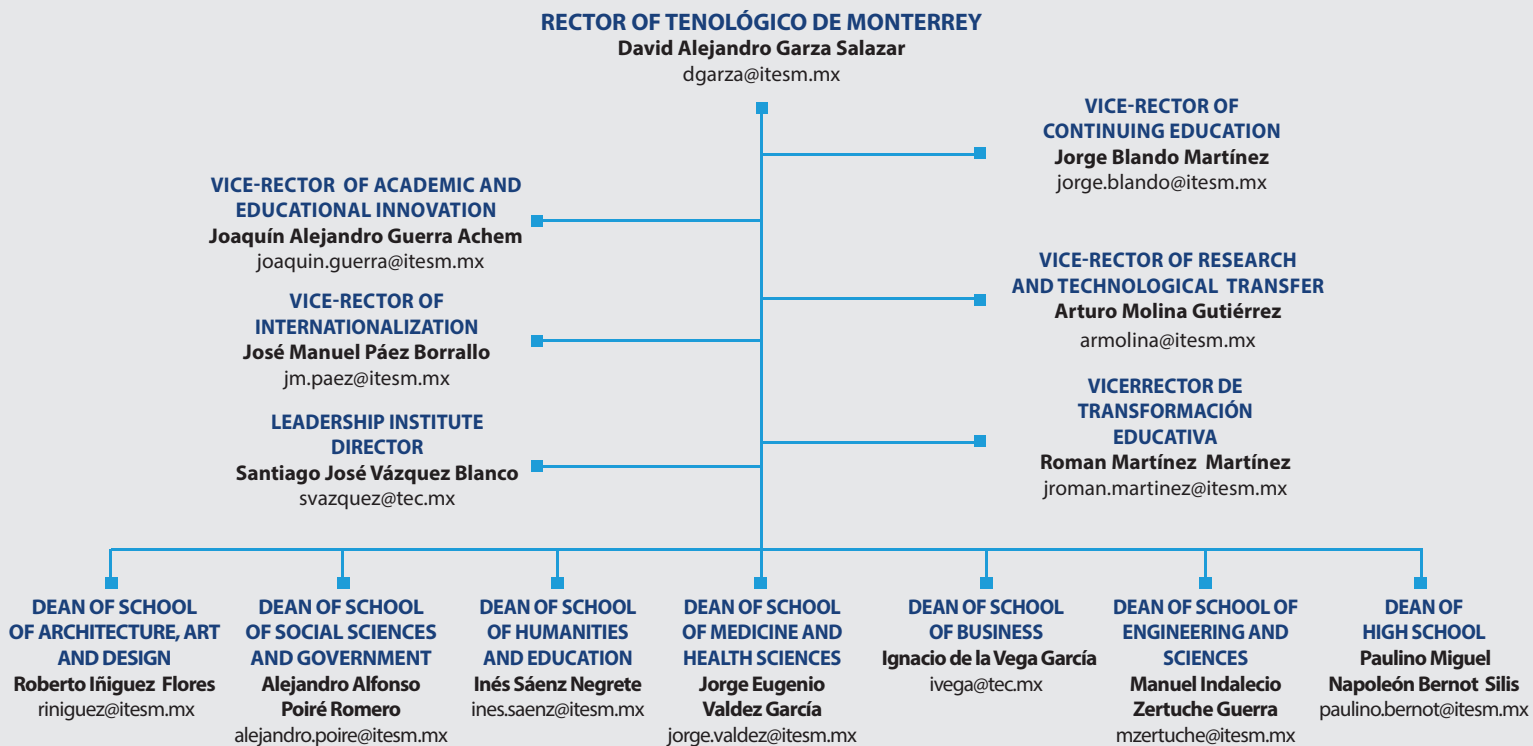


As members of the organization, we are committed to channeling our actions toward the common good and the transformation of our society. Thus, all the board members, directors, faculty, doctors and employees of the Tecnológico de Monterrey:

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 (SACSCOC, <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) Nacional

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) 5514-5514

Program Accreditations

a) National

During 2018, the following agencies recognized by the Council for the Accreditation of Higher Education (COPAES) accredited or maintained the accreditation of the undergraduate academic programs of Tecnológico de Monterrey at its different campuses:

- Association for the Accreditation and Certification of Social Sciences (ACCECISO)
- Mexican Committee for the Accreditation of Education in Agronomy (COMEAA)
- Accreditation Council for Engineering Education (CACEI)
- Accreditation Council for Accounting and Business Administration Education (CACECA)
- Accreditation Council for Education and Research in Psychology (CNEIP)
- National Accrediting Agency for Architecture Programs and Habitable Space Disciplines (ANPADEH)
- Mexican Accreditation Council for Medical Education (COMAEM)
- Mexican Council for the Accreditation of Design Programs (COMAPROD)
- National Accreditation Council for Informatics and Computing (CONAIC)
- Accreditation Council for Communication (CONAC).

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

School	Program	Description
Social Sciences and Government	DPP	Ph. D. in Public Policy
	MAP	Master in Public Administration and Public Policy
	MPE	Master in Prospective and Strategic Studies
Humanities and Education	DEE	Ph. D. in Educational Innovation
	DEH	Ph. D. in Humanistic Studies
	MEE-V	Master in Education (On line Program)
	MEH	Master in Humanistics Studies
	MTE-V	Master in Educational Technology (On line Program)
Engineering and Sciences	DBT	Ph. D. in Biotechnology
	DCC	Ph. D. in Computer Sciences
	DCI	Ph. D. in Engineering Sciences
	DNT	Ph. D. in Nanotechnology
	MBI	Master of Science in Biotechnology
	MCC-I	Master of Science in Computer Science
	MCI	Master of Science in Engineering
	MCP	Master of Science in Quality Systems and Productivity
	MIE	Master of Science in Energetic Engineering
	MIT	Master of Science in Intelligent Systems
	MIR	Master in Automotive Engineering
	MNT	Master in Nanotechnology
	MSE-E	Master in Science in Electronic Engineering (Electronic Systems)
	MEM	Master in Engineering Management
	MSM	Master of Science in Manufacturing Systems
Medicine and Health Science	DBC	Ph. D. in Biomedical Sciences
	DCL	Ph. D. in Program in Clinical Sciences
	MBC	Master in Biomedical Sciences
	RAP	Residency in Anatomic Pathology
	RCA	Residency in Health Care Quality
	RCR	Residency in Cardiology
	REA	Residency in Anesthesiology
	REC	Residency in General Surgery

School	Program	Description
Medicine and Health Science	REE	Residency in Critical Care Medicine
	REG	Residency in Obstetrics and Gynecology
	REM	Residency in Internal Medicine
	REN	Residency in Pediatrics
	REO	Residency in Ophthalmology
	RER	Residency in Radiology and Imaging
	REU	Residency in Neurology
	RGE	Residency in Geriatrics
	RNE	Residency in Neonatology
	RNP	Residency in Pediatric Neurology
	RPS	Residency in Psychiatry
	RUR	Residency in Urology
Business	DCA	Ph. D. in Business Administration
	MAF	Master in Finance
	MBA	Master in Business Administration
	MGN-V	Master in Enterprise Administration (On line Program)

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. 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.

This means that the most important accrediting agencies in the world for business schools and programs, the American Association of Colleges and Schools (AACSB), the Association of MBAs (AMBA), and the European Association of Business Schools (EQUIS), certify the quality of EGADE Monterrey's graduate programs in business administration that have been accredited by international agencies, during 2018 year.

Graduate Programs Accredited by International Agencies, by Campus

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
	MBA-I	Master in Business Administration	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
Telephone: (+44) 0 20 7246 2657

The updated information on the institutional accreditations and academic programs of Tecnológico de Monterrey is available on the institutional website: : <http://www.itesm.edu>, following the path Nosotros-Acreditaciones.



Campus Directory

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

Aguascalientes Campus

Campus Director:

Dr. Agustín Mateo Arredondo Corrales

agustin.mateo@tec.mx

Av. Eugenio Garza Sada # 1500

Aguascalientes, Aguascalientes, C.P. 20328

Telephone: +52 (449) 910-0900

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

Central de Veracruz Campus

Campus Director:

Dr. Rafael Antonio Comonfort Tirado

rcomonfo@tec.mx

Av. Eugenio Garza Sada # 1

Col. Las Quintas

Córdoba, Veracruz, C.P. 94500

Telephone: +52 (271) 717-0500

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

Chiapas Campus

Campus Director:

Manuel de Jesús Villalobos García

mvillalobos@tec.mx

Carretera Tapanatepec Km. 149 + 746

Col. Juan Crispín

Tuxtla Gutiérrez, Chiapas, C.P. 29020

Telephone: +52 (961) 617-6000

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

Chihuahua Campus

Campus Director:

Dr. Rodolfo Julio Castillo Zetina

rodolfo.castello@tec.mx

Av. Heróico Colegio Militar # 4700

Col. Nombre de Dios

Chihuahua, Chihuahua., C.P. 31300

Telephone: +52 (614) 439 5000

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

Ciudad de México Campus

Vice President and Campus Director:

Dr. Rashid Abella Yunes

rabella@tec.mx

Calle del Puente # 222, esq. Periférico Sur

Col. Ejidos de Huipulco, Delegación Tlalpan

México, D.F., C.P. 14380

Telephone: +52 (55) 5483-2020

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

Ciudad Juárez Campus

Campus Director:

Primitivo Javier Taboada Herrero

toboada@tec.mx

Bldv. Tomás Fernández Campos # 8945

Parque Industrial Antonio J. Bermúdez

Ciudad Juárez, Chihuahua, C.P. 32470

Telephone: +52 (656) 629-9100

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

Ciudad Obregón Campus

Campus Director:

Roberto Soto Soto

robertosoto@tec.mx

California # 2100 Nte.

Col. Obregón Norte

Ciudad Obregón, Sonora, C.P. 85010

Telephone: +52 (644) 410-5700

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

Cuernavaca Campus

Campus Director:

José Antonio Moya Peredo

jamoya@tec.mx

Autopista del Sol Km 104

Col. Real del Puente

Xochitepec, Morelos, C.P. 62790

Telephone: +52 (777) 362 0800

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

Estado de México Campus**Vicepresidente de la Región Ciudad de México y****Campus Director:****Dra. Verónica Pedrero Padilla***vpedrero@tec.mx*

Carretera Lago de Guadalupe Km. 3.5

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

Telephone: +52 (55) 5864-5555

<http://www.cem.itesm.mx>**Guadalajara Campus****Vicepresidente de la Región Occidente y****Campus Director:****Dr. Mario Adrián Flores Castro***adrian.flores@tec.mx*

Ave. Gral. Ramón Corona # 2514

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

Telephone: +52 (33) 3669-3000

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

Blvd. Felipe Ángeles # 2003, Col. Venta Prieta

Pachuca, Hidalgo, C.P. 42080

Telephone: +52 (771) 717-02-14

<http://www.hgo.itesm.mx>**Irapuato Campus****Campus Director:****Marcela de Fátima Beltrán Russell***marcela.beltran@tec.mx*

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

Irapuato, Guanajuato, C.P. 36670

Telephone: +52 (462) 606-8000

<http://www.ira.itesm.mx>**Laguna Campus****Campus Director:****Carlos Bejos Acebo***cbejos@tec.mx*

Paseo del Tecnológico # 751

Col. Ampliación la Rosita

Torreón, Coahuila, C.P. 27250

Telephone: +52 (871) 729-6363

<http://www.lag.itesm.mx>**León Campus****Campus Director:****Juan Carlos Arreola Rivas***juan.carlos.arreola@tec.mx*

Av. Eugenio Garza Sada S/N

Col. Cerro Gordo

León, Guanajuato, C.P. 37190

Telephone: +52 (477) 710-9000

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

Av. Eugenio Garza Sada #2501 Sur

Col. Tecnológico

Monterrey, Nuevo León, C.P. 64849

Telephone: +52 (81) 8358-2000

<http://www.mty.itesm.mx>**Morelia Campus****Campus Director:****Master Octavio Díaz Barriga Guizar***odiaz.barriga@tec.mx*

Camino a Jesús del Monte S/N

Col. Jesús del Monte

Morelia, Michoacán, C.P. 58350

Telephone: +52 (443) 322-6800

<http://www.cmr.itesm.mx>**Puebla Campus****Campus Director:****Dr. Pedro Luis Grasa Soler***grasa@tec.mx*

Vía Atlíxcayotl # 2301

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

Telephone: +52 (222) 303-2000

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

Av. Epigmenio González # 500

Fraccionamiento San Pablo

Querétaro, Querétaro, C.P. 76130

Telephone: +52 (442) 238-3100

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

Saltillo Campus**Campus Director:****Dr. Gilberto Tomás Armienta Trejo***garmienta@tec.mx*

Prol. Juan de la Barrera # 1241 Ote.

Col. Cumbres

Saltillo, Coahuila, C.P. 25270

Telephone: +52 (844) 411-8000

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

Av. Eugenio Garza Sada # 300

Fracc. Lomas del Tecnológico

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

Telephone: +52 (444) 834-1000

<http://www.slp.itesm.mx>**Santa Fe Campus****Campus Director:****Karla Jeanire Vargas Díaz***kvargas@tec.mx*

Ave. Carlos Lazo # 100

Col. Lomas de Santa Fe,

Delegación Álvaro Obregón

México, D.F., C.P.01389

Telephone: +52 (55) 9177-8000

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

Blvd. Pedro Infante # 3773 Pte.

Culiacán, Sinaloa, C.P. 80100

Telephone: +52 (667) 759-1600

<http://www.sin.itesm.mx>**Sonora Norte Campus****Campus Director:****Dra. Claudia Margarita Félix Sandoval***c.felix@tec.mx*

Blvd. Enrique Mazón López # 965

Hermosillo, Sonora, C.P. 83000

Telephone: +52 (662) 259-1000

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

Blvd. Petrocel Km. 1.3 Puerto Industrial

Altamira, Tamaulipas, C.P. 89600

Telephone: +52 (833) 229-1600

<http://www.tam.itesm.mx>**Toluca Campus****Campus Director:****Dr. Francisco Javier Quezada Andrade***jquezada@tec.mx*

Eduardo Monroy Cárdenas # 2000

San Antonio Buenavista

Toluca, Estado de México, C.P. 50110

Telephone: +52 (722) 279-9990

<http://www.tol.itesm.mx>**Zacatecas Campus****Campus Director:****Alfredo de Alba Ramírez***adealba@tec.mx*

Ave. Pedro Coronel # 16

Col. Dependencias Federales

Guadalupe, Zacatecas, C.P. 98600

Telephone: +52 (492) 925-6820

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

Educational Model Tec 21

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, leading to the analysis and proposal of answers to complex real-world and business-environment issues. Some of these teaching techniques are: Collaborative Learning, Problem-Based Learning, Project-Oriented Learning, Case Method, Service-Learning and Inquiry-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 TEC21 Initiative, our educational model adapts to the new times, seeking to drive the skills of the current generations to promote in their communities leadership, innovation and entrepreneurship for human flourishing.

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 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 and 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; acting with solidarity and responsibility to enhance the quality of life of the country and the world. Tecnológico de Monterrey's comprehensive education is based 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 an 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.

Internacionalization

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, one intensive course 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 satellite sessions or online courses.
- Participation in projects conducted in association with groups of students from foreign universities through the facilities offered online.
- 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

The Tecnológico de Monterrey Library (<http://biblioteca.tec.mx>) seeks to inspire our students, faculty, collaborators and alumni in a flexible, open and pleasant meeting point, while assuring access to information and driving the interdisciplinary generation of knowledge. Its objective is to contribute to learning, co-creation, innovation and investigation, fostering academic liaison and collaboration, while building memorable experiences.

The Library incorporates a system comprised of 46 on-campus libraries and a national library office. This system works under a collaboration model that makes it possible to integrate a network of library services for three education levels: High School, Undergraduate, and Graduate and Research.

Through the collection development program, the Tecnológico de Monterrey Library offers over 5 million volumes (2.5 million print and 2.8 million digital volumes), including articles, books, encyclopedias, videos, and journals and magazines that cover all the areas of knowledge in which the institution offers academic programs. In addition, every year the library system trains more than 70% of new students in information management skills development; receives over 15 thousand requests for attention, instruction and reference services to accompany our students in their learning process; and manages more than 1 million loan requests for print and digital books.

◆ Online Programs

The Schools offer graduate programs through the Office of 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 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.

◆ Vocational Guidance

A vocational guidance program run by expert specialists is available to students at the Tecnológico de Monterrey campuses upon request. The objec-

tive of this service is to provide high school and undergraduate students with the tools for making decisions regarding their life and career plans, such as choosing which major they are going to study, deciding whether to change majors or if they have doubts about continuing at the Institution. Students can take tests in this space to identify the skills, interests and personality characteristics that coincide with the professional profiles of the different degree programs and which are important components in this decision-making process.

◆ 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:

- Contact the program director
- Register and complete the online application form
- Schedule and take the Graduate Admission Test (PAEP)
- Complete the admission file
- Once admitted, confirm enrollment

For further details on the graduate 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.

Tecnológico de Monterrey recognizes the results of the official examinations by area of knowledge of the International Baccalaureate

(IB) and of the Advanced Placement Program (AP), for undergraduate course credit transfer.

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, students with Academic Support standing will be dismissed for unsatisfactory academic performance if they:

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.

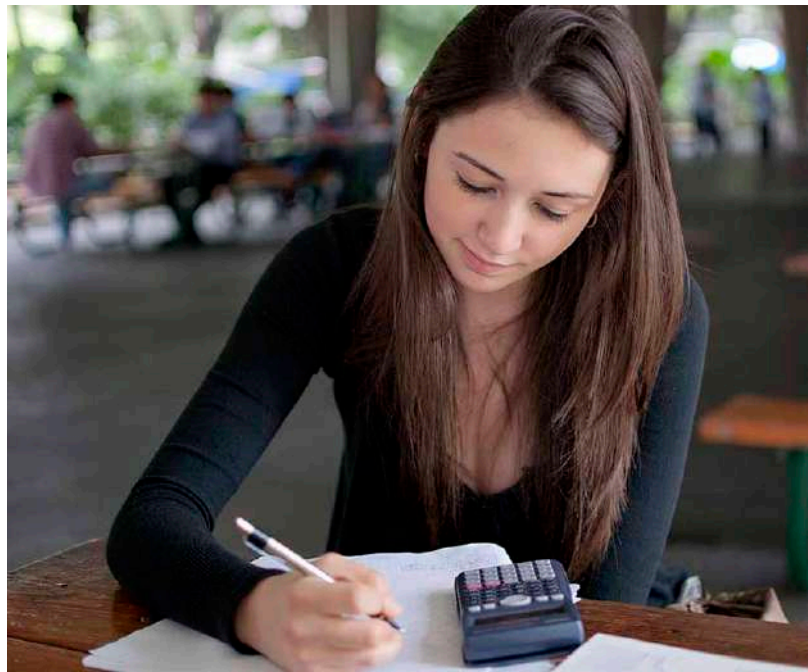
2. Obtain final grades lower than seventy-five in two or more classes (or the equivalent) in the specialization curriculum in which they are enrolled (or in 32% or more of the total work required by the curriculum), or in three or more classes in the case of master's, medical residency or doctoral programs.

Graduation

In order to obtain a specialization diploma, master's degree, medical residency or doctoral degree at Tecnológico de Monterrey, students must have:

1. Fulfilled, in accordance with the regulations in effect, the preliminary academic requirements for the corresponding curriculum, by means of the relevant placement tests, proficiency exams or remedial courses.
2. Obtained a bachelor's degree – preceded by a high school diploma or the equivalent – that is equivalent to those offered by Tecnológico de Monterrey.
3. Completed all the courses of the curriculum in question, either by passing all the courses at Tecnológico de Monterrey, or obtaining revalidation or equivalency agreements – consistent with the corresponding regulations – for the courses studied at other institutions, and passing the remaining courses at Tecnológico de Monterrey. Courses studied at foreign universities with which an agreement has been signed will be considered, for the purposes of this article, as having been studied at Tecnológico de Monterrey, as long as they do not exceed a specific percentage of the curriculum stipulated for each program in particular.
4. Obtained a final grade average for all the courses included in the curriculum equal to or higher than 80. In order to calculate this average, all the courses completed corresponding to the student's curriculum will be taken into consideration. Therefore, preliminary or remedial courses and those passed by means of proficiency tests are excluded from the final grade average calculation.
5. Completed, when stipulated in the curriculum, a research project or thesis that has been presented and passed in an exit exam before an academic jury. The result of this exit exam will be recorded in the student's records by means of a certificate signed by the corresponding academic jury.
6. Studied at Tecnológico de Monterrey at least the equivalent of the second half of the corresponding curriculum, in the case of students who have obtained revalidation or equivalency agreements for this level. This rule can be flexible in the case of graduate programs that are created in conjunction with other universities by means of an agreement.
7. Published or had accepted for publication, in the case of doctoral programs, at least one scientific product of the research project completed for the doctoral thesis. The scientific product or products are defined by each School.

Students must have fulfilled all the academic requirements for graduating from the graduate program in which they are enrolled within the time limit defined for the corresponding program. This time limit should be no more than double the duration of the program, considering a full academic load. When students exceed this time limit, a faculty committee, appointed by the Associate



Academic Dean of the corresponding School, will assess, as of that time and in each subsequent academic period, students' performance, based on their academic record, progress and potential for completion, and will determine their possible continuance in the program. Students who, according to the committee's decision, cannot continue in the program will not be considered as having academic dismissal standing and can apply for admission to another program at the Institute.

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 side. (<http://Tec.mx/>)

Financial Aid and Scholarships

Tecnológico de Monterrey two types of financial aid: scholarships and tuition agreements.

The types of financial aid that can be awarded to students are as follows:

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

For professionally-oriented master's programs, the maximum aid offered is 30% of tuition fees. In the case of scientific graduate degrees, financial 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 graduated from an undergraduate degree at Tecnológico de Monterrey. The financial aid covers 100 % of tuition.

Online program scholarship. The aim of this scholarship is to support academically outstanding students to study online master's programs. The maximum aid offered is 40% of tuition fees.

Scholarship from external funds. The aim of this type of aid is to give students the opportunity to gain experience in their field of study, connect them with strategic areas of industry and the public or private sectors, or prepare them to be future researchers through their incorporation into a project with external funds under the responsibility of a research professor. This financial aid can cover a percentage of tuition fees, living expenses 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. Architecture
- II. Biotechnology
- III. Humanities and Education
- IV. Mechatronics
- V. Medicine
- VI. Business
- VII. Public politics y Social Sciences
- VIII. Information Technologies, Electrónica and Communications
- IX. Sustainable Technologies

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 43 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 megatrends. 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 43 strategic focus groups enjoy the participation of 12 international and national leaders, 714 professors, 460 doctoral students and 79 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 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.

For further information:
<https://tec.mx/es/investigacion>

Of the more than 1,745 faculty members who teach the master's and doctoral students at Tecnológico de Monterrey, 570 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 11 doctoral programs, 34 master's programs, 5 specializations and 17 medical residencies, 70% 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 17 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 first period of 2019 enrollment was: 398 doctoral students, 101 specialization students, 278 medical residency students, and 5400 face-to-face and online master's students. Approximately

1,779 graduate students enjoy a maintenance grant awarded by the National Council for Science and Technology (CONACyT).

Researchers, together with students who participate in research projects, underpin the Patent Program, which, between 2005 and 2018, has accumulated 354 patent applications in Mexico, of which 131 were granted in Mexico, 22 in other countries in America, and 11 in Asia, Africa, Europe and Oceania. Regarding licenses and spinoff development, during 2018, Tecnológico de Monterrey achieved 21 licenses in progress and 3 granted, and 7 spinoffs generated and 3 in progress.

Without doubt, research at Tecnológico de Monterrey fosters our students' learning, supports our faculty's intellectual activities, and generates the knowledge and innovative solutions demanded by society. The impact of these activities is reflected in global rankings, with Tecnológico de Monterrey ranked 178th in the QS World University Ranking 2019, 6th in the QS Latam ranking 2019, and 52nd in the QS Graduate Employability ranking 2019. Moreover, Tec de Monterrey has maintained QS five-star rating for 2019. Quacquarelli Symonds is one of the most prestigious ranking agencies in the world.



Tecnológico de Monterrey is:

#178

in the world

#67

for employers

#30

private university
in the world

#1

private
university in
Mexico

#5

in Latinoamérica in
the QS Latin American
Universities Ranking

— QS world University Rankin —

EGADE Business School is
#1
in the **QS Global
MBA Rankings and Eduniversal Ranking**

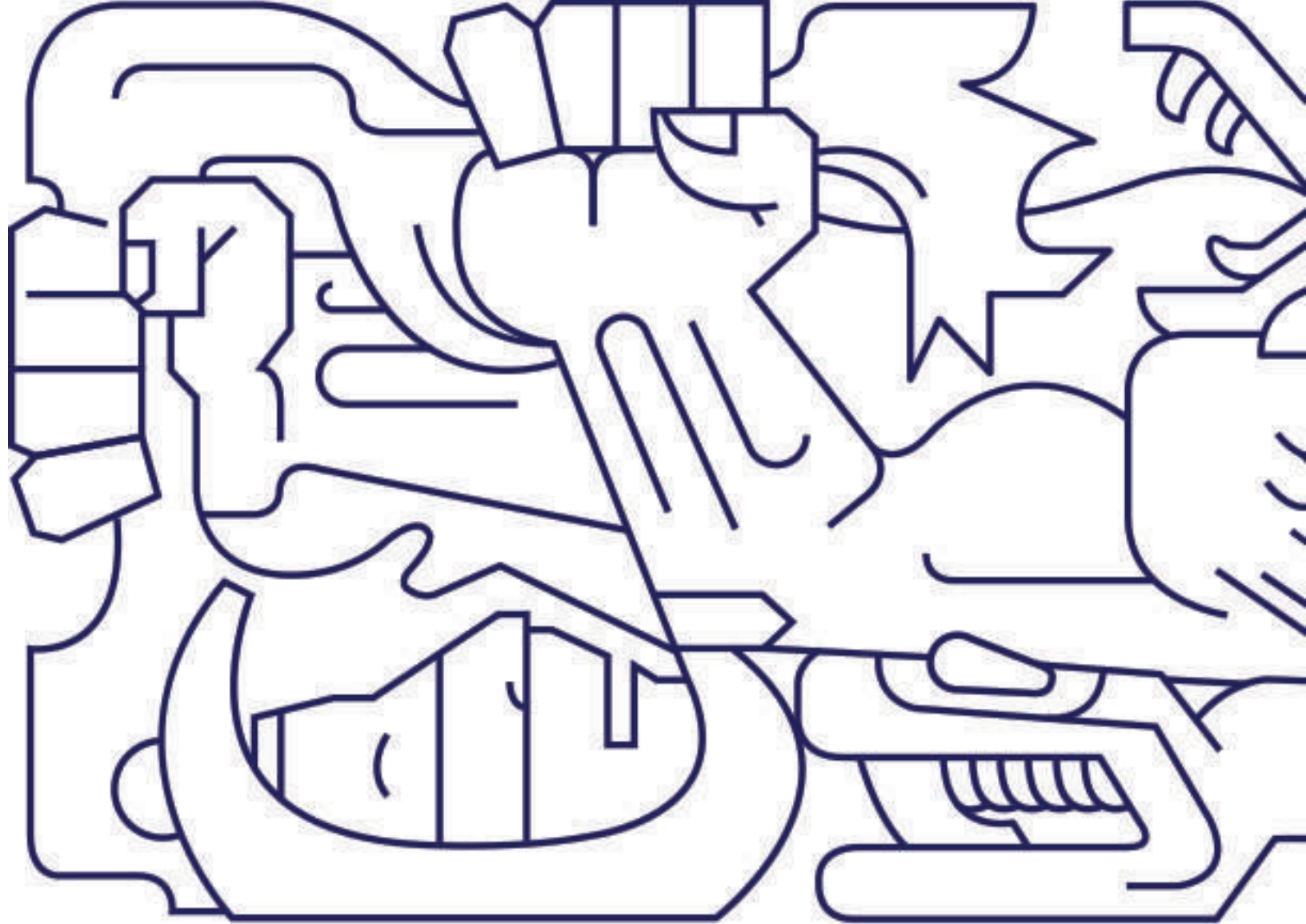
We have been recognized as
#10
in **entrepreneurship on the global level**
in The Princeton Review ranking, the
only university outside the United States.

49%
of our students are
awarded a **scholarship
or financial aid**

To support social mobility,
12%
of our students are
first-generation
college students

Every year, more than
10,500
students study
abroad for an
academic period

As a result,
56%
de nuestros alumnos se
gradúen con **experiencia
Internacional**



II. CURRICULA

Master's Programs Offered 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	MTE-V	MTO	
Ciudad de México							X			1
Monterrey							X		X	1
Monterrey - EGTP	X	X		X	X					4
Programa en Línea			X			X		X		3
Santa Fe - EGTP	X	X		X						3
Total	2	2	1	2	1	1	2	1	1	12

Campus/Program	School of Engineering and Sciences											TOTAL
	Engineering											
	MBI	MCI	MCY	MEM	MER-V	MID-V	MIE	MIP-V	MIR	MNT	MSM	
Ciudad de México		X										1
Estado de México				X						X		2
Guadalajara			X	X								2
Monterrey	X	X	X	X			X			X	X	7
On line program					X	X		X				3
Santa Fe			X									1
Toluca									X			1
Total	1	2	3	3	1	1	1	1	1	2	1	17

Campus/Program	School of Engineering and Sciences				School of Medicine and Health Science	TOTAL
	Tecnologías de Información y Electrónica					
	MCC	MCC-I	MSE-E	MTI-V	MBC	
Estado de México		X				1
Guadalajara	X		X			2
Monterrey		X			X	2
On line program				X		1
Total	1	2	1	1	1	6

The "x" means that the career's offered complete in that Campus.. SA number means that the career's offered in the Campus up to the semester that the number indicates. . Note: Its content reflects the information available in official media as of april de 2019

Master's Programs Offered Each Campus Part 2

Campus/Program	School of Business									TOTAL
	MAF-V	MAF	MBA	MBA-G	MBA-I	MBA-V	MBE	MBM	MGN-V	
Guadalajara			X					X		2
On line Program	X								X	2
Sede EGADE Monterrey		X	X	X		X	X	X		6
Sede EGADE Santa Fe		X	X		X					3
Total	1	2	3	1	1	1	1	2	1	13

Specialization Programs Offered Each Campus

Campus/Program	School of Humanities and Education	School of Business	School of Engineering and Sciences			TOTAL
	EGE-V	EAE	EIS	ELS	EPY	
Ciudad de México			X	X	X	3
Estado de México			X	X	X	3
Programa en Línea	X					1
Santa Fe				X	X	2
Sede EGADE Monterrey		X				1
Sede EGADE Santa Fe		X				1
Toluca			X	X	X	3
Total	1	2	3	4	4	14

The "x" means that the career's offered complete in that Campus.. SA number means that the career's offered in the Campus up to the semester that the number indicates. . Note: Its content reflects the information available in official media as of april de 2019

Doctorate Programs Offered Each Campus Parte 3

Campus/Program	School of Social Sciences and Government	School of Humanities and Education		School of Engineering and Sciences				TOTAL
	DPP	DEE	DEH	DBT	DCC	DCI	DNT	
Ciudad de México			X			X		2
Estado de México					X	X	X	3
Monterrey		X	X	X	X	X	X	6
Monterrey - EGTP	X							1
Santa Fe - EGTP	X							1
Total	2	1	2	1	2	3	2	13

Campus/Program	School of Medicine and Health Science		School of Business		TOTAL
	DBC	DCL	DCA	DCF	
Monterrey	X	X			2
Sede EGADE Monterrey			X		1
Sede EGADE Santa Fe			X	X	2
Total	1	1	2	1	5

Campus Monterrey offers all Residencies Programs.

The "x" means that the career's offered complete in that Campus.. SA number means that the career's offered in the Campus up to the semester that the number indicates. . Note: Its content reflects the information available in official media as of april de 2019

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: www.itesm.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	CL – L – U– CA
MA4005	Applied Statistics	3 – 0 – 12 - 3

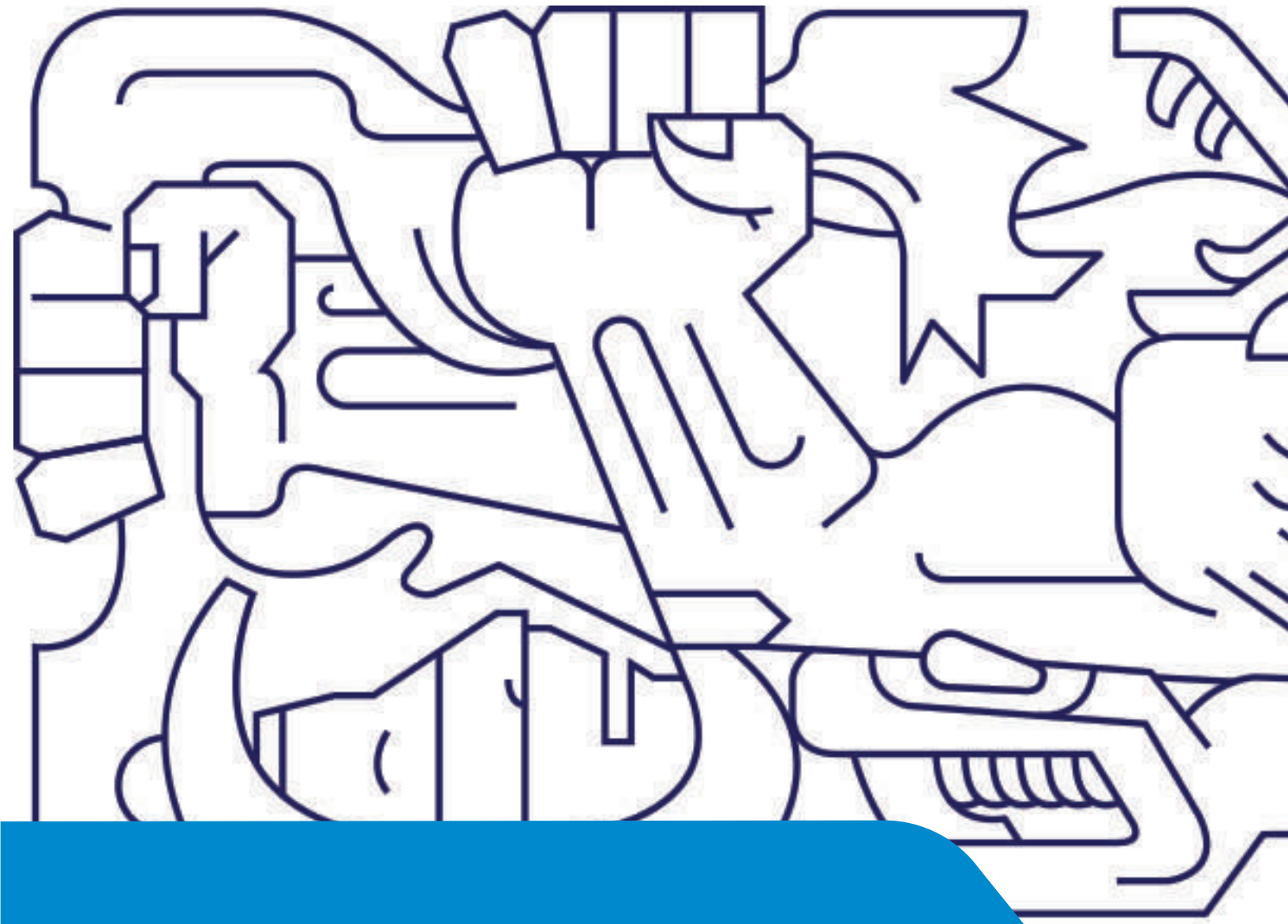
The letters of the code indicate the discipline to which the course belongs; In the example, the letters MA indicate that the course corresponds to the discipline Mathematics. Financial and Administrative Accounting.

The letters “CL” indicates the number of class-hours per week.

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

The letter “U” represents the weekly time that the student dedicates to fulfill the objectives of the course. It includes class-hours and students’ independent work. The letters “CA” represents the number of semester credit hour of the course.

In this case, the course Applied Statistics consist of 3 class hours per week, 0 hour of supervised learning activities or laboratory. 12 horas represents the weekly of the course, includes class-hours and students’ independent work, 3 academic unit.



School of
Social Sciences
and Government

MAP Master in Public Administration and Public Policy

Justification

One of the priority areas established by the Mission of Tecnológico de Monterrey is the issue of public policy and public administration. In this context, the Master in Public Administration and Public Policy (MAP) has a perfect relationship with the strengthening of this area. Since the program seeks to contribute to society with the transformation of the public and to improve the participation of governmental and non-governmental actors in the analysis, design, implementation and evaluation of more and better public policies in different levels of government and in its three powers.

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.

Profile of the graduate

On completing their studies, the graduate 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

The Master in Public Administration and Public Policy is aimed at all those professionals in the fields of economics, public administration, political science, international relations, law and other disciplines related to social sciences, committed to their environment and willing to contribute towards developing of Mexico and the world through the formulation, design, analysis, implementation and evaluation of public policies.

Specially, the program promotes the participation of:

- Public officials from different levels of government interested in knowing more about public administration and public policy areas.
- 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
Plan 2017**

First Trimester

Code	Name	CL	L	U	CA
AP4028	Political Science for Public Policy	3.5	0	12	3
AP4029	Analysis and Implementation of Public Policy	3.5	0	12	3
NB4008	Quantitative Methods in Social Sciences	3.5	0	12	3
		10.5	0	36	9

Second Trimester

Code	Name	CL	L	U	CA
AP4030	Public Finance and Budgeting	3.5	0	12	3
EO4002	Microeconomics	3.5	0	12	3
NB4007	Leadership and Ethics for Civil Service	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
AP4031	Law Applied to Public Policy	3.5	0	12	3
EO4015	Macroeconomics	3.5	0	12	3
OP5053	Elective I	3.5	0	12	3
		10.5	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
AP4032	Strategic Management of Public Organization	3.5	0	12	3
AP5018	Integrative Project I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		10.5	0	36	9

Fifth Trimester

Code	Name	CL	L	U	CA
AP5019	Integrative Project II	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		7	0	24	6

CL The letter "CL" indicates the number of class-hours per week. L The letter "L" indicates the number of laboratory-hours per week.
 U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
 CA The letters "CA" represents the number of semester credit hour of the course.

MDI Master in International Law

Justification

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 their studies, graduates 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

- Law, Economics, International Relations, International Trade and Political Science graduates who are interested in international transactions and the related laws.
- Lawyers from public institutions and private enterprise.
- Specialists in international logistics and imports and exports.
- Partners or associates in consultancy offices and firms.
- Company executives involved in international transactions.
- Mid- and high-level public officials from municipal, state and federal governments.
- People interested in participating in international organizations.
- Legal advisors and analysts.
- Private-sector professionals who want to specialize in government-enterprise relations.
- Faculty related to Law.

Research areas

- International dispute resolution.
- Economic and political relations between Europe and other regions of the world, delving into ethics, international relations, cooperation and investment.
- Relationship of the national and international framework with competitiveness, particularly regarding international trade and investment.
- Promotion and regulation of foreign investment in Mexico and the world.

**MDI Master in International Law
Plan 2009**

First Semester

Code	Name	CL	L	U	CA
DI4021	International Regulation of Trade	3	0	12	3
NB4001	Leadership and Ethics in the Exercise of Public Service	3	0	12	3
NB4005	Legal Research and Writing in English	3	0	12	3
		9	0	36	9

Second Semester

Code	Name	CL	L	U	CA
DI4022	Principles of International Public Law and Conflicts Resolution	3	0	12	3
DI4023	International Law of Human Rights	3	0	12	3
OP5042	Elective I	3	0	12	3
		9	0	36	9

Third Semester

Code	Name	CL	L	U	CA
DI4024	International Contractual Law	3	0	12	3
DI4025	International Arbitration and Litigation	3	0	12	3
OP5043	Elective II	3	0	12	3
		9	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
DI4026	Advanced Topics of International Law	3	0	12	3
DI5001	Applied Research Project	3	0	12	3
OP5044	Elective III	3	0	12	3
		9	0	36	9

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 CA The letters "CA" represents the number of semester credit hour of the course.

MGP-V Master in Public Management

Justificatio

The program emerged from the objective of professionalizing public officials in the diverse government branches in Mexico and all the other countries in Latin America. The political transformation processes taking place in Mexico and other countries have led to the need for highly trained government officials who have a profound sense of ethics in their endeavor to achieve effective public management. In order to guarantee effectiveness and legitimacy in public management, it must be strengthened through a set of methodologies and instruments that will provide public officials with the advanced tools and knowledge required to foment improved governability.

Learning outcomes

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.

Target audience

- Mid- and high-level public officials from federal, state and municipal governments.
- Officials and specialists who want to improve their analytical skills and capacities to make decisions related to local public management.
- People who are interested in participating in popularly elected positions in the diverse areas of government in the executive and legislative branches.
- Leaders and collaborators of political parties and non-government organizations, to strengthen their planning and decision-making processes.
- Professionals who analyze government actions.
- Professionals from the private sector who want to learn more about public administration.

Research areas

- Legal, political and financial aspects of local public administration.
- Public policy planning and management.
- Participation of civil society in government decision-making.
- Effective, efficient development of social programs.
- Leadership and ethics in public management.

MGP-V Master in Public Management (On line Program)
Plan 2009

First Trimester

Code	Name	CL	L	U	CA
AP4033	Economics of the Public Sector	3.5	0	12	3
NB4009	Ethics for Public Administration	3.5	0	12	3
		7	0	24	6

Second Trimester

Code	Name	CL	L	U	CA
AP4034	Planning and Public Policy Management	3.5	0	12	3
AP5026	Public Finances, Theory and Practice	3.5	0	12	3
		7	0	24	6

Third Trimester

Code	Name	CL	L	U	CA
AP4035	Statistical Methods	3.5	0	12	3
AP4036	Public Policy Law	3.5	0	12	3
		7	0	24	6

Fourth Trimester

Code	Name	CL	L	U	CA
AP4037	Social Projects Evaluation	3.5	0	12	3
AP4038	Applied Public Management	3.5	0	12	3
		7	0	24	6

Fifth Trimester

Code	Name	CL	L	U	CA
AP4039	Public Sector Entrepreneurship	3.5	0	12	3
D5019	Decentralization and Intergovernmental Relations	3.5	0	12	3
		7	0	24	6

Sixth Trimester

Code	Name	CL	L	U	CA
OP5049	Elective I	3.5	0	12	3
OP5050	Elective II	3.5	0	12	3
		7	0	24	6

Seventh Trimester

Code	Name	CL	L	U	CA
AP5027	Final Project	3.5	0	12	3
OP5051	Elective III	3.5	0	12	3
		7	0	24	6

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MPE Master in Prospective and Strategic Studies

Justification

The Master in Strategic Foresight, unlike trend analysis, is based on the idea that the future is not a continuation of the past. The future is open to the viewpoint of several actors that act today in accordance with their future projects. It studies the social construction that we have about the future so as to motivate for action in the present.

This vision of the future supports the purpose of Tecnológico de Monterrey of developing honest, visionary, committed people who participate in every environ where they interact. Strategic foresight and futures studies provide students with a comprehensive global vision, fostering social, economic, political, and ecological reflection that allows them to analyze how today's actions affect the future.

Program objectives

- The graduates will be leaders within public, private, and social organizations, able to explore multiple possible, likely, and desirable futures that guide decision making and the design of robust strategic plans.
- The graduates will implement 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.
- The graduates 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.

Profile of the graduate

- Upon completion of their studies, the graduates 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

The master's degree in Strategic Foresight is aimed at:

- 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 Studies Plan 2017

First Trimester

Code	Name	CL	L	U	CA
EO4002	Microeconomics	3.5	0	12	3
NB4007	Leadership and Ethics for Civil Service	3.5	0	12	3
NB4008	Quantitative Methods in Social Sciences	3.5	0	12	3
		10.5	0	36	9

Second Trimester

Code	Name	CL	L	U	CA
OP5053	Elective I	3.5	0	12	3
RE4015	Scenario Modeling	3.5	0	12	3
RE4016	History of Social Transformations	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
OP5054	Elective II	3.5	0	12	3
RE4017	Prospective Methods	3.5	0	12	3
RE4018	Forecast Models for Time Series	3.5	0	12	3
		10.5	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
OP5055	Elective III	3.5	0	12	3
RE4019	Strategic Planning	3.5	0	12	3
RE5010	Integrative Project I	3.5	0	12	3
		10.5	0	36	9

Fifth Trimester

Code	Name	CL	L	U	CA
OP5056	Elective IV	3.5	0	12	3
RE5011	Integrative Project II	3.5	0	12	3
		7	0	24	6

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MPJ Master in Transnational Legal Practice

Justification

Today, legal education must prepare professionals able to compete in a global environment. The proximity of Latin America to the United States of America has created the need to understand the foundations of American law in addition to the ability to understand and manage issues of international law. The diversity of topics encompassed by international law, as a result of the globalization process, creates the necessity to have a solid background on legal education with a transnational perspective.

Program objectives

The objective of the Master in Transnational Legal Practice is to train professionals who:

- Are legal experts in international organizations.
- Are consultants of international law in the United States of America and in Latin America.
- Serve as international arbitrators to resolve disputes.
- Lead complex transnational legal transactions in the public and private sectors.

Learning outcomes

Upon completion of the Master in Transnational Legal Practice the graduate will be able to:

- Play an important role in the solution of legal controversies as an arbitrator or litigator.
- Understand different legal systems and traditions.
- Lead negotiations on key issues of international law.
- Have excellent proficiency of legal English.
- Prosecute complex cases in the transnational arena.
- Manage legal processes for international organizations.
- Target audience.

Research Areas

The program aims to develop research in the following areas:

- Public and private international law.
- International trade law.
- Institutions of international trade.
- Law and Economics.

**MPJ Master in Transnational Legal Practice
Plan 2014**

First Bimester

Code	Name	CL	L	U	CA
DI4029	Civil Procedure in the United States of America	6	0	24	8.9
OP5081	Elective I	6	0	24	8.9
		12	0	48	18

Second Bimester

Code	Name	CL	L	U	CA
DI4030	Contracts in the United States of America	6	0	24	8.9
OP5082	Elective II	6	0	24	8.9
		12	0	48	18

Third Bimester

Code	Name	CL	L	U	CA
DI5007	Professional Responsibility	6	0	24	8.9
DI5008	Negotiation	4	0	16	5.2
		10	0	40	14

Fourth Bimester

Code	Name	CL	L	U	CA
DI5009	Regulation of International Trade and Investment	6	0	24	8.9
OP5083	Elective III	6	0	24	8.9
		12	0	48	18

Fifth Bimester

Code	Name	CL	L	U	CA
DI4031	International Contractual Law	6	0	24	8.9
OP5084	Elective IV	6	0	24	8.9
		12	0	48	18

Sixth Bimester

Code	Name	CL	L	U	CA
DI4032	Leadership and Ethics in the Exercise of Public Service	6	0	24	8.9
DI5010	International Arbitration and Litigation	6	0	24	8.9
		12	0	48	18

CL The letter "CL" indicates the number of class-hours per week. L The letter "L" indicates the number of laboratory-hours per week.
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 CA The letters "CA" represents the number of semester credit hour of the course.

DPP Ph. D. in Public Policy

Objective

The central objective the DPP program is to prepare leading researchers for academia, the public sector and civil society organizations who are capable of driving the analysis, design, implementation and evaluation of innovative public policy in changing environments.

In particular, the Ph.D. in Public Policy has three specific objectives:

- To 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.
- To generate analysts who are capable of proposing and executing solutions to complex, varied problems in the sphere of public interest.
- Prepare world-class specialists who contribute to the democratization and effectiveness processes of public administration and promote the State-Society relationship.

Admission Profile

Tecnológico de Monterrey seeks to integrate in all its graduate programs a new generation of students who have completed their undergraduate studies and who are distinguished by being: talented people, enthusiastic, committed to the development of their environment and the well-being of society; people with the potential to successfully complete their program and become leaders with an entrepreneurial spirit, human sense and internationally competitive.

Academic background: Master's degree in an area related to the research lines of the program.

Learning outcomes

Graduates from the DPP program will have a solid theoretical, analytical and instrumental grounding in public policy processes, with a multidisciplinary approach underpinned by legal, economic and public administration insights.

Specific learning outcomes:

- Serve as leaders in international civil society organizations and autonomous bodies that support institutional processes of change.
- Support government-enterprise liaison strategies.
- Be a generator of cutting-edge knowledge in the field of public policy.

The most important competencies graduates will have gained are:

- The capacity to design, implement and evaluate public policies in the diverse government branches and areas.
- The ability to propose government-civil society-enterprise liaison strategies.
- The ability to propose and execute leadership in research related to the field of public policy.

Target audience

The PhD in Public Policy program targets:

- Civil servants from the different branches and levels of government who are interested in deepening their knowledge of the areas of public administration and public policy.
- Professionals from the private sector who want to specialize in government-enterprise relations.
- Social researchers and professionals who are interested in generating cutting-edge knowledge in the fields of public administration and policy.

Research projects

- Government, democracy and civil society: Analyze from plural perspectives the issues involved in forming government-civil society relationships in a democratic context.
- Economy, development and wellbeing: Analyze the role of the state in its intervention regarding economic mechanisms, its impact on the wellbeing of society and the design of economic and social development policies.
- Public administration and public policy: Analyze public governance and performance in the diverse government branches and the role they play in the design, implementation and evaluation of public policies.

Institutions and practices of contemporary democracies

Investigate, disseminate and generate the exchange of experiences centered on the functioning of contemporary democracies, their institutions, their relevant actors, and the values and attitudes on which they are based. Therefore, the core objective of the research group is the empirical study of the organization and workings of democratic government systems.

- Studies on economics and public policy in Mexico:

Contribute to the analysis of the circumstantial and structural issues faced by the Mexican economy, in both national and international settings, in order to detect effective public policies that will foment the country's economic growth, development and institutional consolidation.

- Public administration, government and citizens:

Analyze federal, state and municipal public administration processes within a changing context, generating knowledge through innovative components that serve as a reference framework for the private sector, political actors and civil society organizations.

- Strategic intelligence:

Analyze the relationship that exists between public policy and long-term planning processes, taking into account the role of the actors.

- Public policy for local development:

Contribute to the generation of knowledge of the three basic dimensions that articulate the local development process: The social dimension, associated with quality of life, equity and social integration; the environmental dimension, referring to natural resource sustainability and urban development and territorial planning; and the political dimension, linked to governance and based on the local actors.

- Government, governability and governance:

Analyze conflict management and political negotiation and social cohesion processes, with citizen participation.

- Public policies and wellbeing:

Analyze social policy so as to influence the policies that affect the wellbeing of the population in any of its forms.

- Public policy:

Study and evaluation of public policies that are relevant for Mexico, which impact regional development, fiscal policy and economic policy.

- Citizenship and civil society:

Investigate from plural perspectives and training oriented by political philosophy, social science and law, the theoretical issues involved in the growth of the third sector as an economic and political protagonist in the world order.

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

In the case of doctoral programs, have published as the lead author (or have evidence of acceptance for publication) at least one article on a topic related to their research project, in Scopus-indexed journals.

In the case of shared authorship, the article can only be used once for graduation purposes in any of the graduate programs of School of Government and Public Transformation (EGTP), only by the student who appears first on the list of authors.

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

First Semester

Code	Name	CL	L	U	CA
GP6000	Theory of Public Organizations and of Public Administration	3	0	12	3
GP6001	Analytical Processes of Public Policy	3	0	12	3
GP6003	Public Administration System of Competencies	3	0	12	3
GP6035	Research Methodology	3	0	12	3
		12	0	48	12

Second Semester

Code	Name	CL	L	U	CA
GP5000	Research Proposal I	3	0	12	3
OP4037	Quality Development Course	3	0	12	3
OP5062	Elective I	3	0	12	3
OP5063	Elective II	3	0	12	3
		12	0	48	12

Third Semester

Code	Name	CL	L	U	CA
GP5001	Research Proposal II	3	0	12	3
GP5002	Research Proposal III	3	0	12	3
GP5003	Research Seminar I	1	0	4	1
OP5064	Elective III	3	0	12	3
		10	0	40	10

Fourth Semester

Code	Name	CL	L	U	CA
GP6021	Doctoral Research I	3	0	12	3
GP6022	Doctoral Research II	3	0	12	3
GP6023	Doctoral Research III	3	0	12	3
GP6024	Doctoral Research IV	3	0	12	3
		12	0	48	12

Fifth Semester

Code	Name	CL	L	U	CA
GP5004	Research Seminar II	1	0	4	1
GP6025	Doctoral Research V	3	0	12	3
GP6026	Doctoral Research VI	3	0	12	3
GP6027	Doctoral Research VII	3	0	12	3
		10	0	40	10

Sixth Semester

Code	Name	CL	L	U	CA
GP6028	Doctoral Research VIII	3	0	12	3
GP6029	Doctoral Research IX	3	0	12	3
GP6030	Doctoral Research X	3	0	12	3
		9	0	36	9

Seventh Semester

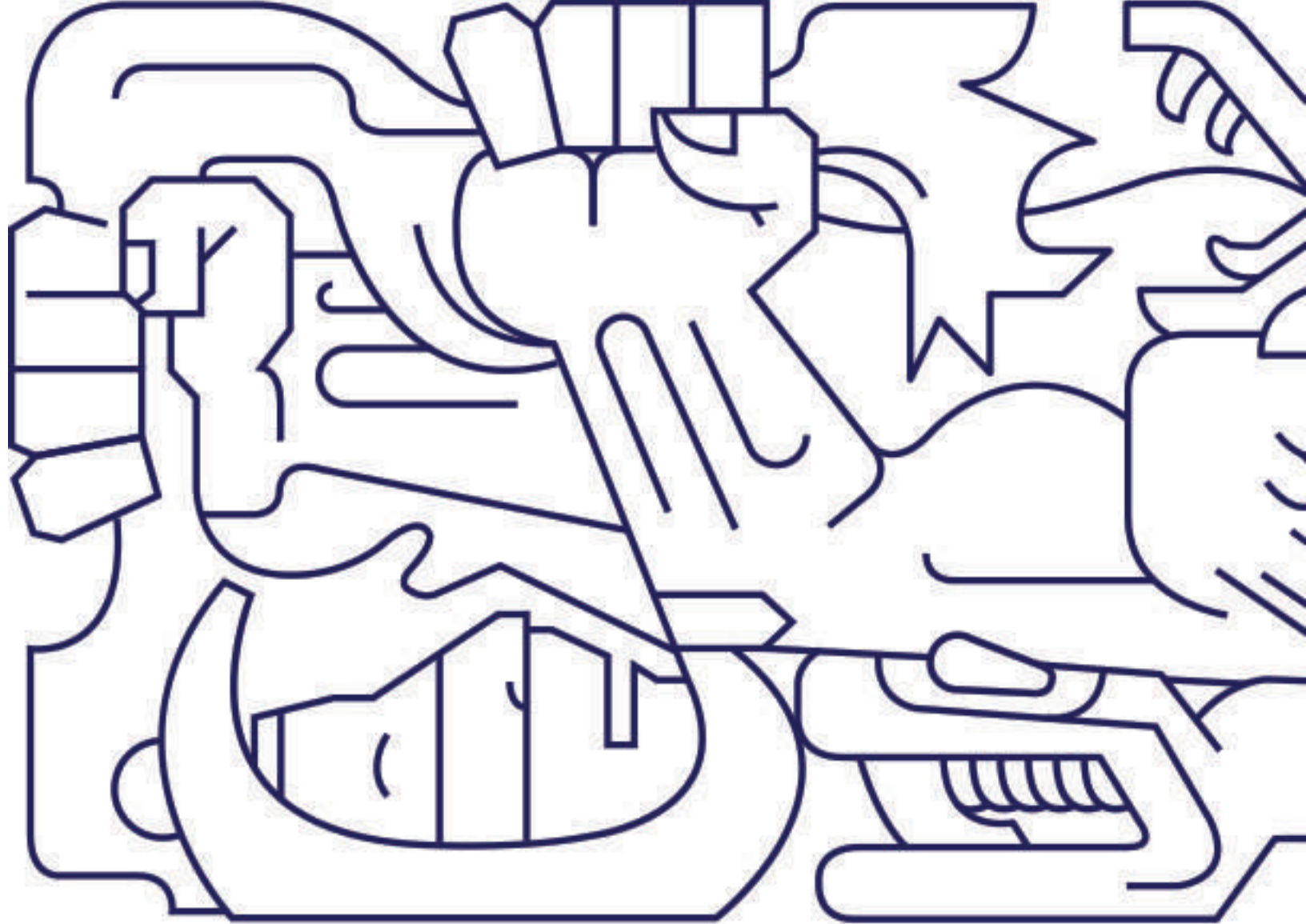
Code	Name	CL	L	U	CA
GP5005	Research Seminar III	1	0	4	1
GP6031	Doctoral Research XI	3	0	12	3
GP6032	Doctoral Research XII	3	0	12	3
GP6033	Doctoral Research XIII	3	0	12	3
GP6034	Doctoral Defense	0	0	1	0.3
		10	0	41	10

This Ph.D program has as requirement a medical residency program.

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School of
Humanities and
Education

EGE-V Specialization in Management for Educational Leadership and Innovation

Program objectives

The objective of this program is to train professionals with the necessary competencies to strategically manage their respective schools and take them effectively to the next level of educational quality.

Target audience

The program is aimed at:

- Directors and coordinators who wish to enrich their educational institution by strengthening their leadership and linking them with avant-garde tools for schools and applying this knowledge in institutions of the private and public sector and organizations.
- Future directors and coordinators who wish to obtain a view of the directive function in the educational field.
- Education professionals with the aspiration of serving as consultants in the private or public sector to guide projects related to the evaluation of institutions, human capital development and institutional management.
- Owners and entrepreneurs who wish to participate in high-level educational projects linked to educational services for institutions. Social entrepreneurship, indispensable in new globalized and digital contexts.

Admission Profile

The candidate to enter the program must:

- Possess verbal and mathematical reasoning skills that are related to the ability to infer, analyze and synthesize, complementing them with the exploration of competencies to organize, obtain and understand information.
- Be familiar with the use of information and communication technologies, so that they are able to use these tools to send and receive information, as well as search for data and reports.
- Have basic or intermediate knowledge of English, allowing an adequate understanding of bibliographic materials.
- Have a proactive attitude, intellectual curiosity and interest in personal and academic improvement.

Profile of the graduate

Once the program is completed, the graduate will be able to:

- Design and implement educational solutions to complex problems in educational centers, with an ethical and socially responsible perspective, through the use of scientific methods and innovative technologies.
- Interact with specialists from all the functional areas of the educational centers in order to define the strategies, guidelines and organizational objectives for the institution, in an atmosphere of respect and inclusion.
- Lead processes of change in complex environments that strengthen the organizational transformation of educational centers promoting transparency and equity.

**EGE-V Specialization in Management for Educational Leadership and Innovation
Plan 2019**

First Trimester

Code	Name	CL	L	U	CA
ED4042	Strategic Leadership	3	0	12	3
OP4046	Quality Development Course	3	0	12	3
OP5085	Elective I	3	0	12	3
		9	0	36	9

Second Trimester

Code	Name	CL	L	U	CA
ED4044	Empowerment of Teams for Transformation	3	0	12	3
ED5104	Partnerships for Financial Management	3	0	12	3
OP5086	Elective II	3	0	12	3
		9	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
ED5110	Traveling Seminar for Innovative Management	3	0	12	3
		3	0	12	3

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MEE-V Master in Education

Justification

The Master's degree in Education responds to the society's current knowledge needs so as to enrich the education professionals in the most advanced theories, methodologies and pedagogical techniques in order to form different scholar levels that assure its students' integral development. The innovative educational model is based on new information and communication techniques that allow us to reach broader audiences within time and space constraints. The teachers will be able to have a positive impact in the educational communities in which they give their services.

Graduate Profile

The Master's Degree in Education graduate is a leader in the area of education that proposes and executes projects and innovative educational programs in order to contribute to the improvement of its institution's services.

The Master's Degree in Education graduate is a professional that uses teaching and learning strategies to accomplish the curricular objectives efficiently and effectively. He uses his investigation abilities to solve current educational problems.

The Master's Degree in Education graduate is a professional that works under ethical criteria which respects the dignity of students, parents, and colleagues whether they are already members of the educational community or the community at large.

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

- Express a vision regarding the reality of education in contemporary, local, regional and global levels which will enable them to contribute to educational change.
- Base their teaching discipline on Educational Science knowledge.
- Research as a professional practice tool in educational settings.
- Generate new ideas, methods and techniques in order to identify opportunities and implement solutions with various stakeholders.
- Incorporate their concept of education to specific areas of emphasis.
- Graduate profile specific emphasis

Emphasis on Teaching and Learning Process:

- Design plans and educational programs consistent with the society's needs.
- Conduct assessment processes and evaluation models through various approaches and methodologies.
- Develop teaching research.

Emphasis on High Schools:

- Analyze educational plans and programs for high school level.
- Conduct collaborative projects aimed at developing teaching competencies in the high school level / tertiary.
- Conduct research into their teaching practice related to high school education.

Emphasis on Cognitive Development:

- Review plans and educational programs based on models and theories for teaching thinking.
- Develop innovative proposals that consider the development of intelligence and emotion.
- Research teaching practice related to teaching thinking skills.

Emphasis on Science Education:

- Incorporate different approaches to the teaching of natural sciences.
- Develop innovative approaches in the teaching of natural sciences.
- Research their teaching practice related to natural sciences.

Target audience

The prospects for the Master's in Education program requires candidates to have finished their Bachelor's Degree in areas related to education, administration or similar. They should preferably have English reading comprehension skills. It is also desirable that they hold a position that allows them to be close to school education scenarios in many educational levels or work in private companies that hold business training programs.

Areas of Research

- Models of educational management.
- Use of technology in education.
- Innovative teaching and learning processes and models.
- Social impact of innovative educational models.

MEE-V Master in Education (On line Program)
Plan 2013

First Semester

Code	Name	CL	L	U	CA
ED4022	Technology and Innovation in Education	3	0	12	3
ED4033	Learning Theories in the Educational Context	3	0	12	3
		6	0	24	6

Second Semester

Code	Name	CL	L	U	CA
OP4006	Elective Course I	3	0	12	3
OP5042	Elective I	3	0	12	3
		6	0	24	6

Third Semester

Code	Name	CL	L	U	CA
ED4034	Applied Research Project I: Identifying Study-Problems	3	0	12	3
OP5043	Elective II	3	0	12	3
		6	0	24	6

Fourth Semester

Code	Name	CL	L	U	CA
ED4035	Applied-Research Project II: Methodological Approaches	3	0	12	3
OP5044	Elective III	3	0	12	3
		6	0	24	6

Fifth Semester

Code	Name	CL	L	U	CA
ED4032	Comparative Education	3	0	12	3
ED5084	Applied-Research Project III: Analysis of Results	3	0	12	3
		6	0	24	6

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MEH Master in Humanistics Studies

Justification

The Master in Humanistic Studies (MEH) is a research-oriented program that provides its students with a broad, solid and up-to-date training in the interdisciplinary field of the humanities, through different learning environments, aligned with the Sustainable Development Goals (SDG 2015-2030) defined by the UN, which promote the analysis and critical reflection on contemporary cultural phenomena and the challenges that human societies deal in a hyperconnected, ideologically polarized and culturally fragmented world.

Target Audience

The Master in Humanistic Studies is aimed at people who seek to start their training as researchers in the interdisciplinary field of the humanities. It is also aimed at graduates and professionals from different disciplines who wish to complement their academic and professional training with a broad, solid and up-to-date humanistic perspective, which adds value to their professional profiles.

From the perspective of the training of researchers, the program is related to the training of graduates and professionals from the areas of humanities, social sciences, political sciences, communication, journalism, visual arts, history and literary studies. As a complementary program to academic and professional training in different disciplines, the Master in Humanistic Studies is relevant for graduates and professionals in education, administrative sciences, legal sciences, information technologies, health sciences, biotechnology, architecture, advertising, industrial design and graphic design, among other disciplines.

Program Objectives

This program aims to train researchers with knowledge, skills and abilities to:

- Apply a critical and purposeful attitude in the identification of the most relevant problems for research, in contemporary social and cultural environments, from a humanistic perspective.
- Propose new approaches to the study of the particular phenomena of the interdisciplinary field of the humanities, which denote a critical vision about culture, based on a solid theoretical and conceptual basis and the application of the most appropriate research techniques and methods for each case study.
- Participate in the design, development, management and evaluation of projects and programs related to the work of public, private and academic institutions, which impact on social and cultural well-being and contribute to solving the main challenges that contemporary societies deal with.

Learning Outcomes

Once completed his/her studies, the graduate will be able to:

- Develop high-quality research, which proposes new approaches to the study of the interdisciplinary field of the humanities, from perspectives aligned with the Sustainable Development Goals (SDG 2015-2030) defined by the UN, which demonstrates its ability to continue its studies in the PhD level.
- Design and develop analysis strategies for contemporary social and cultural phenomena, from a critical humanistic perspective, with knowledge of the environment and purposeful attitude to identify relevant issues in their field of research.
- Manage and evaluate projects of a social and cultural nature, in public and private institutions, as well as in the academic field, which allow it to contribute to the solution of the main challenges facing contemporary societies.

Admission Profile

The candidate to enter the master's degree must be able to demonstrate:

- Strict compliance with the general requirements for admission to graduate programs of the School of Humanities and Education (EHE) of the Tecnológico de Monterrey, through obtaining the minimum score required in the Academic Aptitude Test (PAEP) and the delivery of the complete documentation requested.
- Spanish proficiency, at a higher level, suitable for understanding high performance reading and the correct writing of academic texts, by writing an essay on academic reasons to enter the program.
- Proficiency in English, at a medium-high level, suitable for understanding the bibliographic resources published in that language, through an official certificate stating that they obtained 550 points or more on the TOEFL test, or the required score on an equivalent exam.
- Ability to identify his/her affinity with one of the lines of research offered by the master's degree, through a series of interviews with the coordination of the program, the direction of the program and with researchers who integrate the basic academic core (NAB) of the master's degree.
- Vocation towards research, particularly in the interdisciplinary field of the humanities, through the drafting of a preliminary project appropriate to the guidelines of the research line that he/she has selected.

Research Lines

The Master in Humanistic Studies offers four research lines or lines of generation and/or application of knowledge (LGAC). Each one corresponds to one of the research groups in which the basic academic core (NAB) of the program is organized. The research lines constitute thematic axes, sufficiently broad and with disciplinary and conceptual orientation, which allow the construction of scientific knowledge, of intermediate and advanced level, in the interdisciplinary field of the humanities.

Science, technology and society: this research line addresses the complex interrelationships between science, culture and society, with emphasis on the analysis of the dissemination and reception of scientific narratives, as well as the consequences of the uses, applications and consumptions of technology, in aspects such as the availability and access to basic resources in a safe and sustainable way, the struggle against climate change, sustainable production and consumption, as well as the sustainability of cities and terrestrial and maritime ecosystems.

Communication and media: this research line studies the role that communication, media and networks play in a hyperconnected society, with special emphasis on their participation in the construction of social and cultural imaginaries.

Studies of historical, artistic and literary discourse: this research line addresses the different manifestations of discourses, in their written, sound, material, digital or audiovisual media, from historical, artistic and literary approaches.

Ethics: this line of research offers an area of knowledge generation in which the ideologies, movements and trends of contemporary human societies are questioned, from different ethical-philosophical perspectives that address fundamental notions about welfare, justice, inclusion, diversity, equality, human rights, peace and the fight against poverty, among others.

**MEH Master in Humanistics Studies
Plan 2009**

First Semester

Code	Name	CL	L	U	CA
H4012	Research Methods	3	0	12	3
OP4002	Basic Course I	3	0	12	3
OP5042	Elective I	3	0	12	3
		9	0	36	9

Second Semester

Code	Name	CL	L	U	CA
H5022	Research Seminar	3	0	12	3
OP4003	Basic Course II	3	0	12	3
OP5043	Elective II	3	0	12	3
		9	0	36	9

Third Semester

Code	Name	CL	L	U	CA
OP4004	Basic Course III	3	0	12	3
OP4037	Quality Development Course	3	0	12	3
OP5044	Elective III	3	0	12	3
		9	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
OP4005	Basic Course IV	3	0	12	3
OP4018	Basic Course V	3	0	12	3
OP5045	Elective IV	3	0	12	3
		9	0	36	9

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MHD-V Master in Digital Humanities

Program objectives

This program aims to train professionals with the necessary skills to create humanistic knowledge in the environment of the complexity of the digital society through the development of digital projects, analysis of trends in social networks and products of cultural entrepreneurship.

Target audience

Aimed at graduates and professionals from: humanities, communication and social sciences, information technologies As well as cultural managers, community managers, editors, journalists, publicists, creators, information analysts, librarians, graphic designers, visual artists, educators and academics.

Admission Profile

The candidate to enter the program must:

- Possess abilities to search for information in bibliographic databases.
- Be familiar with the use of information and communication technologies and the dissemination of knowledge in digital media.
- Be capable of locate information and tools on the web for the development of the activities proposed in the courses.
- Possess medium and high performance reading comprehension skills.
- Understand the English language at a medium-high level, allowing an adequate understanding of bibliographic materials.
- Possess the competence of intellectual curiosity and passion for self-learning.

Profile of the graduate

The graduate will be capable of:

- Integrate the humanist tradition with the digital methods and tools to generate new approaches and knowledge in the humanities.
- Create cultural entrepreneurship projects on digital platforms for the dissemination of cultural heritage.
- Critically analyze social behavior and its trends in the digital society.

MHD Master in Digital Humanities Plan 2019

First Trimester

Code	Name	CL	L	U	CA
EH4001	Digital Humanities Fundamentals	3	0	12	3
OP4046	Quality Development Course	3	0	12	3
		6	0	24	6

Second Trimester

Code	Name	CL	L	U	CA
EH4002	Information Architecture for Digital Content	3	0	12	3
OP5085	Elective I	3	0	12	3
		6	0	24	6

Third Trimester

Code	Name	CL	L	U	CA
EH4003	Digital Methods	3	0	12	3
EH5001	Digital Project I	3	0	12	3
OP5086	Elective II	3	0	12	3
		9	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
EH4004	Digital Technologies	3	0	12	3
EH5002	Digital Project II	3	0	12	3
OP5087	Elective III	3	0	12	3
		9	0	36	9

Fifth Trimester

Code	Name	CL	L	U	CA
EH5003	Digital Project III	3	0	12	3
OP5088	Elective IV	3	0	12	3
		6	0	24	6

Sixth Trimester

Code	Name	CL	L	U	CA
EH4005	Philosophy of Technology	3	0	12	3
OP5089	Elective V	3	0	12	3
		6	0	24	6

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MTE-V Master in Educational Technology

Justification

The Master's degree in Educational Technology meets the needs of education and human resources training professionals in the use of technology in teaching and learning, both in different school levels and in public and private companies, allowing a more comprehensive development of students and workers. The innovative educational model is based on new Information and Communications Technology (ICT), which endeavors to reach larger audiences otherwise limited by space and time. Delivering highly trained professional who will have a positive effect on the communities where they live and serve.

The Master's degree in Educational Technology (MTE) with concentrated studies helps to fulfill the vision of the TecVirtual University of developing people's potential through digital learning environments. The program professionalizes teachers and education professionals by training them in pedagogical models, innovative technology and management to improve their educational environments.

Graduate profile

The Master in Educational Technology graduate is an education professional leader that proposes and implements projects, educational programs and innovative technology which contribute to the improvement of their institution's service.

The Master in Educational Technology graduate incorporates technology based teaching and learning strategies to achieve curricular objectives in an effective and efficient way, particularly with introduction and implementation of technology in education . The graduate applies investigation skills to solve educational problems.

The Master of Educational Technology graduate is a professional that works under ethical criteria which respects the dignity of students, parents, and colleagues whether they are members of the educational community or the community at large.

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

- 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.
- Designing 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.

Graduate profile specific emphasis

Emphasis on Innovative Educational Media Concentration:

- Design learning environments for school programs that use technology resources.
- Incorporate technology resources to the teaching-learning process, taking into consideration curriculum, infrastructure, logistics and human aspects.
- Assess training processes oriented technologies, instructional models that use technology, and the impact of both in achieving the learning objectives.
- Conduct educational research projects on issues related to the use of technology in learning processes of educational institutions.

Emphasis on Vocational Training Concentration:

- Designing learning environments for training programs and training that use technological resources.
- Manage technology-based educational projects, from its inception to evaluation, including curricular, human, technological, logistical and financial.
- Assess training processes oriented technologies, instructional models that use technology, and the impact of both in public and private institutions.
- Conduct educational research projects on issues related to the use of technology in learning processes and vocational training.

Targeted Audience

Profile of Income to the Master's degree in Educational Technology requires candidates to finish their Bachelor of Arts degree in areas related education and administration. Have English reading comprehension skills. They should also work in school management scenarios or at various educational levels.

Areas of Research

- Use of technology in education.
- Models and innovations in teaching and learning.

MTE-V Master in Educational Technology (On line Program)
Plan 2013

First Semester

Code	Name	CL	L	U	CA
ED4022	Technology and Innovation in Education	3	0	12	3
ED4033	Learning Theories in the Educational Context	3	0	12	3
		6	0	24	6

Second Semester

Code	Name	CL	L	U	CA
OP4006	Elective Course I	3	0	12	3
OP5042	Elective I	3	0	12	3
		6	0	24	6

Third Semester

Code	Name	CL	L	U	CA
ED4034	Applied Research Project I: Identifying Study-Problems	3	0	12	3
OP5043	Elective II	3	0	12	3
		6	0	24	6

Fourth Semester

Code	Name	CL	L	U	CA
ED4035	Applied-Research Project II: Methodological Approaches	3	0	12	3
OP5044	Elective III	3	0	12	3
		6	0	24	6

Fifth Semester

Code	Name	CL	L	U	CA
ED4032	Comparative Education	3	0	12	3
ED5084	Applied-Research Project III: Analysis of Results	3	0	12	3
		6	0	24	6

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MTO Master in Education Entrepreneurship

Program objectives

This program aims to train professionals with the necessary skills to undertake innovative educational projects that contribute to the transformation of their communities in social and economic aspects.

Target audience

The program is aimed at:

- Teachers and educators regardless of their level of experience or area of expertise.
- Entrepreneurs, future entrepreneurs and professionals who wish to venture into the education sector.

Admission Profile

The candidate to enter the program must:

- Possess verbal and mathematical reasoning skills that are related to the ability to infer, analyze and synthesize, complementing them with the exploration of competencies to organize, obtain and understand information.
- Be familiar with the use of information and communication technologies, so that they are able to use these tools to send and receive information, as well as search for data and reports.
- Understand the English language at a medium-high level, allowing an adequate understanding of bibliographic materials.
- Have a proactive attitude, intellectual curiosity and interest in personal and academic improvement.

Profile of the graduate

Once graduated, the graduate will be able to:

- Identify areas of opportunity in an education environment in order to create a startup in Mexico.
- Develop proposals that translate into real projects in the field of education through interaction with specialists in the areas of education, business, entrepreneurship, technology.
- Carry out a process of strategic communication of a product or service with the intention of sale or investment.
- Develop online marketing strategies for educational products or services.
- Implement negotiation strategies with different audiences and in different contexts.
- Identify trends and do prospective education.

MTO Master in Education Entrepreneurship Plan 2019

First Trimester

Code	Name	CL	L	U	CA
ED4046	Organizational Change for Entrepreneurship in Education	3	0	12	3
ED4047	Prospective Studies in Education	3	0	12	3
ED4050	Educational Entrepreneurship Internship I	1.5	0	6	1.5
ED4054	Educational Entrepreneurship Project I	1.5	0	6	1.5
		9	0	36	9

Second Trimester

Code	Name	CL	L	U	CA
ED4045	Transforming Education Through Emerging Technologies	3	0	12	3
ED4048	Educational Entrepreneurship I	3	0	12	3
ED4051	Educational Entrepreneurship Internship II	1.5	0	6	1.5
OP4046	Quality Development Course	3	0	12	3
		10.5	0	42	10.5

Third Trimester

Code	Name	CL	L	U	CA
ED4049	Educational Entrepreneurship II	3	0	12	3
ED4052	Educational Entrepreneurship Internship III	1.5	0	6	1.5
ED4055	Educational Entrepreneurship Project II	1.5	0	6	1.5
OP5085	Elective I	3	0	12	3
		9	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
ED4053	Educational Entrepreneurship Internship IV	1.5	0	6	1.5
ED4056	Educational Entrepreneurship Project III	1.5	0	6	1.5
OP5086	Elective II	3	0	12	3
		6	0	24	6

Fifth Trimester

Code	Name	CL	L	U	CA
ED5116	Educational Entrepreneurship III	3	0	12	3
ED5117	Educational Entrepreneurship Project IV	1.5	0	6	1.5
OP5087	Elective III	3	0	12	3
		7.5	0	30	7.5

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DEE Ph. D. in Educational Innovation

Justification

The Doctorate in Educational Innovation is based on the formation of individuals capable of contributing, by means of research, towards theoretical-practical knowledge of education; equally to increase the efficiency and effectiveness of educational projects with the goal of innovating and carrying out positive change in organizations. Through this program students will develop capacity for self-learning, creative and critical thinking, collaborative work, and the ability to effectively express themselves in writing and orally.

In this era of globalization, educational institutions and learning organizations are faced with the challenge of examining and changing the way they operate, they incorporate the use of new technologies and new forms of teaching and learning. Our current world and the future world will require its inhabitants to have the ability to visualize, to plan, to motivate people to change their manner of thinking and being. The Doctorate in Educational Innovation invites its participants to examine today's society from the individual, organizational, systemic and social perspectives with the purpose of examining, defining, reformulating, planning and facilitating educational change. This program prepares for researching and generating new knowledge that contributes to the scientific advancement in areas like student-centered learning, the new work of the teacher in a knowledge society, the innovative use of technology as an educational medium that promotes equity, the new models of administration add educational growth, and the teaching and promotion of scientific thought within a scholarly context.

General Program Objective

The aim of the PhD in Educational Innovation comprises:

- 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.

Admission Profile

Tecnológico de Monterrey seeks to integrate in all its graduate programs a new generation of students who have completed their undergraduate studies and who are distinguished by being: talented people, enthusiastic, committed to the development of their environment and the well-being of society; people with the potential to successfully complete their program and become leaders with an entrepreneurial spirit, human sense and internationally competitive.

Graduate Profile

Upon completion of the program the participants will be people with a solid academic background capable of:

Knowledge Skills

- Presenting 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.
- Undertaking research that contributes to the theoretical-practical knowledge of education (in various contexts).

Development Skills

- 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.

Attitudinal Skills

- Practicing proactive leadership 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

The audience to whom this program is directed is composed of academics of a post-graduate nature interested in a career as a researcher within a public or private high school educational institution and/or in educational research centers or in other social sciences, and to a lesser extent to educational administrators in institutions of higher education interested in administrative careers in institutions that require a terminal degree for their administrators. The intention of becoming an academic researcher, working in an educational institution and carrying out classroom teaching, research and spreading this

Participants in this program should have the following characteristics:

- The intention of becoming an academic researcher, working in an educational institution and carrying out classroom teaching, research and spreading this knowledge to the local community.
- A critical-strategic spirit with a desire to innovate in his/her field with the purpose of bettering the educational environment.
- Interest in doing research in one of the current lines of research offered by the program: a.) Administration and growth of educational change; b.) The student as a learner; c.) The role of the

professor and of teaching in the educational process; d.) The social impact of innovative educational models; e.) Education in physical and mathematical sciences

- The intention to better the social and political landscape of Latin American countries and to better the quality of life of its inhabitants by means of education in all of its aspects.
- Being open to a global mindset, to knowing what is happening in other countries and learning from them, sharing from one to the next, seeing the world as a whole, all with the same goal of educating people well.
- The ability to receive and produce information bilingually between Spanish and English the ability to read research and articles in scientific/professional journals, and to take advantage of articles in both languages.
- The desire to act as an agent of change upon examining, redefining and motivating people to act.

Research Lines

- Models of educational growth
- Uses of technology in education
- Innovative models and processes in teaching-learning
- The social impact of innovative educational models

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

Have published (or have evidence of acceptance of the final version for publication) in journals or books indexed in Scopus or in equivalent prestigious publications that guarantee stringent peer reviewing of at least one result of their scientific research work related to their research project, in one of the following formats:

- a) A stringently peer reviewed book chapter.
- b) A stringently peer reviewed book.
- c) An article in journals indexed in Scopus or in peer-reviewed journals of a quality equivalent to Scopus in each field, where the student is the author. In the case of shared authorship, the article can only be used once for graduation purposes in any of the graduate programs of the School of Humanities and Education, only by the student who appears first on the list of authors.

DEE Ph. D. in Educational Innovation Plan 2015

First Semester

Code	Name	CL	L	U	CA
ED4022	Technology and Innovation in Education	3	0	12	3
ED5075	Research Proposal I	3	0	12	3
OP5062	Elective I	3	0	12	3
OP5063	Elective II	3	0	12	3
		12	0	48	12

Second Semester

Code	Name	CL	L	U	CA
ED5076	Research Proposal II	3	0	12	3
OP5064	Elective III	3	0	12	3
OP5065	Elective IV	3	0	12	3
OP5066	Elective V	3	0	12	3
		12	0	48	12

Third Semester

Code	Name	CL	L	U	CA
ED5077	Research Proposal III	3	0	12	3
ED5078	Research Seminar I	1	0	4	1
OP5067	Elective VI	3	0	12	3
OP5068	Elective VII	3	0	12	3
OP5069	Elective VIII	3	0	12	3
		13	0	52	13

Fourth Semester

Code	Name	CL	L	U	CA
ED5081	Assisted Research I	3	0	12	3
ED5082	Assisted Research II	3	0	12	3
OP5070	Elective IX	3	0	12	3
OP5071	Elective X	3	0	12	3
		12	0	48	12

Fifth Semester

Code	Name	CL	L	U	CA
ED5079	Research Seminar II	1	0	4	1
ED5083	Assisted Research III	3	0	12	3
ED6033	Doctoral Research I	3	0	12	3
ED6034	Doctoral Research II	3	0	12	3
OP5072	Elective XI	3	0	12	3
		13	0	52	13

Sixth Semester

Code	Name	CL	L	U	CA
ED6035	Doctoral Research III	3	0	12	3
ED6036	Doctoral Research IV	3	0	12	3
ED6037	Doctoral Research V	3	0	12	3
ED6038	Doctoral Research VI	3	0	12	3
		12	0	48	12

Seventh Semester

Code	Name	CL	L	U	CA
ED5080	Research Seminar III	1	0	4	1
ED6039	Doctoral Research VII	3	0	12	3
ED6040	Doctoral Research VIII	3	0	12	3
ED6041	Doctoral Research IX	3	0	12	3
ED6042	Doctoral Research X	3	0	12	3
		13	0	52	13

Eighth Semester

Code	Name	CL	L	U	CA
ED6000	Doctoral Defense	0	0	1	0.3
ED6043	Doctoral Research XI	3	0	12	3
ED6044	Doctoral Research XII	3	0	12	3
ED6045	Doctoral Research XIII	3	0	12	3
ED6046	Doctoral Research XIV	3	0	12	3
		12	0	49	12

This Ph.D program has as requirement a medical residency program.

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U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.

CA The letters "CA" represents the number of semester credit hour of the course.

DEH Ph. D. in Humanistic Studies

Program objectives

The objectives of this program are to prepare independent researchers with the capacities, knowledge and skills to:

- Put forward, develop and advise national and international research projects in their area of specialization, from the proposal to execution stages.
- Generate new knowledge in the humanities, particularly in areas of specialization, through peer-reviewed scientific publications, such as articles (in Scopus journals), book chapters, or books, or developing innovative educational programs.
- Create social entrepreneurship projects with a high response capacity to the community's needs.
- Belong to the CONACYT National System of Researchers, or similar outside Mexico.
- Be a creator in the National System of Creators, or similar outside Mexico.

Target audience

The program targets individuals who wish to specialize, from an interdisciplinary perspective, in their field of study, generating knowledge and competencies through research that will contribute to the country's social development and improvement. It specifically targets:

- Academics who address social entrepreneurship challenges and needs creatively and appropriately, which is indispensable in the new globalized digital contexts.
- NGO leaders and collaborators who promote understanding of society and its current processes to guide their actions.
- Professionals who practice in the private, public and social sectors, whose work-related interests and needs require the development of an innovative humanistic and social profile.
- Individuals who are interested in strengthening the higher education system through teaching and research practices.

Exit profile

On completing their studies, graduates will be able to:

- Demonstrate a high level of theoretical and methodological knowledge of the humanities, enabling them to participate and play a prominent role in interdisciplinary debates.
- Conduct research in their area of specialization that will contribute new, relevant knowledge to the advancement of the humanities.
- Apply and generate interdisciplinary knowledge in the program's fields of study through complex thinking with a critical and comprehensive vision of cultural and social phenomena.
- Design strategies that will impact social life through consultancy for the public, private and civil sectors.

- Work collectively in high-level research and teaching groups in higher education institutions, and report results, disseminate and foment scientific knowledge.
- Have a proactive, creative attitude to unpublished issues with original proposals.

Areas of specialization

In this program, students can choose one of four specialization areas, according to their interests. The lines of research depend on the program's existing research groups.

Ethics: this research area seeks knowledge generation in an environment in which the ethical and philosophical movements and trends of today's society, interpreted from diverse perspectives, are questioned.

Science, technology and society: this research area seeks to study the complex relations between society, technology, science and culture, and their consequences, ranging from epistemological to financial aspects.

Communication and the media: this research area focuses on exploring and analyzing the media in contemporary society, particularly regarding participation in social construction.

Historical, cultural and literary discourse studies: this research area studies the diverse written, digital or audiovisual discourse manifestations, from historical, art and literary approaches.

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

Have published (or have evidence of acceptance of the final version for publication) in journals or books indexed in Scopus or in equivalent prestigious publications that guarantee stringent peer reviewing of at least one result of their scientific research work related to their research project, in one of the following formats:

- a) A stringently peer reviewed book chapter.
- b) A stringently peer reviewed book.
- c) An article in journals indexed in Scopus or in peer-reviewed journals of a quality equivalent to Scopus in each field, where the student is the author. In the case of shared authorship, the article can only be used once for graduation purposes in any of the graduate programs of the School of Humanities and Education, only by the student who appears first on the list of authors.

DEH Ph. D. in Humanistic Studies Plan 2018

First Semester

Code	Name	CL	L	U	CA
GH6001	Research Mentoring I	3	0	12	3
GH6002	Methodology of Interdisciplinary Research	3	0	12	3
GH6003	Strategic Research Seminar I	1	0	4	1
GH6004	Research Workshop I	1	0	4	1
GH6005	Research Workshop II	1	0	4	1
		9	0	36	9

Second Semester

Code	Name	CL	L	U	CA
GH6006	Research Mentoring II	3	0	12	3
GH6007	Research Protocol Presentation	1	0	4	1
GH6008	Research Integration I	1	0	4	1
GH6009	Methodology of Interdisciplinary Research II	3	0	12	3
GH6010	Strategic Research Seminar II	1	0	4	1
		9	0	36	9

Third Semester

Code	Name	CL	L	U	CA
GH6011	Doctoral Student Conference	3	0	12	3
GH6012	Doctoral Research I	3	0	12	3
GH6013	Communicating Scientific Production I	1.5	0	6	1.5
GH6014	Strategic Research Seminar III	1	0	4	1
GH6015	Research Tutoring I	1	0	2	0.5
		9.5	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
GH6016	Research Integration II	1	0	4	1
GH6017	Doctoral Research II	3	0	12	3
GH6018	Doctoral Research III	3	0	12	3
GH6019	Strategic Research Seminar IV	1	0	4	1
GH6020	Research Workshop III	1	0	4	1
		9	0	36	9

Fifth Semester

Code	Name	CL	L	U	CA
GH6021	Research stay	3	0	12	3
GH6022	Doctoral Research IV	3	0	12	3
GH6023	Strategic Research Seminar V	1	0	4	1
GH6024	Research Workshop IV	1	0	4	1
GH6025	Research Tutoring II	1	0	2	0.5
GH6026	Research Tutoring III	1	0	2	0.5
		10	0	36	9

Sixth Semester

Code	Name	CL	L	U	CA
GH6027	Research integration III	1	0	4	1
GH6028	Doctoral Research V	3	0	12	3
GH6029	Doctoral Research VI	3	0	12	3
GH6030	Communicating Scientific Production II	1.5	0	6	1.5
GH6031	Strategic Research Seminar VI	1	0	4	1
		9.5	0	38	9.5

Seventh Semester

Code	Name	CL	L	U	CA
GH6032	Doctoral Research VII	3	0	12	3
GH6033	Doctoral Research VIII	3	0	12	3
GH6034	Strategic Research Seminar VII	1	0	4	1
GH6035	Research Workshop V	1	0	4	1
GH6036	Research tutoring IV	1	0	2	0.5
GH6037	Research tutoring V	1	0	2	0.5
		10	0	36	9

Eighth Semester

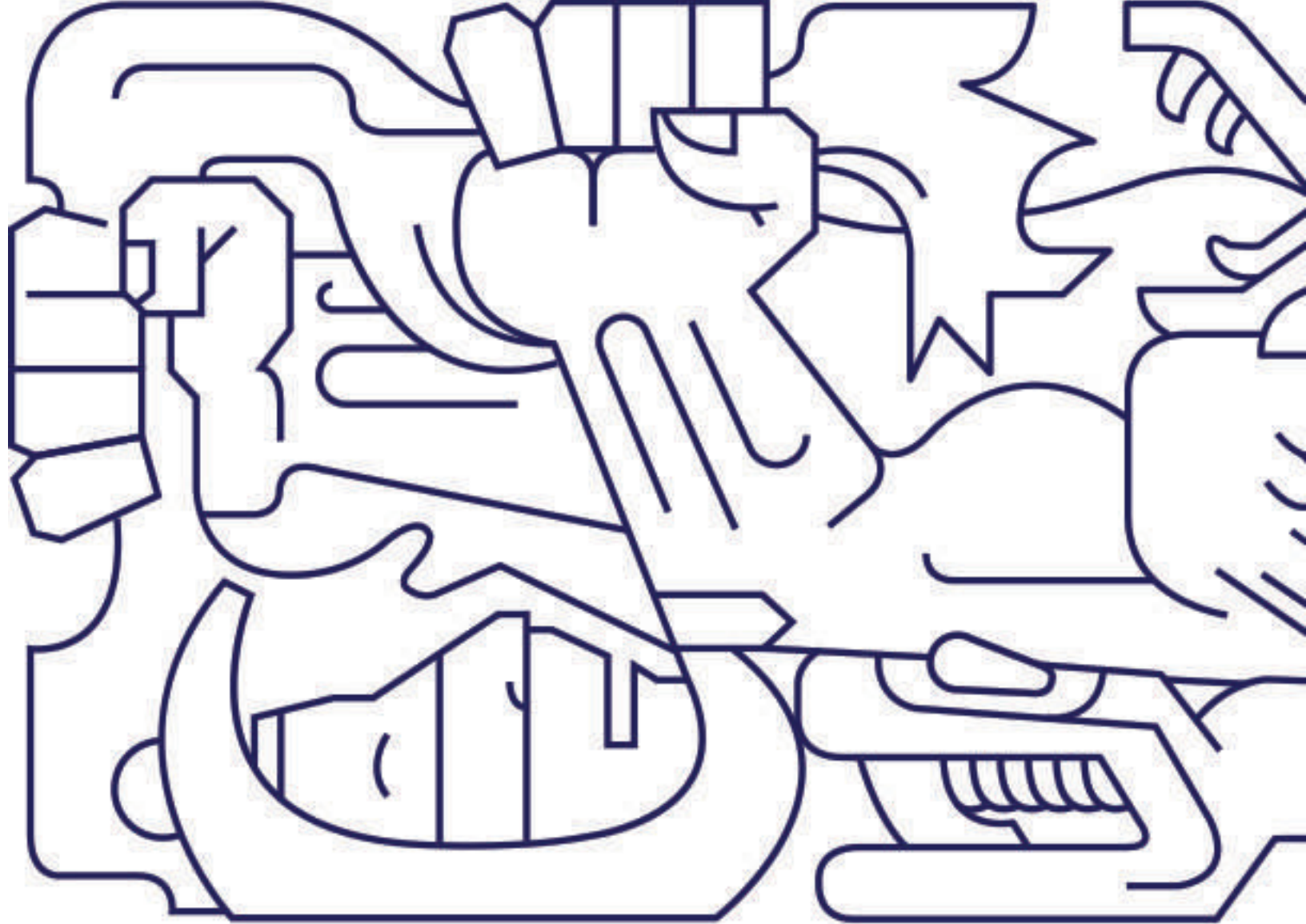
Code	Name	CL	L	U	CA
GH6038	Doctoral Research IX	3	0	12	3
GH6039	Doctoral Research X	3	0	12	3
GH6040	Strategic Research Seminar VIII	1	0	4	1
GH6041	Research Workshop VI	1	0	4	1
GH6042	Research tutoring VI (Doctoral Predefense)	1	0	2	0.5
GH6043	Doctoral defense	0	0	1	0.3
		9	0	35	8.8

This Ph.D program has as requirement a medical residency program.

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School of
Engineering and
Sciences

EIS Especialidad en Ingeniería de Software

Justification

Technologies related to Software Engineering are changing rapidly. There is a proliferation of both software and hardware products emerging from new theories, methods and techniques. These advancements result in a high rate of change in organizations and the appearance and development of new information technologies, thus significantly increasing the demand for specialized human resources with an international profile who are capable of assimilating, assessing, transferring and integrating the new advancements in software engineering to develop new products and services consistent with current requirements.

The horizon of substantial technological changes in software engineering tools, processes and methods ranges from three to five years, which is why leading software engineers are increasingly in demand in competitive firms. They can produce successful developments to offer new services or enhance current services and thus increase the value of the organization's substantive activities.

Tecnológico de Monterrey, aware of these constant technological changes in software, as the basis of business systems, offers the specialization in Software Engineering as an option to train human talent who can drive the country's competitiveness.

Program objective

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

Graduates from Tecnológico de Monterrey's Specialization in Software Engineering will be able to:

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

EIS Specialization in Software Engineering Plan 2011

First Trimester

Code	Name	CL	L	U	CA
TC4016	Software Analysis, Design and Construction	3.5	0	12	3
TC4017	Software Testing and Quality Assurance	3.5	0	12	3
		7	0	24	6

Second Trimester

Code	Name	CL	L	U	CA
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
TC4018	Managing Software Development	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
GI5020	Professional Certification	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		7	0	24	6

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ELS Specialization in Logistics and Supply Chain

Justification

The specialization in Logistics and Supply Chains is justified given the need to use resources efficiently in the supply chain areas, while considering sustainability and IT use from a global, integrating and collaborative perspective.

Current organizational challenges include the identification of strategic worldwide partners, competitive globalized markets, energy costs and market demands, as well as increasingly complex organizations.

Therefore, Logistics and Supply Chain specialists contribute decisively to the development of the highly specialized talent demanded by companies with the capacity to design, implement and lead initiatives that have a high impact on generating added value in their operations.

According to the document "Evaluation of Supply Chain Performance in Mexico, Generation of National Indicators" generated on the basis of the study conducted by ATKEARNEY and sponsored by the Ministry of the Economy and the Council of Supply Chain and Management Professionals, the greatest impact on service indicators comes from strengthening education processes and, in the industrial sector, strengthening the training processes of the supply chain actors has been declared a priority.

In the Logistics Performance Index 2007, México is ranked 56 out of 150 countries, thus revealing the need for specialists in this area who will be able to enhance the nation's competitiveness and economic development. The result of this was the strategy contained in the National Development Plan 2007-2012 of fomenting an increase in the training of human capital with logistic service capacities.

The Ministry of the Economy, on its page devoted to logistics in Mexico (<http://www.elogistica.economia.gob.mx>) states "Together with the economic development of a country, its geographic position, technological advancements and other advantages, the talent of human capital has been a decisive factor to achieve competitiveness. The field of logistics has extensive areas of opportunity in human resource training that can undoubtedly be covered by educational institutions...."

Tecnológico de Monterrey, aware of the need to train logistics specialists, offers the specialization in Logistics and Supply Chains as an option to prepare human talent who can drive the competitiveness of the country by enhancing the supply chain management processes.

Objectives of the specialization

The Logistics and Supply Chain Specialization program prepares specialists so that in their careers they will be able 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.

ELS Specialization in Logistics and Supply Chain Plan 2011

First Trimester

Code	Name	CL	L	U	CA
AD4001	Statistical Analysis in Organizations	3.5	0	12	3
AD5003	Value Creation, Business and Network Models	3.5	0	12	3
		7	0	24	6

Second Trimester

Code	Name	CL	L	U	CA
IN5096	Transportation and Third Party Logistics	3.5	0	12	3
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
GI5021	Professional Certification	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		7	0	24	6

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EPY Specialization in Project Management

Justification

Nowadays, the strategic and operational areas of every public and private organization depend largely on first-rate project management and leadership to optimize the use of the allocated resources.

The specialization in Project Management contributes to the preparation of specialists who address these issues in organizations and who are experts in applying quantitative techniques and tools for project time scheduling and resource allocation in institutions. These methodologies will be optimized by applying specialized computer tools for project management and scheduling.

The Specialization in Project Management is one of the first graduate programs to offer international certifications in the area of project management and administration, specifically the international Project

Management Professional (PMP) certification awarded by the Project Management Institute. Project management is a consolidated field of knowledge at ITESM, which is highly experienced in collaborations, projects, consulting, courses and diploma courses for industry in the area. Project management is an option for professional development that comprises, among others, PMI certifications (Project Management Institute): PMP (Project Management Professional), CAPM (Certified Associate in Project Management).

Objective of the specialization

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

The Specialization in Project Management prepares specialists who, on graduating, will also have earned professional certification and 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.

EPY Specialization in Project Management Plan 2011

First Trimester

Code	Name	CL	L	U	CA
AD4004	Competitive Strategy and Business Design	3.5	0	12	3
AD5034	Project Management	3.5	0	12	3
		7	0	24	6

Second Trimester

Code	Name	CL	L	U	CA
FZ5011	Economic Engineering	3.5	0	12	3
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
GI5023	Professional Certification	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		7	0	24	6

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MBI Master of Science in Biotechnology

Justification

The huge demand to make processes more efficient in the agricultural, healthcare and industrial sectors, among others, has fomented the incorporation of biotechnological techniques into the production and transformation of satisfiers. Therefore, professionals who are able to perform in academic or business settings can participate actively in the development of biotechnological processes in the laboratory and also implement them in industrial settings, thus acquiring a competitive advantage in their careers.

General program objectives

The aim of the MBI program is to prepare professionals who are committed to their communities, on a social, ethical and economic level, aware of the need to create new sustainable technologies, and with a remarkable spirit of entrepreneurship and innovation.

Learning outcomes

On completing the program, graduates will be able to work in the areas of new product and biotechnological process research and development.

Target audience

This program is offered to professionals who hold a degree in biology, agronomy, chemistry, biochemistry, food industry, medicine and biochemical engineering, among others.

Research areas

- Biocatalysis, natural antioxidants and nutraceuticals.
- Biotechnology of cereals, fruits and vegetables.
- Biopackaging and sanitary immunity.
- Bioprocesses: fermentations and bioseparations (pigments, aromas and biofuels).
- Microbiology and the environment: bioremediation.

MBI Master of Science in Biotechnology Plan 2009

First Semester

Code	Name	CL	L	U	CA
BT4005	Cell Biology and Physiology	3	0	12	3
BT5006	Genetic Engineering	3	0	12	3
GI5000	Research and Innovation Methods	1.5	0	6	1.5
OP4000	Quality Development Course	1.5	0	6	1.5
		9	0	36	9

Second Semester

Code	Name	CL	L	U	CA
BT4004	Instrumental Analysis in Biotechnology	3	0	12	3
BT5005	Selected Topics in Biotechnology	3	0	12	3
IN5058	Design and Analysis of Experiments	3	0	12	3
		9	0	36	9

Third Semester

Code	Name	CL	L	U	CA
GI5007	Thesis I	3	0	12	3
OP5042	Elective I	3	0	12	3
OP5043	Elective II	3	0	12	3
		9	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
GI5008	Thesis II	3	0	12	3
OP5044	Elective III	3	0	12	3
OP5045	Elective IV	3	0	12	3
		9	0	36	9

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 CA The letters "CA" represents the number of semester credit hour of the course.

MCC Master of Science in Computer Science

Justification

Technologies related to Computer Science change extremely rapidly: there is a proliferation of both software and hardware products derived from new theories, methods and techniques. These advancements result in a very high obsolescence rate in the area, leading to a significant demand for human resources from three major areas:

- Specialists in the productive sector
- Academics with up-to-date knowledge
- Technological research and development

MCC graduates are professionals who can keep up with the rapid advancements in technology, while also contributing with innovative proposals in the field of computer science to provide solutions to the major challenges of today's world. Master in Computer Science graduates will be able to transfer solutions to specific problems to general concepts or methodologies, and apply general computer concepts to the specific solution of problems found in business and research settings. If they so wish, they will be able to go on to study a PhD in computer science.

General program objectives

- To prepare successful computer science specialists who are capable of contributing to solving problems in production and/or research settings.
- To develop professionals who can work effectively and collaboratively in multidisciplinary working groups.
- To prepare leaders who will act as agents of change in their field of work.
- To train innovative, entrepreneurial professionals who can generate technology-based patents, products and companies.
- To develop talent capable of adapting to technological and methodological change in computer science.

Learning Outcomes

On completing the program, students will be able to:

- Be highly literate in leading-edge computer science technologies and methodologies.
- Fulfill lifelong self-directed learning and adapt to new environments.
- Work collaboratively in multidisciplinary teams.
- Generate scientific-practical research projects.

- Work with a culture of innovation and patent formulation to further the development of technology-based enterprise.
- Communicate effectively orally and in writing in English.

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, the development of control, diagnostic and monitoring systems.
- 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 science professionals, who are practitioners, consultants, instructors or researchers who wish to deepen or update their theoretical and technical knowledge of this field.
- Professionals in related areas (electronics, electrical engineering, communications, mathematics, physics and other professionals who have sufficient basic knowledge to complete their master's studies successfully), who wish to complement their education with computer science studies.

Research areas

- Computer networks and security.
- Bioinformatics.
- Intelligent systems applied to business and engineering.
- Virtual and robotic agents in virtual reality and real environments.
- Grid Computing.
- eLearning.

MCC Master of Science in Computer Science Plan 2009

Remedial Semester

Code	Name	CL	L	U	CA
TC4000	Programming Techniques	3	0	12	3
		3	0	12	3

First Semester

Code	Name	CL	L	U	CA
GT4000	Research and Innovation Methods	1.5	0	6	2
IA4000	Intelligent Systems	3	0	12	3
OP4000	Quality Development Course	1.5	0	6	2
TC4001	Computing Fundamentals	3	0	12	3
TC4002	Software Analysis, Design and Construction	3	0	12	3
		12	0	48	12

Second Semester

Code	Name	CL	L	U	CA
GT5000	Thesis I	3	0	12	3
OP5042	Elective I	3	0	12	3
OP5043	Elective II	3	0	12	3
TC4003	Distributed Systems	3	0	12	3
		12	0	48	12

Third Semester

Code	Name	CL	L	U	CA
GT5001	Thesis II	3	0	12	3
OP5044	Elective III	3	0	12	3
OP5045	Elective IV	3	0	12	3
OP5046	Elective V	3	0	12	3
		12	0	48	12

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MCC-I Master of Science in Computer Science

Description

In the past few decades, Mexico has been characterized as a country with a major economic dimension, privileged geographic position, a young population and openness to globalization, making it an attractive country for investments and achieving a globally relevant industrial manufacturing sector. Companies from this sector constantly require IT and computation capacities that support strategies to enhance their product offering, consolidation and competitiveness, without neglecting their social and environmental responsibilities.

Program objective

To prepare professionals for industry and academia, who, as agents of change, will be capable of conducting applied research, technological development, innovation and technology transfer in computer science settings.

Applicant profile and target audience

The Master in Computer Science program targets professionals mainly from the areas of informatics, engineering and exact sciences, who are interested in conducting high-impact research in one of the specialization areas of Computer Science. Students who enter this program must have an excellent academic background, vocation for knowledge generation and good communication skills; work professionally under the strictest ethical standards; be open to new ways of assimilating knowledge and professional practice; and be intellectually curious.

Graduate profile

On completing 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 specialization that contributes relevant knowledge to the advancement of Computer Science.
- Communicate the outcome of their professional work clearly, effectively and efficiently.
- Work in the professional community in their area of specialization with an efficient, collaborative and ethical leadership.

**MCC-I Master of Science in Computer Science
Plan 2016**

First Semester

Code	Name	CL	L	U	CA
CS4000	Intelligent Systems	3	0	12	3
CS4012	Computing Fundamentals	3	0	12	3
GI5000	Research and Innovation Methods	1.5	0	6	2
OP4000	Quality Development Course	1.5	0	6	2
		9	0	36	9

Second Semester

Code	Name	CL	L	U	CA
CS4013	Machine Learning	3	0	12	3
CS4014	Applied Mathematics	3	0	12	3
CS5058	Thesis I	3	0	12	3
		9	0	36	9

Third Semester

Code	Name	CL	L	U	CA
CS5059	Thesis II	3	0	12	3
OP5042	Elective I	3	0	12	3
OP5043	Elective II	3	0	12	3
		9	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
CS5060	Thesis III	3	0	12	3
OP5044	Elective III	3	0	12	3
OP5045	Elective IV	3	0	12	3
		9	0	36	9

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MCI Master of Science in Engineering

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:

Conceptual competences

- 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.

Procedimental competences

- 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.

Attitudinal competences

- 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 Plan 2017

First Semester

Code	Name	CL	L	U	CA
CS4015	Applied Computing	3	0	12	3
F4005	Mathematical Physical Modeling	3	0	12	3
GI5000	Research and Innovation Methods	1.5	0	6	1.5
OP4000	Quality Development Course	1.5	0	6	1.5
		9	0	36	9

Second Semester

Code	Name	CL	L	U	CA
GI5025	Thesis I	3	0	12	3
IN4027	Data Science and Statistical Inference	3	0	12	3
OP5042	Elective I	3	0	12	3
		9	0	36	9

Third Semester

Code	Name	CL	L	U	CA
GI5026	Thesis II	3	0	12	3
OP5043	Elective II	3	0	12	3
OP5044	Elective III	3	0	12	3
		9	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
GI5027	Thesis III	3	0	12	3
OP5045	Elective IV	3	0	12	3
OP5046	Elective V	3	0	12	3
		9	0	36	9

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MCY Master of Science in Cybersecurity

Objective

The general objective of this program is to prepare professionals who will be agents of change in organizations and capable of innovation, technology development and technology transfer in the areas of cybersecurity, and lead and manage a cybersecurity office.

Exit competencies

Students will have the opportunity throughout the program not only to interact with distinguished consultant in the program's areas of specialization, but also with students from the different lines of research and from other graduate programs at Tecnológico de Monterrey. This rich interaction is one of the greatest strengths of this master's program, which is designed to offer students the necessary preparation and competencies to become innovative leaders in cybersecurity. Therefore, on exiting the program, students will be able to:

Conceptual competencies

Demonstrate a high level of basic knowledge of the fundamental areas of cybersecurity, including, but not limited to, architecture, management and operations. Master efficient, effective methodologies to protect an organization's data, information and knowledge.

Procedural competencies

Analyze cybersecurity problems using appropriate reference models.

Innovate in their area of specialization to contribute new relevant knowledge for the advancement of cybersecurity.

Develop solutions for cybersecurity problems using technology tools.

Communicate the results of their professional work clearly, effectively and efficiently.

Attitudinal competencies

Work in the professional community of their area of specialization efficiently and effectively, with leadership and ethics.

Have a proactive and creative attitude to undocumented problems, generating innovations to as required by the problem.

Target audience

The Master in Cybersecurity targets graduates from bachelor's degrees in engineering or science who have professional work experience in engineering, specifically in IT and telecommunications.

Entry profile

Students who enter this program require a solid foundation in the area of informatics, coding and programming, data networks, communications, protocols, operating systems and computer processes. In addition, they must have an outstanding academic background, a vocation for knowledge generation, fluid communication skills, the capacity to work in a professional manner under strict ethical standards, and be open to ways of assimilating knowledge and professional practices, and be intellectually curious. These qualities will be evaluated by means of motivation letter for admission to the program and an interview with the program director.

MCY Master in Cybersecurity Plan 2019

First Trimester

Code	Name	CL	L	U	CA
OP4046	Quality Development Course	3	0	12	3
TI4020	Cybersecurity Frameworks Outline	3	0	12	3
TI4021	Functional Cybersecurity Structure in Organizations	3	0	12	3
		9	0	36	9

Second Trimester

Code	Name	CL	L	U	CA
TC4020	Cybersecurity Operations	3	0	12	3
TI4023	Data Protection Management	3	0	12	3
TI4024	Innovation in Cybersecurity Technology	3	0	12	3
		9	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
OP5085	Elective I	3	0	12	3
TC5028	Cybersecurity Project	3	0	12	3
TI4025	Innovation and Leadership in Cybersecurity Management	3	0	12	3
		9	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
OP5086	Elective II	3	0	12	3
OP5087	Elective III	3	0	12	3
OP5088	Elective IV	3	0	12	3
		9	0	36	9

Fifth Trimester

Code	Name	CL	L	U	CA
OP5089	Elective V	3	0	12	3
TC5029	Business Cybersecurity Project	3	0	12	3
		6	0	24	6

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MEM Master in Engineering Management

Justification

There is a growing interest in the industry of engineers to direct, identify, and effectively implement projects, considering legal, ethical principles, leadership, innovation and sustainable development. This is further seen in large and / or multinational companies that also require engineers who are trained to be leaders of projects, with a mix of deep technical knowledge and soft skills.

To meet these needs, the Master in Engineering Management is created which seeks to develop in an engineer, communication skills, leadership and project management, combined with specialization in technical and analytical skills to improve their work areas.

The Master of Engineering Management is presented as an option, among other industry-oriented programs in Tecnológico de Monterrey, which focuses on different areas of engineering, with the main objective to develop leaders and project managers, specialists in their area of expertise.

This postgraduate program is designed for graduates from bachelor degrees in engineering and science, in which the goal is that students know and apply technology tools that help them manage and lead projects, responding to particular needs of the industry, thereby supporting, technological and economic development of the country, strengthening further the company-university relation.

As part of the program, the student will carry out a project that meets a need or real problem of a company, where they apply and develop the knowledge and skills promoted by the program, which will be a graduation requirement.

Program Objectives

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

Graduate profile

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.

Audience it addresses

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 start-up 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.

Concentration areas

Information technology

In this area of concentration, we will train students with skills to develop technological perspectives, detect the life cycle of technology (processes and products), analyze market trends and design technology strategies and identify business opportunities, organize engineering teams and be a liaison between the engineering, administrative and commercial equipment. Graduates are innovative leaders committed to their community.

Optimization

In this area of concentration, we will train students with skills to analyze and solve problems in which they need to maximize profits or minimize costs, or some other variable or critical of the company, by using mathematical tools, involving different areas of influence in the problem or area opportunity.

Data Science

In this area of concentration, we will train students with skills to analyze and solve problems that require intensive statistical analysis of information, require testing of hypotheses, design of experiments, regression analysis, capacity analysis process, statistical control of the data, or the application of any other statistical tool engineering.

Supply Chain and Logistics

In this area of concentration, we will train students with skills to analyze and solve problems associated with supply chain management and / or logistics, problems of demand management, product distribution, storage and inventory flow management of manufacturing, among others.

MEM Master in Engineering Management Plan 2016

First Trimester

Code	Name	CL	L	U	CA
IN4029	Engineering Project Management	3.5	0	12	3
IN4030	Financial Analysis for Innovation and Technology Projects	1.5	0	6	1.5
IN5111	Project Design I	1.5	0	6	1.5
OP4036	Quality Development Course	3.5	0	12	3
		10	0	36	9

Second Trimester

Code	Name	CL	L	U	CA
IN4028	Statistical Methods and Visualization	3.5	0	12	3
IN4031	Economic Analysis for Business	1.5	0	6	1.5
IN4032	Risk Analysis Project Management	1.5	0	6	1.5
IN4033	Innovation and Product Development	1.5	0	6	1.5
IN5112	Project Design II	1.5	0	6	1.5
		9.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
IN4034	Legal Aspects in Managing Engineering	1.5	0	6	1.5
IN5121	Business Innovation Project I	2	0	6	1.5
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		10.5	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
IN5122	Business Innovation Project II	2	0	6	1.5
IN5123	Business Innovation Project III	2	0	6	1.5
IN5124	Business Innovation Project IV	2	0	6	1.5
IN5125	Business Innovation Project V	2	0	6	1.5
OP5055	Elective III	3.5	0	12	3
		11.5	0	36	9

Fifth Trimester

Code	Name	CL	L	U	CA
IN5126	Business Innovation Project VI	2	0	6	1.5
IN5127	Business Innovation Project VII	2	0	6	1.5
OP5056	Elective IV	3.5	0	12	3
		7.5	0	24	6

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MER-V Master in Energy Management and Renewable Sources

Justification

Developing countries require that services management and energy use are guaranteed in a context of sustainable development. To achieve this is necessary to innovate in energy management, give priority to the conservation of nonrenewable energy resources and promote the use of alternative energy sources.

Global 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.

Graduate Profile

Graduates of this program 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.

Target Audience

Professionals with responsibility in the processes of planning and management of energy and in the development, implementation and evaluation of energy management policies.

MER-V Master in Energy Management and Renewable Sources (On line Program)
Plan 2011

Remedial Semester

Code	Name	CL	L	U	CA
IQ4002	Fundamentals for Energy Analysis	3	0	12	3
		3	0	12	3

First Semester

Code	Name	CL	L	U	CA
EC4010	Environmental Economics	3	0	12	3
OP4037	Quality Development Course	3	0	12	3
		6	0	24	6

Second Semester

Code	Name	CL	L	U	CA
OP5042	Elective I	3	0	12	3
TE4014	Industrial Applications of Renewable Energy	3	0	12	3
TE4015	Management and Efficient Use of Electrical Energy	3	0	12	3
		9	0	36	9

Third Semester

Code	Name	CL	L	U	CA
OP5043	Elective II	3	0	12	3
TE4011	Cogeneration and Alternate Sources of Energy	3	0	12	3
TE4016	Legislation and Funding of Energy Resources	3	0	12	3
		9	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
GI5010	Research and Innovation Methods	3	0	12	3
OP5044	Elective III	3	0	12	3
		6	0	24	6

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MID-V Master in Innovation for Enterprise Development

Justification

The objective of the nineties was to learn to manage efficiency, competitiveness and productivity models. Nowadays, the growth in sales and results depends on the search for new markets and products, as well as on changes in organizational processes.

Growth in innovative companies is clearly greater than in non-innovative firms, thus requiring the preparation of creative people and teams that generate value and have a vision oriented toward the search for new opportunities. Innovation implies the generation of competitive advantages, the creation of markets and the possibility of maintaining leaderships.

Program objectives

The objectives of the Master in Innovation for Enterprise Development are:

- 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.
- Identify opportunities to generate added value for the market.
- Promote a culture of innovation to generate sustainable competitive advantages.
- Oversee the innovation process, from the generation of an idea, its dissemination and the evaluation of its impact on the company.
- Provide a technology-based product and service model that supports practical learning.
- Develop and strengthen skills to initiate a technology-based project of their own or in an established firm.
- Identify innovation opportunities in established organizations.
- Identify opportunities to generate new technology-based businesses.

Learning Outcomes

Graduates from the Master in Innovation for Enterprise Development are 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.
- 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.

Candidate profile

- Professionals from the areas of Administration, Technology, Engineering, Health, Humanities and Social Sciences interested in acquiring the knowledge necessary to drive innovation in their organization.
- Consultants who offer services in the area of innovation.

MID-V Master in Innovation for Enterprise Development (On line Program)
Plan 2009

Remedial Trimester

Code	Name	CL	L	U	CA
AD4016	Administration	3.5	0	12	3
		3.5	0	12	3

First Trimester

Code	Name	CL	L	U	CA
AD4013	Financial Impact of Innovation in Organizations	3.5	0	12	3
AD4014	Management and Evaluation of Innovation Projects	3.5	0	12	3
DS4002	Leadership for Sustainable Development	3.5	0	12	3
		10.5	0	36	9

Second Trimester

Code	Name	CL	L	U	CA
TI4000	Legal Aspects of Technology	3.5	0	12	3
TI4004	Mental Models and Innovation Methodologies	3.5	0	12	3
TI4005	Innovation Process and Techniques	3.5	0	12	3
TI4006	Design of Technological Products and Services	3.5	0	12	3
		14	0	48	12

Third Trimester

Code	Name	CL	L	U	CA
AD4015	Culture and Innovation Management in Corporations	3.5	0	12	3
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		14	0	48	12

Fourth Trimester

Code	Name	CL	L	U	CA
AD5036	Innovation and Creativity Seminar	3.5	0	12	3
AD5037	Innovation Project	3.5	0	12	3
OP5056	Elective IV	3.5	0	12	3
		10.5	0	36	9

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MIE Master of Science in Energetic Engineering

Justification

The technological, social and economic development of Mexico requires energy services that can be guaranteed in a context of sustainable development, which should prioritize the conservation of non-renewable energy resources and favor the use of alternative fuels.

Energy has become one of the most important inputs for guaranteeing the competitiveness of companies in a highly competitive international context. The study of the efficient use of alternative sources of energy, thermal, electrical, gas, wind, solar and green fuels, requires well-trained engineers in several areas of engineering sciences (Electrical, Electronics, Physics, Mechanical, Thermal and Chemical) who have the capacity to understand the diverse processes and propose innovative solutions.

The Master of Science in Energy Engineering (MIE) equips students with a solid grounding in the fundamentals of engineering, enabling them to become experts in their area of concentration on topics such as: Quality and the Efficient Use of Electrical and Thermal Energy; Efficient Industrial Electrical System Design; Boilers and Combined Cycles for Power Generation; Electronic Power Control applied to: Electrical Systems, Wind Generator Converters, Photovoltaic Systems and Transportation Systems, Hybrid Cars and Flexible Electrical Grids (Smart Grids, FACTS, SVCs, etc.); Generation, Conversion and Distribution of Wind and Solar Energy; Efficient Buildings and Housing: Lighting and Air Conditioning; Regulation and Financing of Energy Resources and the Environmental Impact of Energies.

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 can be accepted from other areas of engineering if they can demonstrate they have sufficient knowledge or are willing to complete additional subjects to acquire this knowledge.

Research areas

- Management, efficient use and renewable energy sources.
- Design, optimization and integration of technology.

MIE Master of Science in Energetic Engineering Plan 2009

First Semester

Code	Name	CL	L	U	CA
GI5000	Research and Innovation Methods	1.5	0	6	1.5
OP4000	Quality Development Course	1.5	0	6	1.5
OP4006	Elective Course I	3	0	12	3
TE4010	Efficient Use of Electric Energy	3	0	12	3
		9	0	36	9

Second Semester

Code	Name	CL	L	U	CA
OP4007	Elective Course II	3	0	12	3
OP5042	Elective I	3	0	12	3
TE4011	Cogeneration and Alternate Sources of Energy	3	0	12	3
		9	0	36	9

Third Semester

Code	Name	CL	L	U	CA
GI5007	Thesis I	3	0	12	3
OP5043	Elective II	3	0	12	3
TE4012	Regulations and Financing of Energy Resources	3	0	12	3
		9	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
GI5008	Thesis II	3	0	12	3
OP5044	Elective III	3	0	12	3
OP5045	Elective IV	3	0	12	3
		9	0	36	9

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

Justification

The challenges faced by organizations in this day and age include the identification of strategic global partners, competitiveness in market globalization, energy costs, market demands and the increasing complexity of organizations. Therefore, the Master of Science in Quality Systems and Productivity is justified given the needs of the environment, contributing through resource efficiency in the areas of supply chain, quality and continuous improvement, engineering management, optimization and productive systems, considering the aspects of sustainability from a global, integrating, collaborative perspective.

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, according to the concentration studied, students will be able to:

- Design, oversee, 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, oversee, execute and evaluate experimental processes that generate tangible solutions for operational optimization.
- Design, oversee, 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

(On line Program)

Plan 2013

First Semester

Code	Name	CL	L	U	CA
OP4006	Elective Course I	3	0	12	3
OP4007	Elective Course II	3	0	12	3
OP4037	Quality Development Course	3	0	12	3
		9	0	36	9

Second Semester

Code	Name	CL	L	U	CA
IN4017	Production Engineering	3	0	12	3
IN4018	Supply Chain Management	3	0	12	3
IN4019	Quality Management and Competitiveness	3	0	12	3
OP5042	Elective I	3	0	12	3
		12	0	48	12

Third Semester

Code	Name	CL	L	U	CA
GI5010	Research and Innovation Methods	3	0	12	3
OP5043	Elective II	3	0	12	3
OP5044	Elective III	3	0	12	3
		9	0	36	9

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CA The letters "CA" represents the number of semester credit hour of the course.

MIR Master in Automotive Engineering

Justification

Mexico has maintained its position as one of the leading countries in vehicle production, ranking 11th in 2007 (OICA). End companies located in Mexico, in order of production volumes, are: General Motors, Nissan, Ford, VW, Chrysler, Honda and Renault. The participation of these companies is increasing. According to the AMIA (Mexican Automotive Industry Association), over three years (2005-2007) 9,000 million dollars were invested and, in 2007, production totaled 2 022 241 vehicles with total internal sales of 1 099 866 vehicles. In 2007, national auto-part exports reached 15 563 million dollars according to INA (National Auto-Part Industry) data. Given its participation in the Mexican economy, the automotive industry is considered one of the priority areas for the country's development and continues to be one of the first-order manufacturing activities, with employment figures rising from 170,000 people in 1994 to approximately 537,000 in 2006 (INEGI). At present, Tecnológico de Monterrey has strong ties with the automotive industry through the technological and scientific development programs in its Automotive Mechatronics Research Center (CIMA) and the Mexican Automotive Industry Development Center (CeDIAM). In addition, the Automotive Engineering Research Group belonging to CIMA conducts research in the same areas as the graduate program's areas of concentration.

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

The program targets mechanical, mechatronics, electronic and industrial engineers.

Research areas

- Automotive design and manufacturing.
- Power generation and control.
- Leadership for manufacturing.

MIR Master in Automotive Engineering Plan 2009

Remedial Semester

Code	Name	CL	L	U	CA
M1002	Computerized Drawing	2	2	8	3
		2	2	8	3

First Semester

Code	Name	CL	L	U	CA
GI5000	Research and Innovation Methods	1.5	0	6	2
M4008	Product Design	3	0	12	3
OP4000	Quality Development Course	1.5	0	6	2
OP4006	Elective Course I	3	0	12	3
TE4001	Instrumentation	3	0	12	3
		12	0	48	12

Second Semester

Code	Name	CL	L	U	CA
M4011	Internal Combustion Engines	3	1	12	3
M5047	Integration Project I	3	0	12	3
OP5042	Elective I	3	0	12	3
OP5043	Elective II	3	0	12	3
		12	1	48	12

Third Semester

Code	Name	CL	L	U	CA
M5048	Integration Project II	3	0	12	3
OP5044	Elective III	3	0	12	3
OP5045	Elective IV	3	0	12	3
OP5046	Elective V	3	0	12	3
		12	0	48	12

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MNT Master in Nanotechnology

Description

In recent decades, Mexico has been characterized as a country with an important economic dimension, privileged geographical position, young population and openness to globalization, positioning itself as an attractive country for investment and industrial sector achieving global relevance. To take advantage of these features this program of Nanotechnology has been developed to help to create and apply knowledge in the areas of materials science at the nanoscale.

Program Objective

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.

Income profile and audience it addresses

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.

Graduate profile

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.

**MNT Master in Nanotechnology
Plan 2016**

First Semester

Code	Name	CL	L	U	CA
F4002	Computer Simulations	3	0	12	3
GI5000	Research and Innovation Methods	1.5	0	6	2
MA4007	Partial Differential Equations	3	0	12	3
OP4000	Quality Development Course	1.5	0	6	2
		9	0	36	9

Second Semester

Code	Name	CL	L	U	CA
MA4009	Statistical Methods	3	0	12	3
NT5011	Thesis I	3	0	12	3
Q4001	Thermodynamics of Materials	3	0	12	3
		9	0	36	9

Third Semester

Code	Name	CL	L	U	CA
NT5012	Thesis II	3	0	12	3
OP5042	Elective I	3	0	12	3
OP5043	Elective II	3	0	12	3
		9	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
NT5013	Thesis III	3	0	12	3
OP5044	Elective III	3	0	12	3
OP5045	Elective IV	3	0	12	3
		9	0	36	9

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

Justification

The growth of information and communications technologies investment and services is increasing nationally and internationally. Moreover, the entire national development plan includes information and communications technologies as the foundation for fulfilling its goals. The demand for specialized, secure communications services, together with the need for miniaturized programmable electronic devices is exponential worldwide. This creates a clear trend of the importance in this day and age of microelectronics, digital signal processing, communications, embedded systems, communication networks, high speed broadband technologies, multimedia services, radio-frequency identification, etc. Nobody should be kept on the sidelines of this revolution since this produce a technological dependency that would represent a lag in the country's development. This trend determines the need to produce highly qualified people with cutting-edge knowledge in these areas and with an attitude of innovation and entrepreneurship to guide the country with leadership. The MSE-T program prepares masters in science in the areas of telecommunications to design, plan, operate, maintain and grow the communications systems and networks that provide specialized, secure services.

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

- Innovative electronics, communications and computer professionals who are interested in learning about and analyzing in depth the functioning of communications technologies in order to develop new trends in the area of communications.

Research areas

- Personal Communication Systems.
- Communications Network Analysis and Management.

**MSE-E Master in Science in Electronic Engineering (Electronic Systems)
Plan 2009**

First Semester

Code	Name	CL	L	U	CA
OP5042	Elective I	3	0	12	3
TE4000	Advanced Mathematics for Electronics Engineering	3	0	12	3
TE4002	Stochastic and Random Processes	3	0	12	3
		9	0	36	9

Second Semester

Code	Name	CL	L	U	CA
F4002	Computer Simulations	3	0	12	3
GT4000	Research and Innovation Methods	1.5	0	6	2
OP4000	Quality Development Course	1.5	0	6	2
TE4001	Instrumentation	3	0	12	3
		9	0	36	9

Third Semester

Code	Name	CL	L	U	CA
GT5000	Thesis I	3	0	12	3
OP5043	Elective II	3	0	12	3
OP5044	Elective III	3	0	12	3
		9	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
GT5001	Thesis II	3	0	12	3
OP5045	Elective IV	3	0	12	3
OP5046	Elective V	3	0	12	3
		9	0	36	9

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MSM Master of Science in Manufacturing Systems

Justification

In the past few decades, Mexico has been characterized as a country with an important economic dimension, privileged geographic position, young population and openness to globalization, making it an attractive country for investment and attaining a globally relevant industrial and manufacturing sector. Companies in this sector continuously require technological capacities to support their strategies and enhance their product offering, consolidation and competitiveness, without neglecting their social and environmental responsibilities.

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 multidisciplinary 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

Engineers from every discipline. Given its interdisciplinary nature, technological development and enhancement in manufacturing systems require the interaction of multiple areas of knowledge.

Research areas

- New product design and innovation.
- Advanced materials.
- Automation and mechatronics for manufacturing.
- Production engineering.

**MSM Master of Science in Manufacturing Systems
Plan 2009**

Remedial Semester

Code	Name	CL	L	U	CA
M1002	Computerized Drawing	2	2	8	3
M2010	Materials Behavior	3	1	8	3
M4000	Analysis and Synthesis of Mechanical Systems	3	0	12	3
		8	3	28	9

First Semester

Code	Name	CL	L	U	CA
GI5000	Research and Innovation Methods	1.5	0	6	2
M4009	Advanced Materials in Manufacturing	3	1	12	3
OP4000	Quality Development Course	1.5	0	6	2
OP4006	Elective Course I	3	0	12	3
		9	1	36	9

Second Semester

Code	Name	CL	L	U	CA
M4008	Product Design	3	0	12	3
M4010	Automation in Manufacturing Systems	3	1	12	3
OP5042	Elective I	3	0	12	3
		9	1	36	9

Third Semester

Code	Name	CL	L	U	CA
GI5007	Thesis I	3	0	12	3
OP5043	Elective II	3	0	12	3
OP5044	Elective III	3	0	12	3
		9	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
GI5008	Thesis II	3	0	12	3
OP5045	Elective IV	3	0	12	3
OP5046	Elective V	3	0	12	3
		9	0	36	9

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 CA The letters "CA" represents the number of semester credit hour of the course.

MTI-V Master in Information Technology Management

Justification

In today's society, the production of value depends largely on knowledge. Advancements in information technologies as well as globalization have resulted in access to large volumes of information; however, this does not ensure that this information is capitalized on in the production of value. Converting information into knowledge and knowledge into value requires professionals who are capable of strategically managing and applying innovative information technologies in order to address the challenges of productivity, sustainability and social responsibility in businesses and organizations.

Therefore, professionals who have the responsibility of knowing and making strategic decisions on resources and projects that involve information technology as a tool for global competitiveness need to be trained. In addition, these professionals have to be capable of assimilating and applying knowledge through information technologies to become leaders who will transform conventional processes and strategies. This transformation will lead organizations toward a new level of technological-administrative-strategic alignment that drives the comprehensive sustainability of enterprise.

In order to achieve and maintain high-performance companies in the long term, leaders must also permanently seek to harmonize the strategic application of information technologies and the organizational culture that will have to underpin and endorse all the initiatives and changes proposed. This is the only way to achieve a truly systemic approach, which is necessary to consider every angle in solving the complex problems implied in the extensive use of information technologies.

Nowadays, information technology managers must be fully identified as interdisciplinary individuals who will not avoid technological challenges and, equally, will not avoid organizational, human resource and financial challenges. Just as problems are not inherent to a single discipline, solutions cannot be polarized and require the expertise of professionals who, relying on IT, have a vision and knowledge that prepares them to find comprehensive solutions.

Program objective

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

Graduates 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.

**MTI-V Master in Information Technology Management (On line Program)
Plan 2012**

Remedial Trimester

Code	Name	CL	L	U	CA
AD4016	Administration	3.5	0	12	3
TI4011	Introduction to Information Technology	3.5	0	12	3
		7	0	24	6

First Trimester

Code	Name	CL	L	U	CA
OP4036	Quality Development Course	3.5	0	12	3
TI4016	Information Technology Governance	3.5	0	12	3
TI4017	Strategic Enterprise Performance Management	3.5	0	12	3
		10.5	0	36	9

Second Trimester

Code	Name	CL	L	U	CA
AD4022	Project, Program and Portfolio Management	3.5	0	12	3
OP5053	Elective I	3.5	0	12	3
TI5024	Dynamic Systems Modeling	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
AD5036	Innovation and Creativity Seminar	3.5	0	12	3
RH4002	Human Capital Management	3.5	0	12	3
TI4015	Business Technology Architecture	3.5	0	12	3
		10.5	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
OP5054	Elective II	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
OP5059	Degree Course I	3.5	0	12	3
		10.5	0	36	9

Fifth Trimester

Code	Name	CL	L	U	CA
OP5056	Elective IV	3.5	0	12	3
OP5060	Degree Course II	3.5	0	12	3
		7	0	24	6

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DBT Ph. D. in Biotechnology

Program Outcomes

Graduates from the Ph.D. in Biotechnology are scientists who create biological knowledge to establish novel and innovative technologies that are relevant for the food and pharmaceutical sectors, and understand basic phenomena within the field of life sciences. They work as leaders or as collaborators within national and international research groups, on areas such as nutraceuticals, biopharmaceuticals, bioinformatics, bioprocesses, cancer, cardiovascular sciences, stem cell biology, biomedical devices, biophysics, immunology and metabolism, 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.

The learning outcomes of this program are the following:

- 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.
- 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.

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

Have published (or have evidence of acceptance for publication of the final version of) at least two scientific papers on a topic related to their research project in a Scopus indexed journal:

- a) The first paper must be published in a Q1 or Q2 journal, in the corresponding area of study and Scopus category;
- b) The second paper must be published in a Q1, Q2 or Q3 journal.

The student must be the lead author of each paper in both publications. In the event of shared lead authorship, the paper can only be used once for graduation purposes in any of the graduate programs of the School of Engineering and Science, and only by the student whose name appears first on the list of authors.

DBT Ph. D. in Biotechnology
Plan 2011

First Semester

Code	Name	CL	L	U	CA
GI5000	Research and Innovation Methods	1.5	0	6	1.5
OP4000	Quality Development Course	1.5	0	6	1.5
OP5062	Elective I	3	0	12	3
OP5063	Elective II	3	0	12	3
OP5064	Elective III	3	0	12	3
		12	0	48	12

Second Semester

Code	Name	CL	L	U	CA
GI5011	Research Proposal I	3	0	12	3
OP5065	Elective IV	3	0	12	3
OP5066	Elective V	3	0	12	3
OP5067	Elective VI	3	0	12	3
		12	0	48	12

Third Semester

Code	Name	CL	L	U	CA
GI5012	Research Proposal II	3	0	12	3
GI5014	Research Seminar I	1	0	4	1
OP5068	Elective VII	3	0	12	3
OP5069	Elective VIII	3	0	12	3
OP5070	Elective IX	3	0	12	3
		13	0	52	13

Fourth Semester

Code	Name	CL	L	U	CA
GI5013	Research Proposal III	3	0	12	3
GI5017	Assisted Research I	3	0	12	3
OP5071	Elective X	3	0	12	3
OP5072	Elective XI	3	0	12	3
		12	0	48	12

Fifth Semester

Code	Name	CL	L	U	CA
GI5018	Assisted Research II	3	0	12	3
GI5019	Assisted Research III	3	0	12	3
GI6021	Doctoral Research I	3	0	12	3
GI6022	Doctoral Research II	3	0	12	3
		12	0	48	12

Sixth Semester

Code	Name	CL	L	U	CA
GI5015	Research Seminar II	1	0	4	1
GI6023	Doctoral Research III	3	0	12	3
GI6024	Doctoral Research IV	3	0	12	3
GI6025	Doctoral Research V	3	0	12	3
		10	0	40	10

Seventh Semester

Code	Name	CL	L	U	CA
GI6026	Doctoral Research VI	3	0	12	3
GI6027	Doctoral Research VII	3	0	12	3
GI6028	Doctoral Research VIII	3	0	12	3
		9	0	36	9

Eighth Semester

Code	Name	CL	L	U	CA
GI5016	Research Seminar III	1	0	4	1
GI6029	Doctoral Research IX	3	0	12	3
GI6030	Doctoral Research X	3	0	12	3
GI6031	Doctoral Research XI	3	0	12	3
		10	0	40	10

Ninth Semester

Code	Name	CL	L	U	CA
GI6000	Doctoral Defense	0	0	1	0.3
GI6032	Doctoral Research XII	3	0	12	3
GI6033	Doctoral Research XIII	3	0	12	3
GI6034	Doctoral Research XIV	3	0	12	3
		9	0	37	9.3

This Ph.D program has as requirement a medical residency program.

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CA The letters "CA" represents the number of semester credit hour of the course.

DCC PH. D. in Computer Sciences

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.

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

Have published (or have evidence of acceptance for publication of the final version of) at least two scientific papers on a topic related to their research project in a Scopus indexed journal:

- a) The first paper must be published in a Q1 or Q2 journal, in the corresponding area of study and Scopus category;
- b) The second paper must be published in a Q1, Q2 or Q3 journal.

The student must be the lead author of each paper in both publications. In the event of shared lead authorship, the paper can only be used once for graduation purposes in any of the graduate programs of the School of Engineering and Science, and only by the student whose name appears first on the list of authors.

DCC PH. D. in Computer Sciences Plan 2016

First Semester

Code	Name	CL	L	U	CA
CS6021	Guided Research I	3	0	12	3
CS6022	Guided Research II	3	0	12	3
CS6025	Integrated Exam	1.5	0	6	1.5
GI6041	Research Seminar I	1	0	2	0.5
GI6051	Research Workshop I	1	0	4	1
		9.5	0	36	9

Second Semester

Code	Name	CL	L	U	CA
CS6031	Research Proposal I	3	0	12	3
CS6032	Research Proposal II	3	0	12	3
CS6035	Research Proposal Defense	1.5	0	6	1.5
GI6042	Research Seminar II	1	0	2	0.5
GI6052	Research Workshop II	1	0	4	1
		9.5	0	36	9

Third Semester

Code	Name	CL	L	U	CA
CS6041	Research Integration I	1.5	0	6	1.5
CS6101	Doctoral Research I	3	0	12	3
CS6102	Doctoral Research II	3	0	12	3
GI6043	Research Seminar III	1	0	2	0.5
GI6053	Research Workshop III	1	0	4	1
		9.5	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
CS6103	Doctoral Research III	3	0	12	3
CS6104	Doctoral Research IV	3	0	12	3
GI6044	Research Seminar IV	1	0	2	0.5
GI6054	Research Workshop IV	1	0	4	1
GI6061	Scientific Product I	1.5	0	6	1.5
		9.5	0	36	9

Fifth Semester

Code	Name	CL	L	U	CA
CS6042	Research Integration II	1.5	0	6	1.5
CS6105	Doctoral Research V	3	0	12	3
CS6106	Doctoral Research VI	3	0	12	3
GI6045	Research Seminar V	1	0	2	0.5
GI6055	Research Workshop V	1	0	4	1
		9.5	0	36	9

Sixth Semester

Code	Name	CL	L	U	CA
CS6107	Doctoral Research VII	3	0	12	3
CS6108	Doctoral Research VIII	3	0	12	3
GI6046	Research Seminar VI	1	0	2	0.5
GI6056	Research Workshop VI	1	0	4	1
GI6062	Scientific Product II	1.5	0	6	1.5
		9.5	0	36	9

Seventh Semester

Code	Name	CL	L	U	CA
CS6109	Doctoral Research IX	3	0	12	3
CS6110	Doctoral Research X	3	0	12	3
CS6111	Doctoral Research XI	3	0	12	3
		9	0	36	9

Eighth Semester

Code	Name	CL	L	U	CA
CS6112	Doctoral Research XII	3	0	12	3
CS6113	Doctoral Research XIII	3	0	12	3
CS6114	Doctoral Research XIV	3	0	12	3
CS6120	Doctoral Defense	0	0	1	0.3
		9	0	37	9.3

This Ph.D program has as requirement a medical residency program.

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U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course.

DCI Ph. D. in Engineering Sciences

Program objectives

The objectives of this program are to prepare independent researchers with the capacities, knowledge and skills to:

- Identify opportunities, and create and manage original research projects at the frontier of knowledge.
- Disseminate research findings.
- Apply the knowledge generated for the country's technological development.
- Conduct high-impact research on engineering in the country's productive, education-academic and social sectors.

Target audience

The Doctor of Science in Engineering program is designed for engineering and exact science professionals interested in conducting high-impact research to contribute to knowledge in one of the Engineering Science areas of specialization. Students who enter this program require an excellent academic background, a vocation for knowledge generation and fluid communication skills, who can work in a professional manner under strict ethical standards, are open to ways of assimilating knowledge and professional practices, and are intellectually curious.

Entry profile

Tecnológico de Monterrey seeks to integrate a new generation of students who have completed their master's studies in areas related to engineering sciences or exact sciences, and are characterized by being: talented, enthusiastic individuals who are committed to the development of their environment and the wellbeing of society. They have the potential to successfully complete their graduate program and to become internationally competitive leaders with an entrepreneurial spirit and humanistic outlook. Academic entry requirement: A master's degree in an area of study related to engineering sciences or exact sciences.

Exit profile

The Ph.D. in Engineering Sciences prepares professionals with the capacity to:

- Generate new knowledge, contributing to the state of the art in their respective areas.
- Conduct research, teach, and develop and manage technology.
- Innovate, develop and apply new technologies in industrial and service processes.

- Display a high level of basic knowledge in fundamental areas of engineering, including, but not limited to, mathematics, statistics and computing.
- Master theoretical and methodological knowledge of engineering sciences in any professional situation.
- Model engineering problems using an appropriate mathematical language.
- Conduct research in their area of specialization that will contribute relevant knowledge to the advancement of engineering, under the supervision of their direct advisor and the thesis committee.
- Develop solutions to engineering problems using technology tools.
- Communicate the findings of their professional work clearly, effectively and efficiently.
- Work in the professional community of their area of specialization efficiently and collaboratively, with leadership and ethics.
- Have a proactive and creative attitude to undocumented problems, generating innovations as required by the problem.

Area of specialization

DCI is, by nature, a multidisciplinary environment, covering four areas of knowledge that have been selected from among the strongest lines of research in the School of Engineering and Science. These areas interact with each other through projects, centers and focus groups. The areas of knowledge serve as a melting pot for the definition of the DCI Program lines of research:

- Mechatronics and Advanced Manufacturing (MMA)

Mechatronics and Advanced Manufacturing consists of the analysis and synthesis of complex systems in which multiple disciplines interact. The Lines of Knowledge Generation and Application of MMA respond to the need to prepare researchers with a high level of training in the disciplines of Automation, Mechanics and Electronics.

- Clean Energy and Sustainable Water Use (ELA)

Clean Energy and Sustainable Water Use responds to global needs for evolution in operating approaches, from pollution control treatments to the concept of corporate social responsibility. It indicates relevance in relation to the economic and social contexts of natural resource management, with an ecosystemic focus, physical environment and populational health protection, implementing a sustainability approach and vision.

- Industrial Engineering (II)

Industrial Engineering is related to growing global competitiveness and represents one of the greatest challenges for every country, in particular the institutions and enterprises that will have to face an ongoing process of increased productivity, the efficient use of resources and the generation of value to address rising competition. Research at the frontier of knowledge of the Lines of Knowledge Generation

and Application of Industrial Engineering contributes to the search, development and implementation of new ways of operating and improving operating and administrative processes, particularly through the development of new, innovative decision-making models.

- Telecommunications (T)

Telecommunications help to solve fundamental problems in networks and systems that transport data and make it possible to design platforms that drive the digital industry of the future and technologies, such as IoT, Smart Cities, Intelligent Transportation Systems (ITS), smart-grid, Big-Data, e-health, 5G, cognitive radio, white spaces, location systems and sensors, to improve the quality of life of 21st-century society. Research is conducted to optimize and stochastically model key understanding of fundamental performance in the areas of wireless communications and networks, signal and data processing, the convergence of optical communications networks and wireless networks, vehicular communications, photonic crystals, aspects of physical layer levels, connectivity, modulation, reconfigurable network architecture, sensors and their applications.

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

Have published (or have evidence of acceptance for publication of the final version of) at least two scientific papers on a topic related to their research project in a Scopus indexed journal:

- a) The first paper must be published in a Q1 or Q2 journal, in the corresponding area of study and Scopus category;
- b) The second paper must be published in a Q1, Q2 or Q3 journal.

The student must be the lead author of each paper in both publications. In the event of shared lead authorship, the paper can only be used once for graduation purposes in any of the graduate programs of the School of Engineering and Science, and only by the student whose name appears first on the list of authors.

DCI Ph. D. in Engineering Sciences Plan 2018

First Semester

Code	Name	CL	L	U	CA
GI5017	Assisted Research I	3	0	12	3
GI5018	Assisted Research II	3	0	12	3
GI6035	Integrated Exam	1.5	0	6	1.5
GI6041	Research Seminar I	1	0	2	0.5
GI6051	Research Workshop I	1	0	4	1
		9.5	0	36	9

Second Semester

Code	Name	CL	L	U	CA
GI5011	Research Proposal I	3	0	12	3
GI5012	Research Proposal II	3	0	12	3
GI6036	Research Proposal Defense	1.5	0	6	1.5
GI6042	Research Seminar II	1	0	2	0.5
GI6052	Research Workshop II	1	0	4	1
		9.5	0	36	9

Third Semester

Code	Name	CL	L	U	CA
GI6021	Doctoral Research I	3	0	12	3
GI6022	Doctoral Research II	3	0	12	3
GI6037	Research Integration I	1.5	0	6	1.5
GI6043	Research Seminar III	1	0	2	0.5
GI6053	Research Workshop III	1	0	4	1
		9.5	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
GI6023	Doctoral Research III	3	0	12	3
GI6024	Doctoral Research IV	3	0	12	3
GI6044	Research Seminar IV	1	0	2	0.5
GI6054	Research Workshop IV	1	0	4	1
GI6061	Scientific Product I	1.5	0	6	1.5
		9.5	0	36	9

Fifth Semester

Code	Name	CL	L	U	CA
GI6025	Doctoral Research V	3	0	12	3
GI6026	Doctoral Research VI	3	0	12	3
GI6038	Research Integration II	1.5	0	6	1.5
GI6045	Research Seminar V	1	0	2	0.5
GI6055	Research Workshop V	1	0	4	1
		9.5	0	36	9

Sixth Semester

Code	Name	CL	L	U	CA
GI6027	Doctoral Research VII	3	0	12	3
GI6028	Doctoral Research VIII	3	0	12	3
GI6046	Research Seminar VI	1	0	2	0.5
GI6056	Research Workshop VI	1	0	4	1
GI6062	Scientific Product II	1.5	0	6	1.5
		9.5	0	36	9

Seventh Semester

Code	Name	CL	L	U	CA
GI6029	Doctoral Research IX	3	0	12	3
GI6030	Doctoral Research X	3	0	12	3
GI6031	Doctoral Research XI	3	0	12	3
		9	0	36	9

Eighth Semester

Code	Name	CL	L	U	CA
GI6000	Doctoral Defense	0	0	1	0.3
GI6032	Doctoral Research XII	3	0	12	3
GI6033	Doctoral Research XIII	3	0	12	3
GI6034	Doctoral Research XIV	3	0	12	3
		9	0	37	9.3

This Ph.D program has as requirement a medical residency program.

CL The letter "CL" indicates the number of class-hours per week. **L** The letter "L" indicates the number of laboratory-hours per week.
U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course.

DNT Ph. D. in Nanotechnology

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.

Audience it Addresses

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.

Graduate Profile

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.

Specialty Area

By its nature, the PhD in Nanotechnology is multidisciplinary, covering three areas of knowledge (Materials Science and Nanotechnology, Micro and Nanosystems and Nanophotonics and Quantum Systems) that have been selected from the research areas with greater strength within the school Engineering and Sciences. These areas interact with each other through projects, centers and focus groups.

The areas of knowledge that assist to define research topics in the DNT program are:

Materials Science and Nanotechnology. This line is oriented to the development of nanostructured functional materials, innovative nanofabrication processes, design of nanostructured devices, and generating innovative concepts as a basis for developing new nanotechnological products. The application of nanoscience with the support of the exact sciences, mathematical modeling of materials, computational simulation and experimental characterization infrastructure for prototyping and testing are highly desirable.

Micro and Nanosystems. This line of research is aimed at generating cutting-edge and world-class research that allows advance knowledge in micro and nanosystems, generate innovative developments in sensors and nano-systems with enhanced sensitivity, selectivity, portability and lower power consumption capabilities. The use of Nanoscience and nanoelectronics and experimental infrastructure for fabrication and characterization will be highly privileged.

Nanophotonics and Quantum Systems. This line of research is aimed at generating frontier research to technological developments and innovation in areas such as interactions between matter and light (photons) on the nanometer scale, the use of light for alteration, manufacture and / or characterization of organic and inorganic nanostructured materials.

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

Have published (or have evidence of acceptance for publication of the final version of) at least two scientific papers on a topic related to their research project in a Scopus indexed journal:

- a) The first paper must be published in a Q1 or Q2 journal, in the corresponding area of study and Scopus category;
- b) The second paper must be published in a Q1, Q2 or Q3 journal.

The student must be the lead author of each paper in both publications. In the event of shared lead authorship, the paper can only be used once for graduation purposes in any of the graduate programs of the School of Engineering and Science, and only by the student whose name appears first on the list of authors.

DNT Ph. D. in Nanotechnology Plan 2016

First Semester

Code	Name	CL	L	U	CA
GI6041	Research Seminar I	1	0	2	0.5
GI6051	Research Workshop I	1	0	4	1
NT6021	Guided Research I	3	0	12	3
NT6022	Guided Research II	3	0	12	3
NT6025	Integrated Exam	1.5	0	6	1.5
		9.5	0	36	9

Second Semester

Code	Name	CL	L	U	CA
GI6042	Research Seminar II	1	0	2	0.5
GI6052	Research Workshop II	1	0	4	1
NT6031	Research Proposal I	3	0	12	3
NT6032	Research Proposal II	3	0	12	3
NT6035	Research Proposal Defense	1.5	0	6	1.5
		9.5	0	36	9

Third Semester

Code	Name	CL	L	U	CA
GI6043	Research Seminar III	1	0	2	0.5
GI6053	Research Workshop III	1	0	4	1
NT6041	Research Integration I	1.5	0	6	1.5
NT6101	Doctoral Research I	3	0	12	3
NT6102	Doctoral Research II	3	0	12	3
		9.5	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
GI6044	Research Seminar IV	1	0	2	0.5
GI6054	Research Workshop IV	1	0	4	1
GI6061	Scientific Product I	1.5	0	6	1.5
NT6103	Doctoral Research III	3	0	12	3
NT6104	Doctoral Research IV	3	0	12	3
		9.5	0	36	9

Fifth Semester

Code	Name	CL	L	U	CA
GI6045	Research Seminar V	1	0	2	0.5
GI6055	Research Workshop V	1	0	4	1
NT6042	Research Integration II	1.5	0	6	1.5
NT6105	Doctoral Research V	3	0	12	3
NT6106	Doctoral Research VI	3	0	12	3
		9.5	0	36	9

Sixth Semester

Code	Name	CL	L	U	CA
GI6046	Research Seminar VI	1	0	2	0.5
GI6056	Research Workshop VI	1	0	4	1
GI6062	Scientific Product II	1.5	0	6	1.5
NT6107	Doctoral Research VII	3	0	12	3
NT6108	Doctoral Research VIII	3	0	12	3
		9.5	0	36	9

Seventh Semester

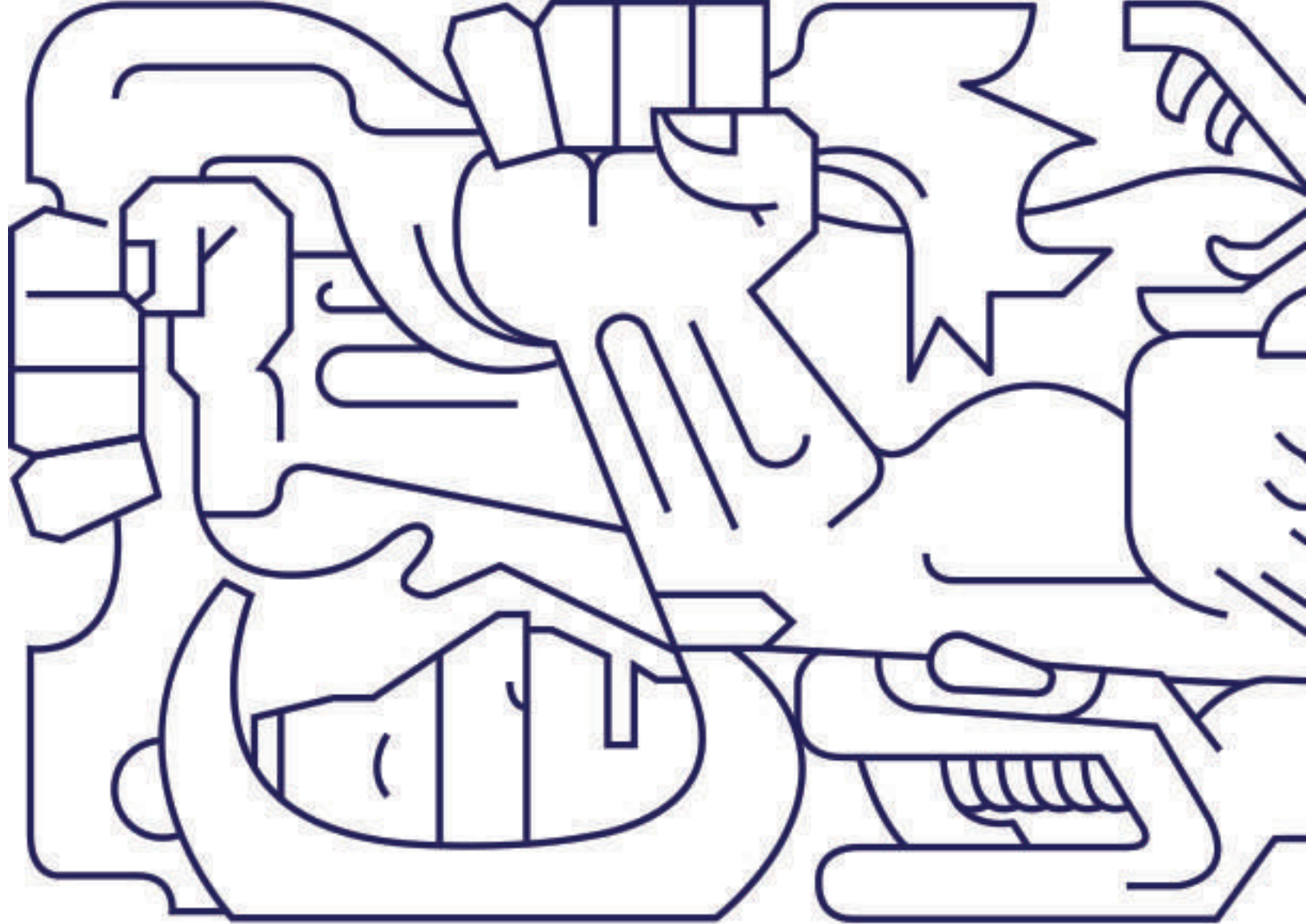
Code	Name	CL	L	U	CA
NT6109	Doctoral Research IX	3	0	12	3
NT6110	Doctoral Research X	3	0	12	3
NT6111	Doctoral Research XI	3	0	12	3
		9	0	36	9

Eighth Semester

Code	Name	CL	L	U	CA
NT6112	Doctoral Research XII	3	0	12	3
NT6113	Doctoral Research XIII	3	0	12	3
NT6114	Doctoral Research XIV	3	0	12	3
NT6120	Doctoral Defense	0	0	1	0.3
		9	0	37	9.3

This Ph.D program has as requirement a medical residency program.

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U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course.



School of Medicine
and Health Science

RAP Residency in Anatomic Pathology

Justification

Anatomical Pathology is, to date, the leading tool for the definitive diagnosis of cancer and, of equal importance in this field, immunohistochemistry and bio-molecular methods have been developed to determine the treatment and prognosis of many malignant neoplasms. Our curriculum includes these important processes. Expert Anatomical Pathologists who graduate from Tecnológico de Monterrey must be capable of fomenting and contributing to the sustainable development of society by addressing health as an inherent asset of Mexicans, and of collaborating on the professionalization of the residency with a constant sense of academic and healthcare competitiveness, from a human perspective.

The Residency in Anatomical Pathology provides residents with the opportunity to learn during the healthcare activities performed by expert pathologists, applying the knowledge obtained through self-directed learning and everyday theoretical activities, while advising them on the acquisition of abilities and skills that will put them in a position to resolve a wide variety of the situations they will face throughout their subsequent careers. The competencies acquired during their preparation will provide them with the necessary tools to practice their profession with the full level of knowledge in accordance with national and international organizations, be certified and maintain the spirit of continuous enhancement through continuing education and updating, lifelong learning and self-confidence, all of which will ultimately benefit the patient.

Program objectives

The aim of the Residency in Anatomical Pathology of Tecnológico de Monterrey is to train exceptional specialist practitioners who support patients and physicians in solving diagnostic problems. 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. Anatomical Pathology Residents who graduate from this institution are outstanding leaders in local and international settings who contribute to the generation and implementation of innovations in human-tissue prosection strategies and procedures that will result in the most accurate diagnosis possible.

Learning outcomes

Graduates from the Anatomical Pathology program will be able to:

- Apply with professionalism their knowledge of Anatomical Pathology in order to establish definitive diagnoses in pathology.
- Develop a critical rationale of the information available to communicate in a scientific, orientating manner with their colleagues who are involved in the patient's diagnosis and treatment.
- Participate in basic and clinical research as a member of a research team.

- Efficiently coordinate healthcare teams of practitioners and technicians in relation to Anatomical Pathology.
- Collaborate in inter-and multi-disciplinary teams exchanging experiences to enhance medical attention.
- Act with professionalism, ethics and a humanistic outlook.

Target audience

The Residency in Anatomical Pathology requires physicians who have completed their undergraduate degree and who throughout their studies showed a special interest in morphological science by participating in activities as scholarship holders within the department, who have selected Pathology as one of their optional rotations and/or conducted social service activities in pathology. Students must satisfactorily meet all the residency and master's admissions requirements of Tecnológico de Monterrey, be proficient in English and have a suitable psychological profile.

Research areas

Cancer: Breast cancer. Immunohistochemistry characteristics of breast neoplasms to endeavor to identify prognosis and therapeutic factors in patients at Hospital San José Tec de Monterrey, together with radiology and oncological treatment projects.

RAP Residency in Anatomic Pathology
Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	2	0	6	2	6
ME4153	Anatomic Pathology I	3	0	12	3	12
ME4154	Clinical Practice in Anatomic Pathology I	0	60	12	3	60
		5	60	30	8	78

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	2	0	6	2	6
ME4155	Anatomic Pathology II	3	0	12	3	12
ME4156	Clinical Practice in Anatomic Pathology II	0	60	12	3	60
		5	60	30	8	78

Third Semester

Code	Name	CL	L	U	CA	HT
ME4142	Quality Health Care	2	0	6	2	6
ME4157	Anatomic Pathology III	3	0	12	3	12
ME4158	Clinical Practice in Anatomic Pathology III	0	60	12	3	60
		5	60	30	8	78

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4143	Research and Innovation Methods	2	0	6	2	6
ME4159	Anatomic Pathology IV	3	0	12	3	12
ME4160	Clinical Practice in Anatomic Pathology IV	0	60	12	3	60
		5	60	30	8	78

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME5201	Anatomic Pathology V	3	0	12	3	12
ME5202	Clinical Practice in Anatomic Pathology V	0	60	12	3	60
		6	60	36	9	84

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5190	Thesis Project II	3	0	12	3	12
ME5203	Anatomic Pathology VI	3	0	12	3	12
ME5204	Clinical Practice in Anatomic Pathology VI	0	60	12	3	60
		6	60	36	9	84

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	2	30
ME5205	Anatomic Pathology VII	3	0	12	3	12
ME5206	Clinical Practice in Anatomic Pathology VII	0	30	6	2	30
		3	60	24	6	72

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	2	30
ME5207	Anatomic Pathology VIII	3	0	12	3	12
ME5208	Clinical Practice in Anatomic Pathology VIII	0	30	6	2	30
ME5266	Thesis Defense	0	0	1	0	0
		3	60	24	6	72

CL The letter "CL" indicates the number of class-hours per week. **L** The letter "L" indicates the number of laboratory-hours per week.
U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. **HT** Total hours.

RCA Residency in Health Care Quality

Justification

There is a growing interest in all health-provider institutions to research and solve quality and safety issues in patient care. However, they are facing an absence of specialist medical practitioners in this field and are, therefore, forced to introduce specialists from the industrial sector who strive to solve infrastructure and comfort problems or who train empirically through their daily practice, unable to have an impact on the physician-patient relationship in clinical and surgical processes, and, thus, failing to make the fundamental aspect of patient safety the focus of attention of the quality programs currently being developed in public and private healthcare institutions.

The Residency in Health Care Quality responds to the need for professionals who can form part of a dynamic, developmental, reforming process tied to the hospital and ambulatory experience and reality, linked inextricably to the hospital and healthcare clinics, with in-depth, consolidated knowledge in several areas of medicine to enhance medical practice within a multidisciplinary team.

The program facilitates the integration of knowledge, skills, abilities and attitudes concerning Health Care Quality with a level of proficiency that provides the resident and future specialist with the leadership to direct and assist in the analysis, restructuring and improvement of processes of change in medical and surgical attention in any of the three levels of attention ambulatory, hospital and emergency that affect the physical, mental and social health of individuals. Knowledge related to the quality, safety, self-sustainability and standardization of clinical processes is integrated within a framework of evidence-based medicine that guarantees its application from the initial patient contact to the patient's recovery in any public or private healthcare system.

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

Graduates from the Health Care Quality program 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

Physicians who have passed the National Medical Residency Applicant Exam and who have an interest in and vocation for this specialty; with the skills and attitudes to evaluate the quality and safety of the clinical care processes and to drive improvement efforts within a framework of health-service organizations; with a sense of commitment to patient safety and quality in the provision of first-contact health services; and the capacity to read and comprehend the medical literature in English; and availability to study full-time in order to cover the academic and healthcare activities consistent with the current regulations.

For admission to the Residency in Health Care Quality, applicants must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Quality Management and Patient Safety. Evaluation of the quality of care at its diverse levels, focusing on structural and organizational factors and their influence on quality. Another focus is determining user perception and other methods of patient and community participation. Use of clinical protocol analysis and improvement, applying quality enhancement tools and methodologies. With the healthcare quality assessment perspective in any of its dimensions, with a patient safety management and improvement approach.

Organizational Change Processes. Derived from the assessment of people, processes and organizations, focusing on improving quality in its diverse dimensions. The general aim of this research group is to advance knowledge of health organizations in their institutional growth, expansion and diversification processes; organization, agents, governance and financing; assessment of institutional quality and public policy programs.

RCA Residency in Health Care Quality Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4177	Management in Clinical Care I	3	0	12	3	12
ME4178	Hospital Practice I	0	60	12	3	60
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4179	Management in Clinical Care II	3	0	12	3	12
ME4180	Hospital Practice II	0	60	12	3	60
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4181	Management in Clinical Care III	3	0	12	3	12
ME4182	Hospital Practice III	0	60	12	3	60
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME5190	Thesis Project II	3	0	12	3	12
ME5225	Management in Clinical Care IV	3	0	12	3	12
ME5226	Hospital Practice IV	0	60	12	3	60
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5227	Management in Clinical Care V	3	0	12	3	12
ME5228	Hospital Practice V	0	30	6	1.5	30
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5229	Management in Clinical Care VI	3	0	12	3	12
ME5230	Hospital Practice VI	0	30	6	1.5	30
ME5266	Thesis Defense	0	0	1	0.3	0
		3	60	25	6.3	72

CL The letter "CL" indicates the number of class-hours per week. L The letter "L" indicates the number of laboratory-hours per week.
U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. HT Total hours.

RCR Residency in Cardiology

Justification

Cardiovascular diseases are the leading cause of death in Mexican men and women, and one of the top causes of occupational incapacity and loss of economic activities. Therefore, specialists trained in the detection of risk factors for the diagnosis, prevention and management of these disorders are needed.

Offering top-quality cardiology medical care requires rigorous discipline in the preparation of professionals who are committed to the social, political, economic and cultural development of the community. Consistent with this demand, the Residency in Cardiology trains medical practitioners in the area of clinical Cardiology through a first-rate teaching model that includes patient care and research to generate new knowledge; to be upright, moral individuals and practitioners in their performance, with respect for life and human dignity, internationally competent and capable of offering full, outstanding medical care, in keeping with the Mission and Vision of Tecnológico de Monterrey.

The Multicentric Cardiology Program of Tecnológico de Monterrey benefits from a world-class university infrastructure, a competency-based, patient-centered educational model; with well-structured academic and research programs and processes, offered by certified specialist physicians who are experts in cardiology subspecialties and trained teachers, converging within a framework of medical care represented by the Hospital San José - Tec de Monterrey, the Zambrano Hellion Medical Center, the Hospital Metropolitano Dr. Bernardo Sepúlveda of the Nuevo León Ministry of Health and international rotations at The Methodist DeBakey Heart Center. Residents have the necessary state-of-the-art technological, scientific and methodological support, are exposed to different health care and management models in regional, national and international contexts, enabling them to acquire the skills for performing successfully in different areas of cardiology.

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

Graduates from the Cardiology program 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.

The Cardiology residents' training in treating patients in national and international contexts allows them to construct specialized knowledge in a thesis project.

Target audience

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

For admission to the Residency in Cardiology of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

The faculty and residents of the Residency in Cardiology participate in the Cardiology and Vascular Medicine Research Group, which focuses on characterizing the cellular and molecular mechanisms that contribute to the development of heart failure. The definition of these mechanisms offers the possibility of evaluating new experimental prevention and treatment therapies in animal models, providing the scientific bases to lead clinical studies with patients. In particular, collaboration with the Research Group will be executed in the research project Participation of proinflammatory cytokines in heart failure.

RCR Residency in Cardiology Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	2	6
ME4142	Quality Health Care	1.5	0	6	2	6
ME4228	Cardiology I	3	0	12	3	12
ME4229	Medical Care in Cardiology I	0	60	12	3	60
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	2	6
ME4143	Research and Innovation Methods	1.5	0	6	2	6
ME4230	Cardiology II	3	0	12	3	12
ME4231	Medical Care in Cardiology II	0	60	12	3	60
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4232	Cardiology III	3	0	12	3	12
ME4233	Medical Care in Cardiology III	0	60	12	3	60
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME5190	Thesis Project II	3	0	12	3	12
ME5281	Cardiology IV	3	0	12	3	12
ME5282	Medical Care in Cardiology IV	0	60	12	3	60
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	2	30
ME5283	Cardiology V	3	0	12	3	12
ME5284	Medical Care in Cardiology V	0	30	6	2	30
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	2	30
ME5266	Thesis Defense	0	0	1	0	0
ME5285	Cardiology VI	3	0	12	3	12
ME5286	Medical Care in Cardiology VI	0	30	6	2	30
		3	60	25	6	72

CL The letter "CL" indicates the number of class-hours per week. L The letter "L" indicates the number of laboratory-hours per week.
U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. HT Total hours.

REA Residency in Anesthesiology

Justification

Advancements in Anesthesiology have evolved at an unprecedented speed. Greater knowledge of anesthesia techniques, the ongoing discovery of new drugs used in anesthesiology and advancements in monitoring during anesthesia are the results of globalization and technological development, all of which provides greater patient safety and benefits. Now more than ever before, anesthesiologists must practice with evidence-based scientific bases, oriented toward medical practice for appropriate perioperative management.

Within the framework of the Mission 2015 of Tecnológico de Monterrey, in association with the Nuevo León Ministry of Health, the educational model of the Multicentric Medical Residency Program of the School of Medicine and Health Sciences, which executes medical practice in the field of social and private institutional medicine, will produce a different profile in our graduates with a profound sense of academic and social responsibility.

We are fully convinced of the high degree of ethics and humanism of our residents, who have to be prepared to face the future challenges of Anesthesiology, practicing in Mexico and abroad in the fields of research and in development of new social opportunities, collaborating to enhance the quality of the professional lives of their colleagues and of their future students, which will be reflected in the benefits attained in the society in which they participate. In conclusion, the broad scope of our goals includes the conservation and enhancement of society's living conditions and opportunities.

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.

Anesthesiologists who graduate from this institution are 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

Graduates from this program will be specialist practitioners trained to a level of excellence in the area of Anesthesiology, capable of applying their knowledge, abilities and skills in a collaborative, multidisciplinary manner, within a framework of safe, comprehensive patient care. They will 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. They are committed to political, economic, social and cultural development and transformation, acting with the humility, good judgment and impartiality that distinguish them within their communities. Through a medical practice based on the problem-solving educational methodology, graduates will be highly competent specialist practitioners in their specific field of action within community-oriented medicine.

Target audience

Qualified physicians in compliance with all the official standards of the Ministry of Education and of the Ministry of Health. They must have the highest moral values, be ethical and congruent with the profession they have chosen to practice. Moreover, they must be willing to work in multidisciplinary teams, interested in conducting research to the highest quality standards, proficient in their native language and a second language, well-presented and respect patients, staff and the institution in which they provide their services.

For admission to the Residency in Anesthesiology of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Patient quality and safety. Research on the application of safety standards in anesthetic procedures in the operating theater and in other hospital areas in which anesthesia is used, in order to enhance the quality of our services.

**REA Residency in Anesthesiology
Plan 2013**

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	2	6
ME4142	Quality Health Care	1.5	0	6	2	6
ME4234	Anesthesiology I	3	0	12	3	12
ME4235	Medical Care in Anesthesiology I	0	60	12	3	60
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	2	6
ME4143	Research and Innovation Methods	1.5	0	6	2	6
ME4236	Anesthesiology II	3	0	12	3	12
ME4237	Medical Care in Anesthesiology II	0	60	12	3	60
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4238	Anesthesiology III	3	0	12	3	12
ME4239	Medical Care in Anesthesiology III	0	60	12	3	60
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4240	Anesthesiology IV	3	0	12	3	12
ME4241	Medical Care in Anesthesiology IV	0	60	12	3	60
ME5190	Thesis Project II	3	0	12	3	12
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	2	30
ME5287	Anesthesiology V	3	0	12	3	12
ME5288	Medical Care in Anesthesiology V	0	30	6	2	30
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	2	30
ME5289	Anesthesiology VI	3	0	12	3	12
ME5290	Medical Care in Anesthesiology VI	0	30	6	2	30
		3	60	24	6	72

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5291	Anesthesiology VII	3	0	12	3	12
ME5292	Medical Care in Anesthesiology VII	0	60	12	3	60
		3	60	24	6	72

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5266	Thesis Defense	0	0	1	0	0
ME5293	Anesthesiology VIII	3	0	12	3	12
ME5294	Medical Care in Anesthesiology VIII	0	60	12	3	60
		3	60	25	6	72

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U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. HT Total hours.

REC Residency in General Surgery

Justification

Society's need for general surgeons can be seen in the number of external consultation services, surgical procedures and hospitalization of patients in the public and private health systems, in our country and in our state. Of the five top hospitalization diagnoses in public and private hospitals, three are directly related to this specialty: digestive tract problems, traumatismos and benign and malignant tumors (INEGI 2009). Regarding causes of death in public and private institutions in the state of Nuevo León, the top causes are tumors and circulatory diseases alike; second place is held by endocrine, nutritional and metabolic diseases; respiratory diseases come third; and digestive tract diseases hold fourth place (2009).

Progress in general surgery in Mexico demands trained specialists who can not only solve clinical situations effectively, but also understand and apply the latest technology, and eventually develop efficient alternatives in teaching management and research, making them agents of change in the community. Parallel to the efficiency required to practice General Surgery, this specialty demands the creation of specialists who are capable of performing as honest leaders with a particular sense of humanism in the execution of their functions.

General Surgeons must be comprehensive practitioners who are proficient in all clinical aspects and also have the creative capacity to develop programs that will influence the advancement of this discipline, and not just draw on their training as a way of life. We are committed to generating this standard of specialists with a high sense of participation and motivation to promote new healthcare models that will enrich the area of General Surgery and shape it as a state-of-the-art discipline among the diverse medical specialties.

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

Graduates of the Residency in General Surgery of Tecnológico de Monterrey 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 targets Mexican and foreign physicians who wish to pursue a highly competitive training program that will equip them with the capacity to be leaders in General Surgery; who are proficient in English, are computer literate and have research skills. They must demonstrate an interest in social commitment, professionalism, leadership and the capacity for entrepreneurship. For admission to the Residency in General Surgery of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Abdominal wall. Innovations in diagnostics and therapeutics of the pathology of the abdominal wall. Digestive surgery. Study of all the disorders of the digestive tract, liver, pancreas and bile duct: etiology, diagnosis and treatment.

Oncological surgery. Study of all the neoplastic disorders: diagnosis and treatment.

Vascular surgery. Innovations in managing arterial, venous and lymphatic diseases. Technological innovations in surgery. Development of techniques or materials to diagnose and treat surgical diseases.

REC Residency in General Surgery Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4250	General Surgery I	3	0	12	3	12
ME4251	Medical Care in General Surgery I	0	60	12	3	60
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4252	General Surgery II	3	0	12	3	12
ME4253	Medical Care in General Surgery II	0	60	12	3	60
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4254	General Surgery III	3	0	12	3	12
ME4255	Medical Care in General Surgery III	0	60	12	3	60
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4256	General Surgery IV	3	0	12	3	12
ME4257	Medical Care in General Surgery IV	0	60	12	3	60
ME5190	Thesis Project II	3	0	12	3	12
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME4258	General Surgery V	3	0	12	3	12
ME4259	Medical Care in General Surgery V	0	60	12	3	60
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5302	General Surgery VI	3	0	12	3	12
ME5303	Medical Care in General Surgery VI	0	60	12	3	60
		3	60	24	6	72

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5304	General Surgery VII	3	0	12	3	12
ME5305	Medical Care in General Surgery VII	0	60	12	3	60
		3	60	24	6	72

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5306	General Surgery VIII	3	0	12	3	12
ME5307	Medical Care in General Surgery VIII	0	60	12	3	60
		3	60	24	6	72

Ninth Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5308	General Surgery IX	3	0	12	3	12
ME5309	Medical Care in General Surgery IX	0	30	6	1.5	30
		3	60	24	6	72

Tenth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5266	Thesis Defense	0	0	1	0.3	0
ME5310	General Surgery X	3	0	12	3	12
ME5311	Medical Care in General Surgery X	0	30	6	1.5	30
		3	60	25	6.3	72

CL The letter "CL" indicates the number of class-hours per week. **L** The letter "L" indicates the number of laboratory-hours per week.
U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. **HT** Total hours.

REE Residency in Critical Care Medicine

Justification

The demand for Critical Care Medicine Specialists is related to the number of hospitalizations, 35% of which require care in an ICU. In 2010, the health institutions where this residency is offered attended 1110 patients. Some of the most frequent diagnoses are: Sepsis, Adult Respiratory Distress Syndrome, Acute Coronary Syndrome, Preeclampsia/Eclampsia and Post-operative Coronary Revascularization.

Offering top-quality medical care to critical patients requires strict discipline in training practitioners who are committed to the social, political, economic and cultural development of the community. Consistent with this demand, the Residency in Critical Care Medicine seeks to prepare highly competent specialists in multimodal monitoring and treatment of severe, life-endangering diseases, who are upright, moral individuals and practitioners, respect life and human dignity, and are internationally competent and capable of offering full, first-rate medical care.

The Multicentric Critical Care Medicine Program benefits from a world-class university infrastructure, a competency-based, patient-centered educational model; with well-structured academic and research programs and processes, offered by qualified specialist physicians who are trained teachers, converging within a framework of medical care represented by the hospitals that are the bases and sub-bases of the program, certified in quality medical attention processes, with inpatient and outpatient settings, with first-rate ICU services. Residents have the necessary state-of-the-art technological, scientific and methodological support, are exposed to different health care and management models in regional, national and international contexts, enabling them to acquire the skills for performing successfully in diverse settings in the area of Critical Care Medicine.

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 targets academically outstanding graduates from Medical Specialties in Internal Medicine, Anesthesiology or Medical-Surgical Emergencies, with a vocation and concern for this discipline, a spirit of innovation and commitment to lifelong learning, with a genuine interest in research and teaching.

For admission to this program, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Research has become a strategic activity in ITESM and the School of Medicine. The Critical Care Medicine faculty, together with their students, are working on the following research projects, which are tied to education and the community:

Nutrition and Sepsis. Nutritional therapy in acute pancreatitis. Abdominal catastrophe management. Immunonutrition. Nutritional assessment of the critical patient. Prognostic markers.

Mechanical ventilation. Comparison of two non-conventional ventilation (HFOV vs APRV).

Critical OB/GYN patients. Use of colloids in Preeclampsia/Eclampsia. Use of a management protocol in patients with con preeclampsia to reduce the morbidity/mortality in second-level hospitals.

**REE Residency in Critical Care Medicine
Plan 2013**

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4197	Critical Care Medicine I	3	0	12	3	12
ME4198	Medical Care in Critical Medicine I	0	60	12	3	60
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4199	Critical Care Medicine II	3	0	12	3	12
ME4200	Medical Care in Critical Medicine II	0	60	12	3	60
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5245	Critical Care Medicine III	3	0	12	3	12
ME5246	Medical Care in Critical Medicine III	0	30	6	1.5	30
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME5190	Thesis Project II	3	0	12	3	12
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5247	Critical Care Medicine IV	3	0	12	3	12
ME5248	Medical Care in Critical Medicine IV	0	30	6	1.5	30
ME5266	Thesis Defense	0	0	1	0.3	0
		6	60	37	9.3	84

CL The letter "CL" indicates the number of class-hours per week. L The letter "L" indicates the number of laboratory-hours per week.
 U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
 CA The letters "CA" represents the number of semester credit hour of the course. HT Total hours.

REG Residency in Obstetrics and Gynecology

Justification

The changing environment of today's world requires that healthcare professionals have new and multiple skills. It also demands the strictest quality in their performance. In the area of Gynecology and Obstetrics in Mexico, there are multiple challenges related to women's healthcare. At present, of a total population of 112 million people, there are 57 million women who require medical attention, whose leading causes of death and disease still correspond to preventable or curable situations if detected and treated on time.

These needs coincide with the high level of technological and scientific development in the diverse branches of Gynecology and Obstetrics: Maternal-fetal Medicine, Reproductive Biology, Reproductive surgery and minimally-invasive surgery (endoscopy), Gynecological Oncology, Gynecological Urology, Child and Adolescent Gynecology. However, the active intervention by practitioners of this medical specialty can turn these challenges and opportunities into benefits for the health of the community.

Our state-of-the-art educational model responds to the current needs of women's healthcare in our country and worldwide, fulfilling the academic objectives determined by our learning outcomes, in a multicentric with four base hospitals, two in the public sector and two in the private sector. In this program, Gynecology and Obstetrics Residents will find that the opportunity to transcend through the holistic health care and attention of women is a challenge experienced on a daily basis.

Program objective

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 this program, graduates will be able to participate in the transformation and development of their community's health through the following competencies:

- 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

Applicants to the Residency in Obstetrics and Gynecology of the Multicentric Program of Tecnológico de Monterrey and the Ministry of Health are graduates of the Physician and Surgeon undergraduate degree program from diverse national and international universities. They must have a high sense of humanity and professional ethics and wish to fulfill the commitment to be agents of change in society. For admission to the Residency in Obstetrics and Gynecology of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Maternal-fetal Medicine. Determine the physiopathological, preventive and management conditions of preeclampsia, one of the leading causes of maternal deaths in Mexico. Evaluate the impact of this disease on newborns and find methods to decrease this impact. Research and innovate in new fetal therapy techniques, aiming to be national leaders in this field. Investigate gestational diabetes, another of the leading causes of maternal-fetal morbidity-mortality in the country, seeking to increase knowledge of the physiopathological conditions and mechanisms of gestational diabetes and the best management strategies.

Child and Adolescent Gynecology. Establish the most common causes of gynecological-endocrine disorders in adolescent women, as well as the incidence, complications and ways of preventing teen pregnancies. Explain aspects related to the use of contraceptives in adolescent women.

Women's Primary Care (Menopause and Obstetrics). Determine relevant aspects of first-contact medical care in women during menopause and during pregnancy in relation to cardiovascular and metabolic diseases, among others. Investigate preventive and medical education aspects.

Reproductive Biology and Minimally-invasive Surgery. Establish the incidence in our community of reproductive diseases, principally endometriosis and polycystic ovarian syndrome, as well as issues related to their diagnosis and treatment, as well as of other reproductive conditions. Investigate aspects related to the best application and results of minimally-invasive surgical techniques.

Oncology. Determine the incidence, management and prevention of malignant diseases in women, its risk factors and best prevention methods.

REG Residency in Obstetrics and Gynecology Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4266	Fundamentals in Obstetrics and Gynecology I	3	0	12	3	12
ME4267	Medical Care in Obstetrics and Gynecology I	0	60	12	3	60
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4268	Fundamentals in Obstetrics and Gynecology II	3	0	12	3	12
ME4269	Medical Care in Obstetrics and Gynecology II	0	60	12	3	60
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4270	Ambulatory Care in Obstetrics and Gynecology	3	0	12	3	12
ME4271	Medical Care in Obstetrics and Gynecology III	0	60	12	3	60
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4272	Obstetrics and Gynecology Specialties I	3	0	12	3	12
ME4273	Medical Care in Obstetrics and Gynecology IV	0	60	12	3	60
ME5190	Thesis Project II	3	0	12	3	12
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5318	Obstetrics and Gynecology Specialties II	3	0	12	3	12
ME5319	Medical Care in Obstetrics and Gynecology V	0	30	6	1.5	30
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5320	Obstetrics and Gynecology Specialties III	3	0	12	3	12
ME5321	Medical Care in Obstetrics and Gynecology VI	0	30	6	1.5	30
		3	60	24	6	72

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5322	Advances in Obstetrics and Gynecology I	3	0	12	3	12
ME5323	Medical Care in Obstetrics and Gynecology VII	0	60	12	3	60
		3	60	24	6	72

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5266	Thesis Defense	0	0	1	0.3	0
ME5324	Advances in Obstetrics and Gynecology II	3	0	12	3	12
ME5325	Medical Care in Obstetrics and Gynecology VIII	0	60	12	3	60
		3	60	25	6.3	72

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U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. HT Total hours.

REM Residency in Internal Medicine

Justification

Over the past few decades, the life expectancy of Mexicans has increased considerably and, accordingly, chronic-degenerative health issues are also on the rise, including diabetes, hypertension, hepatic diseases and cancer, among many others that form part of the field of Internal Medicine and its related subspecialties. At the same time, globalization, advancements in knowledge of biology, genomics and proteomics, the development of new information and communication technologies and systems, social networks, changes in epidemiology, advancements in therapeutics and the growing cost of health services could signify a radical change in the way diseases are addressed in this generation. Today more than ever before, Internal Physicians practice must be based on science and evidence. They will undoubtedly focus on preventive and ambulatory medicine, maintaining their position in intra-hospital medicine as the health-team leader and mentoring doctors who want to study a subspecialty related to internal medicine. Tecnológico de Monterrey's educational process is centered on the acquisition of knowledge and development of the skills, attitudes and values that will enable students to grow as individuals, committed to their community and acting as agents of change to improve it in the area of their specialty, and to keep up-to-date in a changing environment. The curricular content and competencies are developed by the students throughout the four-year program, incorporating during this period the knowledge, skills, attitudes and values required of a good internist. Clinical activities are executed in both public (Hospital Metropolitano) and private (Hospital San José de Monterrey and Centro Médico Zambrano Hellion) settings, thus offering a wide-ranging panorama of Medicine in our region and providing opportunities for national and/or international rotations to extend this panorama.

Program objective

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.

Internal Medicine is the medical specialty that addresses healthcare in adult patients and forms the basis of subspecialties related to attending diseases of the different organs or systems of the human body. The Residency in Internal Medicine Program seeks to prepare practitioners with the following competencies:

- 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 targets academically outstanding graduates from the Physician and General Surgeon undergraduate program, with a vocation and concern for this discipline, and a genuine interest in research and teaching.

For admission to the Residency in Internal Medicine of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Chronic Renal Disease. Research on chronic research disease, centered on enhancing the quality of life of patients and on their treatment. In relation to treatment and given the characteristics of our institution a specific area of interest comprises the results of the diverse treatment approaches, particularly transplants.

Chronic Liver Disease. Hepatic Cirrhosis, Non-alcoholic Steatohepatitis. Research on chronic liver diseases (Hepatic Cirrhosis, Non-alcoholic Steatohepatitis), focusing on gaining a better understanding of these diseases, their risk factors, physiopathological mechanisms and the repercussions of the disease, as well as its possible treatments and relationship with other chronic-degenerative diseases (metabolic syndrome).

Digestive Motility. Reflux Disease, Defecation Disorders. Research and evaluation of diverse diagnostic methods, including the pH meter, pH-impedance, manometry, biopsy and other studies, as well as obstructive constipation and disorders related to incontinence.

Hematological and Infectious Diseases. Biomarkers. Research on biomarkers, their scales and combinations, to identify the risk or severity of different diseases, including clinical, biochemical and molecular markers.

REM Residency in Internal Medicine Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4169	Clinical Practice in Internal Medicine I	0	60	12	3	60
ME4170	Internal Medicine I	3	0	12	3	12
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4171	Clinical Practice in Internal Medicine II	0	60	12	3	60
ME4172	Internal Medicine II	3	0	12	3	12
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4173	Clinical Practice in Internal Medicine III	0	60	12	3	60
ME4174	Internal Medicine III	3	0	12	3	12
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4175	Clinical Practice in Internal Medicine IV	0	60	12	3	60
ME4176	Internal Medicine IV	3	0	12	3	12
ME5190	Thesis Project II	3	0	12	3	12
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5217	Clinical Practice in Internal Medicine V	0	60	12	3	60
ME5218	Internal Medicine V	3	0	12	3	12
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5219	Clinical Practice in Internal Medicine VI	0	60	12	3	60
ME5220	Internal Medicine VI	3	0	12	3	12
		3	60	24	6	72

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5221	Clinical Practice in Internal Medicine VII	0	30	6	1.5	30
ME5222	Internal Medicine VII	3	0	12	3	12
		3	60	24	6	72

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5223	Clinical Practice in Internal Medicine Specialties	0	30	6	1.5	30
ME5224	Internal Medicine Specialties	3	0	12	3	12
ME5266	Thesis Defense	0	0	1	0.3	0
		3	60	25	6.3	72

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CA The letters "CA" represents the number of semester credit hour of the course. HT Total hours.

REN Residency in Pediatrics

Justification

The generation of new specialists in the area of Pediatrics, committed to resolving the needs of a growing child population and in which the use of new technologies and innovation in diagnosis, treatment and prevention are an ongoing necessity, representing the driving force of the Multicentric Residency in Pediatrics Program.

Trained specialists who have a comprehensive vision of the diverse health issues of a child population with different, complex sociocultural characteristics, act ethically in their professional and personal lives, and are willing to seek new and better alternative approaches to the diversity of patients.

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.

Pediatricians who graduate from this institution are 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

Graduates from the Residency in Pediatrics 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

All physicians who are interested in acquiring the knowledge, skills and attitudes needed to preserve and improve the health of children and adolescents. Individuals who are committed to their work and self-directed learning, with the concern and initiative to solve the serious childhood health issues through ongoing progress and updating. Entrepreneurial physicians who are willing to improve the practice and development of Pediatrics in the environment in which they operate.

Research areas

Ambulatory Pediatrics. Research related to infectious diseases, nutrition, accident prevention, mental health, growth and development.

Inpatient Pediatrics. Research related to care quality, patient safety, evidence-based practice and knowledge transfer in the diverse subspecialties.

Medical Education. Research on Educational Innovation, Distance Education, Evidence-based Medicine, applied to training Pediatric specialists.

**REN Residency in Pediatrics
Plan 2013**

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4183	Ambulatory and Hospitalized Care in Pediatrics I	0	60	12	3	60
ME4184	Pediatrics I	3	0	12	3	12
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4185	Ambulatory and Hospitalized Care in Pediatrics II	0	60	12	3	60
ME4186	Pediatrics II	3	0	12	3	12
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4187	Ambulatory and Hospitalized Care in Pediatrics III	0	60	12	3	60
ME4188	Pediatrics III	3	0	12	3	12
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4189	Ambulatory and Hospitalized Care in Pediatrics IV	0	60	12	3	60
ME4190	Pediatrics IV	3	0	12	3	12
ME5190	Thesis Project II	3	0	12	3	12
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5231	Ambulatory and Hospitalized Care in Pediatrics V	0	60	12	3	60
ME5232	Pediatrics V	3	0	12	3	12
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5233	Ambulatory and Hospitalized Care in Pediatrics VI	0	60	12	3	60
ME5234	Pediatrics VI	3	0	12	3	12
		3	60	24	6	72

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5235	Ambulatory and Hospitalized Care in Pediatrics VII	0	30	6	1.5	30
ME5236	Pediatrics VII	3	0	12	3	12
		3	60	24	6	72

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5237	Ambulatory and Hospitalized Care in Pediatrics VIII	0	30	6	1.5	30
ME5238	Pediatrics VIII	3	0	12	3	12
ME5266	Thesis Defense	0	0	1	0.3	0
		3	60	25	6.3	72

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U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. **HT** Total hours.

REO Residency in Ophthalmology

Justification

The accelerated scientific and technological advancement of our era, the demand for upright, competent, ethical health practitioners with a humanistic outlook, who are committed to delivering the highest quality medical attention, using cutting-edge technology to manage the population's health disorders, as well as the need to share, transfer and contribute knowledge to the scientific community through medical education and research, justify the fact that Tec Health, of the Tecnológico de Monterrey System, through its Residency in Ophthalmology Program, has determined in its Mission to focus the educational process on ensuring that our graduate students acquire knowledge and develop the skills, attitudes and values that prepare them to be upright, ethical individuals committed to the transformation and development of their community and who also act as agents of change to enhance each and every aspect of health in the field of their specialty, competing internationally, while contributing knowledge to the area. Diagnostic methodologies and surgical equipment are constantly being modified to benefit the care of patients with eye diseases. This has driven the institution to place particular importance on ongoing medical education, knowledge and diagnostic technique transfer and update, and the preparation of visual health human resources who are committed to providing their community with the best ophthalmological care. The infrastructure of the Multicentric Ophthalmology Program comprises diverse hospital and healthcare settings, with a first-class Ophthalmology Department that seeks to remain at the forefront of the major scientific and technological advancements of the past decade in this area. It uses a competency-based, patient-centered educational model, with well-structured academic and research programs and processes offered by specialist physicians, with teacher training, who converge within a framework of medical attention.

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 targets academically outstanding Medicine graduates with a specific vocation for this specialty who have the following attributes: capacity to use their understanding of basic, clinical and social sciences as the foundation for their medical practice; clinical skills; management of diagnostic and therapeutic resources; health promotion and disease prevention; effective communication; skills to manage printed and electronic information; reasoning, clinical judgment and decision-making skills; self-directed learning; proficiency in English; personal development, incorporation of attitudes and ethical bases; vocation and capacity for study. For admission to the Residency in Ophthalmology of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Medications and eye tissue management. Means of Enrichment and Preservation of Eye Tissue (Cornea and Conjunctiva). Epithelium and Corneal Endothelium Growth and Expansion Drivers. Development of Anti-fungal and Ocular Medications. Development of Low-concentration and Preservative-free Semi-synthetic Steroids. Angiostatic and/or angiogenic factors in corneal and retinal vascularization. Restitution of the External Ocular Surface. Development of diagnostic tools in ocular surface diseases and infectious ocular diseases.

Pediatric ophthalmology. Visual development and amblyopia. Ocular Motility, new surgical procedures and techniques.

REO Residency in Ophthalmology Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4220	Fundamentals in Ophthalmology I	3	0	12	3	12
ME4221	Medical Care and Surgery in Ophthalmology I	0	60	12	3	60
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4222	Fundamentals in Ophthalmology II	3	0	12	3	12
ME4223	Medical Care and Surgery in Ophthalmology II	0	60	12	3	60
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4224	Oculoplastic, Pediatric Ophthalmology and Strabismus	3	0	12	3	12
ME4225	Medical Care and Surgery in Ophthalmology III	0	60	12	3	60
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4226	Glaucoma, Anterior Segment and Neurophthalmology	3	0	12	3	12
ME4227	Medical Care and Surgery in Ophthalmology IV	0	60	12	3	60
ME5190	Thesis Project II	3	0	12	3	12
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5273	Cornea, External Diseases and Refractive Surgery	3	0	12	3	12
ME5274	Medical Care and Surgery in Ophthalmology V	0	60	12	3	60
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5275	Retina and Uveitis	3	0	12	3	12
ME5276	Medical Care and Surgery in Ophthalmology VI	0	30	6	1.5	30
		3	60	24	6	72

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5277	Ophthalmology Specialties	3	0	12	3	12
ME5278	Medical Care and Surgery in Ophthalmology VII	0	30	6	1.5	30
		3	60	24	6	72

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5266	Thesis Defense	0	0	1	0.3	0
ME5279	Diagnostic Procedures in Ophthalmology	3	0	12	3	12
ME5280	Medical Care and Surgery in Ophthalmology VIII	0	60	12	3	60
		3	60	25	6.3	72

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U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. **HT** Total hours.

RER Residency in Radiology and Imaging

Justification

Nowadays, all health institutions are unable to meet the demand for Radiology and Imaging specialists trained to work successfully in this context. Apart from the lack of available qualified specialists there are very few institutions that offer this type of graduate training. This was one of the reasons for the creation of the Residency in Diagnostic Radiology at the Hospital San José de Monterrey in 1976, and as one of the medical residencies of Tecnológico de Monterrey since 1983. At present, this Multicentric Program operates in conjunction with the Nuevo León State Ministry of Health.

Knowledge of the theory and procedures of this specialty, as well as the technology and diversity of new imaging methods, make our residency one of the most dynamic in medicine. The Residency in Radiology is a four-year academic program, thus ensuring the nationally and internationally competitive quality of our graduates.

This program is continuously being updated and maintains a balance between the latest and the basic knowledge of this specialty, so that graduates will be able to work, modify and innovate in any healthcare system. The operative programs and evaluation methods are constantly adjusted so as to be congruent with the program in the diverse hospitals of our Multicentric Program, which also teaches, monitors and assesses the attitudes, values and behavior of our students in accordance with the Mission 2015 of Tecnológico de Monterrey.

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

Radiologists who graduate from this program 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 targets academically outstanding Physicians and Surgeons who graduated from national and international universities that are recognized by Tecnológico de Monterrey, who have leadership capabilities, an interest in being educators and researchers, and a psychological profile for adaptation to change and innovation.

For admission to the Residency in Radiology of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Cardiovascular Radiology and Imaging. Endovascular therapies in occlusive venous diseases. Clinical application of endovascular procedures, such as thrombolysis and the intravascular endoprosthesis in the treatment of occlusive venous diseases. The objective is to apply these procedures, already tested in other territories, to the venal system; evaluate the results and, if they are favorable, offer alternative therapies with a lower morbidity and the costs in occlusive venous diseases.

Oncological Radiology and Imaging. Intra-abdominal Tumors. Magnetic Resonance Diagnosis. Validation of innovative sequences in Magnetic Resonance, to study complex or undetermined intra-abdominal masses. The objective is to obtain new flow algorithms in the presumptive diagnoses and pretreatment of intra-abdominal masses, that are more reliable, safer and less expensive.

Radiological Protection of the Patient. Explore methods and procedures that offer an optimal balance between image quality and the effectiveness of the diagnostic information the radiologist obtains from these images, and the necessary dose of radiation to acquire them. This requires the analysis and application of existing knowledge on the biological effects of ionizing radiations, health exposure risk modeling in diagnostics, the design and physical principles of the functioning of imaging technologies, objective measurement of image quality and diagnostic effectiveness, as well as the measurement of doses in patients. Using a multidisciplinary approach that includes the participation of radiology specialists, this knowledge is used to solve optimization problems that result in practical contributions to enhancing the quality of radiological procedures and maximize patient safety. Some of the specific areas of interest in this research area are: optimization in pediatric and neonatal radiography and fluoroscopy, optimization of protocols in computerized tomography, optimization of radiological procedures in pregnant patients, radiological protection of patients in interventional radiology.

RER Residency in Radiology and Imaging Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4205	Radiology and Image I	3	0	12	3	12
ME4206	Medical Care in Radiology and Image I	0	60	12	3	60
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4207	Radiology and Image II	1.5	0	6	1.5	6
ME4208	Medical Care in Radiology and Image II	0	60	12	3	60
ME4209	Advanced Physics	1.5	0	6	1.5	6
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4210	Radiology and Image III	3	0	12	3	12
ME4211	Medical Care in Radiology and Image III	0	60	12	3	60
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4212	Radiology and Image IV	3	0	12	3	12
ME4213	Medical Care in Radiology and Image IV	0	60	12	3	60
ME5190	Thesis Project II	3	0	12	3	12
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5258	Radiology and Image V	3	0	12	3	12
ME5259	Medical Care in Radiology and Image V	0	60	12	3	60
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5260	Radiology and Image VI	3	0	12	3	12
ME5261	Medical Care in Radiology and Image VI	0	60	12	3	60
		3	60	24	6	72

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5262	Radiology and Image VII	3	0	12	3	12
ME5263	Medical Care in Radiology and Image VII	0	30	6	1.5	30
		3	60	24	6	72

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5264	Radiology and Image VIII	3	0	12	3	12
ME5265	Medical Care in Radiology and Image VIII	0	30	6	1.5	30
ME5266	Thesis Defense	0	0	1	0.3	0
		3	60	25	6.3	72

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U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. **HT** Total hours.

REU Residency in Neurology

Justification

Today, neurological disorders comprise a heterogeneous group of problems with the central and peripheral nervous system. The incidence of these disorders is increasing significantly in Mexico because of the inversion of the population pyramid and an increase in life expectancy. Neurodegenerative diseases present the greatest growth among the different disorders because they have age as an important risk factor. In addition, cerebral vascular disease is the third cause of death in Mexico and an important cause of morbidity. It results in high economic costs because of the rehabilitation and social reinsertion it implies (INEGI 2010). To face these challenges, Mexico needs neurological healthcare professionals who are committed to a society that demands quality medical attention and humanistic professionals, in the prevention, diagnosis and treatment of this group of pathologies. The Residency in Neurology responds to this need to train healthcare professionals with the skills and knowledge to make a real contribution. Since its origins, it has been a program focused on training, continuing education and face-to-face innovative teaching, taking into consideration that neurology is one of the branches of medicine that has grown the most over the past decade, both on a diagnostic level and with regard to new lines of basic and clinical research, in the quest to find novel treatments. The Multicentered Residency in Neurology of Tecnológico de Monterrey is staffed by academic personnel and infrastructure of the highest quality. It is an educational model based on excellence and competencies centered on the patient, offered by successful professionals who are experts in teaching, both clinical and experimental. As a result, the participants in the program have all the leading-edge humanistic, technological and methodological support they need to develop their potential and, therefore, stand out regionally, nationally and internationally. This program is directed to those healthcare professionals who wish to do post-graduate training in clinical neurology.

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

The Residency in Neurology program seeks to train neurologists who are 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 patients 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 of Tecnológico de Monterrey is directed to doctors with a great sense of social responsibility; with a willingness to seek and understand new knowledge; and with the capacity and desire to learn and acquire their own skills in the different areas of the neurological sciences and later to have the capability to generate new knowledge in the field.

For admission to the Residency in Neurology of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Neurodegenerative diseases. Strategic alliance with the Cellular Therapy and Regenerative Medicine Group of Researchers to create protocols of basic and clinical research in motor-neuron diseases, specifically Amyotrophic Lateral Sclerosis, in the research and search for new alternatives for the non-pharmacological handling of this type of pathology.

Movement disorders. Models for experimenting with dopaminergic stem cell implants in Parkinson models in rats, with the subsequent transfer of findings to clinical studies on patients with Parkinson's disease, in the search for treatment based on cellular substitution therapy.

Neoplasias of the nervous system. Search for major mutations; currently a research project is being carried out with the biggest national bank of glioblastoma multiforme DNA, in order to determine the frequency of mutations and subsequently to compare the results with other populations. This project also involves an analysis of the incidence of brain tumors over the past 10 years in the base hospital, in order to have a reference for basic research and then to transfer it to clinical research into this type of pathology.

**REU Residency in Neurology
Plan 2013**

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4214	Neurology I	3	0	12	3	12
ME4215	Medical Care in Neurology I	0	60	12	3	60
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4216	Neurology II	3	0	12	3	12
ME4217	Medical Care in Neurology II	0	60	12	3	60
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4218	Neurology III	3	0	12	3	12
ME4219	Medical Care in Neurology III	0	60	12	3	60
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME5190	Thesis Project II	3	0	12	3	12
ME5267	Neurology IV	3	0	12	3	12
ME5268	Medical Care in Neurology IV	0	60	12	3	60
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5269	Neurology V	3	0	12	3	12
ME5270	Medical Care in Neurology V	0	30	6	1.5	30
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5266	Thesis Defense	0	0	1	0.3	0
ME5271	Neurology VI	3	0	12	3	12
ME5272	Medical Care in Neurology VI	0	30	6	1.5	30
		3	60	25	6.3	72

CL The letter "CL" indicates the number of class-hours per week. L The letter "L" indicates the number of laboratory-hours per week.
U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. HT Total hours.

RGE Residency in Geriatrics

Justification

Today, in Mexico, there are 420 geriatricians who comply with the requirements demanded by educational and health authorities and a population of almost nine million senior citizens. International recommendations suggest the existence of one geriatrician for every 2,500 senior citizens. The aforementioned figure for Mexico implies the existence of one geriatrician for every 22,000 senior citizens. Additionally, the group of the elderly is expected to grow faster than all other age groups over the next 40 years. Senior citizens show physiological changes and sicknesses with a high demand for human, social and economic resources. Tecnológico de Monterrey assumes the commitment to train Specialists in Geriatrics who have a humanistic vision and highly ethical principles, who are committed to the social, educational and economic development of their communities, who are competent on a world level and who are committed to the sustainable use of natural resources.

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

Graduates from the Residency in Geriatrics of Tecnológico de Monterrey 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 directed to general doctors with a high level of social commitment and with an interest in offering comprehensive, quality attention to the elderly, identifying the patient as the protagonist in this attention.

For admission to the Residency in Geriatrics of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Fragility, transitional states and their determinants. Validation of diagnostic methodologies for fragility and the study of the intermediate states between strength and fragility, in order to determine who will tend to become more fragile, as well as the study of the determinants of fragility: nutrition, physical activity, physical condition, sarcolemma, comorbidity, allostatic load, mental problems and support networks. The final objective is to identify a series of actions that would prevent and/or revert the process of fragilization.

Altered cognoscitive state, determinants and consequences. Validation of screening and diagnostic tests for cognoscitive problems in our population across the different educational strata (from those who are unable to read to those with maximum levels of education), identification of modifiable risk factors in our population and the observation of the response to the modification of the said risk factors, as well as the determination of the individual, family and social consequences of cognoscitive disorders. The final objective is to identify a series of actions that would prevent and minimize the consequences of different cognitive disorders.

RGE Residency in Geriatrics Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4170	Internal Medicine I	3	0	12	3	12
ME4201	Medical Care in Geriatrics and Gerontology I	0	60	12	3	60
		4.5	60	30	7.5	78

Second Semester

Code	Name	CL	L	U	CA	HT
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4172	Internal Medicine II	3	0	12	3	12
ME4202	Medical Care in Geriatrics and Gerontology II	0	60	12	3	60
		4.5	60	30	7.5	78

Third Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4174	Internal Medicine III	3	0	12	3	12
ME4203	Medical Care in Geriatrics and Gerontology III	0	60	12	3	60
		4.5	60	30	7.5	78

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4176	Internal Medicine IV	3	0	12	3	12
ME4204	Medical Care in Geriatrics and Gerontology IV	0	60	12	3	60
		4.5	60	30	7.5	78

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME5249	Geriatrics and Gerontology I	3	0	12	3	12
ME5250	Medical Care in Geriatrics and Gerontology V	0	60	12	3	60
		6	60	36	9	84

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5251	Geriatrics and Gerontology II	3	0	12	3	12
ME5252	Medical Care in Geriatrics and Gerontology VI	0	30	6	1.5	30
		3	60	24	6	72

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5190	Thesis Project II	3	0	12	3	12
ME5253	Geriatrics and Gerontology III	3	0	12	3	12
ME5254	Medical Care in Geriatrics and Gerontology VII	0	60	12	3	60
		6	60	36	9	84

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5255	Geriatrics and Gerontology IV	3	0	12	3	12
ME5257	Medical Care in Geriatrics and Gerontology VIII	0	30	6	1.5	30
ME5266	Thesis Defense	0	0	1	0.3	0
		3	60	25	6.3	72

CL The letter "CL" indicates the number of class-hours per week. **L** The letter "L" indicates the number of laboratory-hours per week.
U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. **HT** Total hours.

RNE Residency in Neonatology

Justification

The program of Residency in Neonatology responds to a need, that has been widely recognized since the 1930s, to train specialists in caring for newborns. The program is fully justified if we understand its contribution to reaching the healthcare goals of the World Summit for Children: reducing by one third the mortality rate for children under one-year old; giving access to all pregnant women to specialized attention for their newborns; and reducing the rate of newborn underweight to below 10%.

The profile of the graduate from Medical Neonatology is built by incorporating activities that develop the use of the scientific method, promote medicine based on evidence, and develop in the participant a culture of research. Research topics structure these skills and knowledge, as well as those in education, medical ethics and quality, which are the tools, together with other ones, that strengthen participants attitudes and values. The program also includes a structured component of internationalization, focused on ensuring that participating doctors get to know models of medical attention in other countries, perceive the differences in process that result from diverse socio-cultural contexts, and, not only know about these differences, but are able to understand them and take advantage of them for the benefit of the patient.

The program also includes a seminar on the Doctor-Patient-Family relationship in order to prepare participants to be positive agents in the context of their area of specialty. Thus, the curriculum extends over three years, in order to cover the required areas, as well as assure theoretical, technological and practical knowledge in Neonatology, with a particular focus on Basic, Clinical and Applied Research for the comprehensive training of Neonatologists with highly developed research skills.

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

Graduates of this program present three lines of educational achievement as a result of the formal education received: a professional-humanistic orientation (THE BEING), intellectual training, focusing on medicine based on evidence and the application of the scientific method (THE KNOWLEDGE) and the operational performance of a specialist doctor (THE KNOW-HOW). Through medical training supported

by an educational methodology focused on problem solving, program graduates are highly competent in their specific field of action. They demonstrate that they have the specific skills of their particular area of specialty, as well as the general skills of all specialist doctors.

Medical attention: Graduates from the Residency in Neonatology of Tecnológico de Monterrey 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;

Medical education: Graduates from the Residency in Neonatology will be able to:

- 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 directed to Pediatricians, who have the knowledge, skills, attitudes and values expected for a pediatrics specialist, with an excellent academic record, with a vocation to, and interest in, Neonatology, with a genuine commitment to research and with a command of conversational English. For admission to the Residency in Neonatology of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

The lines of research of the Residency in Neonatology are:

Molecular Biology, Oxidative Damage and Bioprotection. Generation and application of knowledge focused on the study of phenomena related to the oxidative stress involved in human pathologies at the perinatal stage.

Biomarkers in Perinatal Medicine. Generation and application of knowledge focused on the study of possible protein and molecular markers with the potential to be diagnostic tools for pathologies of the perinatal stage.

Pharmacology in Perinatal Medicine. Generation and application of knowledge focused on the study of the pharmacokinetics of the different medications used in the treatment of sicknesses in the newborn and the possible variations associated with genetic polymorphism.

Epidemiology in Perinatal Medicine. Generation and application of knowledge focused on the study and epidemiological characterization of different sicknesses of the newborn.

Bioethics in Perinatal Medicine. and the Application of knowledge focused on the study of, and reflection on, the ethical dilemmas that occur on a daily basis in the specialty area.

RNE Residency in Neonatology Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4191	Medical Care in Neonatology I	0	60	12	3	60
ME4192	Neonatology I	3	0	12	3	12
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4193	Medical Care in Neonatology II	0	60	12	3	60
ME4194	Neonatology II	3	0	12	3	12
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4195	Medical Care in Neonatology III	0	60	12	3	60
ME4196	Neonatology III	3	0	12	3	12
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME5190	Thesis Project II	3	0	12	3	12
ME5239	Medical Care in Neonatology IV	0	60	12	3	60
ME5240	Neonatology IV	3	0	12	3	12
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5241	Medical Care in Neonatology V	0	30	6	1.5	30
ME5242	Neonatology V	3	0	12	3	12
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5243	Medical Care in Neonatology VI	0	30	6	1.5	30
ME5244	Neonatology VI	3	0	12	3	12
ME5266	Thesis Defense	0	0	1	0.3	0
		3	60	25	6.3	72

CL The letter "CL" indicates the number of class-hours per week. L The letter "L" indicates the number of laboratory-hours per week.
U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. HT Total hours.

RNP Residency in Pediatric Neurology

Justification

The Residency in Neurological Pediatrics is a clinical specialty focused on preventing, diagnosing, treating, rehabilitating and studying neurological disorders in children and adolescents in their different stages of growth and development, such as metabolic problems, malformations of the central nervous system, convulsive crises, and neuromuscular, motor, language, learning and other problems related to neurodevelopment.

The training of specialists in Pediatric Neurology is particularly relevant for the community because the neurological, pathological processes that are most prevalent in the population begin in infancy and adolescence or are characteristic of these phases, such as epilepsy (1.5%), learning and communication disorders (5 to 10%), infantile cerebral paralysis (5/1000), mental retardation, pervasive developmental disorders (autism) (1/125), congenital malformations, infections of the central nervous system, craneo-encephalitic trauma and other disorders. Approximately 33% of the population of Mexico is under 15 years old (INEGI 2003), but there are currently fewer than 200 pediatric neurologists in the nation. In fact, certain states have only one pediatric neurologist and others none at all.

Training as a pediatric neurologist in the School of Medicine and Health Sciences of Tecnológico de Monterrey offers the resident and future specialist many advantages: an academic program based on competencies, which emphasizes the knowledge, skills and techno-scientific abilities of the specialty, such as training people to act as agents of change and transformation in their communities and in their area of specialty; multidisciplinary formation based on neurology, pediatrics, neurodevelopment, neuropsychology and the basic neurosciences, such as neuroanatomy, neurophysiology, molecular genetics, neurochemistry, neuropathology and neuroimaging; a multicentered operating model, that has primary and secondary bases in different public and private hospitals; leading-edge, internationally competitive infrastructure and technology in the Zambrano Hellion Medical Center for training in the areas of neurorehabilitation, neuropsychology, neurophysiology, neurosurgery and psychiatry, and interaction with neurological pathologies from the newborn to the adult stage; an innovative teaching-learning model, centered on the student and the patient and incorporating well-structured programs of research, medical education and ethics; and opportunities to experience other national and international academic models and medical attention within the field of specialty.

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 Residency in Pediatric Neurology, participants 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.

The unique characteristic of this program is its emphasis on ambulatory Pediatric Neurology, Neuropsychology and Neurorehabilitation. The pediatric neurologist who graduates from the program will be able to practice in ambulatory neurology and in diverse hospitals with their own patients or as a consultant in emergency, inpatient or intensive care services; in prepaid service or medical insurance organizations; in pediatric departments of teaching institutions or universities and in the government healthcare system; in neurorehabilitation institutions, etc. They will be trained to attend all sectors of the population in every type of ecological environment.

Target audience

The Residency in Neurological Pediatrics of Tecnológico de Monterrey is directed to doctors who have finished their specialty of Pediatrics, with excellent academic results, with a vocation for, and interest in, the discipline, research and teaching, and committed to continuous learning. For admission to the Residency in Pediatric Neurology of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Epilepsy. retrospective, prospective, transversal and comparative studies on epilepsy.

Pervasive developmental disorders. retrospective, prospective, transversal and comparative studies on pervasive developmental disorders (autism, Asperger).

RNP Residency in Pediatric Neurology Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4260	Pediatric Neurology I	3	0	12	3	12
ME4261	Medical Care in Pediatric Neurology I	0	60	12	3	60
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4262	Pediatric Neurology II	3	0	12	3	12
ME4263	Medical Care in Pediatric Neurology II	0	60	12	3	60
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4264	Pediatric Neurology III	3	0	12	3	12
ME4265	Medical Care in Pediatric Neurology III	0	60	12	3	60
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME5190	Thesis Project II	3	0	12	3	12
ME5312	Pediatric Neurology IV	3	0	12	3	12
ME5313	Medical Care in Pediatric Neurology IV	0	60	12	3	60
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5314	Pediatric Neurology V	3	0	12	3	12
ME5315	Medical Care in Pediatric Neurology V	0	30	6	1.5	30
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5266	Thesis Defense	0	0	1	0.3	0
ME5316	Pediatric Neurology VI	3	0	12	3	12
ME5317	Medical Care in Pediatric Neurology VI	0	30	6	1.5	30
		3	60	25	6.3	72

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 U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
 CA The letters "CA" represents the number of semester credit hour of the course. HT Total hours.

RPS Residency in Psychiatry

Justification

The changing environment of today's world requires that healthcare professionals have new and multiple skills. It also demands stricter quality in their performance. In the area of clinical psychiatry, there has been an enormous growth in diagnostic and therapeutic tools, with diagnostic criteria and therapeutic methods being continuously modified and renewed. Hence, it is important for professionals in the field to keep their medical education up-to-date and to teach the most relevant topics with the greatest impact on community health in the formation of human resources for the health sector. The multiple advances in the areas of molecular genetics, pharmacology, psychotherapeutic techniques and new technologies for diagnosis and treatment, as well as their clinical applications, must be rapidly used in patient treatment.

To assure the profile of the graduate in this environment, topics have been incorporated that focus on the scientific method, promote medicine based on evidence, and develop in the student a culture of research and investigation. The topics of basic and advanced research structure the additional skills and knowledge, as do those of medical ethics. These are really tools that, together with the many others, strengthen the desired attitudes and values in the resident. Thus, the curriculum is based on four years covering these areas, as well as the theoretical, technological and practical knowledge of clinical studies, to ensure the comprehensive training of the Psychiatrist. With the innovation in educational techniques and procedures, an alternative solution that comes from the new educational model is learning centered on the student and on clinical patient cases, so that acquired knowledge may be applied directly to patients, being therefore a direct transfer to the reality of the environment, as well as an exercise in self-learning.

This results in a continuous medical education that is closely linked to the development of the scientific and technological knowledge of the discipline. Finally, this methodology confirms the congruence between the basics, our educational model, the areas of training and the discipline itself. The particular characteristics of the residency require a diagnostic laboratory analysis and the development of new studies, technical progress and new knowledge resulting from research, so Psychiatrists in this educational environment are required to acquire theoretical knowledge in their area of specialty, in educational techniques and in research. This will help them to resolve in a comprehensive and satisfactory manner the diagnostic problems in the health of their patients, so that they may carry out professional work with a level of excellence in the areas of expertise mentioned previously (external consultation, hospitalization, community support, preventive education for the general population or for specific groups, distance medical attention via Internet, etc.).

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

Graduates from this multi-centric program in psychiatry of Tecnológico de Monterrey School of Medicine will have acquired the following the competencies:

- 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 directed to doctors with a vocation to study Psychiatry, with high moral values, committed to the ethical exercising of their profession, with a disposition to work in multidisciplinary teams and an interest in the field of research. For admission to the Residency in Psychiatry of the School of Medicine and Health Sciences of Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Migrants. Psycho-social and psycho-pathological aspects in relation to the migratory travel of Central Americans without official papers through Mexico are being studied.

Psychodermatosis. Psycho-social, personality and psycho-pathological aspects related to the diseases psoriasis, acne and atopic dermatitis are being studied. University performance.

Psycho-pathological aspects related to student performance in universities are being studied. Particularly the psychopathological problems related to poor student performance in students who are passed to the PAA academic support program of Tecnológico de Monterrey, Monterrey Campus.

RPS Residency in Psychiatry Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4145	Medical Care in Psychiatry I	0	60	12	3	60
ME4146	Psychiatry I	3	0	12	3	12
		4.5	60	30	7.5	78

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4147	Medical Care in Psychiatry II	0	60	12	3	60
ME4148	Psychiatry II	3	0	12	3	12
		4.5	60	30	7.5	78

Third Semester

Code	Name	CL	L	U	CA	HT
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4149	Medical Care in Psychiatry III	0	60	12	3	60
ME4150	Psychiatry III	3	0	12	3	12
		4.5	60	30	7.5	78

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4151	Medical Care in Psychiatry IV	0	60	12	3	60
ME4152	Psychiatry IV	3	0	12	3	12
		4.5	60	30	7.5	78

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME5193	Medical Care in Psychiatry V	0	60	12	3	60
ME5194	Psychiatry V	3	0	12	3	12
		6	60	36	9	84

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5190	Thesis Project II	3	0	12	3	12
ME5195	Medical Care in Psychiatry VI	0	60	12	3	60
ME5196	Psychiatry VI	3	0	12	3	12
		6	60	36	9	84

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5197	Medical Care in Psychiatry VII	0	30	6	1.5	30
ME5198	Psychiatry VII	3	0	12	3	12
		3	60	24	6	72

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5199	Medical Care in Psychiatry VIII	0	30	6	1.5	30
ME5200	Psychiatry VIII	3	0	12	3	12
ME5266	Thesis Defense	0	0	1	0.3	0
		3	60	25	6.3	72

CL The letter "CL" indicates the number of class-hours per week. **L** The letter "L" indicates the number of laboratory-hours per week.
U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. **HT** Total hours.

RUR Residency in Urology

Justification

The contemporary demands on doctors who work in Mexico in the area of Urology require that they make great efforts to continuously reduce morbidity and mortality from urological diseases. Diseases of the urinary system occupy fourth place nationally, with a mean national rate of 5,0 (INEGI, 2004). Moreover, the most common causes for hospital stays for the 45 to 64 year-old age group are those related to the genitourinary tract (OPS, Cap. Mexico), which, without adequate attention from competent urologists, will continue to grow at the same rate as the population growth, generating great health problems and unnecessary expenses for the nation.

Offering high-quality urological medicine requires strict discipline in the formation of healthcare professionals who are committed to the social, political, economic and cultural development of the community. In accordance with these demands, the Medical Residency in Urology seeks to train highly competent specialist doctors who are able to perform minimally invasive surgical techniques, as well as other new methods of study, medical treatment and surgery for the solution of problems of the prostate, urinary lithiasis and, above all, urogenital cancer. They must be people and professionals who act with integrity and ethical values in their daily activities, who respect life and human dignity, who are internationally competitive and who have capacity to provide complete and excellent medical attention, in accordance with the Mission and Vision of Tecnológico de Monterrey.

The Multicentric Program of Urology of Tecnológico de Monterrey is backed by excellent university infrastructure and an educational model based on skills and centered on the patient. It provides well-structured educational and research programs and processes, offered by medical specialists with educational training, who converge in a framework of medical attention with the Hospital Escuela San José TEC de Monterrey as its base hospital. This facility is a specialty hospital certified in quality processes for medical attention, with both inpatient and outpatient facilities, and a high-level urology department. Residents receive the state-of-the-art technological, scientific and educational support that they need for their development. They are exposed to different models of healthcare attention and management in a regional, national and international context, which allows them to acquire the skills necessary for successful performance in the different areas of Urology.

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

Residents who graduate from the Urology program 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 Program of Urology of Tecnológico de Monterrey is directed to graduates of Medicine, with an excellent academic record, with a vocation for and express interest in the discipline, who are innate leaders with the capacity to grow and discover new frontiers within themselves, medicine and their profession, with an innovative spirit and a commitment to continuous learning on a daily basis, with the strength to provide high-quality face-to-face patient services, and with a genuine interest in research and teaching.

For admission to the Residency in Urology of the School of Medicine and Health Sciences of the Tecnológico de Monterrey, candidates must satisfactorily meet all the graduate admissions requirements of the Tecnológico de Monterrey and of the Ministry of Health.

Research areas

Urology-Oncology. Clinical research into prostate, kidney and testicular cancer.

RUR Residency in Urology Plan 2013

First Semester

Code	Name	CL	L	U	CA	HT
ME4140	Clinical Ethics	1.5	0	6	1.5	6
ME4142	Quality Health Care	1.5	0	6	1.5	6
ME4161	Medical Care in Urology I	0	60	12	3	60
ME4162	General Urology I	3	0	12	3	12
		6	60	36	9	84

Second Semester

Code	Name	CL	L	U	CA	HT
ME4141	Health Sciences Education	1.5	0	6	1.5	6
ME4143	Research and Innovation Methods	1.5	0	6	1.5	6
ME4163	Medical Care in Urology II	0	60	12	3	60
ME4164	General Urology II	3	0	12	3	12
		6	60	36	9	84

Third Semester

Code	Name	CL	L	U	CA	HT
ME4144	Thesis Project I	3	0	12	3	12
ME4165	Medical Care in Urology III	0	60	12	3	60
ME4166	General Urology III	3	0	12	3	12
		6	60	36	9	84

Fourth Semester

Code	Name	CL	L	U	CA	HT
ME4167	Medical Care in Urology IV	0	60	12	3	60
ME4168	General Urology IV	3	0	12	3	12
ME5190	Thesis Project II	3	0	12	3	12
		6	60	36	9	84

Fifth Semester

Code	Name	CL	L	U	CA	HT
ME5209	Medical Care in Urology V	0	60	12	3	60
ME5210	General Urology V	3	0	12	3	12
		3	60	24	6	72

Sixth Semester

Code	Name	CL	L	U	CA	HT
ME5211	Medical Care in Urology VI	0	60	12	3	60
ME5212	General Urology VI	3	0	12	3	12
		3	60	24	6	72

Seventh Semester

Code	Name	CL	L	U	CA	HT
ME5191	Elective Specialty I	0	30	6	1.5	30
ME5213	Medical Care in Urology VII	0	30	6	1.5	30
ME5214	General Urology VII	3	0	12	3	12
		3	60	24	6	72

Eighth Semester

Code	Name	CL	L	U	CA	HT
ME5192	Elective Specialty II	0	30	6	1.5	30
ME5215	Medical Care in Urology VIII	0	30	6	1.5	30
ME5216	General Urology VIII	3	0	12	3	12
ME5266	Thesis Defense	0	0	1	0.3	0
		3	60	25	6.3	72

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U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
CA The letters "CA" represents the number of semester credit hour of the course. **HT** Total hours.

MBC Master in Biomedical Sciences

Program objective

The aim of this program is to form a parallel, well-articulated structure of biomedicine researchers, who will collaborate with experts in diverse disciplines on the scientific work required to achieve real progress in medical research in every specialization, addressing our population's most pressing health needs.

Entry profile and Target audience

The Master in Biomedical Sciences targets students who have earned bachelor degrees in Medicine, Biotechnology, Engineering, Biomedicine, Medicinal Chemistry, Pharmacology, Nutrition, Biology or Biochemistry from Tecnológico de Monterrey, or other prestigious universities in areas related to the program, who are interested in continuing their academic preparation through research in applied medicine.

Admission to the Master in Biomedical Sciences program is competitive. Each candidate must meet the established requirement guidelines.

Exit profile

The Master in Biomedical Sciences program prepares researchers in the field of biomedicine, at the master's level, with the necessary competencies to participate in interdisciplinary research to achieve real progress in medical research in every specialization, validating experimental models, and testing new drugs and devices in preclinical models, with immediate application to the patient's needs.

Scope of action

Master in Biomedical Sciences graduates will be able to collaborate in interdisciplinary groups in the areas of molecular diagnosis, design of specific units, such as xenografts, cell line management, tumor banks, among other complex competencies required by translational research.

**MBC Master in Biomedical Sciences
Plan 2017**

First Semester		CL	L	U	CA
Code	Name				
BI4000	Translational Medicine and Experimental Models	3	0	12	3
BI4001	Biostatistics	3	0	12	3
BI5000	Research and Innovation Methods	1.5	0	6	2
OP4000	Quality Development Course	1.5	0	6	2
		9	0	36	9
Second Semester		CL	L	U	CA
Code	Name				
BI4002	Cellular and Molecular Biology and Human Genetics	3	0	12	3
BI4003	Oxidative Stress and Inflammation	3	0	12	3
BI5001	Thesis I	3	0	12	3
		9	0	36	9
Third Semester		CL	L	U	CA
Code	Name				
BI5002	Thesis II	3	0	12	3
OP5042	Elective I	3	0	12	3
OP5043	Elective II	3	0	12	3
		9	0	36	9
Fourth Semester		CL	L	U	CA
Code	Name				
BI5003	Thesis III	3	0	12	3
OP5044	Elective III	3	0	12	3
OP5045	Elective IV	3	0	12	3
		9	0	36	9

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 U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.
 CA The letters "CA" represents the number of semester credit hour of the course.

DBC PH. D. in Biomedical Sciences

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

At the 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.

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

Have published as the lead author (or have evidence of acceptance of the final version for publication) at least one scientific article on a topic related to their research project, with the following characteristics:

- a) The scientific article must adhere to international authorship guidelines (International Committee of Medical Journal Editors. Recommendations for the conduct, reporting, editing, and publication of scholarly work in medical journals).
- b) It must have been published recently, no more than three years ago, and in a Scopus journal (Q1/Q2) or have a journal impact factor of at least 1.

In the case of shared authorship, the article can only be used once for graduation purposes in any of the graduate programs of the School of Medicine and Health Sciences, only by the student who appears first on the list of authors.

DBC Ph. D. in Biomedical Sciences Plan 2017

First Semester

Code	Name	CL	L	U	CA
BI6000	Guided Research I	3	0	12	3
BI6001	Guided Research II	3	0	12	3
BI6018	Integrated Exam	1.5	0	6	1.5
GM6000	Research Seminar I	1	0	2	0.5
GM6006	Research Workshop I	1	0	4	1
		9.5	0	36	9

Second Semester

Code	Name	CL	L	U	CA
BI6002	Research Proposal I	3	0	12	3
BI6003	Research Proposal II	3	0	12	3
BI6021	Research Proposal Defense	1.5	0	6	1.5
GM6001	Research Seminar II	1	0	2	0.5
GM6007	Research Workshop II	1	0	4	1
		9.5	0	36	9

Third Semester

Code	Name	CL	L	U	CA
BI6004	Doctoral Research I	3	0	12	3
BI6005	Doctoral Research II	3	0	12	3
BI6019	Research Integration I	1.5	0	6	1.5
GM6002	Research Seminar III	1	0	2	0.5
GM6008	Research Workshop III	1	0	4	1
		9.5	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
BI6006	Doctoral Research III	3	0	12	3
BI6007	Doctoral Research IV	3	0	12	3
GM6003	Research Seminar IV	1	0	2	0.5
GM6009	Research Workshop IV	1	0	4	1
GM6013	Scientific Product I	1.5	0	6	1.5
		9.5	0	36	9

Fifth Semester

Code	Name	CL	L	U	CA
BI6008	Doctoral Research V	3	0	12	3
BI6009	Doctoral Research VI	3	0	12	3
BI6020	Research Integration II	1.5	0	6	1.5
GM6004	Research Seminar V	1	0	2	0.5
GM6010	Research Workshop V	1	0	4	1
		9.5	0	36	9

Sixth Semester

Code	Name	CL	L	U	CA
BI6010	Doctoral Research VII	3	0	12	3
BI6011	Doctoral Research VIII	3	0	12	3
GM6005	Research Seminar VI	1	0	2	0.5
GM6011	Research Workshop VI	1	0	4	1
GM6014	Scientific Product II	1.5	0	6	1.5
		9.5	0	36	9

Seventh Semester

Code	Name	CL	L	U	CA
BI6012	Doctoral Research IX	3	0	12	3
BI6013	Doctoral Research X	3	0	12	3
BI6014	Doctoral Research XI	3	0	12	3
		9	0	36	9

Eighth Semester

Code	Name	CL	L	U	CA
BI6015	Doctoral Research XII	3	0	12	3
BI6016	Doctoral Research XIII	3	0	12	3
BI6017	Doctoral Research XIV	3	0	12	3
BI6022	Doctoral Defense	0	0	1	0.3
		9	0	37	9.3

This Ph.D program has as requirement a medical residency program.

CL The letter "CL" indicates the number of class-hours per week. **L** The letter "L" indicates the number of laboratory-hours per week.

U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.

CA The letters "CA" represents the number of semester credit hour of the course.

DCL PH. D. in Program in Clinical Sciences

Program Outcomes

The Ph.D. Program in Clinical Sciences will develop 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.

The graduate of this program 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.

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

Have published as the lead author (or have evidence of acceptance of the final version for publication) at least one scientific article on a topic related to their research project, with the following characteristics:

- a) The scientific article must adhere to international authorship guidelines (International Committee of Medical Journal Editors. Recommendations for the conduct, reporting, editing, and publication of scholarly work in medical journals).
- b) It must have been published recently, no more than three years ago, and in a Scopus journal (Q1/Q2) or have a journal impact factor of at least 1.

In the case of shared authorship, the article can only be used once for graduation purposes in any of the graduate programs of the School of Medicine and Health Sciences, only by the student who appears first on the list of authors.

DCL Ph. D. in Program in Clinical Sciences Plan 2012

First Semester

Code	Name	CL	L	U	CA
DS4000	Leadership for Sustainable Development	1.5	0	6	1.5
ME5183	Doctoral Research Proposal I	3	0	12	3
ME5184	Research and Innovation Methods	1.5	0	6	1.5
ME6000	Bioethics and Regulations in Research	3	0	12	3
ME6001	Methodological Structure and Statistics in Biomedical and Clinical Research	3	0	12	3
		12	0	48	12

Second Semester

Code	Name	CL	L	U	CA
ME5185	Doctoral Research Proposal II	3	0	12	3
ME5186	Doctoral Research Proposal III	3	0	12	3
ME5187	Research Seminar I	1	0	4	1
ME6002	Epidemiological Research	3	0	12	3
		10	0	40	10

Third Semester

Code	Name	CL	L	U	CA
ME6003	Doctoral Research I	3	0	12	3
ME6004	Doctoral Research	3	0	12	3
ME6005	Doctoral Research III	3	0	12	3
ME6006	Doctoral Research IV	3	0	12	3
		12	0	48	12

Fourth Semester

Code	Name	CL	L	U	CA
ME6007	Doctoral Research V	3	0	12	3
ME6008	Doctoral Research VI	3	0	12	3
ME6009	Doctoral Research VII	3	0	12	3
ME6010	Doctoral Research VIII	3	0	12	3
		12	0	48	12

Fifth Semester

Code	Name	CL	L	U	CA
ME5188	Research Seminar II	1	0	4	1
ME6011	Doctoral Research IX	3	0	12	3
ME6012	Doctoral Research X	3	0	12	3
ME6013	Doctoral Research XI	3	0	12	3
		10	0	40	10

Sixth Semester

Code	Name	CL	L	U	CA
ME5189	Research Seminar III	1	0	4	1
ME6014	Doctoral Research XII	3	0	12	3
ME6015	Doctoral Research XIII	3	0	12	3
ME6016	Doctoral Research XIV	3	0	12	3
		10	0	40	10

Seventh Semester

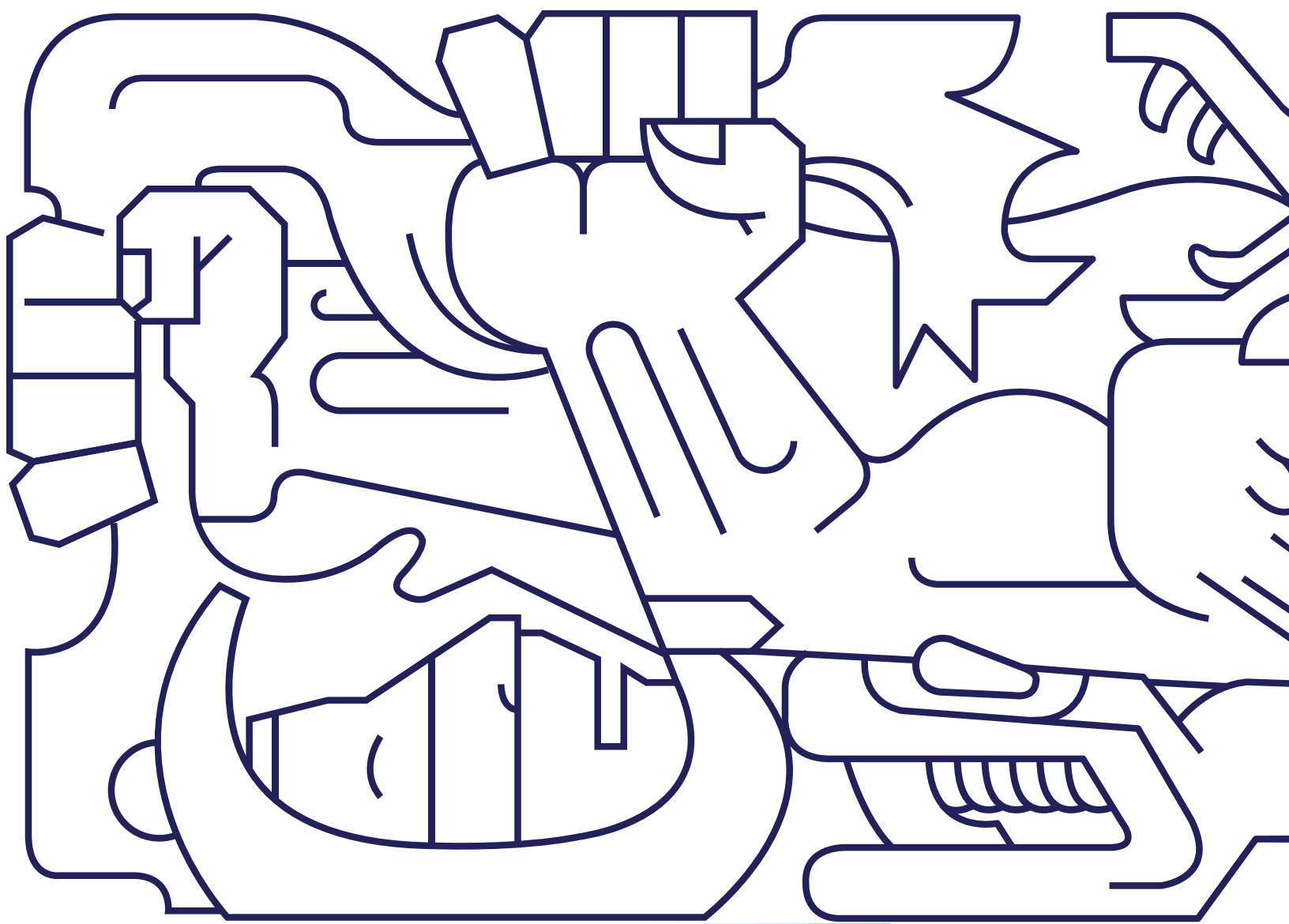
Code	Name	CL	L	U	CA
ME6017	Doctoral Research XV	3	0	12	3
ME6018	Doctoral Research XVI	3	0	12	3
ME6019	Doctoral Research XVII	3	0	12	3
ME6020	Doctoral Defense	0	0	1	0.3
		9	0	37	9.3

This Ph.D program has as requirement a medical residency program.

CL The letter "CL" indicates the number of class-hours per week. **L** The letter "L" indicates the number of laboratory-hours per week.

U The letter "U" represents the weekly time that the student dedicates to fulfill the objectives of the course.

CA The letters "CA" represents the number of semester credit hour of the course.



School of
Business

EAE Specialization in Energy Management

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 Plan 2015

First Trimester

Code	Name	CL	L	U	CA
AD5080	Management in Energy Markets	3.5	0	12	3
AD5081	Energy Law and Regulations of Energy Industries	3.5	0	12	3
		7	0	24	6

Second Trimester

Code	Name	CL	L	U	CA
AD5083	Sustainability and Efficiency Strategies	3.5	0	12	3
FZ5036	Energy Finance	3.5	0	12	3
		7	0	24	6

Third Trimester

Code	Name	CL	L	U	CA
AD5082	Risk Management in Energy Industry	3.5	0	12	3
AD5084	Evaluation of Energy Projects	3.5	0	12	3
AD5085	Field Project on Energy	3.5	0	12	3
		10.5	0	36	9

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 CA The letters "CA" represents the number of semester credit hour of the course.

MAF Master in Finance

Justification

In the global financial environment, increasingly complex opportunities and threats are currently intertwined. The systemic events of the past few decades have put the financial and even the economic system to the test, especially regarding saver and entrepreneur confidence, which has resulted in compulsory and radical changes to the financial markets, their players and their methods

The Master in Finance responds categorically to these changes and prepares business leaders with a solid knowledge of the broad financial market and company corporate life, economic-financial analysis and modeling skills, and the ability to negotiate effectively to generate value for the organization's diverse stakeholders. This is achieved through innovative financial strategies, meeting the highest standards of professional conduct and market discipline, thereby, generating trust in agents and their institutions, and with a sustainable global vision of business consistent with the objectives of Tecnológico de Monterrey.

Program objectives

The objective of the Master in Finance is to prepare professionals with:

- Solid knowledge of the market and company corporate life.
- Economic-financial analysis and modeling skill.
- The ability to negotiate effectively to generate value for the organization's diverse stakeholders meeting the highest standards of professional conduct and market discipline.

Exit profile

On completing the new Master in Finance, graduates will be able to:

- Analyze financial and business information according to its relevance, in order to offer a diagnosis and capitalize opportunities and mitigate threats faced by organizations in globalized markets.
- Generate innovative, reasonable structural models on solid conceptual bases and diverse technological platforms, which add value to organizations in that they make it possible to forecast, analyze or identify the causes and effects of financial challenges that arise in uncertain, complex competitive environments.
- Negotiate in an informed, effective manner on national and international transactions that will generate value for the organization's stakeholders, comprehensively considering legal, operational, institutional, economic, social and environmental aspects, among others.
- Have a broad knowledge of the range of local and global market investment, hedging and funding vehicles, in order to propose and execute innovative financial strategies in the organization.
- Understand comprehensively the globally accepted precepts of ethics and professional conduct for the analysis, design, exposition or execution of sustainable financial models and strategies associated with market discipline, and that promote society's confidence in their performance.

Candidate profile

The Master in Finance seeks to incorporate as students business executives who hold at least middle management positions and are potential entrepreneurs, preferably with two or more years' experience, and who seek to enhance their professional career through local opportunities, based on the development of international application competences, in disciplinary areas such as corporate finance, financial markets and banking. If possible, although this is not a restriction, applicants should have completed field-related studies (including, but not limited to, accounting, finance, economics, mathematics, actuarial science and engineering), with verbal, quantitative and scientific reasoning abilities, and cognitive and writing skills. Candidates should also be able to join in conversations in English, in order to formulate their own ideas, understand and transmit, give or receive detailed instructions, express feelings and respond flexibly in different situations.

**MAF Master in Finance
Plan 2015**

Remedial Trimester

Code	Name	CL	L	U	CA
EC4018	Strategic Economics for Finance	1.5	0	6	2
FZ4012	Managerial Analysis for Financial Information	1.5	0	6	2
FZ4013	Statistical Foundations for Finance	1.5	0	6	2
MA4018	Mathematical Foundations for Finance	1.5	0	6	2
		6	0	24	6

First Trimester

Code	Name	CL	L	U	CA
EC4009	Financial Econometrics	3.5	0	12	3
FZ4014	Macroeconomics	3.5	0	12	3
FZ4015	International Financial Analysis	3.5	0	12	3
		10.5	0	36	9

Second Trimester

Code	Name	CL	L	U	CA
FZ4016	Asset Valuation	3.5	0	12	3
FZ5037	Financial Modeling	3.5	0	12	3
FZ5038	Modern Corporate Finance	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
FZ5039	Investments	3.5	0	12	3
FZ5040	Derivatives and Risk Management	3.5	0	12	3
OP5053	Elective I	3.5	0	12	3
		10.5	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
AD5103	Negotiation Skills	1.5	0	6	2
CR5000	Communication Skills	1.5	0	6	2
OP5054	Elective II	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		10	0	36	9

Fifth Trimester

Code	Name	CL	L	U	CA
AD4027	Corporate Governance and Ethics	1.5	0	6	2
DS4005	Corporate Sustainability	1.5	0	6	2
FZ5004	Finance Project	3.5	0	12	3
		6.5	0	24	6

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MAF-V Master in Finance

Justification

In current national and global markets, understanding and solving financial problems and making the most of investment, efficiency and profitability opportunities constitute a decisive tool for business competitiveness and executive management.

The Master in Finance is a scientific-practical professionalizing program that seeks to prepare people with a solid theoretical and practical grounding, ethical values and critical thinking, trained to manage financial analysis models and techniques to make the best financial decisions and solve investment-financing problems, as well as to propose actions that will enhance the quality of administration and the effectiveness of strategies in the organizations in which they collaborate.

This program provides an in-depth understanding of national and international financial systems and markets, and prepares specialists who are capable of interacting with representatives from all the functional areas of the organization to define strategies and guidelines for actions in order to achieve competitive advantages.

The curriculum combines experience and innovation to prepare people who can offer optimal responses to real business problems and opportunities by means of a collaborative learning system, the practical application of theory in projects, problems and case studies.

As a result, this program is highly relevant in regional and national settings, demonstrated by the executive and senior management positions held by its graduates in both private enterprise and the public sector, at national and international levels.

Program objectives

The general objective of the Master in Finance is to prepare professionals who:

- Are 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.
- Are 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.

Research areas

The Master in Finance conducts research in the following areas:

- Corporate finance.
- Financial markets and financial intermediation.
- Risk management.

MAF-V Master in Finance (On line Program)
Plan 2009

Remedial Trimester

Code	Name	CL	L	U	CA
CD4001	Introduction to Statistical Finance	3.5	0	12	3
EC4008	Economics	3.5	0	12	3
FZ4004	Financial Information Analysis	3.5	0	12	3
MA4000	Introduction to Mathematics for Finance	3.5	0	12	3
		14	0	48	12

First Trimester

Code	Name	CL	L	U	CA
FZ4005	Financial Economics	3.5	0	12	3
FZ4006	Introduction to Corporate Finance	3.5	0	12	3
OP4036	Quality Development Course	3.5	0	12	3
		10.5	0	36	9

Second Trimester

Code	Name	CL	L	U	CA
EC4009	Financial Econometrics	3.5	0	12	3
FZ4007	Advanced Corporate Finance	3.5	0	12	3
FZ4008	Investments	3.5	0	12	3
FZ5000	International Financial Management	3.5	0	12	3
		14	0	48	12

Third Trimester

Code	Name	CL	L	U	CA
FZ5001	Markets and Financial Derivatives Valuation	3.5	0	12	3
FZ5003	Capstone Seminar in Finance	3.5	0	12	3
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		14	0	48	12

Fourth Trimester

Code	Name	CL	L	U	CA
FZ5004	Finance Project	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
OP5056	Elective IV	3.5	0	12	3
		10.5	0	36	9

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MBA Master in Business Administration

Justification

The current complex and changing environment requires leaders with strategic vision and organizational capacity to make and implement effective, ethical and sustainable decisions. These professionals should be competent in international environments and on methodologies supported in technology that allow them to develop innovative and profitable business models to contribute to the sustainable development of their communities.

The Master in Business Administration responds to these needs by preparing innovative leaders, entrepreneurs, with an ethical and sustainable global business vision aligned with the objectives of Technologic de Monterrey.

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 Plan 2015

Remedial Trimester

Code	Name	CL	L	U	CA
AD4024	Business Analytics Foundations	3.5	0	12	3
		3.5	0	12	3

First Trimester

Code	Name	CL	L	U	CA
AD4025	Managerial Skills I	1	0	4	1
AD4026	Business Intelligence	1.5	0	6	2
AD4027	Corporate Governance and Ethics	1.5	0	6	2
MT4016	Consumer Behavior and Marketing Strategies	3.5	0	12	3
RH4003	Leadership and Managing People in Organizations	3.5	0	12	3
		11	0	40	10

Second Trimester

Code	Name	CL	L	U	CA
AD4028	Operations Management	3.5	0	12	3
EC4005	Managerial Economics	3.5	0	12	3
FZ4001	Corporate Finance	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
AD5086	Strategic Management	3.5	0	12	3
AD5087	Strategy and Negotiations in Multicultural Environments	3.5	0	12	3
AD5088	Service Management	1.5	0	6	2
DS4005	Corporate Sustainability	1.5	0	6	2
		10	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
AD5089	Innovation and Entrepreneurship	3.5	0	12	3
AD5090	Managerial Skills II	1	0	4	1
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		11.5	0	40	10

Fifth Trimester

Code	Name	CL	L	U	CA
AD5107	Applied Project (A)	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		7	0	24	6

CL The letter "CL" indicates the number of class-hours per week. L The letter "L" indicates the number of laboratory-hours per week.
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MBA-G MBA in Global Business Administration and Strategy

Justification

The current complex and changing environment requires leaders with strategic vision and organizational capacity to make and implement effective, ethical and sustainable decisions. These professionals should be competent in international environments and on methodologies supported in technology that allow them to develop innovative and profitable business models to contribute to the sustainable development of their communities.

The Master in Business Administration responds to these needs by preparing innovative leaders, entrepreneurs, with an ethical and sustainable global business vision aligned with the objectives of Technologic de Monterrey.

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-G MBA in Global Business Administration and Strategy Plan 2017

Remedial Trimester (1)

Code	Name	CL	L	U	CA
AD4024	Business Analytics Foundations	3.5	0	12	3
		3.5	0	12	3

First Trimester

Code	Name	CL	L	U	CA
AD4025	Managerial Skills I	1	0	4	1
AD4026	Business Intelligence	1.5	0	6	2
AD4027	Corporate Governance and Ethics	1.5	0	6	2
MT4016	Consumer Behavior and Marketing Strategies	3.5	0	12	3
RH4003	Leadership and Managing People in Organizations	3.5	0	12	3
		11	0	40	10

Second Trimester

Code	Name	CL	L	U	CA
AD4028	Operations Management	3.5	0	12	3
EC4005	Managerial Economics	3.5	0	12	3
FZ4001	Corporate Finance	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
AD5086	Strategic Management	3.5	0	12	3
AD5087	Strategy and Negotiations in Multicultural Environments	3.5	0	12	3
AD5088	Service Management	1.5	0	6	2
DS4005	Corporate Sustainability	1.5	0	6	2
		10	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
AD5089	Innovation and Entrepreneurship	3.5	0	12	3
AD5090	Managerial Skills II	1	0	4	1
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		11.5	0	40	10

Fifth Trimester

Code	Name	CL	L	U	CA
AD5107	Applied Project (A)	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		7	0	24	6

CL The letter "CL" indicates the number of class-hours per week. L The letter "L" indicates the number of laboratory-hours per week.
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MBA-I Master in Business Administration

Justification

The current complex and changing environment requires leaders with strategic vision and organizational capacity to make and implement effective, ethical and sustainable decisions. These professionals should be competent in international environments and on methodologies supported in technology that allow them to develop innovative and profitable business models to contribute to the sustainable development of their communities.

The Master in Business Administration responds to these needs by preparing innovative leaders, entrepreneurs, with an ethical and sustainable global business vision aligned with the objectives of Technologic de Monterrey.

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
Plan 2017**

Remedial Trimester

Code	Name	CL	L	U	CA
AD4024	Business Analytics Foundations	3.5	0	12	3
		3.5	0	12	3

First Trimester

Code	Name	CL	L	U	CA
AD4025	Managerial Skills I	1	0	4	1
AD4026	Business Intelligence	1.5	0	6	2
AD4027	Corporate Governance and Ethics	1.5	0	6	2
MT4016	Consumer Behavior and Marketing Strategies	3.5	0	12	3
RH4003	Leadership and Managing People in Organizations	3.5	0	12	3
		11	0	40	10

Second Trimester

Code	Name	CL	L	U	CA
AD4028	Operations Management	3.5	0	12	3
EC4005	Managerial Economics	3.5	0	12	3
FZ4001	Corporate Finance	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
AD5086	Strategic Management	3.5	0	12	3
AD5087	Strategy and Negotiations in Multicultural Environments	3.5	0	12	3
AD5088	Service Management	1.5	0	6	2
DS4005	Corporate Sustainability	1.5	0	6	2
		10	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
AD5089	Innovation and Entrepreneurship	3.5	0	12	3
AD5090	Managerial Skills II	1	0	4	1
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		11.5	0	40	10

Fifth Trimester

Code	Name	CL	L	U	CA
AD5107	Applied Project (A)	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		7	0	24	6

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MBA-V Master in Business Administration

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 cuttingedge 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 cuttingedge 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-V Master in Business Administration (On line Program)
Plan 2019

Remedial Trimester

Code	Name	CL	L	U	CA
AD4024	Business Analytics Foundations	3.5	0	12	3
		3.5	0	12	3

First Trimester

Code	Name	CL	L	U	CA
AD4025	Managerial Skills I	1	0	4	1
AD4026	Business Intelligence	1.5	0	6	2
AD4027	Corporate Governance and Ethics	1.5	0	6	2
MT4016	Consumer Behavior and Marketing Strategies	3.5	0	12	3
RH4003	Leadership and Managing People in Organizations	3.5	0	12	3
		11	0	40	10

Second Trimester

Code	Name	CL	L	U	CA
AD4028	Operations Management	3.5	0	12	3
EC4005	Managerial Economics	3.5	0	12	3
FZ4001	Corporate Finance	3.5	0	12	3
		10.5	0	36	9

Third Trimester

Code	Name	CL	L	U	CA
AD5086	Strategic Management	3.5	0	12	3
AD5087	Strategy and Negotiations in Multicultural Environments	3.5	0	12	3
AD5088	Service Management	1.5	0	6	2
DS4005	Corporate Sustainability	1.5	0	6	2
		10	0	36	9

Fourth Trimester

Code	Name	CL	L	U	CA
AD5089	Innovation and Entrepreneurship	3.5	0	12	3
AD5090	Managerial Skills II	1	0	4	1
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		11.5	0	40	10

Fifth Trimester

Code	Name	CL	L	U	CA
AD5107	Applied Project (A)	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		7	0	24	6

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 CA The letters "CA" represents the number of semester credit hour of the course.

MBE Master in Business Administration Executive Program

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

Remedial Semester

Code	Name	CL	L	U	CA
GA4025	Fundamental Administrative Environment	2	0	8	2
		2	0	8	2

First Semester

Code	Name	CL	L	U	CA
GA4027	Analytical Tools for Decision Making and Macroeconomics for Managers	3	0	11	3
GA4028	Leadership, Organization and Change	2	0	8	2
GA4030	General Management and Strategy	1	0	5	1
GA4034	Advanced Marketing Strategy	2	0	10	3
		8	0	34	9

Second Semester

Code	Name	CL	L	U	CA
GA4029	Global Operations Management	2	0	8	2
GA4032	Financial & Managerial Accounting	2	0	10	3
GA4033	Corporate Finance	3	0	12	3
		7	0	30	8

Third Semester

Code	Name	CL	L	U	CA
GA4026	Global Business Environment	3	0	6	2
GA4031	Logistics and Sustainability	3	0	6	2
GA4035	Micro and Strategic Economics	2	0	9	2
GA5028	International Finance and Strategic Technology	2	0	9	2
		10	0	30	8

Fourth Semester

Code	Name	CL	L	U	CA
GA5025	Globalization of Finance and Cultural Marketing	3	0	6	2
GA5026	Strategic Thinking and Change	3	0	11	3
GA5027	Ethics and Business Environment	3	0	13	3
GA5029	Adaptation to Dynamic Business Environments	3	0	6	2
		12	0	36	9

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MBM Master in Business Management

Justification

The program emerged from the need to prepare professionals with leadership, management skills, an entrepreneurial spirit and international vision, and who are IT literate and ethically responsible, in order to be competitive in globalized business contexts.

After three years, MBM graduates will be able to:

- Perform successfully in management positions in multinational companies.
- Identify business opportunities.
- Design and implement innovative business processes and/or models.
- Create sustainable wealth through their own companies.

Exit profile

On completing the program, students will be able to:

- Design and implement innovative sustainable business processes and/or models.
- Generate solutions with sustainable profitability, based on quantitative and qualitative analyses.
- Lead work teams and exercise leadership skills.
- Use ethical reasoning to assure the sustainable development of organizations.
- Use technologies to generate value.

Candidate profile

Young professionals and/or executives who want to enrich their education with:

- A global perspective of the business world.
- Knowledge, skills and attitudes that comprise the competencies for organizational management and analysis.
- Design new business and entrepreneurship models.
- Lines of research.

This professionalizing program focuses on student development in the following concentrations:

- Innovation and entrepreneurship.
- Global business perspective.
- Service management.
- Consulting.

MBM Master in Business Management Plan 2009

First Trimester

Code	Name	CL	L	U	CA
EC4006	Managerial Economics	3.5	0	12	3
EC4007	International Business Environment and Emerging Regional Scenarios	3.5	0	12	3
MT4011	Strategies of International Marketing Products and Services	3.5	0	12	3
OP4036	Quality Development Course	3.5	0	12	3
		14	0	48	12

Second Trimester

Code	Name	CL	L	U	CA
AD4007	Business and Product Innovation	3.5	0	12	3
AD5003	Value Creation, Business and Network Models	3.5	0	12	3
AD5004	Leadership and Human Capital	3.5	0	12	3
FZ4003	Financial Analysis and Management	3.5	0	12	3
		14	0	48	12

Third Trimester

Code	Name	CL	L	U	CA
AD4008	Management and Strategies of Entrepreneurship	3.5	0	12	3
AD5005	Services Management	3.5	0	12	3
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		14	0	48	12

Fourth Trimester

Code	Name	CL	L	U	CA
AD4009	Business Seminar I	1	0	4	1
AD4010	Business Seminar II	1	0	4	1
AD4011	Business Seminar III	1	0	4	1
AD5006	Integrative Project	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
OP5056	Elective IV	3.5	0	12	3
		13.5	0	48	12

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MGN-V Master in Enterprise Administration

General Program Objectives

The overall objective of the Master in Enterprise Administration is to prepare professionals to:

- Design and implement solutions with an ethic perspective and socially responsible for solving complex business problems using analytic methods and innovative technologies.
- Interact with specialists from functional areas in an organization, in order to define strategies and organizational objectives.
- Have character to lead change processes in complex environments that support organizational transformation.
- Comprehend the design and implementation of innovative business models that add values to the organization.

Learning Outcomes

- Be resilient to different organizational dynamics.
- Generate sustainable solutions to institutional problems through abilities, ideas, and entrepreneurship within an ethical framework.
- Generate results with value added using innovative business models.
- Interact in multicultural and global environments taking advantage of diversity.
- Visualize and create the future of organizations and companies, identifying opportunities to generate value.
- Use information technologies for business intelligence that allow an analytic decision-making.
- Apply and promote interdisciplinary and collaborative work, being a guide for high-performance teams.
- Communicate, interact and influence stakeholders in the organization.
- Perform in virtual environment without time and space limitations.

Target Audience

- Executives who wish to enrich their global perspective in the multinational business environment, and apply this knowledge in companies, enterprises and organizations, in order to progress in their business career.
- Consultants, entrepreneurs and business owners who wish to participate in high-level projects and progress within a business career or improve their business from an innovative perspective.

MGN-V Master in Enterprise Administration (On line Program)
Plan 2017

Remedial Trimester

Code	Name	CL	L	U	CA
AD4035	Quantitative Methods for Decision Making	3.5	0	12	3
FZ4017	Analysis and Interpretation of Financial Information	3.5	0	12	3
		7	0	24	6

First Trimester

Code	Name	CL	L	U	CA
AD4036	Social Responsibility, Ethics and Sustainability	3.5	0	12	3
AD4037	Management and Managerial Philosophy	3.5	0	12	3
		7	0	24	6

Second Trimester

Code	Name	CL	L	U	CA
AD4038	Management and Direction of Human Capital	3.5	0	12	3
EC4019	Managerial Economics	3.5	0	12	3
		7	0	24	6

Third Trimester

Code	Name	CL	L	U	CA
AD4039	Financial Management	3.5	0	12	3
MT4017	Strategic Marketing Management	3.5	0	12	3
		7	0	24	6

Fourth Trimester

Code	Name	CL	L	U	CA
AD4040	Value Chain Management	3.5	0	12	3
AD5109	Strategic Planning	3.5	0	12	3
		7	0	24	6

Fifth Trimester

Code	Name	CL	L	U	CA
AD5110	Business Intelligence	3.5	0	12	3
AD5111	Entrepreneurship and Business Model Design	3.5	0	12	3
		7	0	24	6

Sixth Trimester

Code	Name	CL	L	U	CA
OP5053	Elective I	3.5	0	12	3
OP5054	Elective II	3.5	0	12	3
		7	0	24	6

Seventh Trimester

Code	Name	CL	L	U	CA
AD5112	Field Project	3.5	0	12	3
OP5055	Elective III	3.5	0	12	3
		7	0	24	6

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DCA PH. D. in Business Administration

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.

Learning outcomes

Graduates from the PhD in Administrative Science will have:

- The capacity to generate critical original knowledge, with the ability to develop theoretical and empirical administrative science models.
- Cutting-edge knowledge of the theoretical and empirical advancements in administrative science.
- In-depth knowledge of the theoretical and empirical advancements in administrative science (according to their area of specialization).
- The capacity to design and analyze measurement instruments for the identification and diagnosis of administrative science topics and issues.
- The ability to report and publish research findings in order to design, lead and assess research projects.
- A positive attitude to assess and act with honesty and responsibility in highly complex and ambiguous research situations.

Target audience

- The PhD in Administrative Science is for people who: are interested in developing intellectual leadership in administrative science.
- Have proven research skills and are interested in the scientific development of administrative science
- Have an academic background in administrative science and related areas.
- Are fluent in English.
- Focus on seeking intellectual challenges drawn from an awareness of their environment and its issues.

Research Areas (Monterrey Site)

- Entrepreneurship.
- International Competitiveness.
- Leadership and Organizational Behavior.
- Strategy.

Associated Research Groups at EGADE, Monterrey:

1. Entrepreneurship

- Technology-based Enterprise.
- SMEs.

2. International Competitiveness

- Innovation Models and New Business Models.
- International Business.
- International Competitiveness.
- Strategies in Regulated Industries.

3. Leadership and Organizational Behavior

- Organizational Behavior and Leadership.
- Culture, Human Resources and Humanistic Society.
- Business Management.

4. Strategy

- Market Strategy and Financial Institutions, Applied Finance (Corporate), Consumer Behavior, Knowledge Management, Business Social Responsibility.

Research areas (Ciudad de México Campus Site):

Finance, Marketing, Competitiveness and Economics; Associated Research Groups at EGADE, Ciudad de México Campus - Finance: Risk Management and Corporate Finance; Marketing: Consumer, Brand and Competitiveness; and Economics: Business Models in the Knowledge Economy, Regulation and Economic Indicators, Logistics and Supply Chains.

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

In the case of doctoral programs, have published as the lead author (or have evidence of acceptance for publication) at least one article on a topic related to their research project, in Scopus-indexed journals.

In the case of shared authorship, the article can only be used once for graduation purposes in any of the graduate programs of EGADE Business School, only by the student who appears first on the list of authors.

**DCA PH. D. in Business Administration
Plan 2011**

First Semester

Code	Name	CL	L	U	CA
AD4019	Fundamentals of Management	3	0	12	3
H5014	Philosophy of Science	3	0	12	3
MA4009	Statistical Methods	3	0	12	3
MA4011	Matrix Algebra and Optimization	3	0	12	3
		12	0	48	12

Second Semester

Code	Name	CL	L	U	CA
AD4020	Research Methodology	3	0	12	3
EC5004	Fundamental Economics	3	0	12	3
MT4015	Multivariate Analysis	3	0	12	3
OP5062	Elective I	3	0	12	3
		12	0	48	12

Third Semester

Code	Name	CL	L	U	CA
GD5002	Research Proposal I	3	0	12	3
MT4014	Design of Research Measurement Instruments	3	0	12	3
OP5063	Elective II	3	0	12	3
OP5064	Elective III	3	0	12	3
		12	0	48	12

Fourth Semester

Code	Name	CL	L	U	CA
AD4018	Business Policy, Ethics and Corporate Social Responsibility	3	0	12	3
GD5003	Research Proposal II	3	0	12	3
GD5005	Research Seminar I	1	0	4	1
OP5065	Elective IV	3	0	12	3
OP5066	Elective V	3	0	12	3
		13	0	52	13

Fifth Semester

Code	Name	CL	L	U	CA
GD5004	Research Proposal III	3	0	12	3
GD5008	Assisted Research I	3	0	12	3
GD5009	Assisted Research II	3	0	12	3
GD5010	Assisted Research III	3	0	12	3
		12	0	48	12

Sixth Semester

Code	Name	CL	L	U	CA
GD5006	Research Seminar II	1	0	4	1
GD6017	Doctoral Research I	3	0	12	3
GD6018	Doctoral Research II	3	0	12	3
GD6019	Doctoral Research III	3	0	12	3
		10	0	40	10

Seventh Semester

Code	Name	CL	L	U	CA
GD6020	Doctoral Research IV	3	0	12	3
GD6021	Doctoral Research V	3	0	12	3
GD6022	Doctoral Research VI	3	0	12	3
		9	0	36	9

Eighth Semester

Code	Name	CL	L	U	CA
GD5007	Research Seminar III	1	0	4	1
GD6023	Doctoral Research VII	3	0	12	3
GD6024	Doctoral Research VIII	3	0	12	3
GD6025	Doctoral Research IX	3	0	12	3
		10	0	40	10

Ninth Semester

Code	Name	CL	L	U	CA
GD6000	Doctoral Defense	0	0	1	0.3
GD6026	Doctoral Research X	3	0	12	3
GD6027	Doctoral Research XI	3	0	12	3
GD6028	Doctoral Research XII	3	0	12	3
		9	0	37	9.3

This Ph.D program has as requirement a medical residency program.

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DCF Ph. D. in Financial Science

Justification

The intrinsic challenges of globalized, dynamic financial markets require researchers with analytical skills, knowledge of economics and finance, and the capacity to model phenomena in the world of finance in order to make decisions that will enhance company, market and financial institution management, thus contributing to the sustainable development of regional, national and international economies.

DCF is a research program with a scientific approach that seeks to prepare people with a solid grounding in financial theory, ethical values and critical thinking, trained in handling sophisticated financial analysis models and techniques to make the best financial decisions and solve sophisticated investment, financing, working capital management and risk management issues in enterprise, financial institutions, government agencies and other organizations.

In this way, the institution delivers to the community scientists with a high sense of social and civic commitment and with ethical values, who carry out their research, teaching and professional work in favor of an objective diagnosis and the generation of proposals that will result in a more efficient, transparent and equitable performance by economic agents who participate in or supervise financial markets.

As a result, this program is relevant regionally and nationally as can be seen in the national and international recognitions received by its graduates in relation to research and contributions to financial management and business and financial market risk management.

Program objectives

In their careers, DCF graduates conduct applied research 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

DCF graduate competencies are as follows:

- Theoretical knowledge and the capacity 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.
- The capacity to 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.
- The ability to 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.

- The ability and capacity to interact effectively and efficiently with individuals who have different cultural characteristics and work in organizations that operate in globalized settings.

Target audience

DCF targets people who have:

- The desire and capacity to investigate and extend their knowledge in the fields of financial science.
- The discipline and intellectual curiosity to ask fundamental questions and conduct research that contributes to creating and disseminating original and/or innovative knowledge and/or practices in the area of theory, administration and financial economics.
- The intention of having a career in which they will become opinion leaders and generators of schools of thought in finance and economics.
- The desire to participate in financial science research, teaching and consulting.

Research areas associated to the program

- Financial Risk Management and Corporate Finance

Graduation requirements

Have fulfilled the graduation requirements provided in the Academic Regulations for Graduate Students, and with the following requirements established in the program:

In the case of doctoral programs, have published as the lead author (or have evidence of acceptance for publication) at least one article on a topic related to their research project, in Scopus-indexed journals.

In the case of shared authorship, the article can only be used once for graduation purposes in any of the graduate programs of EGADE Business School, only by the student who appears first on the list of authors.

**DCF Ph. D. in Financial Science
Plan 2011**

First Semester

Code	Name	CL	L	U	CA
AD4018	Business Policy, Ethics and Corporate Social Responsibility	3	0	12	3
GF5019	Research Proposal I	3	0	12	3
MA4016	Calculus and Linear Algebra	3	0	12	3
OP5062	Elective I	3	0	12	3
		12	0	48	12

Second Semester

Code	Name	CL	L	U	CA
FZ5024	Investment Theory	3	0	12	3
GF5020	Research Proposal II	3	0	12	3
MA4017	Probability and Statistics	3	0	12	3
OP5063	Elective II	3	0	12	3
		12	0	48	12

Third Semester

Code	Name	CL	L	U	CA
EO4009	Open Macroeconomics	3	0	12	3
EO4011	Advanced Microeconomics	3	0	12	3
GF5021	Research Proposal III	3	0	12	3
OP5064	Elective III	3	0	12	3
		12	0	48	12

Fourth Semester

Code	Name	CL	L	U	CA
FZ5002	Financial Information and Decision Making	3	0	12	3
FZ5026	Mathematics for Finance	3	0	12	3
GF5022	Research Seminar I	1	0	4	1
GF6027	Doctoral Research I	3	0	12	3
OP5065	Elective IV	3	0	12	3
		13	0	52	13

Fifth Semester

Code	Name	CL	L	U	CA
AD4020	Research Methodology	3	0	12	3
GF6028	Doctoral Research II	3	0	12	3
GF6029	Doctoral Research III	3	0	12	3
OP5066	Elective V	3	0	12	3
		12	0	48	12

Sixth Semester

Code	Name	CL	L	U	CA
GF5023	Research Seminar II	1	0	4	1
GF5025	Assisted Research I	3	0	12	3
GF6030	Doctoral Research IV	3	0	12	3
GF6031	Doctoral Research V	3	0	12	3
		10	0	40	10

Seventh Semester

Code	Name	CL	L	U	CA
GF5026	Assisted Research II	3	0	12	3
GF6032	Doctoral Research VI	3	0	12	3
GF6033	Doctoral Research VII	3	0	12	3
		9	0	36	9

Eighth Semester

Code	Name	CL	L	U	CA
GF5024	Research Seminar III	1	0	4	1
GF5027	Assisted Research III	3	0	12	3
GF6034	Doctoral Research VIII	3	0	12	3
GF6035	Doctoral Research IX	3	0	12	3
		10	0	40	10

Ninth Semester

Code	Name	CL	L	U	CA
GF6000	Doctoral Defense	0	0	1	0.3
GF6036	Doctoral Research X	3	0	12	3
GF6037	Doctoral Research XI	3	0	12	3
GF6038	Doctoral Research XII	3	0	12	3
		9	0	37	9.3

This Ph.D program has as requirement a medical residency program.

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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/3_3EN.htm

This catalogue presents information on the **Graduate Programs Catalogue 2019** of Tecnológico de Monterrey. Its content reflects the information available in official media at the time of its publication.

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