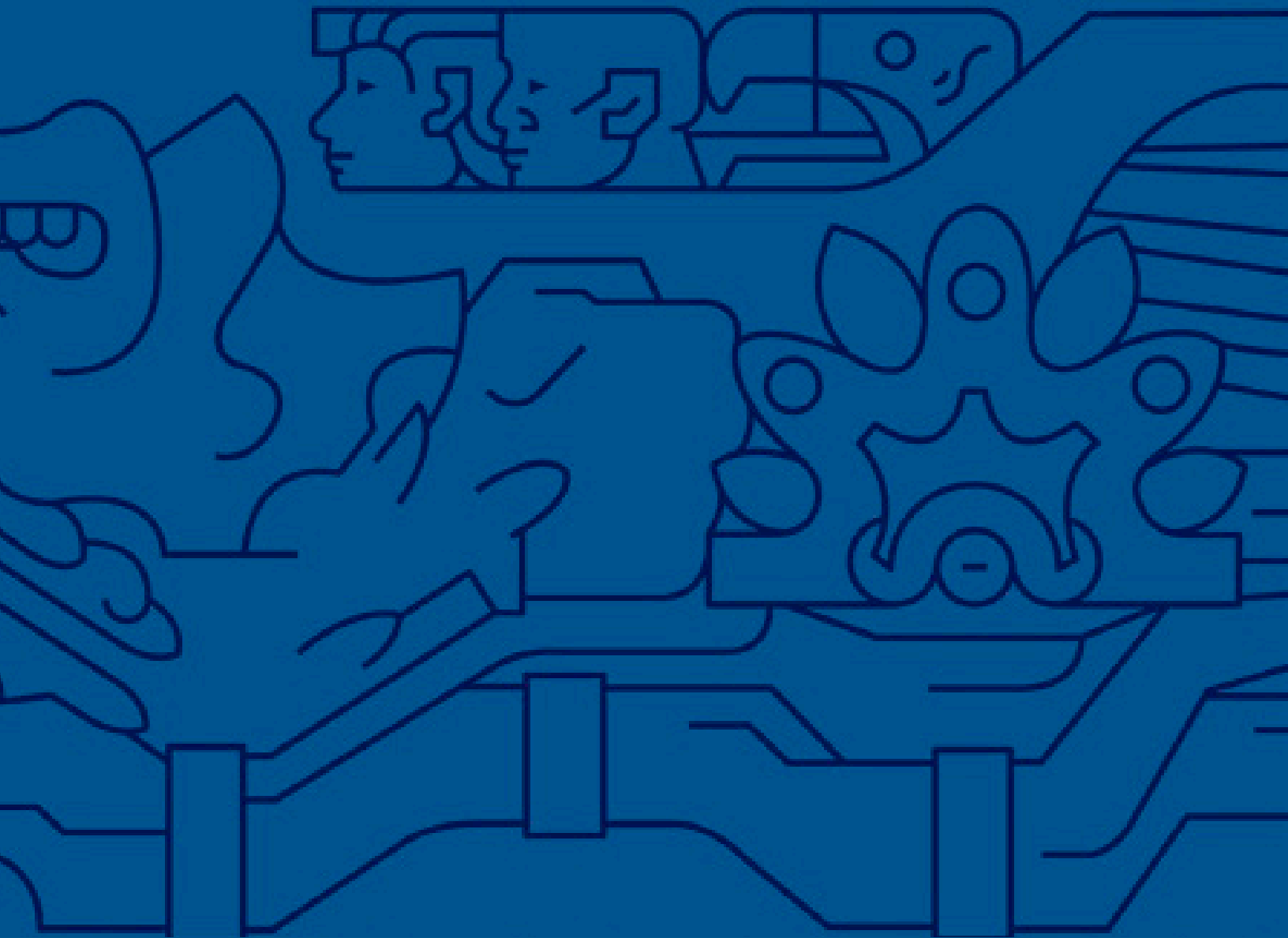


Undergraduate Programs Catalogue



TECNOLÓGICO
DE MONTERREY



GRADUATE PROGRAMS CATALOGUE

INSTITUTO TECNOLÓGICO Y DE ESTUDIOS SUPERIORES DE MONTERREY

Date of promulgation: Agosto 2016
Modification: 2013, 2014, 2015, 2017, 2018, 2019

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Publication by the Academic Vice-Rector.

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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 precepts 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.

INDEX

INTRODUCTION	11
I. TECNOLÓGICO DE MONTERREY	13
History and evolution	15
Education that transforms lives	
• Multi-campus university	21
• Values	21
• Vision	22
• Differentiators	22
• Code of Ethics	22
Educational Model	23
Academic Policies and Academic Regulations	24
• Admissions	24
• Revalidations	24
• Evaluation and permanence	24
• Graduation	25
• General Student Regulations	26
• Scholarships and educational support	26
• Fee refunds	26
II. Curricula	27
Graduate Program Profiles and Curricula	29
School of Architecture, Art and Design	31
• MDU Master in Architecture and Urban Design	33
School of Social Sciences and Government	37
• EAE Specialization in Energy Management	39
• EEA Specialization in Applied Economics and Data Science	42
• ETD Specialization in Public Decision Making and Data Science	45
• MAP Master in Public Administration and Public Policy	47
• MAP-V Master in Public Administration and Public Policy (Online Program)	51
• MCS Master in Social Sciences	54
• MDI Master in International Law	57

• MDP	Master in Laws	60
• MDP-V	Master in Laws (Online Program)	63
• MEK	Master in Applied Economics	66
• MEK-V	Master in Applied Economics (Online Program)	69
• MGP-V	Master in Applied Public Management (Online Program)	72
• MGT	Master in Government and Public Transformation	75
• MGT-M	Master in Government and Public Transformation (Mixed Program)	78
• MGT-V	Master in Government and Public Transformation (Online Program)	81
• MPE	Master in Strategic Foresight	84
• MPE-V	Master in Strategic Foresight (Online Program)	87
• DGT	Ph. D. in Government and Public Transformation	89
• DPP	Ph. D. en Política Pública	95

Escuela de Humanidades y Educación **101**

• EEE-V	Specialization in Teaching and Evaluation of English as a Second Language (Online Program)	103
• EGE-V	Specialization in Management for Leadership and Educational Innovation (Online Program)	106
• MEE-V	Master in Education (Online Program)	109
• MEH	Master in Humanistic Studies	112
• MHD-V	Master in Digital Humanities (Online Program)	116
• MTE-V	Master in Educational Technology (Online Program)	119
• MTO-V	Master in Educational Entrepreneurship (Online Program)	122
• DEE	Ph. D. in Educational Innovation	125
• DEH	Ph. D. in Humanistic Studies	130

School of Engineering and Sciences **135**

• EIS	Software Engineering Specialization	137
• ELS	Specialization in Logistics and Supply Chain	139
• ENA-V	Specialization in Applied Artificial Intelligence (Online Program)	142
• EPY	Project Management Specialization	145
• MBI	Master in Science with a Specialization in Biotechnology	147
• MCC	Master in Computer Science	149
• MCC-I	Master in Computer Science	152
• MCI	Master in Engineering	154
• MCY	Master in Cybersecurity	157
• MCY-M	Master in Cybersecurity (Mixed Program)	160
• MEM	Master in Engineering Management	163
• MER-V	Master in Energy Management and its Renewable Sources (Online Program)	167
• MID-V	Master in Innovation for Business Development (Online Program)	169
• MIE	Master in Science with a Specialization in Energy Engineering	172
• MIP-V	Master in Engineering with a Specialization in Quality Systems and Productivity (Online Program)	175

• MIR	Master in Automotive Engineering	178
• MNA-V	Master in Applied Artificial Intelligence (Online Program)	181
• MNT	Master in Nanotechnology	184
• MOI	Master in Industrial Engineering	186
• MSE-E	Master in Science with a major in Electronic Engineering (Electronic Systems)	189
• MSM	Master in Science with a Specialization in Manufacturing Systems	192
• MTI-V	Master in Information Technology Management (Online Program)	194
• DBT	Ph. D. in Biotechnology	197
• DCC	Ph. D. in Computer Science	200
• DCI	Ph. D. in Engineering Sciences	204
• DNT	Ph. D. in Nanotechnology	209

School of Medicine and Health Sciences **213**

• RAP	Residency in Pathological Anatomy	215
• RCA	Residency in Quality of Clinical Care	219
• RCR	Residency in Cardiology	222
• REA	Residency in Anesthesiology	225
• REC	Residency in General Surgery	229
• REE	Residency in Medicine of the Critically Ill	233
• REG	Residency in Gynecology and Obstetrics	236
• REM	Residency in Internal Medicine	240
• REN	Residency in Pediatrics	245
• REO	Residency in Ophthalmology	249
• RER	Residency in Radiology and Imaging	253
• REU	Residency in Neurology	257
• RGE	Residency in Geriatrics	261
• RNE	Residency in Neonatology	265
• RNP	Residency in Pediatric Neurology	269
• RPS	Residency in Psychiatry	272
• RUR	Residency in Urology	276
• MBC	Master in in Biomedical Sciences	280
• DBC	Ph. D. in Biomedical Sciences	282
• DCL	Ph. D. in Clinical Sciences	286

Business School **291**

• EED	Specialization in Digital Strategy	293
• MAF	Master in Finance	296
• MAF-V	Master in Finance (Online Program)	300
• MBA	Master in Business Administration and Management (Part-time)	303
• MBA-G	Master in Business Administration and Management	306
• MBA-I	Master in Business Administration and Management (Full-time)	309
• MBA-V	Master in Business Administration and Management (Online Program)	312
• MBD	Master in Business Analytics	314
• MBE	Master in Global Business Management	317

• MBM	Master in Management	320
• MBM-V	Master in Management (Online Program)	323
• MDE	Master in Global Business Administration	326
• MGN-V	Master in Business Administration (Online Program)	330
• DCA	Ph. D. in Administrative Sciences	333
• DCF	Ph. D. in Financial Sciences	338

Course content by academic discipline

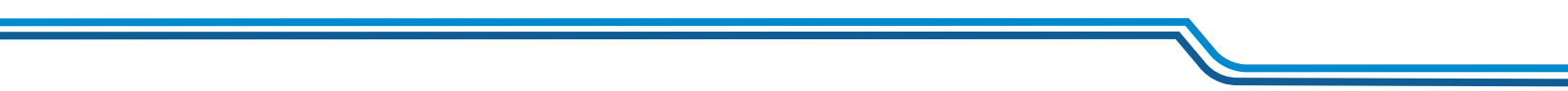
The description of the courses that make up the curricula of the graduate programs offered by Tecnológico de Monterrey are published online at the following electronic address:
http://sitios.itesm.mx/va/planes_de_estudio/3_3ES.htm

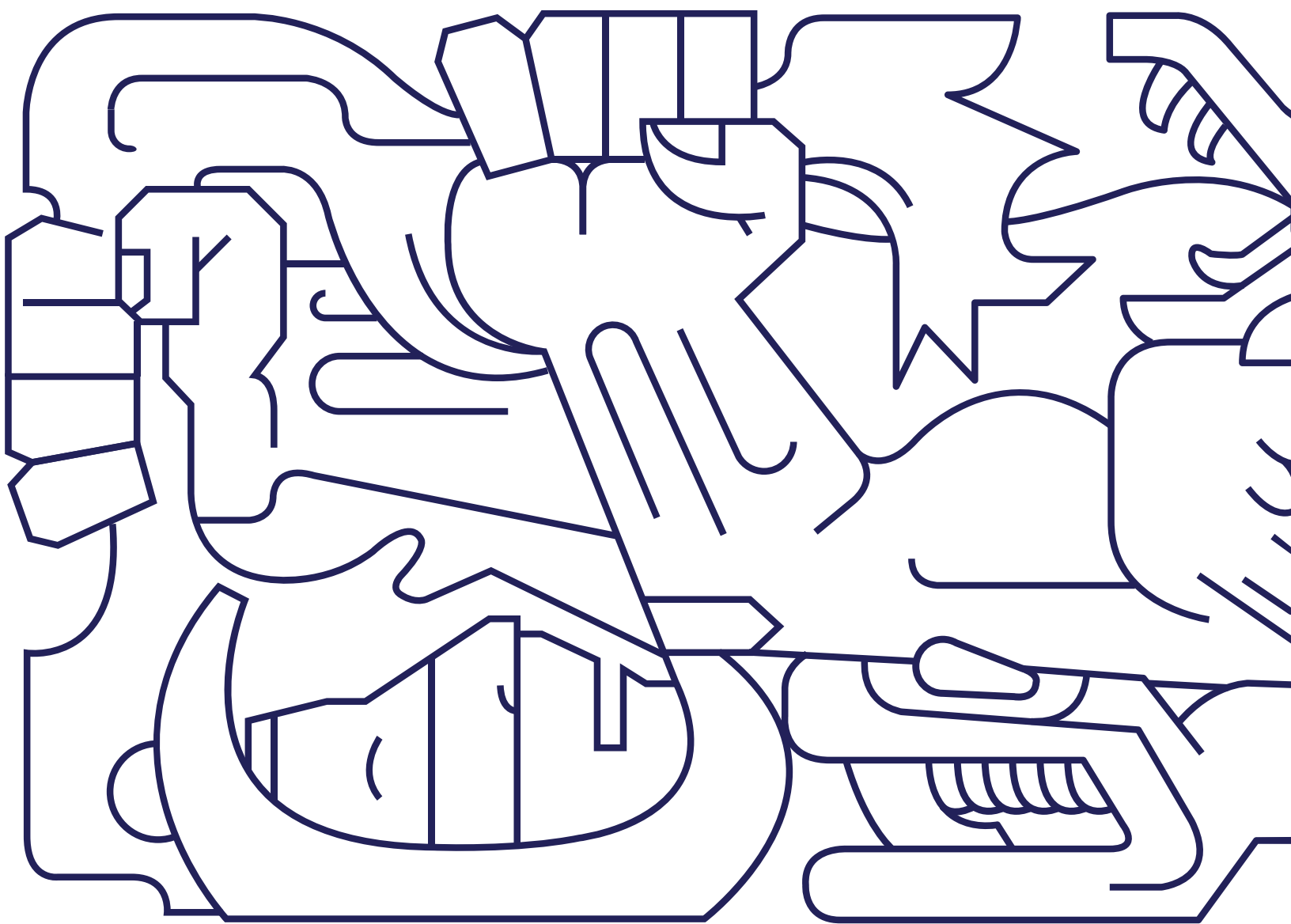
INTRODUCTION

This document describes the wide educational offer of Tecnológico de Monterrey at the graduate level, gives a brief description of our educational model, the structure of the curricula, the resources and means available to all our students, student life, and academic policies and regulations.

It also includes a brief description of the areas of excellence and Specialization topics in which professors and students carry out research projects, with the aim of training, transforming, innovating and transcending in society.

March 2021





I. TECNOLÓGICO DE MONTERREY



I. TECNOLÓGICO DE MONTERREY

History and Evolution

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

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

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

Every year, the board members of these associations meet to define the goals that will guide the major decisions which will help Tecnológico de

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

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

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

These are some of the main events that distinguish our Institution 78 years after the foundation of Tecnológico de Monterrey:



Beginning

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

Growth

- 1960** Tecnológico de Monterrey has 4,458 students from 19 countries in America and all the states of Mexico.
- 1963** At the beginning of this year, the first master's degree is awarded in Chemical Sciences. Twenty years after its foundation, Tecnológico de Monterrey begins to delve into two educational facets that will be of paramount importance: the use of electronic computers and educational television.
- 1967** The first campus outside the city of Monterrey is founded: the Guaymas Campus.
- 1968** This year sees the launch of the first doctoral program: the Ph. D. 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

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.

2020 Appointment of Juan Pablo Murra Lascurain as Rector of the Graduate and Undergraduate Programs at the Monterrey Institute of Technology.

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. Anteponeamos 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.

Modelo Educativo

Tecnológico de Monterrey's graduate educational model is a comprehensive proposal that seeks to impact education through the training of professional and scientific talent. This approach focuses on Code aspects such as leadership, innovation, and entrepreneurship, and is designed to provide specialized post-bachelor's education. The main objectives of postgraduate programs are to update, expand knowledge and generate new knowledge, which translates into a significant influence at the individual and institutional level.

This educational model is based on various reflections and conclusions resulting from collaborative workshops and diagnoses that identified areas of opportunity in both academic and administrative processes. The postgraduate degree is structured according to clearly defined educational levels: Specialization, master's and doctorate, which are aligned with the official regulations of education in Mexico. Thus, a training proposal is established that not only characterizes the institution, but also differentiates it from other educational models.

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As for the delivery modalities, Tecnológico de Monterrey offers its postgraduate degrees in different modalities. The face-to-face modality implies a coincidence of time and space between students and teachers, while the online modality uses technological tools and digital environments, which requires a high degree of self-direction on

the part of the students.

The graduate model is based on four pillars: cutting-edge options, experience with impact, community of leaders, and learning that transcends. These pillars allow the educational offer to be stratified according to different orientations, encompassing programs ranging from professional impact and executive training to scientific research and medical specialties. In addition, it is complemented by Alternative Credentials that certify specific skills and competencies.

Finally, the updating of programs is a priority within the educational model. Quality criteria and standards are established that govern the opening and closing of programs, ensuring that the offer continues to innovate and meet the demands of the audiences it serves. The effectiveness of these programs is evaluated annually to ensure that they meet established standards and remain relevant in an ever-changing educational environment.

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.

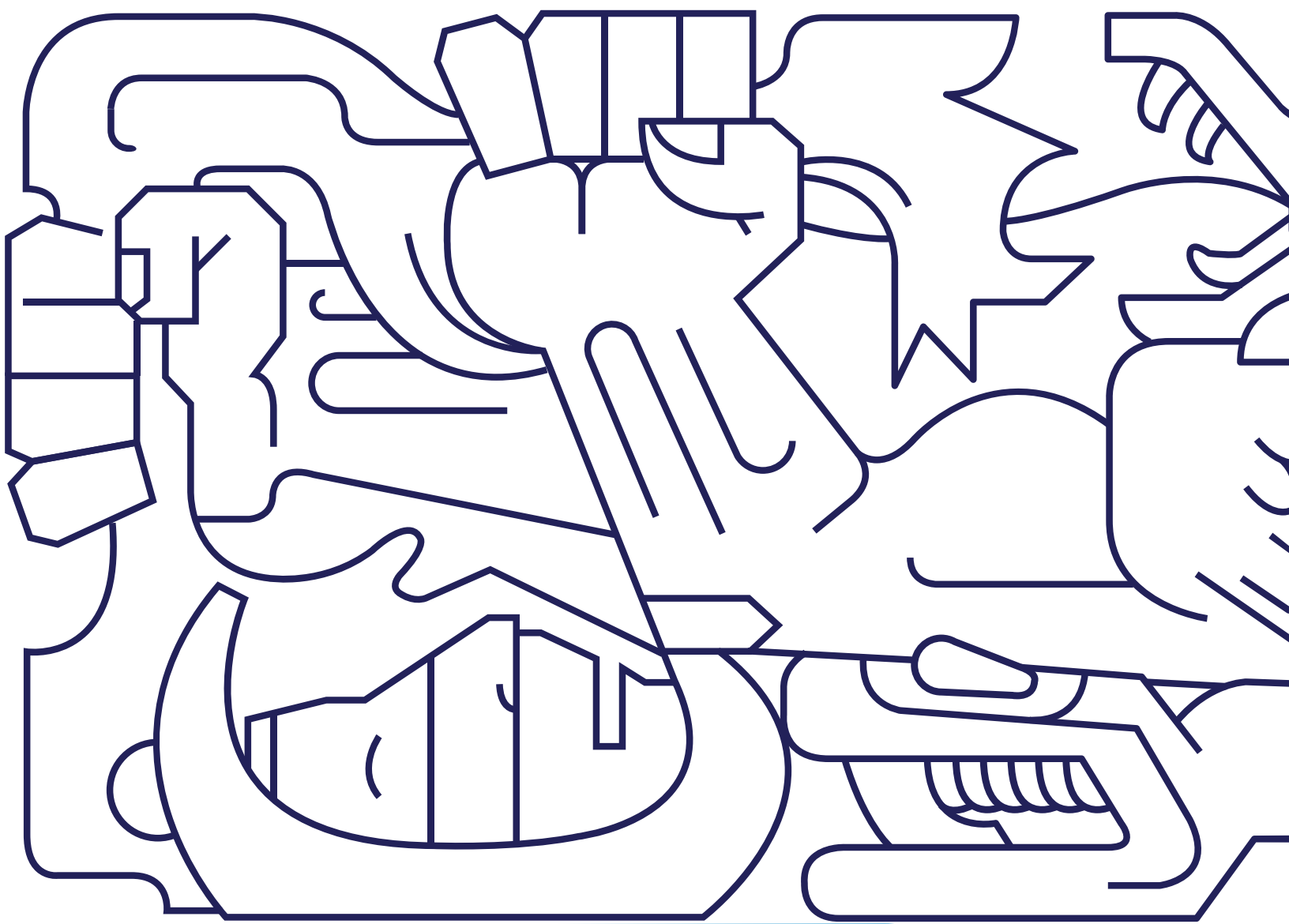
Academic excellence scholarship. The aim of this scholarship is to attract academically outstanding students who have graduated from an undergraduate degree at Tecnológico de Monterrey. The financial aid covers 100 % of tuition.

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/>).



II. CURRICULA



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.

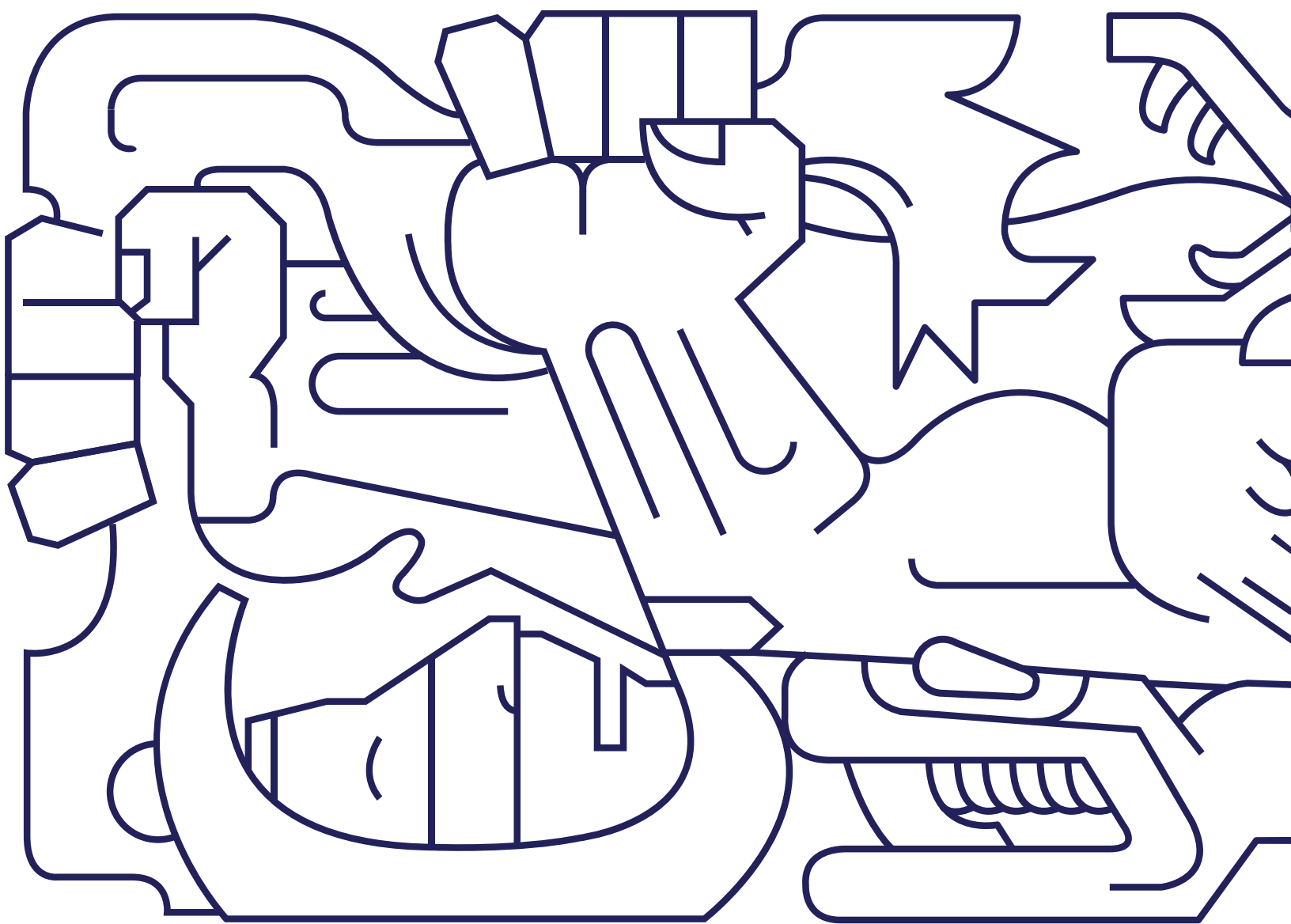
Course Code	Course	CA
MA4005	Applied Statistics	3

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.

All courses in a curriculum are described in the course content section by academic discipline.

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

In this case, the Applied Statistics course consists of 3 academic credits.



Profiles and curricula

School of Architecture, Art and Design



MDU Master in Urban Design and Architecture

Justification

The Master in Architecture and Urban Design responds to the need to transform our cities into resilient, healthy, just and sustainable places. The program proposes to address the urban challenges of climate change, migration, inequality and accelerated growth through tools and methodologies focused on the design and management of multi-scale projects that impact the regeneration of ecological systems in the built environment.

This will promote the integration of groups of professionals interested in the possibilities found in urban design and planning, as well as in areas related to the social sciences, natural resources, and engineering. Consequently, the program seeks to create, maintain and strengthen the interrelationships between the physical, built environment, and the social, economic and political institutions that form urban areas.

The Master in Architecture and Urban Design is directly related to Tecnológico de Monterrey's Vision 2030, where the Institute has identified global trends that are redefining education. Among them is Open Cities, which is focused on addressing the need to respond to rapid urbanization and the concentration of talent and value in cities. The program also addresses the recognized challenge of training the next generation of innovative citizens who will take advantage of the resources of their communities, improve their environment and raise the quality of life.

In this Vision, among others, there are two differentiating pillars where the program contributes:

- Impeller in the transformation of cities and communities. It focuses on understanding how cities and migratory movements have evolved. In addition to recognizing urbanization as one of the fundamental transformations in the history of humanity, as well as the challenges and opportunities brought about by the rapid growth of cities.
- The person at the center to create a sustainable world. It seeks to understand the individual as a being interconnected with his or her environment, living in harmony with the environment and putting his or her capabilities at the service of others.

Target audience

The Master in Architecture and Urban Design is aimed primarily at applicants who have the fundamentals of disciplines of architecture, urban planning, sustainability and environment, ecology and civil engineering. It is also intended for professionals in sociology, management, economics, political science, engineering or community administration, when they have developed a minimum experience of two years in the topics related to the Program to focus on an interdisciplinary study of urban problems and their interventions.

Program objectives

The Master in Architecture and Urban Design is a program that aims to train professionals:

- To be promoters of change in the transformation of cities based on a critical and proactive understanding of the challenges and opportunities of the environment.
- To develop urban scale projects, taking advantage of the use of technological, participatory and creative tools in the formulation of strategies or projects applicable to different scales and contexts.

Learning Outcomes

The Master in Architecture and Urban Design is based on the gradual construction of Learning Outcomes, in a context of high academic rigor, from the aggregation of diverse knowledge, skills, values and attitudes based on a more granular design of courses. Upon completion of their studies, graduates will be able to:

- Carry forward innovative proposals to actively design, plan and build sustainable cities.
- Use state-of-the-art urban design methodologies and tools.
- Perform leadership roles within their organizations.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive screening process that considers:

- The result of the Graduate Admission Test (PAEP)
- The overall grade point average of professional studies
- Additional requirements for each school.

MDU Master in Urban Design and Architecture 2021 Plan

First Trimester

Code	Name	CA
AR4021	Theories of urban architectural development	3
AR4022	Spatial analysis and GIS	3
AR4027	Architectural and urban design design project	3
		9

Second Trimester

Code	Name	CA
AR4026	Social participation in planning and social cartography	3
OP4046	Seal course	3
OP5085	Optative I	3
		9

Third Trimester

Code	Name	CA
AR4024	Critical thinking of the urban model	3
AR4025	Governance and tools for urban management	3
OP5086	Optative II	3
		9

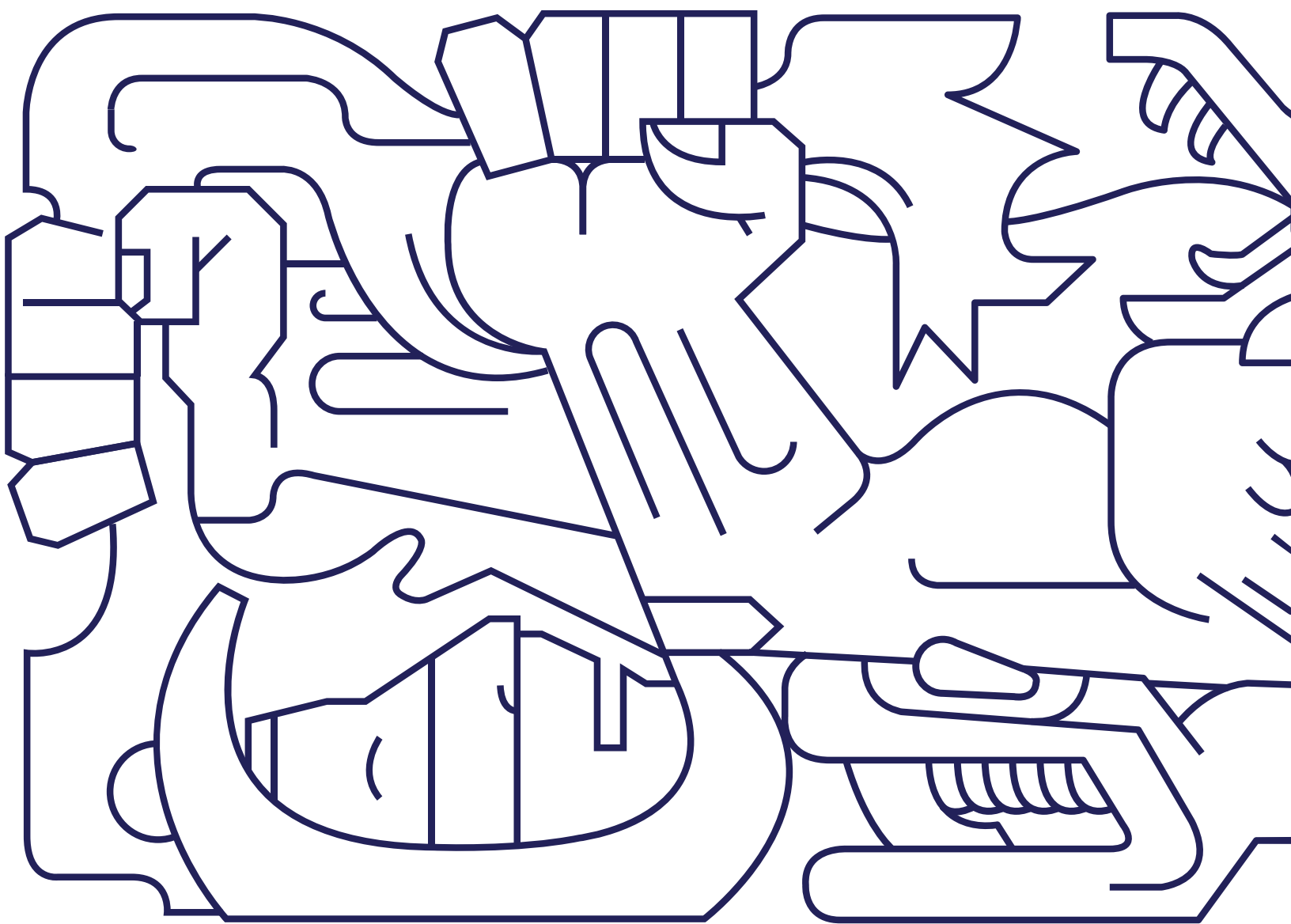
Fourth Trimester

Code	Name	CA
AR4023	Methodologies and tools for environmental assessment	3
OP5087	Optative III	3
OP5088	Optative IV	3
		9

Fifth Trimester

Code	Name	CA
AR5034	Integration project	3
OP5089	Optative V	3
		6

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



Profiles and curricula

School of Social Sciences and Government



EAE Specialization in Energy Management

Justification

As a result of the opening of the energy sector in the country, Mexico faces the challenge of taking advantage of the opportunities that the renewed industry will present. Undoubtedly, the energy reform has transformed the industry, driving the need for new businesses and energy professionals. Given this, it is necessary to have academic programs that help a quick and profitable adaptation to the new environment, in the face of the challenges that will arise with investment and development in the sector.

In this sense, universities play a very important role, since the entire energy production chain will require in the short term, the training and training of specialized human resources.

The Specialization in Energy Management by EGADE Business School responds to these needs by training innovative, entrepreneurial, ethical leaders with a global and sustainable vision of business, in accordance with the Mission of Tecnológico de Monterrey.

Program objectives

- To train specialists with knowledge and skills to work in the energy sector, which will allow them to lead and manage energy organizations in global environments. They will be able to apply their skills and knowledge acquired in the Specialization on the energy sector, in topics such as: administration, entrepreneurship and global markets. His training transcends state companies and those dedicated to energy, and covers all types of organizations with projects that arise from the spaces derived from the Energy Reform.
- To develop excellent professionals who apply their skills in the analysis and use of energy project evaluation techniques, which allows them to generate value to the organization and its local, national and international environment.
- To train professionals with skills and aptitudes to participate in work with groups in project evaluation for decision-making on their implementation with impact measurement. through technical research, action research, and field projects.
- To train specialists with skills to identify and create business opportunities in the energy sector environment through the implementation and analysis of innovative and sustainable business models.

Graduate profile

- The Specialization in Energy Management trains professionals capable of:
 - Analyse and apply the legal, economic and financial foundations of businesses in the energy sector, both in oil and gas, as well as in electricity and renewable energies.
 - Understand the market behavior of the energy sector.
 - Demonstrate knowledge of project finance and market risk management.
 - Put into practice their knowledge, skills and abilities to evaluate strategic projects from a multidisciplinary

point of view and thereby identify business opportunities in the various areas of the field.

- Show skills to apply the regulatory framework and the contractual framework of the energy sector both in the evaluation of projects and in the design of business models.
- Evaluate the efficiency as well as the environmental, economic and social sustainability of projects.
- Possess skills to generate information and issue recommendations on 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 impact.
- Perform with professionalism, ethics and humanistic vision.
-

Lines of research

- Energy Finance.
- Evaluation of energy projects.
- Regulations, contracts and business.
- Energy Markets

EAE Specialization in Energy Management 2015 Plan

First Trimester

Code	Name	CA
AD5080	Energy Market Administration	3
AD5081	Energy Law and Regulations in Energy Industries	3
		6

Second Trimester

Code	Name	CA
AD5083	Sustainability and efficiency strategies	3
FZ5036	Finance for Energy	3
		6

Third Trimester

Code	Name	CA
AD5082	Risk Management in the Energy Industry	3
AD5084	Evaluation of energy projects	3
AD5085	Energy Field Project	3
		9

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

EEA Specialization in Applied Economics and Data Science

Justification

Data has become a fundamental input in any economic process. In its raw state – untreated, isolated – the data is a priori worthless. It is from its treatment, processing and scientific analysis that useful and original knowledge is extracted – never before could data be “read” as it can be done today – thanks to innovations in big data and Data Science. New tools (programming languages, machine learning, data science methods), new capabilities (Internet in Mobility and Internet of Things, cloud computing) and new professional skills in the digital field (which are duly realized, since today we are in a scenario of scarcity of profiles) are what have made it possible for business models to be generated around data that were unimaginable until recently. because they are unfeasible.

In this context, the Specialization of Applied Economics and Data Science takes on singular importance, as it becomes a cutting-edge educational option, which privileges the balance between the theoretical and the practical for economic analysis through the strict management of data.

Target audience

The program is aimed at:

- To train specialists with knowledge and skills to work in the energy sector, which will allow them to lead and manage energy organizations in global environments. They will be able to apply their skills and knowledge acquired in the Specialization on the energy sector, in topics such as: administration.
- Professionals and entrepreneurs from all areas of knowledge who share an interest in incorporating economic analysis concepts and tools into their training that enrich their capacity for analysis and strategic vision.
- Graduates of the bachelor's degrees in economics and related areas: Social (political science, sociology, history, public policies, international relations); Business (business administration, accounting, finance); Mathematics (actuarial, statistics).

Program objectives

This program aims to train economists specialized in robust and up-to-date analytical tools, who participate in the creation and dissemination of high-level scientific knowledge, as well as in the understanding and solution of the socioeconomic problems that afflict the country.

Learning Outcomes

Once they have completed their studies, the graduate will be able to:

- Apply the systematic use of analytical and econometric tools for the formulation and solution of real problems.
- Develop critical and reflective thinking about economic phenomena.
- Apply, in a combined way, economic theory and quantitative methods.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.
- Each School may have additional requirements.

**EEA Specialization in Applied Economics and Data Science
2021 Plan**

First Trimester

Code	Name	CA
EO4021	Quantitative methods for inference	3
EO4022	Macroeconomics	3
		6

Second Trimester

Code	Name	CA
EO4024	Pricing and agent behavior	3
EO4025	Econometrics	3
OP5085	Optative I	3
		9

Third Trimester

Code	Name	CA
EO4026	Microeconometrics	3
OP5086	Optative II	3
		6

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

ETD Specialization in Public Decision Making and Data Science

Justification

In government, private and social sectors, decision-making increasingly depends on data analysis, which is why access, sharing, and opening up data is critical. Governments are faced with the need to generate the right skills in their employees to be able to take advantage of new technologies (Big Data, Artificial Intelligence, etc.) and thus strengthen evidence-based decision-making.

In this context, the Specialization in Public Decision Making and Data Science is of particular importance, as it becomes a cutting-edge educational option, which privileges the balance between the theoretical and the practical for the solution to real problems of our environment and is an intensive training in the process of transformation of the public.

Target audience

The program is aimed at:

- Public officials from different orders and levels of government interested in deepening their knowledge for public decision-making.
- Professionals from the private sector who seek to specialize in data science for strategic decision-making.
- Researchers and professionals in public policy and public administration and management, with an interest in updating their knowledge in the field of public affairs.
- Public entrepreneurs interested in creating and transforming the way things are done.

Program objectives

This program aims to train experts in the use of technical and analytical tools related to data science and their implementation in strategic decision-making in both the public and private spheres.

Learning Outcomes

- Once they have completed their studies, the graduate will be able to:
- Solve problems in the public, private and social sectors, based on collective intelligence, behavioural sciences, experimentation, data science and simulation models.
- Apply public policy tools for strategic decision-making, both in the public and business spheres.
- Prioritize evidence-based public problems.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.
- Each School may have additional requirements.

ETD Specialization in Public Decision Making and Data Science 2021 Plan

First Trimester

Code	Name	CA
AP4041	Ethical Dilemmas of Public Leadership	3
EO4021	Quantitative methods for inference	3
		6

Second Trimester

Code	Name	CA
AP4040	Applied public choice	3
AP5039	Negotiation and conflict	3
OP5085	Optative I	3
		9

Third Trimester

Code	Name	CA
AP5040	Anticipation systems in governments	3
OP5086	Optative II	3
		6

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

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 in Public Administration and Public Policy

2020 Plan

First Trimester

Code	Name	CA
EO4021	Quantitative methods for inference	3
OP5085	Optative I	3
TC4025	Data Science	3
		9

Second Trimester

Code	Name	CA
AP4040	Applied public choice	3
EO4024	Pricing and agent behavior	3
TC4026	Machine Learning for Decision-Making	3
		9

Third Trimester

Code	Name	CA
AP4041	Ethical Dilemmas of Public Leadership	3
OP5086	Optative II	3
RE4020	Economics for development	3
		9

Fourth Trimester

Code	Name	CA
EO4023	Public finance and budget	3
OP5087	Optative III	3
RE4021	Scenario planning	3
		9

Fifth Trimester

Code	Name	CA
AP4042	Entrepreneurship for public policy	3
AP5037	Integrative project	3
		6

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

MAP-V Master in Public Administration and Public Policy (Online Program)

Justification

The Master's Program in Public Administration and Public Policy seeks to contribute to society with the transformation of the public sector and improve the participation of governmental and non-governmental actors in the analysis, design, implementation and evaluation of better public policies in different levels of government and in the three branches of the Union.

Target audience

The program is aimed at:

- Public officials from different orders and levels of government interested in deepening their knowledge in the areas of public administration and public policy.
- Professionals from the private sector who seek to specialize in government-business relations.
- Researchers and professionals in the social area interested in generating cutting-edge knowledge in the fields of public administration, management and public management.
- Public entrepreneurs interested in creating and transforming the way things are done.

Program objectives

This program aims to train professionals who:

- Be leaders in solving public problems through innovative proposals for public policy and transformation of government work.
- Be transformative agents of change dedicated to solving society's most pressing challenges by developing strategies for the successful implementation of public policies.

Learning Outcomes

Upon completion of their Master's studies, graduates will be able to:

- Design, implement and evaluate public policies with the highest possible technical requirements through the rigorous use of technical and methodological, statistical and economic analysis tools.
- Use cutting-edge analytical frameworks in the formulation, implementation, and evaluation of public policies.
- Perform empirical analyses in public policy applications through the management of data science and rigorous statistical analysis.
- Work on public policy from an interdisciplinary perspective.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Admission Test to Postgraduate Studies (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MAP-V Master in Public Administration and Public Policy (Online Program)

2021 Plan

First Trimester

Code	Name	CA
EO4021	Quantitative methods for inference	3
OP5085	Optative I	3
TC4025	Data Science	3
		9

Second Trimester

Code	Name	CA
AP4040	Applied public choice	3
EO4024	Pricing and agent behavior	3
TC4026	Machine Learning for Decision-Making	3
		9

Third Trimester

Code	Name	CA
AP4041	Ethical Dilemmas of Public Leadership	3
OP5086	Optative II	3
RE4020	Economics for development	3
		9

Fourth Trimester

Code	Name	CA
EO4023	Public finance and budget	3
OP5087	Optative III	3
RE4021	Scenario planning	3
		9

Fifth Trimester

Code	Name	CA
AP4042	Entrepreneurship for public policy	3
AP5037	Integrative project	3
		6

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

MCS Master in Social Sciences

Justification

The unprecedented historical circumstances of the twenty-first century, manifested in climate change, the effects of technological disruptions and advances in biotechnology present new challenges and dilemmas for humanity. At the national level, for example, there is a need to propose new governance schemes, the fight against poverty and the fight against corruption; We also need mechanisms to address exponential technological change and its multiple effects, such as its impact on the future of employment and technological inclusion.

The Master's program in Social Sciences responds to the urgency of training leaders who contribute to the solution of the most important public problems facing our country and the entire world.

Target audience

The program is aimed at:

- Public servants who want to contribute innovative initiatives to their work within the Government.
- Citizens with an exceptional and proven track record in public transformation processes who require Code skills or resources to realize their vision of change.
- Professionals who want to increase their public innovation landscape and who have worked, ideally, in the following areas: companies and social enterprises, international organizations or Government and public organizations.

Program objectives

The objective of the Master's program in Social Sciences is to train professionals who:

- Create sustainable public enterprises that improve public life at the local, national or global level.
- Form teams and deploy projects that involve analysis techniques, advanced statistics and evidence-based predictive to make better decisions in the public or private sector.
- Carry out foresight projects that help the public and private sectors to assess the technological, socioeconomic and cultural changes of the future of their environments.

Learning Outcomes

Upon completion of their Master's studies, graduates will be able to:

- Identify entrepreneurship opportunities in different contexts, through a validation process.
- Identify entrepreneurial opportunities based on unmet problems, aspirations, desires, trends, or needs.
- Detect problems and create entrepreneurial solutions by integrating information from specialized sources.

- To generate innovative and valuable solutions to environmental problems, through an ethical framework and a methodological process of feasibility, in national and regional contexts.
- Develop and validate functional prototypes through an analysis of economic feasibility and technical feasibility.
- Analyze problems with an integrated vision, conceiving reality as a set of interconnected systems.
- Prioritize variables to define the innovation path by exploring different systemic models.
- Propose solutions to complex problems and projects integrating knowledge, experiences and methodologies from other disciplines, interest groups and cultures.

Entry profile

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

- Therefore, for admission, the applicant participates in a comprehensive selection process that considers: - The result of the Admission Test to Postgraduate Studies (PAEP).
- The general average of grades of professional level studies.

MCS Master in Social Sciences

2020 Plan

First Trimester

Code	Name	CA
AP4040	Applied public choice	3
AP4045	Political philosophy	3
EO4021	Quantitative methods for inference	3
		9

Second Trimester

Code	Name	CA
AP4046	Public Entrepreneurship I	3
EO4022	Macroeconomics	3
TC4025	Data Science	3
		9

Third Trimester

Code	Name	CA
AP4047	Public Entrepreneurship II	3
AP4048	Public opinion	3
EO4023	Public finance and budget	3
		9

Fourth Trimester

Code	Name	CA
AP4049	Applied public management	3
OP5085	Optative I	3
TC5030	Advanced Data Science	3
		9

Fifth Trimester

Code	Name	CA
AP5042	Integrative project	3
OP5086	Optative II	3
		6

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. The legal professional needs to speak different legal languages to understand clients and colleagues from other latitudes when making complex business transactions or participating in the resolution of disputes involving parties in different jurisdictions around the world.

The aim of the programme is to train globally competitive legal professionals who are able to speak and understand these different languages.

Graduate profile

Once the graduate has completed his studies, he will be able to:

- Carry out legal analysis on international issues.
- Interpret the various existing national and international norms, applying the method of comparative law.
- Participate in strategic decision-making and in the execution of contracts and other transnational transactions.
- To carry out international political and administrative activities related to Law.
- Understand the role of Mexico in the new international context

Target audience

- Graduates of Law, Economics, International Relations, International Trade and Political Science, with an interest in international transactions and the law that governs them.
- Lawyers from public institutions and private companies.
- Specialists in international logistics and imports and exports - Partners or associates in dispatches and consulting firms.
- Executives of companies involved in international transactions.
- Mid- and senior-level public officials from municipal, state, and federal governments.
- People interested in working in international organizations.
- Legal advisors and analysts.
- Private sector professionals seeking to specialize in government-business relations.
- Professors related to Law.

Lines of research

- Settlement of international disputes.
- Economic and political relations between Europe and other regions of the world, delving into ethics, in the areas of international relations, cooperation and investment.
- Relationship of the national and international legal framework with competitiveness, particularly in relation to international trade and investment.
- Promotion and regulation of foreign investment in Mexico and the world.

MDI Master in International Law 2009 Plan

First Semester

Code	Name	CA
DI4021	International trade regulation	3
NB4001	Leadership and ethics in the exercise of public office	3
NB4005	Theory of Law and Applied Legal Research	3
		9

Second Semester

Code	Name	CA
DI4022	Principles of international law and dispute settlement	3
DI4023	International human rights law	3
OP5042	Optative I	3
		9

Third Semester

Code	Name	CA
DI4024	International Recruitment	3
DI4025	Transnational arbitration and litigation	3
OP5043	Optative II	3
		9

Fourth Semester

Code	Name	CA
DI4026	Advanced topics in international law	3
DI5001	Applied Research Project	3
OP5044	Optative III	3
		9

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

MDP Master in Laws

Justification

The Master in Law program at Tecnológico de Monterrey focuses on the interdisciplinary study of the legal order in real and concrete situations that have an impact on the phenomena of economic growth and development. In this sense, the courses consider various methodologies to analyze social, economic and political conditions that have an impact on the so-called economic cycles (crisis, depression, revival and boom) and that also affect the practice of Law.

The program is designed to increase awareness and criticism of the complexity of legal relationships in the areas of: Governance, regulation and business; Regulation and development of infrastructure; Financial System, and Law, Science and Technology, in which issues of ethics, international law, public policies in the fight against corruption or data analysis tools are studied.

Target audience

The program is aimed at:

- Public servants of the three levels of government – federal, state and municipal.
- Practicing lawyers from the public and private sectors interested in delving into the areas of projects for the development of infrastructure or the financial system.
- Consultants specialized in projects for the development of infrastructure or the financial system.

Program objectives

The objective of this program is to train professionals who:

- Have technical tools to analyze social, economic, political, institutional and legal conditions that affect the areas of knowledge of regulation and development of infrastructure, and financial system.
- Be able to analyse and propose solutions to complex legal issues arising from the regulation applicable to the aforementioned areas of knowledge.
- Be transformative agents in their communities, contributing to the solution of urgent societal challenges through the development of strategies for the successful implementation of public policies.

Learning Outcomes

Once the Master in Law studies is completed, the graduate will be able to:

- Analyze legal problems from a critical, ethical and interdisciplinary perspective.
- Design, implement and evaluate strategies, from a legal point of view, for infrastructure development projects or the financial system.
- Advise clients in the public and private sectors who require highly specialized regulatory services for the development of infrastructure or the financial system.
- Know data analysis tools for the effective application of the law.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MDP Master in Laws
2021 Plan

First Trimester

Code	Name	CA
DP4015	Institutional and business framework	3
EO4027	Economics for development and public finance	3
		6

Second Trimester

Code	Name	CA
DP4016	Compliance	3
DP4017	Public administration and business	3
		6

Third Trimester

Code	Name	CA
DP4018	Economic competition law	3
DP4019	Investment protection and alternative dispute resolution	3
		6

Fourth Trimester

Code	Name	CA
OP4046	Seal course	3
OP5085	Optative I	3
		6

Fifth Trimester

Code	Name	CA
OP5086	Optative II	3
OP5087	Optative III	3
		6

Sixth Trimester

Code	Name	CA
DP5051	Sectoral regulation	3
OP5088	Optative IV	3
		6

Seventh Trimester

Code	Name	CA
DP5052	Advanced sectoral regulation	3
DP5053	Integrative project	3
		6

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

MDP-V Master in Laws (Online Program)

Justification

The Master in Law program at Tecnológico de Monterrey focuses on the interdisciplinary study of the legal order in real and concrete situations that have an impact on the phenomena of economic growth and development. In this sense, the courses consider various methodologies to analyze social, economic and political conditions that have an impact on the so-called economic cycles (crisis, depression, revival and boom) and that also affect the practice of Law.

The program is designed to increase awareness and criticism of the complexity of legal relationships in the areas of: Governance, regulation and business; Regulation and development of infrastructure; Financial System, and Law, Science and Technology, in which issues of ethics, international law, public policies in the fight against corruption or data analysis tools are studied.

Target audience

The program is aimed at:

- Public servants of the three levels of government – federal, state and municipal.
- Practicing lawyers from the public and private sectors interested in delving into the areas of projects for the development of infrastructure or the financial system.
- Consultants specialized in projects for the development of infrastructure or the financial system.

Program objectives

The objective of this program is to train professionals who:

- Have technical tools to analyze social, economic, political, institutional and legal conditions that affect the areas of knowledge of regulation and development of infrastructure, and financial system.
- Be able to analyse and propose solutions to complex legal issues arising from the regulation applicable to the aforementioned areas of knowledge.
- Be transformative agents in their communities, contributing to the solution of urgent societal challenges through the development of strategies for the successful implementation of public policies.

Learning Outcomes

Once the Master in Law studies is completed, the graduate will be able to:

- Analyze legal problems from a critical, ethical and interdisciplinary perspective.
- Design, implement and evaluate strategies, from a legal point of view, for infrastructure development projects or the financial system.
- Advise clients in the public and private sectors who require highly specialized regulatory services for the development of infrastructure or the financial system.
- Know data analysis tools for the effective application of the law.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MDP-V Master in Laws (Online Program)

2021 Plan

First Trimester

Code	Name	CA
DP4015	Institutional and business framework	3
EO4027	Economics for development and public finance	3
		6

Second Trimester

Code	Name	CA
DP4016	Compliance	3
DP4017	Public administration and business	3
		6

Third Trimester

Code	Name	CA
DP4018	Economic competition law	3
DP4019	Investment protection and alternative dispute resolution	3
		6

Fourth Trimester

Code	Name	CA
OP4046	Seal Course	3
OP5085	Optative I	3
		6

Fifth Trimester

Code	Name	CA
OP5086	Optative II	3
OP5087	Optative III	3
		6

Sixth Trimester

Code	Name	CA
DP5051	Sectoral regulation	3
OP5088	Optative IV	3
		6

Seventh Trimester

Code	Name	CA
DP5052	Advanced sectoral regulation	3
DP5053	Integrative project	3
		6

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

MEK Master in Applied Economics

Justification

The Master's program in Applied Economics focuses on the study of economic decisions in three aspects: first, the rigorous study of economic theory that allows questions and problems to be posed in a solid way; second, to incorporate the use of modern and sophisticated tools, including econometrics and data science, into the analysis; and, third, to broaden the perspective of the discipline through the study of public policy and leadership matters that contribute to the design of viable public policies.

Target audience

The program is aimed at those who:

- They are immersed in strategic planning processes.
- They are dedicated to the design of public policy and finance.
- They analyze consumer and stock markets.
- They analyze economic and social problems.
- They offer consulting in the public, private and social sectors.
- They carry out statistical and data analysis work in large companies and financial institutions.
- They carry out project evaluation.
- They make decisions in companies, non-governmental organizations and governments.

Program objectives

The objective of this program is to train professionals who:

- Be leaders within public, private and social organizations, capable of solving problems that arise in them.
- Design and chart the critical path to implement economic and social public policies that have a high probability of positive impacts.
- Be a reference in Latin America in the study and implementation of economic analysis applied to the improvement of society and public affairs.

Learning Outcomes

Upon completion of their master's degree studies, the graduate will be able to:

- Systematically analyze complex economic problems taking into account not only the economic environment but also the local, national and international socio-political environment.
- Propose public policy solutions based on a solid and rigorous analysis, which allows increasing the possibilities of positive impact on society.
- Rigorously evaluate any public policy, determining its impact and economic, financial and social viability.
- Use rigorous methodologies to analyse the decisions of agents in an economy, to propose innovative solutions.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MEK Master in Applied Economics 2020 Plan

First Trimester

Code	Name	CA
EO4021	Quantitative methods for inference	3
OP5085	Optative I	3
TC4025	Data Science	3
		9

Second Trimester

Code	Name	CA
EO4024	Pricing and agent behavior	3
EO4025	Econometrics	3
TC5030	Advanced Data Science	3
		9

Third Trimester

Code	Name	CA
AP4041	Ethical Dilemmas of Public Leadership	3
EO4022	Macroeconometrics	3
RE4020	Economics for development	3
		9

Fourth Trimester

Code	Name	CA
EO4023	Public finance and budget	3
EO4026	Microeconometrics	3
OP5086	Optative II	3
		9

Fifth Trimester

Code	Name	CA
AP4040	Applied public choice	3
EO5021	Integrative project	3
		6

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

MEK-V Master in Applied Economics (Online Program)

Justification

The Master's program in Applied Economics focuses on the study of economic decisions in three aspects: first, the rigorous study of economic theory that allows questions and problems to be posed in a solid way; second, to incorporate the use of modern and sophisticated tools, including econometrics and data science, into the analysis; and, third, to broaden the perspective of the discipline through the study of public policy and leadership matters that contribute to the design of viable public policies.

Target audience

The program is aimed at those who:

- They are immersed in strategic planning processes.
- They are dedicated to the design of public policy and finance.
- They analyze consumer and stock markets.
- They analyze economic and social problems.
- They offer consulting in the public, private and social sectors.
- They carry out statistical and data analysis work in large companies and financial institutions.
- They carry out project evaluation.
- They make decisions in companies, non-governmental organizations and governments.

Program objectives

The objective of this program is to train professionals who:

- Be leaders within public, private and social organizations, capable of solving problems that arise in them.
- Design and chart the critical path to implement economic and social public policies that have a high probability of positive impacts.
- Be a reference in Latin America in the study and implementation of economic analysis applied to the improvement of society and public affairs.

Learning Outcomes

Upon completion of their master's degree studies, the graduate will be able to:

- Systematically analyze complex economic problems taking into account not only the economic environment but also the local, national and international socio-political environment.
- Propose public policy solutions based on a solid and rigorous analysis, which allows increasing the possibilities of positive impact on society.
- Rigorously evaluate any public policy, determining its impact and economic, financial and social viability.
- Use rigorous methodologies to analyse the decisions of agents in an economy, to propose innovative solutions.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MEK-V Master in in Applied Economics (Online Program)
2021 Plan

First Trimester

Code	Name	CA
EO4021	Quantitative methods for inference	3
OP5085	Optative I	3
TC4025	Data Science	3
		9

Second Trimester

Code	Name	CA
EO4024	Pricing and agent behavior	3
EO4025	Econometrics	3
TC5030	Advanced Data Science	3
		9

Third Trimester

Code	Name	CA
AP4041	Ethical Dilemmas of Public Leadership	3
EO4022	Macroeconomics	3
RE4020	Economics for development	3
		9

Fourth Trimester

Code	Name	CA
EO4023	Public finance and budget	3
EO4026	Microeconometrics	3
OP5086	Optative II	3
		9

Fifth Trimester

Code	Name	CA
AP4040	Applied public choice	3
EO5021	Integrative project	3
		6

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

MGP-V Master in Applied Public Management (Online Program)

Justification

As a result of the processes of political transformation taking place in Mexico and various Latin American countries, highly trained public servants with a deep ethical sense are required to carry out effective public management. This master's degree will offer cutting-edge content according to the needs and competencies that the work environment requires.

To guarantee the effectiveness and legitimacy of public management, it must be strengthened through a methodological and instrumental set that provides public servants with advanced tools and knowledge to promote better governance.

Thus, with a curriculum with current subjects and concentrations, a consolidated online education model and the recognition of its academic faculty, the Master in Applied Public Management (MGP) will become the most prestigious professionalizing online master's program in the area of public administration in Mexico.

Program objectives

- To provide solutions to the needs of society using innovative methodologies for the creation of public value.
- Promote positive leadership by developing it through management tools and national and international learning experiences.
- Use analytical tools to better understand the country's most relevant problems, and to design efficient management models for the creation of public value.
- To contribute to the professionalization of actors from the private sector and organized society to achieve better coordination in the construction of a participatory community committed to its political, social and economic environment.
- Contribute to the training of public service professionals to be agents of change in public management in any of the three levels of government.

Graduate profile

Once they have completed their studies, the graduate will be able to:

- Understand the methods of quantitative and qualitative analysis, management models, legal responsibilities in the different levels of government, as well as the foundations for the design, management, and evaluation of public policies to face the most relevant public challenges. This will provide the graduate with a solid conceptual and practical preparation of public management, which is achieved through the contents of the curriculum.
- Generate, design, and implement reforms to drive institutional change processes at the state and municipal levels, as well as positively influence the governmental decision-making process, conduct the administration of financial, material, and human resources efficiently in public management, and use analytical frameworks and empirical methods to formulate and evaluate effective public management.

- Have a critical attitude that will allow them to reflect and analyze ethical dilemmas in public practice and be sensitive to the social, economic, political and ecological reality, to act with solidarity and citizen responsibility. Have an attitude of service for the creation of public value.

Target audience

The Master's program in Applied Public Management is aimed at:

- Middle and senior public officials of local governments in Latin America.
- Officials and specialists who wish to improve their analytical skills and capacities for decision-making in matters of local public management.
- Interested in participating in popularly elected positions (in local governments).
- Leaders and officials of political parties.
- Professionals involved in the analysis of government actions.
- Professionals from the private sector who seek a better knowledge of public processes at the local level.
- Academics interested in participating in the improvement of public administration and public policies.

MGP-V Master in Applied Public Management (Online Program)
2018 Plan

First Trimester

Code	Name	CA
AP4033	Public sector economics	3
NB4009	Ethics for the transformation of public management	3
		6

Second Trimester

Code	Name	CA
AP4034	Planning and administration for public policy	3
AP5026	Applied public finance	3
		6

Third Trimester

Code	Name	CA
AP4035	Statistical methods	3
AP4036	Law for public policy	3
		6

Fourth Trimester

Code	Name	CA
AP4037	Social evaluation of projects	3
AP4038	Applied public management	3
		6

Fifth Trimester

Code	Name	CA
AP4039	Public entrepreneurship	3
D5019	Decentralization and intergovernmental relations	3
		6

Sixth Trimester

Code	Name	CA
OP5049	Optative I	3
OP5050	Optative II	3
		6

Seventh Trimester

Code	Name	CA
AP5027	Integrative project	3
OP5051	Optative III	3
		6

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

MGT Master in Government and Public Transformation

Justification

The unprecedented historical circumstances of the twenty-first century, manifested in climate change, the effects of technological disruptions and advances in biotechnology present new challenges and dilemmas for humanity. At the national level, for example, there is a need to propose new governance schemes, the fight against poverty and the fight against corruption; We also need mechanisms to address exponential technological change and its multiple effects, such as its impact on the future of employment and technological inclusion.

The Master's program in Government and Public Transformation responds to the urgency of training leaders who contribute to the solution of the most important public problems facing our country and the entire world.

Target audience

The program is aimed at:

- Public servants who want to contribute innovative initiatives to their work within the Government.
- Citizens with an exceptional and proven track record in public transformation processes who require Code skills or resources to realize their vision of change.
- Professionals who want to increase their public innovation landscape and who have worked, ideally, in the following areas: companies and social enterprises, international organizations or Government and public organizations.

Program objectives

The Program Objective is to train professionals who:

- Create sustainable public enterprises that improve public life at the local, national or global level.
- Form teams and deploy projects that involve analysis techniques, advanced statistics and evidence-based predictive to make better decisions in the public or private sector.
- Carry out foresight projects that help the public and private sectors to assess the technological, socioeconomic and cultural changes of the future of their environments.

Learning Outcomes

Upon completion of their master's degree studies, the graduate will be able to:

- Identify entrepreneurship opportunities in different contexts, through a validation process.
- Identify entrepreneurial opportunities based on unmet problems, aspirations, desires, trends, or needs.
- Detect problems and create entrepreneurial solutions by integrating information from specialized sources.
- To generate innovative and valuable solutions to environmental problems, through an ethical framework and a methodological process of feasibility, in national and regional contexts.
- Develop and validate functional prototypes through an analysis of economic feasibility and technical feasibility.
- Analyze problems with an integrated vision, conceiving reality as a set of interconnected systems.
- Prioritize variables to define the innovation path by exploring different systemic models.
- Propose solutions to complex problems and projects integrating knowledge, experiences and methodologies from other disciplines, interest groups and cultures.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MGT Master in Government and Public Transformation 2021 Plan

First Trimester

Code	Name	CA
EO4021	Quantitative methods for inference	3
OP5085	Optative I	3
TC4025	Data Science	3
		9

Second Trimester

Code	Name	CA
AP4040	Elección pública aplicada	3
OP5086	Optative II	3
TC5030	Advanced Data Science	3
		9

Third Trimester

Code	Name	CA
AP4046	Public Entrepreneurship I	3
EO4022	Macroeconomics	3
EO4023	Public finance and budget	3
		9

Fourth Trimester

Code	Name	CA
AP4045	Political philosophy	3
AP4047	Public Entrepreneurship II	3
AP4048	Public opinion	3
		9

Fifth Trimester

Code	Name	CA
AP4049	Applied public management	3
AP5042	Integrative project	3
		6

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

MGT-M Master in Government and Public Transformation

(Mixed program)

Justification

The unprecedented historical circumstances of the twenty-first century, manifested in climate change, the effects of technological disruptions and advances in biotechnology present new challenges and dilemmas for humanity. At the national level, for example, there is a need to propose new governance schemes, the fight against poverty and the fight against corruption; We also need mechanisms to address exponential technological change and its multiple effects, such as its impact on the future of employment and technological inclusion.

The Master's program in Government and Public Transformation responds to the urgency of training leaders who contribute to the solution of the most important public problems facing our country and the entire world.

Target audience

The program is aimed at:

- Public servants who want to contribute innovative initiatives to their work within the Government.
- Citizens with an exceptional and proven track record in public transformation processes who require Code skills or resources to realize their vision of change.
- Professionals who want to increase their public innovation landscape and who have worked, ideally, in the following areas: companies and social enterprises, international organizations or Government and public organizations.

Program objectives

The Program Objective is to train professionals who:

- Create sustainable public enterprises that improve public life at the local, national or global level.
- Form teams and deploy projects that involve analysis techniques, advanced statistics and evidence-based predictive to make better decisions in the public or private sector.
- Carry out foresight projects that help the public and private sectors to assess the technological, socioeconomic and cultural changes of the future of their environments.

Learning Outcomes

Upon completion of their master's degree studies, the graduate will be able to:

- Identify entrepreneurship opportunities in different contexts, through a validation process.
- Identify entrepreneurial opportunities based on unmet problems, aspirations, desires, trends, or needs.
- Detect problems and create entrepreneurial solutions by integrating information from specialized sources.
- To generate innovative and valuable solutions to environmental problems, through an ethical framework and a methodological process of feasibility, in national and regional contexts.
- Develop and validate functional prototypes through an analysis of economic feasibility and technical feasibility.
- Analyze problems with an integrated vision, conceiving reality as a set of interconnected systems.
- Prioritize variables to define the innovation path by exploring different systemic models.
- Propose solutions to complex problems and projects integrating knowledge, experiences and methodologies from other disciplines, interest groups and cultures.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MGT-M Master in Government and Public Transformation (Mixed Program)
2021 Plan

First Trimester

Code	Name	CA
EO4021	Quantitative methods for inference	3
OP5085	Optative I	3
TC4025	Data Science	3
		9

Second Trimester

Code	Name	CA
AP4040	Applied public choice	3
OP5086	Optative II	3
TC5030	Advanced Data Science	3
		9

Third Trimester

Code	Name	CA
AP4046	Public Entrepreneurship I	3
EO4022	Macroeconomics	3
EO4023	Public finance and budget	3
		9

Fourth Trimester

Code	Name	CA
AP4045	Political philosophy	3
AP4047	Public Entrepreneurship	3
AP4048	Public opinion	3
		9

Fifth Trimester

Code	Name	CA
AP4049	Applied public management	3
AP5042	Integrative project	3
		6

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

MGT-V Master in Government and Public Transformation

(Online Program)

Justification

The unprecedented historical circumstances of the twenty-first century, manifested in climate change, the effects of technological disruptions and advances in biotechnology present new challenges and dilemmas for humanity. At the national level, for example, there is a need to propose new governance schemes, the fight against poverty and the fight against corruption; We also need mechanisms to address exponential technological change and its multiple effects, such as its impact on the future of employment and technological inclusion.

The Master's program in Government and Public Transformation responds to the urgency of training leaders who contribute to the solution of the most important public problems facing our country and the entire world.

Target audience

The program is aimed at:

- Public servants who want to contribute innovative initiatives to their work within the Government.
- Citizens with an exceptional and proven track record in public transformation processes who require Code skills or resources to realize their vision of change.
- Professionals who want to increase their public innovation landscape and who have worked, ideally, in the following areas: companies and social enterprises, international organizations or Government and public organizations.

Program objectives

The Program Objective is to train professionals who:

- Create sustainable public enterprises that improve public life at the local, national or global level.
- Form teams and deploy projects that involve analysis techniques, advanced statistics and evidence-based predictive to make better decisions in the public or private sector.
- Carry out foresight projects that help the public and private sectors to assess the technological, socioeconomic and cultural changes of the future of their environments.

Learning Outcomes

Upon completion of their master's degree studies, the graduate will be able to:

- Identify entrepreneurship opportunities in different contexts, through a validation process.
- Identify entrepreneurial opportunities based on unmet problems, aspirations, desires, trends, or needs.
- Detect problems and create entrepreneurial solutions by integrating information from specialized sources.
- To generate innovative and valuable solutions to environmental problems, through an ethical framework and a methodological process of feasibility, in national and regional contexts.
- Develop and validate functional prototypes through an analysis of economic feasibility and technical feasibility.
- Analyze problems with an integrated vision, conceiving reality as a set of interconnected systems.
- Prioritize variables to define the innovation path by exploring different systemic models.
- Propose solutions to complex problems and projects integrating knowledge, experiences and methodologies from other disciplines, interest groups and cultures.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MGT-V Master in Government and Public Transformation (Online Program)
2021 Plan

First Trimester

Code	Name	CA
EO4021	Quantitative methods for inference	3
OP5085	Optative I	3
TC4025	Data Science	3
		9

Second Trimester

Code	Name	CA
AP4040	Applied public choice	3
OP5086	Optative II	3
TC5030	Advanced Data Science	3
		9

Third Trimester

Code	Name	CA
AP4046	Public Entrepreneurship I	3
EO4022	Macroeconomics	3
EO4023	Public finance and budget	3
		9

Fourth Trimester

Code	Name	CA
AP4045	Political philosophy	3
AP4047	Public Entrepreneurship II	3
AP4048	Public opinion	3
		9

Fifth Trimester

Code	Name	CA
AP4049	Applied public management	3
AP5042	Integrative project	3
		6

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

MPE Master in Strategic Foresight

Justification

The Master's Program in Strategic Foresight focuses on meeting the need for prospective and futures analysis to improve decision-making in the public, private, and social spheres.

Target audience

The program is aimed at those who:

- They are immersed in strategic planning processes.
- They are dedicated to innovation and technological change.
- They design public policies with a focus on the future.
- They analyze the environment of organizations to identify potential disruptive changes.
- They offer consulting in the public, private and social sectors.
- They analyze sectoral perspectives in regional and global areas.
- They make decisions in companies, non-governmental organizations and governments.

Program objectives

This program aims to train professionals who:

- Be leaders within public, private, and social organizations, capable of exploring the multiplicity of possible, probable, and desirable futures that guide decision-making and the design of robust strategic plans.
- Implement systemic analysis processes within public, private, and social organizations that allow the visualization of complex problems for a better understanding of the organization's challenges that guide their strategy.
- Use robust analytics methodologies leveraging data science and artificial intelligence to enrich forward-looking and futures analysis.
- Be a benchmark in Latin America in the study and implementation of foresight and future studies, contributing to the strengthening of foresight capacities in the region, given the marked increase in interest in this type of studies for governments, companies, civil society organizations and international organizations.

Learning Outcomes

Once they have completed their studies, the graduate will be able to:

- Analyze complex problems taking into account the local, national and international economic and socio-political environment.
- Model complex systems using data science and artificial intelligence.
- Design and facilitate planning processes by scenarios for public or private organizations or for topics of interest.
- Identify early warnings in the local, regional and global context that provide organizations with the ability to anticipate.
- Design robust strategic plans that contemplate the multiplicity of plausible futures based on the characteristics of their environment.
- Link the process of foresight, planning and innovation for public or private organizations.
- Propose strategic foresight structures for organizations.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MPE Master in Strategic Foresight 2020 Plan

First Trimester

Code	Name	CA
EO4021	Quantitative methods for inference	3
OP5085	Optative I	3
TC4025	Data Science	3
		9

Second Trimester

Code	Name	CA
AP4040	Applied public choice	3
EO4024	Pricing and agent behavior	3
TC4026	Machine Learning for Decision Making	3
		9

Third Trimester

Code	Name	CA
AP4041	Ethical Dilemmas of Public Leadership	3
RE4020	Economics for development	3
RE4023	System Modeling	3
		9

Fourth Trimester

Code	Name	CA
OP5086	Optative II	3
RE4021	Scenario planning	3
RE4022	Futures Methods	3
		9

Fifth Trimester

Code	Name	CA
OP5087	Optative III	3
RE5019	Integrative project	3
		6

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

MPE-V Master in Strategic Foresight (Online Program)

Justification

The Master's Program in Strategic Foresight focuses on meeting the need for prospective and futures analysis to improve decision-making in the public, private, and social spheres.

Target audience

The program is aimed at those who:

- They are immersed in strategic planning processes.
- They are dedicated to innovation and technological change.
- They design public policies with a focus on the future.
- They analyze the environment of organizations to identify potential disruptive changes.
- They offer consulting in the public, private and social sectors.
- They analyze sectoral perspectives in regional and global areas.
- They make decisions in companies, non-governmental organizations and governments.

Program objectives

This program aims to train professionals who:

- Be leaders within public, private, and social organizations, capable of exploring the multiplicity of possible, probable, and desirable futures that guide decision-making and the design of robust strategic plans.
- Implement systemic analysis processes within public, private, and social organizations that allow the visualization of complex problems for a better understanding of the organization's challenges that guide their strategy.
- Use robust analytics methodologies leveraging data science and artificial intelligence to enrich forward-looking and futures analysis.
- Be a benchmark in Latin America in the study and implementation of foresight and future studies, contributing to the strengthening of foresight capacities in the region, given the marked increase in interest in this type of studies for governments, companies, civil society organizations and international organizations.

Learning Outcomes

Once they have completed their studies, the graduate will be able to:

- Analyze complex problems taking into account the local, national and international economic and socio-political environment.
- Model complex systems using data science and artificial intelligence.
- Design and facilitate planning processes by scenarios for public or private organizations or for topics of interest.
- Identify early warnings in the local, regional and global context that provide organizations with the ability to anticipate.
- Design robust strategic plans that contemplate the multiplicity of plausible futures based on the characteristics of their environment.
- Link the process of foresight, planning and innovation for public or private organizations.
- Propose strategic foresight structures for organizations.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MPE-V Master in Strategic Foresight (Online Program)
2021 Plan

First Trimester

Code	Name	CA
EO4021	Quantitative methods for inference	3
OP5085	Optative I	3
TC4025	Data Science	3
		9

Second Trimester

Code	Name	CA
AP4040	Applied public choice	3
EO4024	Pricing and agent behavior	3
TC4026	Machine Learning for Decision Making	3
		9

Third Trimester

Code	Name	CA
AP4041	Ethical Dilemmas of Public Leadership	3
RE4020	Economics for development	3
RE4023	System Modeling	3
		9

Fourth Trimester

Code	Name	CA
OP5086	Optative II	3
RE4021	Scenario planning	3
RE4022	Futures Methods	3
		9

Fifth Trimester

Code	Name	CA
OP5087	Optative III	3
RE5019	Integrative project	3
		6

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

DGT Ph. D. in Government and Public Transformation

Justification

The unprecedented historical circumstances of the twenty-first century, manifested in climate change, the effects of technological disruptions and advances in biotechnology present new challenges and dilemmas for humanity. At the national level, for example, there is a need to propose new governance schemes, the fight against poverty and the fight against corruption; We also need mechanisms to address exponential technological change and its multiple effects, for example, on the future of employment, cybersecurity and technological inclusion. Students in this program will address these and other issues of public interest, having the opportunity to develop in an environment of academic excellence and simultaneously propose innovative solutions to various public problems that oppose the economic and social development of the country.

Given the above, this program seeks to generate knowledge from the field of Social Sciences and Government, through high-quality applied and transdisciplinary research, with the intention of generating ventures with which the most relevant public transformations of the current environment, its challenges and opportunities can be influenced. Thus, it seeks to provide a platform for the training of transformative leaders who contribute to the solution of the most important public problems facing our country and the world.

Target audience

Given its transdisciplinary nature and innovation component, this program is not limited to the selection of candidates specialized in specific disciplines, but also to their trajectory and the potential impact of their proposal for public entrepreneurship projects. through research that contributes to the development and social improvement of the country. In particular, it is aimed at:

- Citizens who seek to face the most pressing challenges and needs in a logic of public entrepreneurship and frontier technologies.
- Public servants who want to contribute innovative initiatives to their work within the Government.
- Citizens with an exceptional and proven track record in public transformation processes who require Code skills or resources to realize their vision of change.
- Professionals who are working in the private, public or social sector, whose interests or work needs require the development of innovative solutions.
- Individuals interested in the creation of higher-level public value through applied research, the use of technologies, and public entrepreneurship.

Program objectives

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

- Propose, develop and evaluate national and international research projects, in their area of Specialization.
- To generate new knowledge in the field of social sciences and government.
- Use frontier technology and forward-looking methods to develop high-impact public enterprises.

Learning Outcomes

Once they have completed their studies, the graduate will be able to:

- Demonstrate a high level of theoretical and methodological knowledge of the Social Sciences that allow them to participate in the most relevant public challenges from a transdisciplinary perspective and a logic of innovation and entrepreneurship.
- Carry out research in their area of specialization that provides new knowledge of relevance to the advancement of the transformation of the public sphere.
- Hold public office with a specialized focus on analytical methods, government innovation, and civic technologies with a critical and comprehensive view of their context.
- Apply and generate transdisciplinary knowledge as consultants and directors in areas of data science and innovation in the public and private sectors.
- Work as representatives and analysts of international organizations, being able to identify relevant data and the use of technologies for the development of applied research projects.
- Develop its own companies that promote solutions to unprecedented problems, which it is capable of solving with innovative proposals.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

Specialization areas

In this program, the student, depending on their interests, can choose one of the three lines of specialization. The enunciation of these lines corresponds to the research groups in which the academic faculty of the program is organized.

Innovation and public entrepreneurship.

This line of research constitutes a space for the development of ventures with the potential to transform people's lives in real environments, designed to enable individual and collective innovation processes that contribute to the construction of a fairer society.

Emerging technologies for public transformation..

This line of research constitutes a space for the management and implementation of frontier technology in the analysis of the social panorama, as well as for the generation of knowledge that contributes to the solution of public problems. Currently, it would be a serious disadvantage to miss out on the potential of using emerging technologies (big-data, artificial intelligence, the Internet of Things, blockchain, etc.) as part of the analytical skills of the social landscape or as instruments for designing public policies.

Prospective methods and future studies (ethics, technology and society).

This line of research provides essential tools to understand the complexity and speed of the current historical moment in the ethical, technological and social dimensions of life. It also makes it possible to take advantage of technological situations and foresee dystopian scenarios. In this research space, robust forecasting and scenario design techniques are applied for decision-making from different environments and in environments with high uncertainty.

DGT Ph. D. in Government and Public Transformation 2021 Plan

First Semester

Code	Name	CA
GP6036	Research Seminar I	1
GP6042	Research Workshop I	1
GP6054	Prospective methods for research I	1
GP6057	Directed Research I	3
GP6058	Directed Research II	3
		9

Second Semester

Code	Name	CA
GP6037	Research Seminar II	1
GP6043	Research Workshop II	1
GP6048	Integration of research I	1.5
GP6053	Defense of the research proposal	1.5
GP6055	Prospective methods for research II	1
GP6061	Doctoral Research I	3
		9

Third Semester

Code	Name	CA
GP6038	Research Seminar III	1
GP6044	Research Workshop III	1
GP6049	Integration of research II	1.5
GP6051	Scientific production and dissemination I	1.5
GP6056	Prospective methods for research III	1
GP6062	Doctoral Research II	3
		9

Fourth Semestre

Code	Name	CA
GP6039	Research Seminar IV	1
GP6040	Research Seminar V	1
GP6045	Research Workshop IV	1
GP6059	Research stay I	3
GP6063	Doctoral Research III	3
		9

Fifth Semestre

Code	Name	CA
GP6050	Integration of research III	1.5
GP6052	Scientific production and dissemination II	1.5
GP6060	Research stay II	3
GP6064	Doctoral Research IV	3
		9

Sixth Semester

Code	Name	CA
GP6041	Research Seminar VI	1
GP6046	Research Workshop V	1
GP6047	Research Workshop VI	1
GP6065	Doctoral Research V	3
GP6072	Doctoral Forum	3
		9

Seventh Semester

Code	Name	CA
GP6066	Doctoral Research VI	3
GP6067	Doctoral Research VII	3
GP6068	Doctoral Research VIII	3
		9

Eighth Semester

Code	Name	CA
GP6069	Doctoral Research IX	3
GP6070	Doctoral Research X	3
GP6071	Doctoral Research XI	3
GP6073	Doctoral defense	0.3
		9.3

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

DPP Ph. D. in Public Policy

Justification

One of the priority areas established by Tecnológico de Monterrey in its Mission is the issue of public administration and policy. In this context, the Doctoral Program in Public Policy (DPP) is perfectly related to the strengthening of this area, since the Doctoral Program seeks to contribute to society through: professionalizing public administration; improve public policies in the three levels of government and in the three branches; to promote sustainable national and regional development; to train citizens committed to development, the rule of law and good governance, and to establish a healthy link between public administration, the private sector and civil society.

Objetivo

- The central objective of the Doctoral Program in Public Policy is to prepare leading researchers for academia, the public sector, and civil society organizations, capable of conducting the analysis, design, implementation, and evaluation of innovative public policies in changing environments.
- In particular, the Doctoral Programme in Public Policy has three specific objectives:
- To train human capital specialized in public policies with high technical rigor of economic analysis and the sophistication of organizational and institutional analysis.
- Generate analysts capable of proposing and executing solutions to the complex and varied problems of public affairs.
- To prepare high-level specialists who contribute to the processes of democratization and effectiveness of public management and promote the relationship between the State and society.

Admission profile

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

Academic background of entry: Master in an area related to the lines of research of the program.

Graduate profile

Graduates of the Doctoral Program in Public Policy will have a solid theoretical, analytical and instrumental training in public policy processes, with a multidisciplinary approach and a solid legal, economic and public administration support.

In particular, the profile of the graduate will be:

- Serve as leaders of international organizations, civil society, and autonomous bodies that support institutional processes of change.

- Support government-business linkage strategies.
- To be a generator of cutting-edge knowledge in the field of public policy.

Its most important Learning Outcomes will be:

- The ability to design, implement and evaluate public policies in the different orders and spheres of government.
- The ability to propose strategies for linking government, civil society and companies.
- The ability to propose and exercise leadership in research related to the field of public policy.

Target audience

The Ph. D. Program in Public Policy is aimed at:

- Public officials from different orders and levels of government interested in deepening their knowledge in the areas of public administration and public policy.
- Professionals from the private sector who seek to specialize in government-business relations.
- Researchers and professionals in the social area interested in generating cutting-edge knowledge in the fields of administration and public policy.

Lines of research

- **Government, democracy and civil society**

To analyse from plural perspectives the problems involved in establishing between government and civil society in a democratic context

- **Economy, development and well-being**

To analyze the role of the state in its intervention on the mechanisms of the economy, its impact on the well-being of society and the design of policies aimed at economic and social development.

- **Public administration and public policy**

Analyze the public management and performance of the different levels of government and the role they play in the design, implementation, and evaluation of public policies.

Cátedras de investigación asociadas al programa

- **Institutions and Practices of Contemporary Democracies**

To research, disseminate and generate an exchange of experiences focused on the functioning of contemporary democracies, their institutions, their relevant actors, as well as the values and attitudes on which they are based. Therefore, the central objective of the chair is the empirical study of the organization and functioning of democratic systems of government.

- **Studies on economics and public policy in Mexico**

To contribute to the analysis of the conjunctural and structural problems facing the Mexican economy, both nationally and internationally, in order to discern effective public policies that promote economic growth, development and institutional strengthening of the country.

- Public administration, government and citizens

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

- Strategic intelligence

To analyze the relationship between public policy and long-term planning processes, taking into account the role of the actors.

- Public Policy for Local Development

To contribute to the generation of knowledge on 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 the sustainability of natural resources and urban development of the territories, and the political dimension, linked to the governance of and supported by the local actors themselves.

- Government, governance and governance

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

- Public policies and well-being

To analyze social policy, so that it has an impact on policies that affect the well-being of the population in any of its forms.

- Public policy

Study and evaluation of public policies relevant to Mexico with an impact on regional development, fiscal policy and economic policy.

- Citizenship and civil society

To investigate, from plural perspectives and formations but guided by political philosophy, social sciences and law, the theoretical problems involved in the growth of the third sector as an economic and political protagonist of the world order.

DPP Ph. D. in Public Policy 2011 Plan

First Semester

Code	Name	CA
GP6000	Theory of public organizations	3
GP6001	Public Policy Analytical Processes	3
GP6003	The system of competence of the public administration	3
GP6035	Research methodology	3
		12

Second Semester

Code	Name	CA
GP5000	Research Proposal I	3
OP4037	Seal Course	3
OP5062	Optative I	3
OP5063	Optative II	3
		12

Third Semester

Code	Name	CA
GP5001	Research Proposal II	3
GP5002	Research Proposal III	3
GP5003	Research Seminar I	1
OP5064	Optative III	3
		10

Fourth Semester

Code	Name	CA
GP6021	Doctoral Research I	3
GP6022	Doctoral Research II	3
GP6023	Doctoral Research III	3
GP6024	Doctoral Research IV	3
		12

Fifth Semester

Code	Name	CA
GP5004	Research Seminar II	1
GP6025	Doctoral Research V	3
GP6026	Doctoral Research VI	3
GP6027	Doctoral Research VII	3
		10

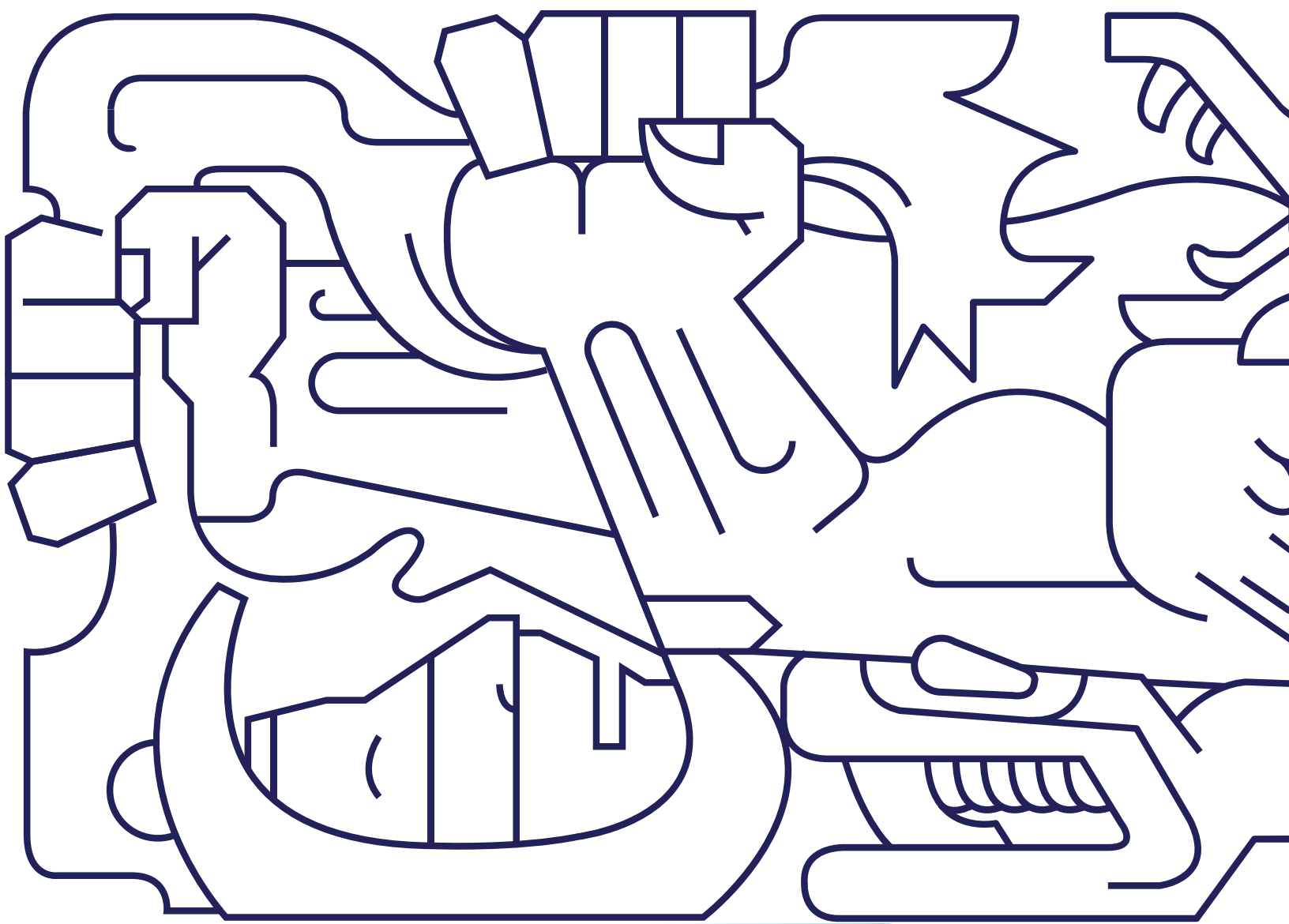
Sixth Semester

Code	Name	CA
GP6028	Doctoral Research VIII	3
GP6029	Doctoral Research IX	3
GP6030	Doctoral Research X	3
		9

Seventh Semester

Code	Name	CA
GP5005	Research Seminar III	1
GP6031	Doctoral Research XI	3
GP6032	Doctoral Research XII	3
GP6033	Doctoral Research XIII	3
GP6034	Doctoral defense	0.3
		12.3

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



Profiles and curricula

School of
Humanities and
Education



EEE-V Specialization in Teaching and Evaluation of English as a Second Language (Online Program)

Justification

The Specialization in Teaching and Evaluation of the English Language seeks to provide advanced preparation in the teaching and evaluation of the English language as a foreign language, and thus contribute to meeting the current need of the national education system, and of other latitudes, to strengthen these competencies in teachers and other professionals. This specialized training will allow English teachers of different educational levels to design and implement academic programs that help improve the coverage of attention to students who intend to be bilingual.

Target audience

The program is aimed at:

- Teachers graduated from normal schools that teach English in primary and secondary schools.
- Teachers graduated from university degrees in humanities such as Applied Linguistics and English Language, among others.
- Teachers of primary, secondary and high schools who have a bachelor's or even Master in another discipline, but who, due to their high level of proficiency in English, seek to teach this subject.

Program objectives

The objective of the Specialization Program is to train professionals who:

- Are highly trained, know and use the most current and advanced pedagogy in the teaching and evaluation of English as a foreign language, both at the various school levels and in public and private institutions.
- Integrate the use of technological tools applied to the teaching and assessment of English as a foreign language in their teaching practice.

Learning Outcomes

Once they have completed their Specialization studies, the graduate will be able to:

- Design and teach English courses in public and private sector educational institutions at the basic, middle and higher levels.
- To assess, through the use of international standards, the level of proficiency in English as a foreign language or second language of participants and candidates for formal and informal education

programs, as well as of applicants for jobs where English language proficiency is a requirement.

- Design and implement innovative training solutions in English as a foreign language or second language through the use of cutting-edge technological resources for public and private sector institutions.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

EEE-V Specialization in Teaching and Evaluation of English as a Second Language
(Online Program)

2021 Plan

First Trimester

Code	Name	CA
ED4043	Entrepreneurship and innovation	3
ED4058	Fundamentals for the design of educational programs in English as Second language	3
		6

Second Trimester

Code	Name	CA
ED4059	Learning assessment	3
ED4060	Technological innovation in teaching, learning and assessment of Foreign Languages	3
OP5085	Optative I	3
		9

Third Trimester

Code	Name	CA
ED5124	Assessment of language competence	3
OP5086	Optative II	3
		6

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

EGE-V Specialization in Management for Educational Leadership and Innovation

(Online Program)

Program objectives

This program aims to train professionals with the necessary competencies to strategically manage their respective educational facilities and effectively take them to the next level of educational quality.

Target audience

The program is aimed at:

- Directors and coordinators with the desire to enrich their educational institution by strengthening their leadership and linking them through cutting-edge tools for educational centers and applying this knowledge in institutions of the private and public sectors and organizations.
- Future managers and coordinators with the desire to obtain an overview of the managerial function in the educational field.
- Education professionals with aspirations to work as consultants in the private or public sector to guide projects related to the evaluation of institutions, development of human capital 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 the new globalized and digital contexts.

Entry 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.
- To have a basic or intermediate understanding of the English language, allowing an adequate understanding of bibliographic materials.
- Have a proactive attitude, intellectual curiosity and interest in personal and academic improvement.

Graduate profile

Once they have completed their studies, the graduate will be able to:

- Design and implement educational solutions with an ethical and socially responsible perspective to complex problems in schools, through the use of scientific methods and innovative technologies.
- Interact with specialists from all functional areas of the educational centers in order to define strategies, guidelines and organizational objectives for the institution, in an environment of respect and inclusion.

EGE-V Specialization in Management for Educational Leadership and Innovation

(Online Program)

2019 Plan

First Trimester

Code	Name	CA
ED4042	Strategic leadership	3
OP4046	Seal Course	3
		6

Second Trimester

Code	Name	CA
ED5110	Roving Seminar for Innovative Management	3
OP5085	Optative I	3
		6

Third Trimester

Code	Name	CA
ED4044	Empowering Teams for Transformation	3
OP5086	Optative II	3
		6

Fourth Trimester

Code	Name	CA
ED5104	Partnerships for financial management	3
		3

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

MEE-V Master in Education (Online Program)

Justification

The Master's program in Education is designed to respond to the current needs of the knowledge society, enriching the training of education professionals through their access to cutting-edge theories, methodologies and pedagogical techniques applicable to the different educational levels. The program is conducted through an educational model based on the development of personal and professional competencies. The model also integrates new information and communication technologies (e-learning), which makes it easier for students to take their subjects in digital environments, in a flexible way, without limitations of time and space, training professionals from various areas that will have a positive impact on the solution of educational problems in the communities where they provide their services.

Graduate profile

The graduate of the Master in Education is a leading professional in the field of education who proposes and executes innovative educational projects and programs that contribute to the improvement of the service provided in their institutions.

The graduate of the Master in Education is a professional who carries out his teaching practice through teaching-learning strategies to achieve the curricular objectives in an effective and efficient way. He is also a professional who applies his research skills to solve current educational problems.

The graduate of the Master in Education is a professional who conducts himself under ethical criteria that demonstrate through his teaching work, a respect for the dignity of his students, parents and other colleagues, whether they are members of the educational community or the community in general.

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

- To solve challenges of contemporary, local, regional and global educational reality, contributing to processes of educational change.
- Apply the knowledge of the Educational Sciences in the teaching of disciplinary content so that their educational practice is grounded.
- Carry out applied educational research as a work tool in their professional practice in both formal and non-formal business or educational environments.
- Generate new ideas, procedures and techniques in order to identify areas of opportunity and implement solutions jointly with various social actors.
- Incorporate their conception of education into their own intervention project.

Target audience

The entry profile to the Master's in Education program requires that candidates be people with completed professional careers, from any discipline interested in teaching and learning processes. Likewise, it is desirable that they are working in a position that allows them to have an approach to different professional scenarios to implement their intervention project, thus impacting the solution of multidisciplinary educational problems.

Lines of Knowledge Generation and Application (LGAC)

Psychopedagogical studies

This line of research includes studies related to learning and teaching in general. From a pedagogical perspective, this line includes studies that involve the curriculum, competency-based education models, instructional design, the use of different didactic techniques and methodologies, and educational evaluation, among others. From a psychological perspective, studies involving different cognitive, affective, and motivational processes are included.

Disciplinary studies

This line of research includes studies related to the curriculum and the teaching-learning process of disciplines such as mathematics, natural sciences, engineering, accounting, business and English, among others. Some specific topics addressed in this line of research are mathematical modeling, problem solving, conceptual understanding, and technological applications to promote the learning of these disciplines.

Sociocultural Studies in Education

This line of research contains studies that emphasize the sociocultural context in which the educational process takes place. From approaches aimed at specific cultures, to studies of an international nature, this line of work includes studies on the social construction of knowledge, intra and interdisciplinarity, collaboration networks, communities of practice, connectivism, dialogism, social inclusion, multi and interculturality, morality and ethics, school violence and educational policy, among others.

MEE-V Master in Education (Online Program)
2013 Plan

First Semester

Code	Name	CA
ED4022	Technology and innovation in education	3
ED4033	Learning theories in the educational context	3
		6

Second Semester

Code	Name	CA
OP4006	Basic Optative I	3
OP5042	Optative I	3
		6

Third Semester

Code	Name	CA
ED4034	Applied Research Project I: Problem Identification	3
OP5043	Optative II	3
		6

Fourth Semester

Code	Name	CA
ED4035	Applied Research Project II: Methodological Approaches	3
OP5044	Optative III	3
		6

Fifth Semester

Code	Name	CA
ED4032	Comparative education	3
ED5084	Applied Research Project III: Analysis of Results	3
		6

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

MEH Master in Humanistic Studies

Justification

The Master in Humanistic Studies (MEH) is a research-oriented program, which 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 (SDGs 2015-2030) defined by the UN, which promote analysis and critical reflection on contemporary cultural phenomena and the challenges faced by societies in a hyperconnected, ideologically polarized and culturally fragmented world.

Target audience

The Master in Humanistic Studies is aimed at people who seek to begin their training as researchers in the interdisciplinary field of 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 updated 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 in 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 proactive attitude in the identification of the most relevant problems for research, in contemporary social and cultural environments, from a humanistic perspective.
- To propose new approaches to the study of the particular phenomena of the interdisciplinary field of the humanities, which denote a critical vision of 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 social and cultural well-being and contribute to solving the main challenges faced by contemporary societies.

Learning Outcomes

Once they have completed their 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 (SDGs 2015-2030) defined by the UN, which demonstrates their aptitude to continue their studies at the doctoral level.

- Design and develop analysis strategies for contemporary social and cultural phenomena, from a critical humanistic perspective, with knowledge of the environment and a proactive attitude to identify relevant problems 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 them to contribute to the solution of the main challenges faced by contemporary societies.

Entry profile

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

- Strict compliance with the general admission requirements to the graduate programs of the School of Humanities and Education (EHE) of Tecnológico de Monterrey, through obtaining the minimum score required in the Academic Aptitude Test (PAEP) and the delivery of the complete documentation requested.
- Proficiency in Spanish, at a higher level, suitable for high-performance reading comprehension and the correct writing of academic texts, by writing an essay of academic reasons for entering the program.
- Proficiency in English, at a medium-high level, adequate for the comprehension of bibliographic resources published in that language, through an official certificate indicating that you obtained 550 points or more in the TOEFL exam, or the required score in an equivalent exam.
- Ability to identify their affinity with one of the lines of research offered by the master's degree, through a series of interviews with the program coordinator, its management and with researchers who make up 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 line of research that has been selected.

Lines of research

The Master in Humanistic Studies offers four lines of research 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 lines of research constitute thematic axes, sufficiently broad and with a disciplinary and conceptual orientation, which allow the construction of intermediate and advanced level scientific knowledge in the interdisciplinary field of the humanities.

Science, technology and society: this line of research 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 on the consequences of the uses, applications and consumption of technology, in aspects such as the availability and access to basic resources in a safe and sustainable way. the fight against climate change, sustainable production and consumption, as well as the sustainability of cities and terrestrial and maritime ecosystems.

Communication and media: this line of research studies the role played by communication, media and networks 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 line of research addresses the different manifestations of discourses, in their written, sound, material, digital or audiovisual supports, from historical, artistic and literary approaches.

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

**MEH Master in Humanistic Studies
2009 Plan**

First Semester

Code	Name	CA
H4012	Research methodology	3
OP4002	Fundamental Optative I	3
OP5042	Optative I	3
		9

Second Semester

Code	Name	CA
H5022	Research project	3
OP4003	Fundamental Optative II	3
OP5043	Optative II	3
		9

Third Semester

Code	Name	CA
OP4004	Fundamental Optative II	3
OP4037	Seal Course	3
OP5044	Optative III	3
		9

Fourth Semester

Code	Name	CA
OP4005	Fundamental Optative IV	3
OP4018	Fundamental Optative V	3
OP5045	Optative IV	3
		9

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

MHD-V Master in Digital Humanities (Online Program)

Justification

This program responds to needs present in humanistic studies, mainly: the dissemination of cultural heritage through digital platforms, the analysis of large amounts of data for the study of the humanities and social sciences, the understanding of socio-digital phenomena from a philosophical perspective that addresses the human being in the digital world and the integration of the humanist tradition with digital methods and tools to generate New approaches and knowledge in the 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 cultural entrepreneurship products.

Target audience

The program is aimed at graduates and professionals of: 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.

Entry profile

The candidate to enter the program must:

- Possess skills for searching for information in bibliographic databases.
- Be familiar with the use of information and communication technologies and the dissemination of knowledge in digital media.
- Be able to 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.
- Have developed the competence of intellectual curiosity and passion for self-learning.

Graduate profile

Once they have completed their studies, the graduate will be able to:

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

MHD-V Master in Digital Humanities (Online Program)
2019 Plan

First Trimester

Code	Name	CA
EH4001	Fundamentals of Digital Humanities	3
OP4046	Seal Course	3
		6

Second Trimester

Code	Name	CA
EH4002	Information architecture for digital content	3
OP5085	Optative I	3
		6

Third Trimester

Code	Name	CA
EH4003	Digital methods	3
EH5001	Digital Project I	3
OP5086	Optative II	3
		9

Fourth Trimester

Code	Name	CA
EH4004	Digital technologies	3
EH5002	Digital Project II	3
OP5087	Optative III	3
		9

Fifth Trimester

Code	Name	CA
EH5003	Digital Project III	3
OP5088	Optative IV	3
		6

Sixth Trimester

Code	Name	CA
EH4005	Technology Philosophy	3
OP5089	Optative V	3
		6

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

MTE-V Master in Educational Technology (Online Program)

Justification

The Master's program in Educational Technology responds to the current needs of the knowledge society to prepare professionals in education and the area of training human talent in the most current and advanced use of technologies in the teaching-learning and training processes, both at the various school levels and in public and private organizations. that will allow a more comprehensive development of its students and collaborators. Through an innovative educational model based on the most advanced learning platforms and applications that allow reaching larger audiences with mobility limitations of space and time restrictions, highly trained professionals are trained to have a positive and direct effect on the communities where they will provide their services.

The Master in Educational Technology (MTE) contributes to the professionalization of the educational practice of teachers and organizational training professionals based on innovative pedagogical and technological models that improve their educational environments.

Target audience

The entry profile to the Master's program in Educational Technology requires that candidates have completed a professional career, related to the areas of education, administration or related fields and, preferably, that they have skills for reading comprehension in the English language. Likewise, it is desirable that they are working in a position that allows them to have an approach to organizational or school scenarios at the various educational levels.

Program objectives

This program aims to train professionals who:

- Be leaders in the field of education who propose and execute innovative educational and technological projects and programs that contribute to the improvement of the service provided in their institutions and organizations.
- Carry out their teaching practice through teaching-learning strategies to achieve curricular objectives in an effective and efficient way, particularly with the incorporation and implementation of technology in the educational field.
- Use their applied research skills to solve current educational problems.
- Conduct themselves with ethical criteria that they demonstrate through their educational practice, respecting the dignity of their students, parents, collaborators and other colleagues, whether they are members of the educational community or the community in general.

Learning Outcomes

Upon completion of the program, the student will be able to:

- Design learning environments by selecting the right technologies.
- Apply educational technology in their courses as a basic, high school or higher level teacher, or as a training instructor and human talent trainer.
- Implement and evaluate technology projects applied to education.

Lines of research

- Development and research of the impact of innovative educational proposals based on technology.
- Sociocultural contexts of the use of digital technology.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

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

First Semester

Code	Name	CA
ED4022	Technology and innovation in education	3
ED4033	Learning theories in the educational context	3
		6

Second Semester

Code	Name	CA
OP4006	Basic Optative I	3
OP5042	Optative I	3
		6

Third Semester

Code	Name	CA
ED4034	Applied Research Project I: Problem Identification	3
OP5043	Optative II	3
		6

Fourth Semester

Code	Name	CA
ED4035	Applied Research Project II: Methodological Approaches	3
OP5044	Optative III	3
		6

Fifth Semester

Code	Name	CA
ED4032	Comparative education	3
ED5084	Applied Research Project III: Analysis of Results	3
		6

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

MTO-V Master in Educational Entrepreneurship (Online Program)

Justification

The Master's program in Educational Entrepreneurship seeks to encourage transformations in educational environments, whether formal, non-formal or lifelong learning, through the principles of entrepreneurship and educational innovation as agile and efficient response elements in VICA (volatile, uncertain, complex and ambiguous) environments.

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 degree of experience or area of specialization.
- Entrepreneurs, future entrepreneurs and professionals who wish to venture into the education sector.

Entry 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.

Graduate profile

Once they have completed their studies, the graduate will be able to:

- Identify areas of opportunity in an educational environment.
- Develop proposals that translate into real projects in the educational field through interaction with specialists in the areas of education, business, entrepreneurship, technology.
- Carry out a strategic communication process of a product or service with the intention of selling or investing.
- Develop online marketing strategies for educational products or services. - Implement negotiation strategies with different audiences and in different contexts.
- Identify trends and make prospects for education.

MTO-V Master in Educational Entrepreneurship (Online Program)
2020 Plan

First Trimester

Code	Name	CA
ED4046	Organizational Change for Educational Entrepreneurship	3
ED4047	Educational Foresight	3
ED4050	Educational Entrepreneurship Stay I	1.5
ED4054	Educational Entrepreneurship Project I	1.5
		9

Second Trimester

Code	Name	CA
ED4045	Transforming education through emerging technologies	3
ED4048	Educational Entrepreneurship I	3
ED4051	Educational Entrepreneurship Stay II	1.5
OP4046	Seal Course	3
		10.5

Third Trimester

Code	Name	CA
ED4049	Educational Entrepreneurship II	3
ED4052	Educational Entrepreneurship Stay III	1.5
ED4055	Educational Entrepreneurship Project II	1.5
OP5085	Optative I	3
		9

Fourth Trimester

Code	Name	CA
ED4053	ducational Entrepreneurship Stay IV	1.5
ED4056	Educational Entrepreneurship Project III	1.5
OP5086	Optative II	3
		6

Fifth Trimester

Code	Name	CA
ED5116	Educational Entrepreneurship III	3
ED5117	Educational Entrepreneurship Project IV	1.5
OP5087	Optative III	3
		7.5

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

DEE Ph. D. in Educational Innovation

Justification

The Ph. D. in Educational Innovation supports the training of individuals capable of contributing, through research, to the theoretical-practical knowledge of education; likewise, to increase the efficiency and effectiveness of educational projects with a goal of innovating and carrying out positive change in organizations. Through this program, students will develop the skills of self-learning, critical and creative thinking, collaborative work, and the ability to express themselves effectively in oral and written form.

In this era of globalization, educational institutions and learning organizations are faced with the challenge of examining and changing the way they operate, of incorporating the use of new technologies and new ways of teaching and learning. Our world today and the world of the future will require its inhabitants to have the ability to visualize, to plan, to motivate people to change their way of thinking and being.

The Ph. D. 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 the process of educational change. This program prepares them to research and generate new knowledge that contributes to scientific advancement in areas such as student-centered learning, the new work of the teacher in the knowledge society, the innovative use of technology as an educational medium that promotes equity, new models of educational administration and management, and the teaching and promotion of scientific thinking within school contexts.

Program objectives

The Ph. D. in Educational Innovation seeks the development of its students for their comprehensive training as academic researchers in the field of educational innovation, which generates innovative projects that contribute to local and international knowledge of education. Through the work of its graduates, the doctoral program has the following purposes:

- To contribute to the theoretical and practical knowledge of education through scientific research, disseminating such knowledge in the specialized spheres of researchers and in the local and professional context of the student.
- Contribute to improving the educational systems of which they are part in a quantitative and qualitative way, actively participating in their community as a postgraduate teacher, as a scientific researcher, and as a science communicator.

Admission profile

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

Graduate profile

The Ph. D. in Educational Innovation trains researchers in the educational field with the following competencies:

Conceptual competencies

- Present the necessary credentials in terms of research conducted, published works, specialization in an area of knowledge, and research training to aspire to the position of professor at any Mexican or foreign university.
- Conduct research that contributes to the theoretical-practical knowledge of education (in various contexts).

Procedural competences

- Exercise proactive leadership in organizations of different types that carry out educational activities where they work, designing and implementing educational innovation projects that result in concrete and sustainable improvements in the medium and long term.
- Design, implement, and evaluate educational projects that contribute to the response of educational institutions and other organizations to the commitments they have as such to the social, economic, and political development of their community, and to the care of their immediate environment.
- Identify the needs of educational institutions and other educational organizations, planning and executing the necessary actions to meet them.
- Make use of modern information and communication technologies that promote the collaborative work of networks of people at a national and international level.

Attitudinal competencies

- Exercise proactive leadership in organizations of different types that carry out educational activities where they work, designing and implementing educational innovation projects that result in concrete and sustainable improvements in the medium and long term.

Target audience

The target audience of this program is made up of graduate-level academics interested in a career as researchers within a public or private higher education institution and/or in research centers on education or other social sciences, and to a lesser extent educational administrators in higher education institutions interested in pursuing an administrative career in institutions that require a completed Ph. D. from their administrators.

It is expected that those participating in the program will have the following characteristics:

- A commitment to be an academic researcher, working in an educational institution and carrying out teaching, research, and science outreach activities in your local community.

- A critical-strategic spirit, with the desire to innovate in their field, with the purpose of improving the educational environment.
- Interest in doing research in any of the current lines offered by the program.
- A commitment to improve the social and political environment of the countries of Latin America, and to improve the quality of life of their inhabitants through education in all its aspects.
- The openness to internationalize, to know what they are doing in other countries and to learn from them, to share what is done in one's country, to see the world as a whole, all with the same main goals of educating their population well.

Lines of research

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

DEE Ph. D. in Educational Innovation 2015 Plan

First Semester

Code	Name	CA
ED4022	Technology and innovation in education	3
ED5075	Research Proposal I	3
OP5062	Optative I	3
OP5063	Optative II	3
		12

Second Semester

Code	Name	CA
ED5076	Research Proposal II	3
OP5064	Optative III	3
OP5065	Optative IV	3
OP5066	Optative V	3
		12

Third Semester

Code	Name	CA
ED5077	Research Proposal III	3
ED5078	Research Seminar I	1
OP5067	Optative VI	3
OP5068	Optative VII	3
OP5069	Optative VIII	3
		13

Fourth Semester

Code	Name	CA
ED5081	Directed Research I	3
ED5082	Directed Research II	3
OP5070	Optative IX	3
OP5071	Optative X	3
		12

Fifth Semester

Code	Name	CA
ED5079	Research Seminar II	1
ED5083	Directed Research III	3
ED6033	Doctoral Research I	3
ED6034	Doctoral Research II	3
OP5072	Optative XI	3
		13

Sixth Semester

Code	Name	CA
ED6035	Doctoral Research III	3
ED6036	Doctoral Research IV	3
ED6037	Doctoral Research V	3
ED6038	Doctoral Research VI	3
		12

Seventh Semester

Code	Name	CA
ED5080	Research Seminar III	1
ED6039	Doctoral Research VII	3
ED6040	Doctoral Research VIII	3
ED6041	Doctoral Research IX	3
ED6042	Doctoral Research X	3
		13

Eighth Semester

Code	Name	CA
ED6000	Doctoral Defense	0.3
ED6043	Doctoral Research XI	3
ED6044	Doctoral Research XII	3
ED6045	Doctoral Research XIII	3
ED6046	Doctoral Research XIV	3
		12.3

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

DEH Ph. D. in Humanistic Studies

Program objectives

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

- Propose, develop and advise national and international research projects, in their area of Specialization, from the approach to the execution.
- Generate new knowledge in the Humanities, particularly in the areas of their Specialization, through peer-reviewed scientific publications, such as articles (in Scopus journals), chapters in books, books or the development of innovative educational programs.
- Develop social entrepreneurship projects with a high capacity to respond to the needs of the community.
- Belong to the National System of Researchers of CONACYT or similar, if you reside outside Mexico.
- Be a creator in the National System of Creators or similar, if you reside outside of Mexico.

Target audience

The program is aimed at people who seek to develop from an interdisciplinary perspective a training with which they can specialize, in their fields of study, generate knowledge and skills through research that contributes to the development and social improvement of the country. In particular, it is aimed at:

- Academics who creatively and adequately face the challenges and needs of social entrepreneurship, indispensable in the new globalized and digital contexts.
- Leaders and collaborators of non-governmental organizations that promote the understanding of society and its current processes to guide their action.
- Professionals who are practicing in the private, public and social sectors, whose interests or labor needs require the development of an innovative humanistic and social profile.
- People interested in strengthening the higher education system through teaching and research.

Entry profile

The candidate to enter the Ph. D. must have an excellent academic record, and a vocation as a researcher, and be academically interested in one of the fields of knowledge promoted by the doctoral program. The admissions process is designed to ensure that the candidate meets the above and has the necessary skills and potential for research. During the admissions process, the financial support that the student needs is reviewed, as well as the research topic that he or she proposes. All of the above with the purpose of increasing the student's chances of success and the development and consolidation of the program's lines of research.

Graduate profile

Once they have completed their studies, the graduate will be able to:

- Demonstrate a high level of theoretical and methodological knowledge of the Humanities that allows them to participate and position themselves in interdisciplinary debates.

- Conduct research in their area of Specialization that provides new knowledge of relevance to the advancement of the Humanities.
- Apply and generate interdisciplinary knowledge in the fields of study of the program through complex thinking with a critical and comprehensive vision of cultural and social phenomena.
- Design strategies for impact on social life through consulting for the public, private and civil sectors.
- Work collectively in high-level research and teaching groups in higher education institutions and communicate results, disseminate and promote scientific knowledge.
- Have a proactive, creative attitude in the face of unprecedented problems that they solve with original proposals.

Lines of research

The Ph. D. in Humanistic Studies offers four lines of research 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 lines of research constitute thematic axes, sufficiently broad and with a disciplinary and conceptual orientation, which allow the construction of advanced scientific knowledge in the interdisciplinary field of the humanities.

Science, technology and society: this line of research 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 on the consequences of the uses, applications and consumption of technology, in aspects such as the availability and access to basic resources in a safe and sustainable way, the fight against climate change, sustainable production and consumption, as well as the sustainability of cities and terrestrial and maritime ecosystems.

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

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

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

DEH Ph. D. in Humanistic Studies 2018 Plan

First Semester

Code	Name	CA
GH6001	Research Consulting I	3
GH6002	Interdisciplinary Research Methodology I	3
GH6003	Strategic Research Seminar I	1
GH6004	Research Workshop I	1
GH6005	Research Workshop II	1
		9

Second Semester

Code	Name	CA
GH6006	Research Advisory II	3
GH6007	Investigation Protocol Defense	1
GH6008	Integration of research I	1
GH6009	Interdisciplinary Research Methodology II	3
GH6010	Strategic Research Seminar II	1
		9

Third Semester

Code	Name	CA
GH6011	Doctoral Forum	3
GH6012	Doctoral Research I	3
GH6013	Scientific production and dissemination I	1.5
GH6014	Strategic Research Seminar III	1
GH6015	Research Tutoring I	0.5
		9

Fourth Semester

Code	Name	CA
GH6016	Integration of research II	1
GH6017	Doctoral Research II	3
GH6018	Doctoral Research III	3
GH6019	Strategic Research Seminar IV	1
GH6020	Research Workshop III	1
		9

Fifth Semester

Code	Name	CA
GH6021	Research stay	3
GH6022	Doctoral Research IV	3
GH6023	Strategic Research Seminar V	1
GH6024	Research Workshop IV	1
GH6025	Research Mentoring II	0.5
GH6026	Research Mentoring III	0.5
		9

Sixth Semester

Code	Name	CA
GH6027	Integration of research III	1
GH6028	Doctoral Research V	3
GH6029	Doctoral Research VI	3
GH6030	Scientific production and dissemination II	1.5
GH6031	Strategic Research Seminar VI	1
		9.5

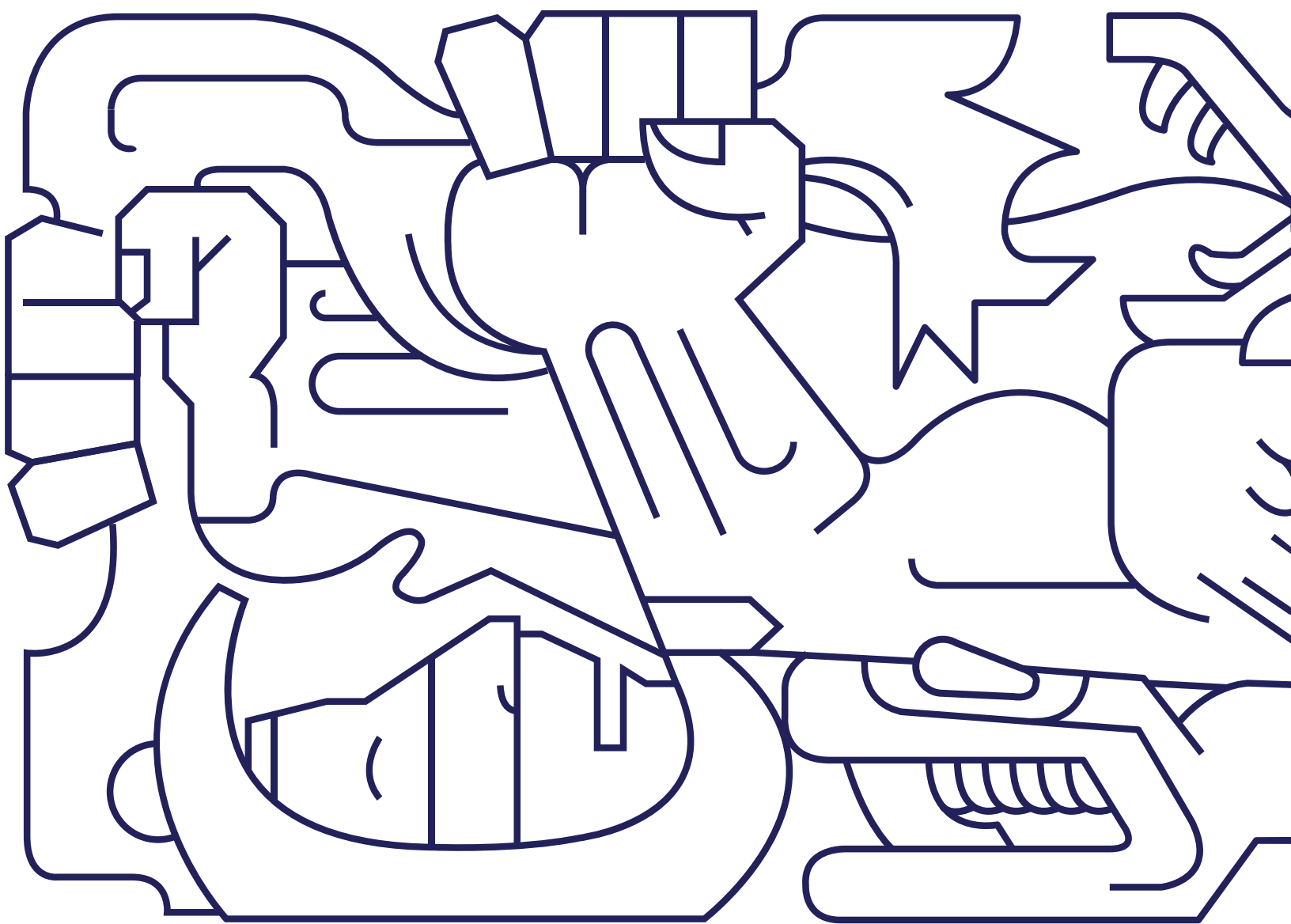
Seventh Semester

Code	Name	CA
GH6032	Doctoral Research VII	3
GH6033	Doctoral Research VIII	3
GH6034	Strategic Research Seminar VII	1
GH6035	Research Workshop V	1
GH6036	Research Tutoring IV	0.5
GH6037	Research Tutoring V	0.5
		9

Eighth Semester

Code	Name	CA
GH6038	Doctoral Research IX	3
GH6039	Doctoral Research X	3
GH6040	Strategic Research Seminar VIII	1
GH6041	Research Workshop VI	1
GH6042	Research Tutoring VI (Doctoral Pre-Defense)	0.5
GH6043	Doctoral defense	0.3
		8.8

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



Profiles and curricula

School of
Engineering &
Science



EIS Software Engineering Specialization

Justification

The technologies related to Software Engineering change very rapidly: there is a proliferation of both software and hardware products as a result of new theories, methods and techniques. These advances result in a high rate of change in organizations and the appearance and development of new information technologies, which leads to a significant demand for specialized human resources with an international profile capable of assimilating, evaluating, transferring and integrating new advances in software engineering for the development of new products and services in accordance with current requirements.

The horizon of substantial technological changes in the tools, processes and methods of software engineering goes from three to five years, which is why competitive companies increasingly require leaders in software engineering who can carry out successful developments, where new services can be offered or current ones can be improved that allow increasing the value in the substantive activities of the organization.

Tecnológico de Monterrey, aware of this scheme of constant technological changes in the area of software, as the basis of business systems, offers the Specialization in Software Engineering as an option to prepare human talent that can boost the country's competitiveness.

Program Objective

The objective of the Software Engineering Specialization is to train specialists who can exercise leadership in the conceptualization and development of software applications that increase the competitiveness of organizations, in accordance with the technological changes of the environment.

Graduate profile

Graduates of the Specialization in Software Engineering at Tecnológico de Monterrey will be able to:

- Design, develop and evaluate software in organizations using modern analysis and development methodologies as well as advanced programming languages.
- Select software platforms, prioritizing quality requirements and attributes.
- Self-learning on an ongoing basis and adapting to new software engineering environments.
- Work collaboratively in multi-disciplinary teams for the development of complex software systems.

EIS Especialidad en Ingeniería de Software 2011 Plan

First Trimester

Code	Name	CA
TC4016	Software Analysis, Design & Construction	3
TC4017	Software testing and quality assurance	3
		6

Second Trimester

Code	Name	CA
OP5053	Optative I	3
OP5054	Optative II	3
TC4018	Software Development Management	3
		9

Third Trimester

Code	Name	CA
GI5020	Professional Certification	3
OP5055	Optative III	3
		6

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

ELS Specialization in Logistics and Supply Chain

Justification

The Specialization in Logistics and Supply Chain is justified given the need of the environment to make efficient use of its resources in the areas of supply chain. This considering the aspects of sustainability and use of information technologies, from a global, integrative and collaborative perspective.

The challenges offered by organizations today can include the identification of strategic partners at a global level, competitiveness in the globalization of markets, energy costs and market demands, as well as the increase in the complexity of organizations.

Thus, the training of specialists in the area of Logistics and Supply Chain contributes decisively to the development of highly specialized talent, which is demanded by companies, capable of designing, implementing and leading high-impact initiatives in the generation of added value in their operations. According to the document "Evaluation of the Performance of Supply Chains in Mexico – Generation of National Indicators" generated from the study carried out by ATKEARNEY and sponsored by the Ministry of Economy and the Council of Supply Chain and Management Professionals, the greatest impact on service indicators occurs through the strengthening of training processes. In addition to the fact that at the industrial sector level, the strengthening of the training processes of the actors in the supply chain is declared a priority.

Considering the 2007 Logistics Performance Index, Mexico ranks 56th out of 150 countries, which makes evident the need to have specialists in the area to improve the country's competitiveness and economic development. As a result of this, the National Development Plan 2007-2012 has adopted a strategy to promote the increase in the training of human capital with capabilities in logistics services.

The Ministry of Economy, on its page dedicated to logistics in Mexico (<http://www.elogistica.economia.gob.mx>) states "Along with the economic development of a country, its geographical position, its technological advances and other advantages, the talent of its human capital has been a determining factor in achieving competitiveness. In the field of logistics, there are ample areas of opportunity that educational institutions with the training of human resources will surely be able to cover.."

Tecnológico de Monterrey, aware of the need to train specialists in the area of logistics, offers the Specialization in Logistics and Supply Chain as an option to prepare human talent that can boost the country's competitiveness through the improvement of supply chain management processes.

Objectives of the Specialization

The Logistics and Supply Chain Specialization program develops specialists to achieve in their professional career:

- 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.

Graduate profile

Upon completion of the program, the student will be able to:

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

ELS Specialization in Logistics and Supply Chain 2011 Plan

First Trimester

Code	Name	CA
AD4001	Statistics in organizations	3
AD5003	Value creation, business models and networks	3
		6

Second Trimester

Code	Name	CA
IN5096	Transportation and Outsourcing	3
OP5053	Optative I	3
OP5054	Optative II	3
		9

Third Trimester

Code	Name	CA
GI5021	Professional Certification	3
OP5055	Optative III	3
		6

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

ENA-V Specialization in Applied Artificial Intelligence (Online Program)

Justification

Nowadays, any type of company, large or small, traditional or virtual, demands professionals with specialized knowledge in the areas of data science, software engineering and business intelligence. In the same way, the emerging Industry 4.0 is increasingly demanding specialists to support the great diversity of new technologies, among which we can highlight the Internet of Things (IoT) and autonomous mobility. However, cutting-edge knowledge and technologies in recent years have shown that intelligent and cutting-edge solutions to the real problems that companies face daily in each of these issues are enriched and enhanced by framing them within the area of Artificial Intelligence (AI). In other words, the solutions to today's problems will not be in line with our times without the support of AI.

In this context, the (ENA-V) Specialization in Applied Artificial Intelligence is an educational alternative that arises as a response to the need of local, national and international companies to have specialized professionals with knowledge in very particular topics such as visualization or data science, intelligent software, autonomous mobility or business strategy. Any of these topics in which the candidate is required to specialize will be framed with a solid AI component that will allow them to enrich the proposed solutions and according to the demand for specialists for the current Industry 4.0 and in support of the construction of a smart city.

Target audience

The (ENA-V) Specialization in Applied Artificial Intelligence program is aimed at:

- Professionals from any area interested in acquiring solid knowledge of AI as a means to consolidate and transform their company through solutions based on one of the emerging technologies, in support of decision-making and business intelligence.
- Professionals interested in designing and proposing intelligent and innovative solutions supported by any of the topics associated with emerging technologies such as visualization and data science, intelligent software, autonomous mobility, the design and construction of a sensor network, among others.
- Professionals in the engineering area who want to delve into solutions based on an emerging technology and supported by artificial intelligence, to transform some of the processes or activities of the organization.

Program Objective

To train specialists who are agents of change in organizations, who carry out innovation, technological development and transfer through some emerging technology through solutions based on artificial intelligence.

Learning Outcomes

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

- Demonstrate and use a high level of knowledge and business intelligence in an emerging technology, to propose solutions to real and complex problems that arise in companies.
- Analyze, manage, direct, and propose solutions to processes and problems that come from any of the areas of their Specialization: software engineering, intelligent manufacturing, autonomous mobility, or in general any process that arises from a company with technologies involved in Industry 4.0.
- Communicate clearly, effectively and efficiently the results of their professional work orally, in writing and through data visualization. This effective and contextualized communication must be applicable when informing both colleagues in their work group, as well as their superiors or clients.
- Work in the professional community of their area of expertise with leadership in an efficient, collaborative, and ethical manner.

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

ENA-V Specialization in Applied Artificial Intelligence (Online Program)
2021 Plan

First Trimester

Code	Name	CA
OP5085	Optative I	3
TC4029	Data Science & Analytics	3
TC5032	Data Visualization	3
		9

Second Trimester

Code	Name	CA
OP4046	Seal Course	3
OP5086	Optative II	3
		6

Third Trimester

Code	Name	CA
OP5087	Optative III	3
TC5038	Solutions with technology application	3
		6

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

EPY Specialization in Project Management

Justification

Currently, the strategic and operational areas of any public and private organization depend to a large extent on excellent project management and direction to optimize the use of assigned resources. The specialization in Project Management contributes to the training of specialists who support the satisfaction of these problems in organizations.

Through this Specialization, experts are trained in the application of quantitative techniques and time scheduling tools, as well as the allocation of resources for a specific project that is developed in an institution. These methodologies will be optimized through the application of specialized computer tools for the management and programming of projects.

The Specialization in Project Management is one of the first graduate programs that offers international certifications in the area of Project Management and Administration and specifically in the international certification granted by the Project Management Institute, known as the Project Management Professional (PMP).

Project management is a field of knowledge consolidated at ITESM that has extensive experience in collaborations, projects, consulting, courses and diplomas for the industry in the area. Project management is a professional development option that includes, among others, certifications from the PMI (Project Management Institute):

PMP (Project Management Professional)
CAPM (Certified Associate in Project Management)

Objetivo de la especialidad

The Project Management Specialization aims to train specialists who exercise their leadership in an organization to plan, execute, control, close, and evaluate projects with an efficient management of human and material resources.

Graduate profile

The Project Management Specialization prepares specialists who, upon graduation, in addition to having a professional certification, are able to:

- Initiate, plan, execute, control, and close projects correctly.
- Make the best decisions in the management of projects according to the conditions of the environment.
- Form, integrate, develop effective work teams for project management.

EPY Specialization in Project Management 2011 Plan

First Trimester

Code	Name	CA
AD4004	Competitive strategy, design and modeling of the organization	3
AD5034	Project Management and Administration	3
		6

Second Trimester

Code	Name	CA
FZ5011	Evaluation of investment and economic engineering projects	3
OP5053	Optative I	3
OP5054	Optative II	3
		9

Third Trimester

Code	Name	CA
GI5023	Professional Certification	3
OP5055	Optative III	3
		6

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

MBI Master in Science with a major in Biotechnology

Justification

The great demand for streamlining processes in the agricultural, health and industrial sectors, among others, has encouraged the incorporation of biotechnological techniques into the production and transformation of satisfiers. Therefore, the professional who is able to work in academic or business environments will be able to actively participate in the development of biotechnological processes at the laboratory level and their implementation at the industrial level, thus acquiring a competitive advantage in the professional environment.

General objectives of the programme

The Program Objective is to train professionals committed to their communities, both socially, ethically and economically, aware of the need to create new sustainable technologies and with a remarkable entrepreneurial and innovative spirit.

Graduate profile

At the end of the program, students will be able to work in the areas of research and development of new products and biotechnological processes.

Target audience

This master's degree is offered to professionals graduated from areas related to biology, agronomy, chemistry, biochemistry, food industries, medicine, biochemical engineering, among others.

Lines of research

- 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 in Science with a Specialization in Biotechnology 2009 Plan

First Semester

Code	Name	CA
BT4005	Cell biology and physiology	3
BT5006	Genetic engineering	3
GI5000	Research and innovation methods	1.5
OP4000	Seal Course	1.5
		9

Second Semester

Code	Name	CA
BT4004	Instrumental analysis in biotechnology	3
BT5005	Selected topics in biotechnology	3
IN5058	Design and analysis of experiments	3
		9

Third Semester

Code	Name	CA
GI5007	Thesis I	3
OP5042	Optative I	3
OP5043	Optative II	3
		9

Fourth Semester

Code	Name	CA
GI5008	Thesis II	3
OP5044	Optative III	3
OP5045	Optative IV	3
		9

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

MCC Master in Computer Science

Justification

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

- Specialists in the productive sector.
- Academics with up-to-date knowledge.
- Research and technological development.

The graduate of the program is a professional who can not only follow the rapid technological advance, but also contributes with innovative proposals in the field of computer sciences and thus respond to the great challenges of today's world.

Graduates of the Master in Computer Science will be able to transfer solutions of particular problems to general concepts or methodologies, and apply general concepts of computing to the specific solution of problems encountered in the business and research field, being able to carry out, if desired, doctoral studies in computer science.

Objetivos Generales del Programa

The objectives of this master's degree are:

- To train successful specialists in Computer Science capable of contributing to the solution of problems in the productive environment and/or research.
- To develop professionals capable of working effectively and collaboratively in multi-disciplinary working groups.
- To train leaders who function as agents of change in their field of work.
- To train innovative and entrepreneurial professionals capable of generating patents, products and technology-based companies.
- To develop talent capable of adapting to technological and methodological changes in Computer Science.

Graduate profile

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

- Master and correctly apply cutting-edge technologies and methodologies in Computer Science.
- Self-learning on an ongoing basis and adapting to new environments.

- Work collaboratively in multi-disciplinary teams.
- Develop scientific and practical research projects.
- Work with a culture of innovation and patent development for the development of technology-based companies.
- Communicate effectively orally and in writing in English.

Depending on the area of specialization chosen, the student will also be able to:

- Analyze, model, and develop computational systems capable of representing real agents in virtual worlds. You will be an expert in the creation of computational images with application to the entertainment industry, modeling, video games, exploration, among others.
- Develop intelligent computer systems that can be applied to the solution of various problems such as: process optimization, intelligent information search, development of control, diagnosis and supervision systems.
- Analyze, model, design, and maintain computer networks using cutting-edge technologies. You will be an expert in the design and operation of distributed systems, high-performance computing, and security.
- Design, develop, and evaluate software in industries that require it using modern software development methodologies and advanced programming languages.

Target audience

- Computer science professionals, whether practitioners, consultants, instructors or researchers who wish to deepen or update their knowledge in the theory and techniques of this field.
- Professionals in related areas (electronics, electrical, communications, mathematics, physics and other professionals who prove their basic knowledge to successfully carry out their master's studies), who wish to complement their training, educating themselves in the area of computer science.

Lines of research

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

**MCC Master in Computer Science
2009 Plan**

Remedial Semester

Code	Name	CA
TC4000	Programming techniques	3
		3

First Semester

Code	Name	CA
GT4000	Research and innovation methods	1.5
IA4000	Intelligent systems	3
OP4000	Seal Course	1.5
TC4001	Fundamentals of Computing	3
TC4002	Software Analysis, Design & Construction	3
		12

Second Semester

Code	Name	CA
GT5000	Thesis I	3
OP5042	Optative I	3
OP5043	Optative II	3
TC4003	Distributed Systems	3
		12

Third Semester

Code	Name	CA
GT5001	Thesis II	3
OP5044	Optative III	3
OP5045	Optative IV	3
OP5046	Optative V	3
		12

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

MCC-I Master in Computer Science

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 achieving a manufacturing industrial sector of global relevance. On an ongoing basis, companies in this sector require information and computer technology capabilities that support their strategies to improve their product offering, consolidation and competitiveness, without neglecting social and environmental responsibility.

Program Objective

To train professionals for industry and academia, who, as agents of change, are capable of doing applied research, technological development, innovation, and technology transfer, in the fields of computer science.

Entry profile and Target audience

The master's program in Computer Science is aimed at professionals in the areas of computer science, engineering and exact sciences mainly, interested in conducting high-impact research, to contribute to the knowledge of one of the Specialization areas of Computer Science. Students who enter this program must have an excellent academic record, a vocation in the generation of knowledge, fluency in communication, work professionally under strict ethical standards, be open to new ways of assimilating knowledge and professional practice and be intellectually curious.

Graduate profile

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

- Demonstrate a high level of theoretical and methodological knowledge of Computer Science in any professional situation.
- Carry out research in their area of Specialization that provides knowledge of relevance to the advancement of Computer Science.
- Communicate the results of their professional work clearly, effectively and efficiently.
- Work in the professional community of their area of expertise with leadership in an efficient, collaborative, and ethical manner.

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

First Semester

Code	Name	CA
CS4000	Intelligent systems	3
CS4012	Fundamentals of Computing	3
GI5000	Research and innovation methods	1.5
OP4000	Seal Course	1.5
		9

Second Semester

Code	Name	CA
CS4013	Machine learning	3
CS4014	Applied mathematics	3
CS5058	Thesis I	3
		9

Third Semester

Code	Name	CA
CS5059	Thesis II	3
OP5042	Optative I	3
OP5043	Optative II	3
		9

Fourth Semester

Code	Name	CA
CS5060	Thesis III	3
OP5044	Optative III	3
OP5045	Optative IV	3
		9

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

MCI Master in Engineering Science

Objetivo

The general objective of this program is to train professionals, 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.

Graduate competencies

During the duration of the program, students will have the opportunity not only to interact with distinguished professors in the program's lines of research and who have extensive research training, but also to interact with students from the different lines and students from other graduate programs at Tecnológico de Monterrey. This richness of interactions is one of the great strengths of this master's program. This program is designed to provide the student with the preparation and competencies necessary to become a leading researcher in Engineering Sciences. Therefore, the student upon graduating from the program will be able to:

Conceptual competencies

- Show a high level of basic knowledge in fundamental areas of engineering including, but not limited to, mathematics, statistics, and computing.
- Master the theoretical and methodological knowledge of Engineering Sciences in any professional situation.

Procedural competences

- Model engineering problems using appropriate mathematical language.
- Carry out research in their area of specialization that provides new knowledge of relevance to 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 the results of their professional work clearly, effectively and efficiently.

Attitudinal competencies

- Work in the professional community of their area of expertise with leadership in an efficient, collaborative, and ethical manner.
- Have a proactive and creative attitude towards undocumented problems, being able to generate innovations to the extent that the problem requires it.

Applicant profile

Professionals in the areas of engineering and exact sciences interested in conducting high-impact research, to contribute to the knowledge of one of the Specialization areas of Engineering Sciences. Students who enter this program must have an excellent academic record, a vocation in the generation of knowledge, fluency in communication, work professionally under strict ethical standards, be open to new ways of assimilating knowledge and professional practice and be intellectually curious.

**MCI Master in Engineering Science
Plan 2017**

First Semester

Code	Name	CA
CS4015	Applied Computing	3
F4005	Mathematical Physical Modeling	3
GI5000	Research and innovation methods	1.5
OP4000	Seal Course	1.5
		9

Second Semester

Code	Name	CA
GI5025	Thesis I	3
IN4027	Data Science and Statistical Inference	3
OP5042	Optative I	3
		9

Third Semester

Code	Name	CA
GI5026	Thesis II	3
OP5043	Optative II	3
OP5044	Optative III	3
		9

Fourth Semester

Code	Name	CA
GI5027	Thesis III	3
OP5045	Optative IV	3
OP5046	Optative V	3
		9

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

MCY Master in Cybersecurity

Objetivo

The general objective of this program is to train professionals, agents of change in organizations who are capable of innovation, technological development, technology transfer in the areas of cybersecurity. As well as leading and managing a cybersecurity office.

Graduate competencies

During the duration of the program, students will have the opportunity not only to interact with distinguished consultants in the program's Specialization areas and who have extensive training in innovation, but also to interact with students from different lines and students from other graduate programs at Tecnológico de Monterrey. This richness of interactions is one of the great strengths of this master's program. This program is designed to provide the student with the preparation and competencies necessary to become a leading innovator in cybersecurity. Therefore, the student upon graduating from the program will be able to:

Conceptual competencies

Show a high level of basic knowledge in fundamental areas of cybersecurity including, but not limited to, architecture, management, and operation.

Master efficient and effective methodologies to protect an organization's data, information, and knowledge.

Procedural competences

Analyze cybersecurity issues using appropriate reference models.

Carry out innovation in their area of specialization that provides new knowledge of relevance to the advancement of Cybersecurity.

Develop solutions to cybersecurity problems using technological tools. Communicate the results of their professional work clearly, effectively and efficiently.

Attitudinal competencies

Work in the professional community of their area of expertise with leadership in an efficient, collaborative, and ethical manner.

Have a proactive and creative attitude towards undocumented problems, being able to generate innovations to the extent that the problem requires it.

Target audience

The Master in Cybersecurity is aimed at graduates of professional careers in the areas of engineering or sciences who have experience in professional engineering work, specifically in information technologies and telecommunications. tecnologías de la información y telecomunicaciones.

Admission profile

Students entering this program must have solid knowledge in the area of computer science, coding and programming, data networks, communications, protocols, operating systems and computer processes. In addition, they must have an excellent academic background, a vocation in the application of knowledge, fluency in their communication, that they work professionally under strict ethical standards, that they are open to new ways of assimilating knowledge and professional practice and that they are intellectually curious, qualities that will be evaluated through a letter of reasons for entering the program and an interview with the program director.

MCY Master in Cybersecurity 2019 Plan

First Trimester

Code	Name	CA
OP4046	Seal Course	3
TI4020	Cybersecurity Frameworks	3
TI4021	Functional structure of cybersecurity in organizations	3
		9

Second Trimester

Code	Name	CA
TC4020	Cybersecurity operations	3
TI4023	Data protection management	3
TI4024	Innovation in cybersecurity technology	3
		9

Third Trimester

Code	Name	CA
OP5085	Optative I	3
TC5028	Cybersecurity Project	3
TI4025	Innovation and leadership in cybersecurity management	3
		9

Fourth Trimester

Code	Name	CA
OP5086	Optative II	3
OP5087	Optative III	3
OP5088	Optative IV	3
		9

Fifth Trimester

Code	Name	CA
OP5089	Optative V	3
TC5029	Enterprise Cybersecurity Project	3
		6

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

MCY-M Master in Cybersecurity (Mixed Program)

Objetivo

The general objective of this program is to train professionals, agents of change in organizations who are capable of innovation, technological development, technology transfer in the areas of cybersecurity. As well as leading and managing a cybersecurity office.

Competencias del egresado

During the duration of the program, students will have the opportunity not only to interact with distinguished consultants in the program's Specialization areas and who have extensive training in innovation, but also to interact with students from different lines and students from other graduate programs at Tecnológico de Monterrey. This richness of interactions is one of the great strengths of this master's program. This program is designed to provide the student with the preparation and competencies necessary to become a leading innovator in cybersecurity. Therefore, the student upon graduating from the program will be able to:

Conceptual competencies

Show a high level of basic knowledge in fundamental areas of cybersecurity including, but not limited to, architecture, management, and operation.

Master efficient and effective methodologies to protect an organization's data, information, and knowledge.

Procedural competences

Analyze cybersecurity issues using appropriate reference models.

Carry out innovation in their area of specialization that provides new knowledge of relevance to the advancement of Cybersecurity.

Develop solutions to cybersecurity problems using technological tools. Communicate the results of their professional work clearly, effectively and efficiently.

Attitudinal competencies

Work in the professional community of their area of expertise with leadership in an efficient, collaborative, and ethical manner.

Have a proactive and creative attitude towards undocumented problems, being able to generate innovations to the extent that the problem requires it.

Target audience

The Master in Cybersecurity is aimed at graduates of professional careers in the areas of engineering or sciences who have experience in professional engineering work, specifically in information technologies and telecommunications.

Admission profile

Students entering this program must have solid knowledge in the area of computer science, coding and programming, data networks, communications, protocols, operating systems and computer processes. In addition, they must have an excellent academic background, a vocation in the application of knowledge, fluency in their communication, that they work professionally under strict ethical standards, that they are open to new ways of assimilating knowledge and professional practice and that they are intellectually curious, qualities that will be evaluated through a letter of reasons for entering the program and an interview with the program director.

MCY-M Master in Cybersecurity (Mixed Program)
2020 Plan

First Trimester

Code	Name	CA
OP4046	Seal Course	3
TI4020	Cybersecurity Frameworks	3
TI4021	Functional structure of cybersecurity in organizations	3
		9

Second Trimester

Code	Name	CA
TC4020	Cybersecurity operations	3
TI4023	Data protection management	3
TI4024	Innovation in cybersecurity technology	3
		9

Third Trimester

Code	Name	CA
OP5085	Optative I	3
TC5028	Cybersecurity Project	3
TI4025	Innovation and leadership in cybersecurity management	3
		9

Fourth Trimester

Code	Name	CA
OP5086	Optative II	3
OP5087	Optative III	3
OP5088	Optative IV	3
		9

Fifth Trimester

Code	Name	CA
OP5089	Optative V	3
TC5029	Enterprise Cybersecurity Project	3
		6

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

MEM Master in Engineering Management

Justification

There is a growing interest in the industry for engineers who effectively direct, identify, and execute projects, considering legal, ethical, leadership, innovation, and sustainable development principles. This is even more observed in large and/or transnational companies that also require engineers to be trained to be project leaders, with a mixture of deep technical knowledge and soft skills.

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

The Master in Engineering Management is presented, as an option, among the related programs that Tecnológico de Monterrey currently has, which focuses on different areas of engineering, with the main objective of developing leaders and project managers, specialists in their area of knowledge.

This postgraduate program is designed for graduates of engineering and science careers, where the objective is for the student to know and apply technological tools that help them direct and lead projects, responding to particular needs of the industry, thus supporting the technological and economic development of the country, also strengthening the company-university link.

As part of the program, the student will carry out a project that solves a real need or problem of a company, where the knowledge and skills promoted by the program are applied and developed, which will constitute a graduation requirement.

Program Objectives

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

Graduate profile

During the duration of the program, students will have the opportunity not only to interact with distinguished professors in the program's Specialization areas, and who also have extensive experience in solving engineering problems in industry, but also to interact with students from different Specialization areas, who work or have worked in small or multinational companies from different regions of the country. This richness of interactions is one of the great strengths of this master's program. This program is designed to provide students with the preparation and competencies necessary to become a leading professional in engineering.

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

- Have directed high-impact engineering projects.

- Be a leader in the technical or engineering area of multinational companies.
- Have directed consulting projects in administration and management of engineering projects in their area of Specialization.

In addition, upon graduating from the program, the student will be able to:

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

Target audience

The Master in Science in Engineering Management is aimed at graduates of an undergraduate science or engineering program who have a strong interest in developing engineering skills in project management and business code processes, technology management, or entrepreneurship. It is also aimed at future technological leaders in industrial management, high technology management, R+D or business management with high technology and start-ups.

In the same way, this program is aimed at professionals in the engineering area who require in their areas of work, to identify critical problems, generate solutions, evaluate alternatives, make decisions, and implement actions, leading multidisciplinary teams.

Areas of concentration

Information Technology

In this specialization we will train students with skills to develop technological foresight, detect the life cycle of technology (processes and products), analyze trends in the markets and design technological strategies in addition to identifying business opportunities, organizing engineering teams and being a liaison between engineering, administrative and commercial teams. Graduates are innovative leaders committed to their community.

Optimisation

In this Specialization, we will train students with skills to analyze and solve problems where it is necessary to maximize profits or minimize costs, or some other variable or critical factor of the company, through the use of mathematical tools, involving the different areas of influence in the problem or area of opportunity.

Data Science

In this Specialization, we will train students with skills to analyze and solve problems that require intense statistical analysis of information and where hypothesis testing, experiment designs, regression analysis,

process capacity analysis, statistical data control, or the application of any other statistical engineering tool are required.

Supply Chain & Logistics

In this Specialization, we will train students with skills to analyze and solve problems associated with Supply Chain Management and/or Logistics, demand management problems, product distribution, storage and inventories, manufacturing flow management, among others.

**MEM Master in Engineering Management
2016 Plan**

First Trimester

Code	Name	CA
IN4029	Engineering Project Management	3
IN4030	Financial analysis for innovation and technology projects	1.5
IN5111	Project Design I	1.5
OP4036	Seal Course	3
		9

Second Trimester

Code	Name	CA
IN4028	Statistical methods and visualization	3
IN4031	Economic Analysis for Business	1.5
IN4032	Risk Analysis in Project Management	1.5
IN4033	Innovation and product development	1.5
IN5112	Project Design II	1.5
		9

Third Trimester

Code	Name	CA
IN4034	Legal aspects in engineering management	1.5
IN5121	Business Innovation Project I	1.5
OP5053	Optative I	3
OP5054	Optative II	3
		9

Fourth Trimester

Code	Name	CA
IN5122	Business Innovation Project II	1.5
IN5123	Business Innovation Project III	1.5
IN5124	Business Innovation Project IV	1.5
IN5125	Business Innovation Project V	1.5
OP5055	Optative III	3
		9

Fifth Trimester

Code	Name	CA
IN5126	Business Innovation Project VI	1.5
IN5127	Business Innovation Project VII	1.5
OP5056	Optative IV	3
		6

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

MER-V Master in Energy Management and Renewable Sources

(Online Program)

Justification

The development of countries requires that the management of services and the use of energy be guaranteed in a context of sustainable development. To achieve this, it is necessary to innovate in energy management, give preference to the conservation of non-renewable energy resources and favor the use of alternative sources of energy.

General Objectives of the Program

- To train professionals capable of optimizing the use of energy, both in the private and public sectors.
- To train qualified professionals for energy management, including the use of alternative and conventional sources.

Graduate profile

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

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

Target audience

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

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

Remedial Semester

Code	Name	CA
IQ4002	Fundamentals for Energy Analysis	3
		3

First Semester

Code	Name	CA
EC4010	Economic valuation of the environment	3
OP4037	Seal Course	3
		6

Second Semester

Code	Name	CA
OP5042	Optative I	3
TE4014	Industrial applications of renewable energy	3
TE4015	Efficient management and use of electrical energy	3
		9

Third Semester

Code	Name	CA
OP5043	Optative II	3
TE4011	Cogeneration and alternative energy sources	3
TE4016	Energy Legislation and Financing	3
		9

Fourth Semester

Code	Name	CA
GI5010	Research and innovation methods	3
OP5044	Optative III	3
		6

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

MID-V Master in Innovation for Enterprise Development

(Online Program)

Justification

Innovation is a decisive capacity for companies that are in constant competition to attract more customers, delivering products and services with high added value. In the absence of innovations, companies could find themselves lagging behind in increasingly dynamic and competitive business environments. Innovation confers advantages to companies that seek to maintain a high level of performance in current and emerging industries, in a context in which the technological revolution has placed us at the gates of a new era, that of Industry 4.0 and the consequent transformation that it will imply for organizations.

The Master in Innovation for Business Development (MID) develops in a professional skills to propose original ideas and projects, applying the appropriate techniques and methodologies, to develop innovative solutions and ventures with high added value. It also develops the competencies of these professionals to manage the mobilization of resources for entrepreneurship and the promotion of the necessary changes to transform the culture of organizations into a culture oriented to innovation.

Target audience

The program is aimed at:

- Professionals from different areas interested in developing the necessary skills to promote innovation in organizations.
- Professionals who seek to make their innovative ideas a reality in ventures that generate high added value in both current and emerging industries.

Program objectives

The Master in Innovation for Business Development is a program that aims to train professionals:

- That they are promoters of innovation in their area of responsibility.
- That they develop, visualize, generate and propose original ideas and projects in ventures that generate high added value in current and emerging industries.
- That they integrate interdisciplinary teams managing the mobilization of resources for their realization.
- That they carry out projects on their own initiative, committing certain resources in order to exploit an opportunity, and assuming the risk that this entails.

Learning Outcomes

Once they have completed their studies, the graduate will be able to:

- Generate original and quality ideas, which can be expressed in a formal way and defended in both known and emerging situations and/or problems.
- Propose changes and solutions to given situations and/or problems, based on methodologies appropriate to the relevant context.
- Carrying out projects on their own initiative, committing certain resources in order to exploit an opportunity, and assuming the risk that this entails.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

**MID-V Master in Innovation for Enterprise Development (Online Program)
2021 Plan**

First Trimester

Code	Name	CA
IN4038	Creativity and Design Thinking	3
IN4039	Strategy, innovation and leadership	3
		6

Second Trimester

Code	Name	CA
IN4040	Innovation models and processes	3
IN4041	Intellectual Property Strategies	1.5
IN4042	Analysis and financial impact for innovation and technology projects	1.5
		6

Third Trimester

Code	Name	CA
IN4043	Project Management	3
OP5085	Optative I	3
		6

Fourth Trimester

Code	Name	CA
IN4044	Product and service development	3
OP5086	Optative II	3
		6

Fifth Trimester

Code	Name	CA
OP4046	Seal Course	3
OP5087	Optative III	3
		6

Sixth Trimester

Code	Name	CA
IN5128	Innovation Project I	3
OP5088	Optative IV	3
		6

Seventh Trimester

Code	Name	CA
IN5129	Innovation Project II	3
OP5089	Optative V	3
		9

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

MIE Master in Science with a Specialization in Energy Engineering

Justification

Mexico's technological, social and economic development requires that the country's energy services be guaranteed in a context of sustainable development, which must give preference to the conservation of non-renewable energy resources and favor the use of alternative sources of energy.

Energy has become one of the most important inputs to guarantee the competitiveness of companies in an international context of high competition. The study of the Efficient Use of it in its thermal, electrical, gas, wind, solar and green fuel alternatives, requires engineers with extensive training in many areas of engineering sciences (Electrical, Electronics, Physics, Mechanical, Thermal and Chemical) capable of understanding the different processes and proposing innovative solutions.

The Master in Science with a Specialization in Energy Engineering (MIE) allows its students to acquire a solid training in the fundamentals of engineering and become an expert according to their area of concentration in topics such as: Quality and Efficient Use of Electrical and Thermal Energy; Design of Efficient Industrial Electrical Systems; Boilers and Combined Cycle Power Generation; Electronic Power Control applied to: Electrical Systems, Converters for Wind Generators, Photovoltaic and Transport Systems, Hybrid Cars and Flexible Electricity Grids (Smart Grids, FACTS, SVCs, etc.); Generation, Conversion and Distribution of Wind and Solar Energy; Efficient Buildings and Homes: Lighting and Air Conditioning; Regulation and Financing of Energy Resources and Environmental Impact of Energies.

General objectives of the programme

- To train highly qualified professionals in issues relevant to the conversion, transmission, distribution, storage, conservation and efficient use of energy, including clean and renewable sources.
- To develop professionals capable in the technical aspects of the area and motivated to keep themselves permanently updated in order to solve current problems and apply engineering to the problems that arise in the future.
- To train professionals interested in applied research and technological development activities, solving relevant problems in the energy area through subjects with updated content and a strategic vision of the technological evolutions of the energy area.

Graduate profile

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

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

- Evaluate the different alternative sources of energy and ensure the good management of the energy resources necessary for adequate sustainable development.
- Understand the impacts of energy sector technologies on the environment.
- To explore promising new alternatives in the energy area, taking into account the economic limitations, current regulations, and sensitive to the country's sustainable development needs.

Target audience

Energy Engineers, Chemical Engineers, Electrical Engineers, Mechanical Engineers or Physical Engineers. In special cases, students from other areas of engineering may be received who can prove that they have sufficient knowledge or are willing to take additional subjects to acquire it.

Lines of research

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

MIE Master in Science with a Specialization in Energy Engineering 2009 Plan

First Semester

Code	Name	CA
GI5000	Research and innovation methods	1.5
OP4000	Seal Course	1.5
OP4006	Basic Optative I	3
TE4010	Efficient use of electrical energy	3
		9

Second Semester

Code	Name	CA
OP4007	Basic Optative II	3
OP5042	Optative I	3
TE4011	Cogeneration and alternative energy sources	3
		9

Third Semester

Code	Name	CA
GI5007	Thesis I	3
OP5043	Optative II	3
TE4012	Regulation and financing of energy resources	3
		9

Fourth Semester

Code	Name	CA
GI5008	Thesis II	3
OP5044	Optative III	3
OP5045	Optative IV	3
		9

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

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

Justification

Among the challenges offered by organizations, currently can be included the identification of strategic partners at a global level, competitiveness in the globalization of markets, energy costs and market demands, as well as the increase in the complexity of organizations. Therefore, the Master's program in Engineering with a Specialization in Quality and Productivity Systems is justified, given the needs of the environment, contributing to the efficient use of resources in the areas of supply chain, quality and continuous improvement, engineering management, optimization and production systems; considering sustainability aspects from a global, integrative and collaborative perspective.

Objetivos Generales del Programa

The Master in Engineering with a Specialization in Quality and Productivity Systems contributes decisively to the development of 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. This is achieved through the preparation of professionals with skills and knowledge to:

- Organize the participation of the human element and use or create new approaches that allow improving quality and integral productivity in manufacturing or service organizations. As well as the ability to promote the strategic and efficient participation of organizational and technological resources.
- Contribute to the competitiveness and innovation of your company through the following factors: growth in your market share, increase in profits, decrease in costs and improvement in user perception.
- Apply new methodologies, improve existing systems and exercise leadership aimed at driving the change process and its consequent implementation.
- Have a solid background to develop a managerial career in areas such as quality, engineering management, statistical engineering, production systems and logistics.

Graduate profile

Graduates of the program will be able to plan, design, implement, control and improve systems integrated by human, administrative and technological factors, in the search for a better competitive position of organizations. For this, the specialist in Quality and Productivity Systems is based on the knowledge and skills acquired in quality management and engineering, improvement of production systems and statistical engineering.

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

- Design, manage, evaluate and improve management systems for service and production areas based on principles and philosophies of quality, innovation and competitiveness.
- Design, manage, execute, and evaluate experimental processes that generate tangible solutions for the

optimization of operations.

- To lead in an integral way the process of continuous improvement and innovation in the production systems of a company that allow it to be more competitive.

- Design, manage, evaluate and improve production systems based on contemporary principles and philosophies of production and manufacturing, supported by the use of statistical and process optimization tools.

- Integrate the participation of human resources as a Code element in the operation of organizational management and production processes, as well as the efficient administration of organizational and technological resources.

Target audience

Graduates of professional careers either engineering or bachelor's degree, with knowledge of probability and statistics and operations research.

MIP-V Master in Engineering with specialization in Quality Systems and Productivity
(Online Program)
2013 Plan

First Semester

Code	Name	CA
OP4006	Basic Optative I	3
OP4007	Basic Optative II	3
OP4037	Seal Course	3
		9

Second Semester

Code	Name	CA
IN4017	Production Engineering	3
IN4018	Supply Chain Management	3
IN4019	Quality and competitiveness	3
OP5042	Optative I	3
		12

Third Semester

Code	Name	CA
GI5010	Research and innovation methods	3
OP5043	Optative II	3
OP5044	Optative III	3
		9

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

MIR Master in Automotive Engineering

Justification

Mexico has remained one of the leading countries in vehicle production, in 2007 Mexico ranked 11th (OICA). The terminal companies located in Mexico and in order of production volume are: General Motors, Nissan, Ford, VW, Chrysler, Honda and Renault. The participation of these companies is increasing, according to the AMIA (Mexican Association of the Automotive Industry) in the last three years (2005-2007) about 9,000 million dollars have been invested and in 2007 there was a production of 2,022,241 vehicles against a total domestic sale of 1,099,866 vehicles. In 2007, the national export of auto parts reached 15,563 million dollars, according to data from the INA (National Auto Parts Industry). Due to 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 among the leading manufacturing activities, going from employing around 170,000 people in 1994 to approximately 537,000 in 2006 (INEGI).

Currently, Tecnológico de Monterrey has strong relations with the automotive industry through technological and scientific development programs through its Center for Research in Automotive Mechatronics (CIMA) and the Center for the Development of the Automotive Industry of Mexico (CeDIAM). In addition, there is the Chair in Automotive Engineering belonging to CIMA and whose lines of research are the same as the areas of concentration of the postgraduate program.

Objetivos generales del programa

- To train leaders for the design and improvement of automotive systems, contributing to technological development in the mechanical aspects of design and manufacturing, electronics and power systems of automotive vehicles.
- To train professionals who carry out engineering or research projects that allow the development of technology and/or knowledge in areas of automotive engineering.
- Through the development of its graduates Promote the creation of companies focused on service, manufacturing or technical consulting related to the automotive industry.
- To train professionals in a position to successfully carry out further studies in specific areas of knowledge in relation to mechanical design, advanced manufacturing, electronics and power systems.

Graduate profile

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

- Develop multidisciplinary engineering projects for the solution of industrial problems through the generation, integration or innovation of technologies in the areas of automotive design and manufacturing, vehicle instrumentation systems, optimization of production means and performance of vehicle power systems.

- Actively participate in the development of industrial or research work in national and international collaborative networks.
- Design strategies and processes focused on increasing the competitiveness of existing companies by optimizing production systems, instrumentation, logistics and product life cycle.

Target audience

The program is aimed at mechanical, mechatronic, electronic and industrial engineers.

Lines of research

- Automotive design and manufacturing.
- Power generation and control.
- Manufacturing address.

**MIR Master in Automotive Engineering
2009 Plan**

Remedial Semester

Code	Name	CA
M1002	Computer Drawing	3
		3

First Semester

Code	Name	CA
GI5000	Research and innovation methods	1.5
M4008	Product Design	3
OP4000	Seal Course	1.5
OP4006	Basic Optative I	3
TE4001	Instrumentation	3
		12

Second Semester

Code	Name	CA
M4011	Internal combustion engines	3
M5047	Integrative project I	3
OP5042	Optative I	3
OP5043	Optative II	3
		12

Third Semester

Code	Name	CA
M5048	Integrative project II	3
OP5044	Optative III	3
OP5045	Optative IV	3
OP5046	Optative V	3
		12

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

MNA-V Master in Applied Artificial Intelligence

Justification

Nowadays, any type of company, large or small, traditional or virtual, demands professionals with specialized knowledge in the areas of data science, software engineering and business intelligence. In the same way, the emerging Industry 4.0 is increasingly demanding specialists to support the great diversity of new technologies, among which we can highlight the Internet of Things (IoT) and autonomous mobility. However, cutting-edge knowledge and technologies in recent years have shown that intelligent and cutting-edge solutions to the real problems that companies face daily in each of these issues are enriched and enhanced by framing them within the area of Artificial Intelligence (AI). In other words, the solutions to today's problems will not be in line with our times without the support of AI.

In this context, within the postgraduate programs linked to industry, the (MNA-V) Master in Applied Artificial Intelligence is an educational alternative that arises as a response to the need of local, national and international companies to have postgraduate professionals specialized in the areas of data science, intelligent software, autonomous mobility and business strategy. All of them framed with a solid AI component that enriches the solutions to their problems, helping in their transition to consolidate themselves as an Industry 4.0 and in support of the construction of a smart city.

Target audience

The (MNA-V) Master in Applied Artificial Intelligence program is aimed at:

- Professionals from any area interested in acquiring solid knowledge of AI as a means to consolidate and transform their company through solutions based on emerging technologies, helping in decision-making and business intelligence.
- Professionals interested in designing and proposing intelligent and innovative solutions supported by studies and analysis through data science, intelligent software, autonomous mobility or a network of sensors, underpinning the competitiveness and leadership of organizations.
- Professionals in the engineering area who want to delve into solutions based on emerging technologies and supported by artificial intelligence to transform the processes and activities of the organization.

Program Objective

To train professionals who are agents of change in organizations, who carry out innovation, technological development and technology transfer through solutions based on artificial intelligence and emerging technologies.

Learning Outcomes

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

- Demonstrate and use a high level of knowledge and business intelligence, through the use of intelligent algorithms, to propose solutions to real and complex problems that arise in companies.
- Analyze, manage, direct and propose solutions to processes and problems that come from areas such as: software engineering, smart manufacturing, autonomous mobility and in general any process that arises from a company with technologies involved in Industry 4.0.
- Communicate clearly, effectively and efficiently the results of their professional work orally, in writing and through data visualization. This effective and contextualized communication must be applicable when informing both colleagues in their work group, as well as their superiors or clients.
- Work in the professional community of their area of expertise with leadership in an efficient, collaborative, and ethical manner.

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Admission Test to Postgraduate Studies (PAEP).
- The general average of grades of professional level studies.

**MNA-V Master in Applied Artificial Intelligence (Online Program)
2021 Plan**

First Trimester

Code	Name	CA
OP5085	Optative I	3
TC4029	Data Science & Analytics	3
TC5032	Data Visualization	3
		9

Second Trimester

Code	Name	CA
OP5086	Optative II	3
TC4030	Artificial Intelligence and Machine Learning	3
TE4017	Internet of Things and Sensor Networks	3
		9

Third Trimester

Code	Name	CA
OP4046	Seal Course	3
OP5087	Optative III	3
OP5088	Optative IV	3
		9

Fourth Trimester

Code	Name	CA
OP5089	Optative V	3
OP5096	Optative VI	3
OP5097	Optative VII	3
		9

Fifth Trimester

Code	Name	CA
OP5098	Optative VIII	3
TC5035	Integrative project	3
		6

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

MNT Master in Nanotechnology

Descripción

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 achieving an industrial sector of global relevance. To take advantage of these characteristics, this Nanotechnology program has been developed that will help the creation and application of knowledge in the areas of materials sciences at the nanoscale.

Program Objective

This program aims to train specialists who carry out high-impact research, to contribute to the knowledge of one of the Specialization areas of Nanotechnology.

Admission profile and Target audience

The master's program in Nanotechnology is aimed at professionals in the areas of engineering and natural and exact sciences, mainly interested in carrying out high-impact research, to contribute to the knowledge of one of the areas of Specialization of Nanotechnology. Students who enter this program must have an excellent academic record, a vocation in the generation of knowledge, fluency in communication, work professionally under strict ethical standards, be open to new ways of assimilating knowledge and professional practice and be intellectually curious.

Graduate profile

The Master's program in Nanotechnology trains professionals capable of:

- To know and analyse the intelligent materials (shape memory alloys, magnet and electro-rheological fluids, piezoelectric crystals, among others) commonly used in industry and their principles of behaviour.
- To carry out applied research, technological development, innovation, and technology transfer in the fields of nanotechnology.
- Demonstrate a high level of theoretical and methodological knowledge of nanotechnology in any professional situation.
- Communicate the results of their professional work clearly, effectively and efficiently.
- Work in the professional community of their area of expertise with leadership in an efficient, collaborative, and ethical manner.

MNT Master in Nanotechnology 2016 Plan

First Semester

Code	Name	CA
F4002	Computer simulations	3
GI5000	Research and innovation methods	1.5
MA4007	Partial Differential Equations	3
OP4000	Seal Course	1.5
		9

Second Semester

Code	Name	CA
MA4009	Statistical methods	3
NT5011	Thesis I	3
Q4001	Thermodynamics of materials	3
		9

Third Semester

Code	Name	CA
NT5012	Thesis II	3
OP5042	Optative I	3
OP5043	Optative II	3
		9

Fourth Semester

Code	Name	CA
NT5013	Thesis III	3
OP5044	Optative III	3
OP5045	Optative IV	3
		9

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

MOI Master in Industrial Engineering

Justification

In global and highly competitive companies, the areas of project management and supply chain constitute a differentiating factor and, to a large extent, the enabling element of such competitiveness and their capacity for innovation. The knowledge required for mastery of this area changes very rapidly; There is a proliferation of both software and hardware products as a result of new theories, methods and techniques, directly impacting activities increasing value in organizations. These advances result in a very high obsolescence rate in the area, which leads to a significant demand for human resources with an international profile capable of assimilating, evaluating, transferring and integrating new advances in the development of new products and services for the areas of project management and supply chain management in accordance with the requirements of their time.

In this sense, the training of specialized professionals who respond to the needs in the areas of project management and supply chain becomes a priority. Tecnológico de Monterrey, concerned about these demands, has launched various academic actions aimed at responding to the needs enunciated. An example of this dynamism is the Master in Industrial Engineering (MOI); Academic program that aims to strengthen the professional competitiveness of its graduates and promote the new role of these expert professionals in project management and supply chain in society. It is an academic program that is differentiated, efficient, flexible, and totally aligned with the Mission of Tecnológico de Monterrey.

Program objectives

The training of graduates who design, implement and manage solutions that involve the use of Industrial Engineering in the different aspects of organizations and companies. In addition, it has the following specific objectives:

- To train highly qualified professionals with a broad concept to manage, evaluate and program projects, with a medium and long-term vision for the development and implementation of project plans.
- To train highly qualified professionals who contribute to improving the competitiveness of an organization through innovations in supply chain management; Optimize an organization's logistics and supply chain processes through technological and administrative innovations.

Graduate profile

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

- Apply methodologies for business innovation.
- Apply quantitative techniques and tools for scheduling time and resources for projects, including the application of specialized project scheduling management software.
- Support the strategic and efficient management of organizational and technological resources in the supply chain.

- Design, manage, evaluate and improve global production systems.
- Address the pressing need for environmental conservation by proposing new ways to address return flows in production.

Target audience

Professionals who wish to support the transformation of organizations through knowledge of tools for project management and supply chain management in their strategic, business, operations, transportation, and warehouse areas. Professionals in the areas of projects and supply chain, whether interns, consultants or instructors who wish to deepen, update or strengthen their knowledge in the various areas of expertise.

Lines of application of knowledge

The lines of application of the MOI knowledge are:

- Project management.
- Supply chain.

**MOI Master in Industrial Engineering
2013 Plan**

First Trimester

Code	Name	CA
AD4004	Competitive strategy, design and modeling of the organization	3
AD5034	Project Management and Administration	3
OP4036	Seal Course	3
		9

Second Trimester

Code	Name	CA
AD4001	Statistics in organizations	3
AD5003	Value creation, business models and networks	3
FZ5011	Evaluation of investment and economic engineering projects	3
		9

Third Trimester

Code	Name	CA
IN5096	Transportation and Outsourcing	3
OP5053	Optative I	3
OP5054	Optative II	3
		9

Fourth Trimester

Code	Name	CA
OP5055	Optative III	3
OP5056	Optative IV	3
OP5057	Optative V	3
		9

Fifth Trimester

Code	Name	CA
IN5101	Integrative project	3
OP5058	Optative VI	3
		6

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

MSE-E Master in Science with a major in Electronic Engineering (Electronic Systems)

Justification

The greatest growth at the national and global level, both in investment and services, is taking place in information and communication technologies; Likewise, every national development plan includes information and communication technologies as a basis for achieving the goals set. The demand for specialized and secure communications services, coupled with the need for miniaturized programmable electronic devices is exponential worldwide. This sets a clear trend in the importance of microelectronics, digital signal processing, communications, embedded systems, communications networks, high-speed and broadband technologies, multimedia services, radio frequency identification, etc. No one should be left out of this revolution since it would mark a technological dependence that would represent a delay in the development of the country. This trend determines the need to produce highly prepared people with cutting-edge knowledge in these areas with an innovative and entrepreneurial attitude to guide the country with leadership. The MSE-E program prepares masters of science in the areas of microelectronics, microsystems, embedded systems, and optical engineering for the design, analysis, and implementation of systems on a chip that allow innovative solutions tailored to applications to be brought to market.

Objetivos Generales del Programa

- To train professionals who are innovators and leaders in the areas of microelectronic design, microsystems, embedded software (firmware), optical engineering and power electronics.
- To train professionals capable of designing and developing products or services using electronic technology, software and communications considering the frequent advances in technology.
- To train professionals capable of designing and developing the technological infrastructure necessary to allow the development of these products and services.

Graduate profile

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

- Design, model, and implement microsystems (MEMS) and special-purpose integrated circuits using technological tools frequently used in the industry.
- Develop special-purpose intelligent electronic systems that provide solutions to problems or situations through the digital processing of the information they can obtain from their environment in applications such as biomedicine, communications, automotive, automation, and communications.
- Design, develop, test, and detect flaws in embedded software and hardware using programming languages, hardware descriptor languages (HDL), as well as development tools and boards frequently used in the industry.

- Learn on their own and work efficiently collaboratively on interdisciplinary and multidisciplinary projects.
- To make contributions to the body of scientific knowledge in the areas of photonics and lasers.

Target audience

This program is aimed at professionals in the areas of electronic engineering, control, electronic systems, biomedical engineering, industrial physics and related areas. The program is also aimed at professionals motivated to contribute to the advancement of electronic and computer technology as well as to acquire in-depth knowledge about current technology and its trends that will allow them to create innovative solutions that are of benefit to society and national industry.

Lines of research

- Microsystems and embedded systems.
- Optical engineering.

MSE-E Master in Science with a major in Electronic Engineering (Electronic Systems)
2009 Plan

First Semester

Code	Name	CA
OP5042	Optative I	3
TE4000	Advanced Mathematics in Electronic Engineering	3
TE4002	Stochastic and random processes	3
		9

Second Semester

Code	Name	CA
F4002	Computer simulations	3
GT4000	Research and innovation methods	1.5
OP4000	Seal Course	1.5
TE4001	Instrumentation	3
		9

Third Semester

Code	Name	CA
GT5000	Thesis I	3
OP5043	Optative II	3
OP5044	Optative III	3
		9

Fourth Semester

Code	Name	CA
GT5001	Thesis II	3
OP5045	Optative IV	3
OP5046	Optative V	3
		9

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

MSM Master in Science with a Specialization in Manufacturing Systems

Justification

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 achieving a manufacturing industrial sector of global relevance. On an ongoing basis, companies in this sector require technological capabilities that support their strategies to improve their product offering, consolidation and competitiveness, without neglecting social and environmental responsibility.

General Objectives of the Program

To train professionals for industry and academia, who, as agents of change, are capable of doing applied research, technological development, innovation, and technology transfer, in the fields of design of new products, advanced materials, and production processes.

Graduate profile

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

- Improve the competitiveness of companies through the development and integration of design and manufacturing technology to increase productivity, improve quality, reduce costs and reliability.
- Plan, manage and execute research and development projects in the field of design and manufacture of high value-added products, taking into account the technical, economic and social impact of such projects.
- Interact with multidisciplinary working groups (national and international) for the research, development and innovation of new products and manufacturing processes.
- To update their knowledge independently to continue to be an agent of technological change and development in the manufacturing industry.

Target audience

The program is aimed at engineers from all disciplines. Due to its interdisciplinary nature, the development and technological improvement of manufacturing systems requires the interaction of multiple areas of knowledge.

Lines of research

- Design and innovation of new products.
- Advanced materials.
- Automation and mechatronics for manufacturing.
- Production engineering.

MSM Master in Science with a Specialization in Manufacturing Systems 2009 Plan

Remedial Semester

Code	Name	CA
M1002	Computer Drawing	3
M2010	Material behavior	3
M4000	Analysis and synthesis of mechanical systems	3
		9

First Semester

Code	Name	CA
GI5000	Research and innovation methods	1.5
M4009	Advanced Materials in Manufacturing	3
OP4000	Seal Course	1.5
OP4006	Basic Optative I	3
		9

Second Semester

Code	Name	CA
M4008	Product Design	3
M4010	Automation in manufacturing systems	3
OP5042	Optative I	3
		9

Third Semester

Code	Name	CA
GI5007	Thesis I	3
OP5043	Optative II	3
OP5044	Optative III	3
		9

Fourth Semester

Code	Name	CA
GI5008	Thesis II	3
OP5045	Optative IV	3
OP5046	Optative V	3
		9

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

MTI-V Master in Information Technology Management

(Online Program)

Justification

Nowadays, any type of company, large, small, traditional or online, demands professionals with specialized knowledge in the areas of information technology management. And it doesn't matter if a company is directly focused on the area of technologies, the reality is that currently they all handle, manage and make use of various frontier technologies, generating a huge amount of information that needs to be processed and managed intelligently to support their business strategies.

In this context, the Master in Information Technology Management is an educational alternative that arises as a response to the need of local, national and international companies to have professionals specialized in the areas of management and administration of information technologies. Companies require the knowledge and skills of a person who knows how to communicate transversally and vertically within a company, managing and communicating the needs and solutions to problems related to emerging technologies.

Target audience

The MTI program is aimed at:

- Professionals from any area interested in specializing in IT management as a tool to transform transversal processes and strategically underpin the competitiveness of organizations.
- Professionals interested in technology management, understanding the value of technologies for organizations, mastering the necessary techniques for their administration and the search for business opportunities.
- Professionals in the engineering area who want to delve into information and communication technologies as a tool to transform the processes and activities of the organization.

Program Objective

The Master in Information Technology Management is a program that aims to train professionals:

- That they are capable of promoting, with a strategic vision of the organization, the generation of value through information and communication technologies.
- That they are able to serve as the means of communication between decision-makers and designers of growth strategies with new technologies.

Learning Outcomes

The graduate will be able to:

- Generate value in organizations with leadership based on the application of emerging information technologies.
- Understand the business model and unify the global strategy and the IT strategy under an innovative scheme.
- Identify the IT projects and resources required, as well as lead the necessary changes to increase competitiveness in a globalized environment.

Admission profile

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

MTI-V Master in Information Technology Management (Online Program)
2021 Plan

First Trimester

Code	Name	CA
AD4050	Project, program, and portfolio management	3
RH4005	Human talent development	3
		6

Second Trimester

Code	Name	CA
TI4029	Technology architecture models	3
TI4030	Information Technology Corporate Governance	3
		6

Third Trimester

Code	Name	CA
TI4031	Strategic management of corporate performance	3
TI4032	Digital transformation of companies	3
		6

Fourth Trimester

Code	Name	CA
OP4046	Seal Course	3
OP5085	Optative I	3
		6

Fifth Trimester

Code	Name	CA
OP5086	Optative II	3
OP5087	Optative III	3
		6

Sixth Trimester

Code	Name	CA
OP5088	Optative IV	3
TC5036	Integrative project I	3
		6

Seventh Trimester

Code	Name	CA
OP5089	Optative V	3
TC5037	Integrative project II	3
		6

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

DBT Ph. D. in Biotechnology

Competencias

Graduates of the Ph. D. in Biotechnology are scientists capable of producing innovative biological knowledge to establish cutting-edge technologies relevant to the food and pharmaceutical sector, as well as understanding basic phenomena in the field of life sciences. In national and international research groups, they have the potential to serve as leaders or collaborators in areas such as: nutraceuticals, biopharmaceuticals, bioinformatics, bioprocesses, cancer, cardiovascular sciences, stem cell biology, biomedical devices, biophysics, immunology and metabolism, among others.

The results of their discoveries must be refereed to be published in: conferences, articles, indexed journals or patents. This transfer of knowledge, as well as all their professional achievements, must follow legal, ethical and official standards.

The competencies developed in this program are:

- Understand the application of basic sciences and research methods in the areas of cell biology, physiology, biochemistry, and bioprocess engineering.
- Use research skills, including translational research, critical thinking, laboratory safety practices, and experimental planning.
- Design experiments, from identifying problems to interpreting results.
- Critically analyze results and data with advanced statistical tools, such as bioinformatics and data mining.
- Communicate effectively orally and in writing with colleagues: mentors, researchers, society, and sponsors.
- Make decisions with scientific criteria and critical thinking in their practice as a researcher following the legal provisions, ethics and official regulations of the government.

Admission profile

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

Academic background of entry: Master in an area related to the lines of research of the program.

DBT Ph. D. in Biotechnology 2011 Plan

First Semester

Code	Name	CA
GI5000	Research and innovation methods	1.5
OP4000	Seal Course	1.5
OP5062	Optative I	3
OP5063	Optative II	3
OP5064	Optative III	3
		12

Second Semester

Code	Name	CA
GI5011	Research Proposal I	3
OP5065	Optative IV	3
OP5066	Optative V	3
OP5067	Optative VI	3
		12

Third Semester

Code	Name	CA
GI5012	Research Proposal II	3
GI5014	Research Seminar I	1
OP5068	Optative VII	3
OP5069	Optative VIII	3
OP5070	Optative IX	3
		13

Fourth Semester

Code	Name	CA
GI5013	Research Proposal III	3
GI5017	Directed Research I	3
OP5071	Optative X	3
OP5072	Optative XI	3
		12

Fifth Semester

Code	Name	CA
GI5018	Directed Research II	3
GI5019	Directed Research III	3
GI6021	Doctoral Research I	3
GI6022	Doctoral Research II	3
		12

Sixth Semester

Code	Name	CA
GI5015	Research Seminar II	1
GI6023	Doctoral Research III	3
GI6024	Doctoral Research IV	3
GI6025	Doctoral Research V	3
		10

Seventh Semester

Code	Name	CA
GI6026	Doctoral Research VI	3
GI6027	Doctoral Research VII	3
GI6028	Doctoral Research VIII	3
		9

Eighth Semester

Code	Name	CA
GI5016	Research Seminar III	1
GI6029	Doctoral Research IX	3
GI6030	Doctoral Research X	3
GI6031	Doctoral Research XI	3
		10

Noveno Semestre

Code	Name	CA
GI6000	Doctoral defense	0.3
GI6032	Doctoral Research XII	3
GI6033	Doctoral Research XIII	3
GI6034	Doctoral Research XIV	3
		9.3

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

DCC Ph. D. in Computer Science

Program objectives

This program aims to train independent researchers who will be able to:

- Identify opportunities, develop, and direct original research projects at the frontier of computational science knowledge.
- Apply the knowledge generated in the technological development of the country.
- To carry out research in high-impact computer science in the productive, educational-academic and social sectors of the country.

Target audience

The Ph. D. program in Computer Science is designed for candidates with proven academic ability, creativity, motivation, and potential to conduct research that manifests itself in original works that contribute to enriching the field of information and computing technologies.

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

Admission profile

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

Academic background of entry: Master in an area related to the lines of research of the program.

Graduate profile

The Ph. D. program in Computer Science trains professionals capable of:

- Demonstrate a high level of theoretical, experimental, and methodological knowledge of computer science in any professional situation.
- Identify relevant and pertinent scientific information for the development of research projects.
- Innovate and develop new technological tools that contribute to the advancement of science in general and computer science in particular.

- Develop innovative research projects in their area of specialization that enhance entrepreneurial opportunities in one of the following areas: Bio-Inspired Systems, Machine Learning Models or Data Science and Applied Mathematics.
- Communicate topics and results of their research orally to specialized audiences.
- To create and transmit scientific and technological knowledge in an ethical and civic way with a high sense of responsibility and social commitment.
- Protect the intellectual property of your research findings in accordance with existing national and international rules.

Líneas de generación y aplicación de conocimiento

The lines of Knowledge Generation and Application (LGAC) that are worked on in the program's research groups are described below:

1. **Bio-inspired Algorithms.** This line of research focuses on the development, extension and modification of algorithms and methods to solve complex problems by systematizing informal solutions in heuristic and mathematical models.
2. **Machine Learning models.** This line focuses on the research of computational learning models with the aim of forecasting or identifying behaviors on a set of data or input examples and that leads to better decision-making.
3. **Data Science and Applied Mathematics (Data & Computational Science).** The line of research in data science and applied mathematics studies aspects related to data processing and statistical analysis, as well as knowledge of the discourse domain, with the purpose of extracting knowledge from data, generally of large volume (big data) and that may or may not be structured. This line is complemented by the first two to structure the solution to major problems of modern life, such as the supply of food, water, energy, health, security, etc.
4. **Bioinformatics and Biomedicine.** In Bioinformatics and Biomedicine, algorithms and experiments are studied for the analysis, identification and validation of bio-markers, diagnoses for diseases (including cancer) and in the processes of stem cell differentiation. For the Biomedical part, the line investigates the control and processing of biomedical signals, especially in electroencephalography or magnetic resonance imaging; In addition, how to design new medical devices is being studied.

DCC Ph. D. in Computer Science 2016 Plan

First Semester

Code	Name	CA
CS6021	Directed Research I	3
CS6022	Directed Research II	3
CS6025	Integrative Exam	1.5
GI6041	Research Seminar I	0.5
GI6051	Research Workshop I	1
		9

Second Semester

Code	Name	CA
CS6031	Research Proposal I	3
CS6032	Research Proposal II	3
CS6035	Research Proposal Defense	1.5
GI6042	Research Seminar II	0.5
GI6052	Research Workshop II	1
		9

Third Semester

Code	Name	CA
CS6041	Integration of research I	1.5
CS6101	Doctoral Research I	3
CS6102	Doctoral Research II	3
GI6043	Research Seminar III	0.5
GI6053	Research Workshop III	1
		9

Fourth Semester

Code	Name	CA
CS6103	Doctoral Research III	3
CS6104	Doctoral Research IV	3
GI6044	Research Seminar IV	0.5
GI6054	Research Workshop IV	1
GI6061	Scientific Product I	1.5
		9

Fifth Semester

Code	Name	CA
CS6042	Integration of research II	1.5
CS6105	Doctoral Research V	3
CS6106	Doctoral Research VI	3
GI6045	Research Seminar V	0.5
GI6055	Research Workshop V	1
		9

Sixth Semester

Code	Name	CA
CS6107	Doctoral Research VII	3
CS6108	Doctoral Research VIII	3
GI6046	Research Seminar VI	0.5
GI6056	Research Workshop VI	1
GI6062	Scientific Product II	1.5
		9

Seventh Semester

Code	Name	CA
CS6109	Doctoral Research IX	3
CS6110	Doctoral Research X	3
CS6111	Doctoral Research XI	3
		9

Eighth Semester

Code	Name	CA
CS6112	Doctoral Research XII	3
CS6113	Doctoral Research XIII	3
CS6114	Doctoral Research XIV	3
CS6120	Doctoral defense	0.3
		9.3

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

DCI Ph. D. in Engineering Sciences

Program objectives

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

- Identify opportunities, develop and direct original research projects at the frontier of knowledge.
- Disseminate the results of their research.
- Apply the knowledge generated for the technological development of the country.
- To carry out high-impact engineering research in the productive, educational-academic and social sectors of the country.

Target audience

The Doctoral Program in Engineering Sciences is designed for professionals in the areas of engineering and exact sciences interested in conducting high-impact research, to contribute to the knowledge of one of the Specialization areas of Engineering Sciences. Students who enter this program must have an excellent academic record, a vocation in the generation of knowledge, fluency in communication, work professionally under strict ethical standards, be open to new ways of assimilating knowledge and professional practice and be intellectually curious.

Admission profile

Tecnológico de Monterrey seeks to integrate a new generation of students who have completed their master's degree studies in areas related to engineering sciences or exact sciences, who are distinguished by being: talented, enthusiastic people, committed to the development of their environment and the well-being of society; people who have the potential to successfully conclude their graduate program and become leaders with an entrepreneurial spirit, human sense and internationally competitive.

Academic background of entry: Master in an area of studies related to engineering sciences or exact sciences.

Graduate profile

The Ph. D. program in Engineering Sciences trains professionals capable of:

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

- Conduct research in their area of Specialization that provides new knowledge of relevance to 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 the results of their professional work clearly, effectively and efficiently.
- Work in the professional community of their area of expertise with leadership in an efficient, collaborative, and ethical manner.
- Have a proactive and creative attitude towards undocumented problems, being able to generate innovations to the extent that the problem requires it.

Área de especialidad

By its nature, the DCI is multidisciplinary in scope, covering four areas of knowledge that have been selected from among the strongest lines of research within the School of Engineering and Sciences. These areas interact with each other through projects, hubs, and focus groups. The areas of knowledge serve as a crucible for the definition of the lines of research of the DCI Programme:

Mechatronics and Advanced Manufacturing (MMA)

Mechatronics and Advanced Manufacturing comprises the analysis and synthesis of complex systems where multiple disciplines interact. The MMA LGAC responds to the need to train human research personnel, with a high level of preparation 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 due to the evolution of operating approaches, from treatments for pollution control to the concept of corporate social responsibility. It indicates the relevance in relation to the economic and social spheres of the use of natural resources with an ecosystem approach, the care of the physical environment and the protection of the health of the population, all with a focus and vision of sustainability.

Industrial Engineering (II)

Industrial Engineering is related to the increase of competitiveness worldwide and represents one of the greatest challenges of any nation, in particular of its institutions and companies that will have to face a continuous process of increasing productivity, efficient use of resources and generation of value to face the growing competition. The research at the frontier of knowledge of the LGAC of Industrial Engineering contributes to the search, development and implementation of new ways of operating and improving operational and administrative processes mainly through the development of new and innovative decision-making models.

Telecommunications (T)

Telecommunications contributes with solutions to fundamental problems in networks and systems that transport information and that allow the design of platforms that drive the digital industry of the future and technologies such as IoT, Smart Cities, Intelligent Transport Systems (ITS), smartgrid, Big-Data, e-health, 5G, cognitive radio, white spaces, location systems, and sensors, to improve the quality of life of the society of the 21st century. Research is developed to optimize and stochastically model the essential

understanding of fundamental performance in the areas of wireless communications and networks, in signal and information processing, in the convergence between optical communications networks and wireless networks, vehicular communications, photonic crystals, aspects of the physical layer levels, connectivity, modulation, reconfigurable network architecture, sensors, and their applications.

DCI Ph. D. in Engineering Sciences 2018 Plan

First Semester

Code	Name	CA
GI5017	Directed Research I	3
GI5018	Directed Research II	3
GI6035	Integrative Exam	1.5
GI6041	Research Seminar I	0.5
GI6051	Research Workshop I	1
		9

Second Semester

Code	Name	CA
GI5011	Research Proposal I	3
GI5012	Research Proposal II	3
GI6036	Research Proposal Defense	1.5
GI6042	Research Seminar II	0.5
GI6052	Research Workshop II	1
		9

Third Semester

Code	Name	CA
GI6021	Doctoral Research I	3
GI6022	Doctoral Research II	3
GI6037	Integration of research I	1.5
GI6043	Research Seminar III	0.5
GI6053	Research Workshop III	1
		9

Fourth Semester

Code	Name	CA
GI6023	Doctoral Research III	3
GI6024	Doctoral Research IV	3
GI6044	Research Seminar IV	0.5
GI6054	Research Workshop IV	1
GI6061	Scientific Product I	1.5
		9

Fifth Semester

Code	Name	CA
GI6025	Doctoral Research V	3
GI6026	Doctoral Research VI	3
GI6038	Integración de la investigación II	1.5
GI6045	Research Seminar V	0.5
GI6055	Research Workshop V	1
		9

Sixth Semester

Code	Name	CA
GI6027	Doctoral Research VII	3
GI6028	Doctoral Research VIII	3
GI6046	Research Seminar VI	0.5
GI6056	Research Workshop VI	1
GI6062	Scientific Product II	1.5
		9

Seventh Semester

Code	Name	CA
GI6029	Doctoral Research IX	3
GI6030	Doctoral Research X	3
GI6031	Doctoral Research XI	3
		9

Eighth Semester

Code	Name	CA
GI6000	Doctoral defense	0.3
GI6032	Doctoral Research XII	3
GI6033	Doctoral Research XIII	3
GI6034	Doctoral Research XIV	3
		9.3

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

DNT Ph. D. in Nanotechnology

Program objectives

This program aims to train independent researchers who will be able to:

- Develop and advise national and international research projects, in their area of Specialization, from their approach, obtaining funds and the successful achievement of the project.
- To generate new knowledge in Nanotechnology, in particular in the areas of nanostructured materials, micro and nanosystems or Nanophotonics, published through peer-reviewed scientific texts, such as articles (in Q1/Q2 journals), chapters or books (in international publishers) or documented in patents, technological developments, etc.

Target audience

The Ph. D. program in Nanotechnology is designed for candidates with proven academic ability, creativity, motivation, and potential to carry out research that manifests itself in original work that contributes to enriching the field of nanotechnology.

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

Admission profile

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

Academic background of entry: Master in an area related to the lines of research of the program.

Graduate profile

The Ph. D. program in Nanotechnology trains professionals capable of:

- Demonstrate a high level of theoretical, experimental and methodological knowledge of Nanotechnology in any professional situation.
- Identify relevant and pertinent scientific information for the development of research projects.

- Innovate and develop new nanotechnological tools that contribute to the advancement of science in general and Nanotechnology in particular.
- Develop innovative research projects in their area of specialization that enhance entrepreneurship opportunities in one of the following areas: Materials Science and Nanotechnology; Micro and Nanosystems, Nanophotonics; and Quantum Systems.
- Communicate topics and results of their research orally to specialized audiences.
- To create and transmit scientific and technological knowledge in an ethical and civic way with a high sense of responsibility and social commitment.
- Protect the intellectual property of your research findings in accordance with existing national and international rules.

Specialization Area

Due to its nature, the Ph. D. in Nanotechnology is multidisciplinary in scope, covering three areas of knowledge (Materials Science and Nanotechnology, Micro and Nanosystems and Nanophotonics and Quantum Systems) that have been selected among the lines of research with the greatest strength within the School of Engineering and Sciences. These areas interact with each other through projects, hubs, and focus groups.

The areas of knowledge that serve to define the research topics of the DNT Program are:

Materials Science and Nanotechnology. This line is aimed at the development of functional nanostructured materials, innovative nanofabrication processes, design of nanostructured devices, and the generation of innovative concepts as the basis for the development of new nanotechnological products. The application of Nanosciences with the support of exact sciences, mathematical modeling of materials, computational simulation, and experimental infrastructure for characterization and manufacture of test prototypes are highly desirable.

Micro and Nanosystems. This line of research is aimed at generating cutting-edge and world-class research that allows advancing knowledge in micro and nanosystems, generating innovative developments of sensors and nanosystems with improved capabilities of sensitivity, selectivity, portability and lower energy consumption. The use of Nanosciences and Nanoelectronics as well as the experimental infrastructure for fabrication and characterization will be highly privileged.

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

DNT Ph. D. in Nanotechnology 2016 Plan

First Semester

Code	Name	CA
GI6041	Research Seminar I	0.5
GI6051	Research Workshop I	1
NT6021	Directed Research I	3
NT6022	Directed Research II	3
NT6025	Integrative Exam	1.5
		9

Second Semester

Code	Name	CA
GI6042	Research Seminar II	0.5
GI6052	Research Workshop II	1
NT6031	Research Proposal I	3
NT6032	Research Proposal II	3
NT6035	Research Proposal Defense	1.5
		9

Third Semester

Code	Name	CA
GI6043	Research Seminar III	0.5
GI6053	Research Workshop III	1
NT6041	Integration of research I	1.5
NT6101	Doctoral Research I	3
NT6102	Doctoral Research II	3
		9

Fourth Semester

Code	Name	CA
GI6044	Research Seminar IV	0.5
GI6054	Research Workshop IV	1
GI6061	Scientific Product I	1.5
NT6103	Doctoral Research III	3
NT6104	Doctoral Research IV	3
		9

Fifth Semester

Code	Name	CA
GI6045	Research Seminar V	0.5
GI6055	Research Workshop V	1
NT6042	Integration of research II	1.5
NT6105	Doctoral Research V	3
NT6106	Doctoral Research VI	3
		9

Sixth Semester

Code	Name	CA
GI6046	Research Seminar VI	0.5
GI6056	Research Workshop VI	1
GI6062	Scientific Product II	1.5
NT6107	Doctoral Research VII	3
NT6108	Doctoral Research VIII	3
		9

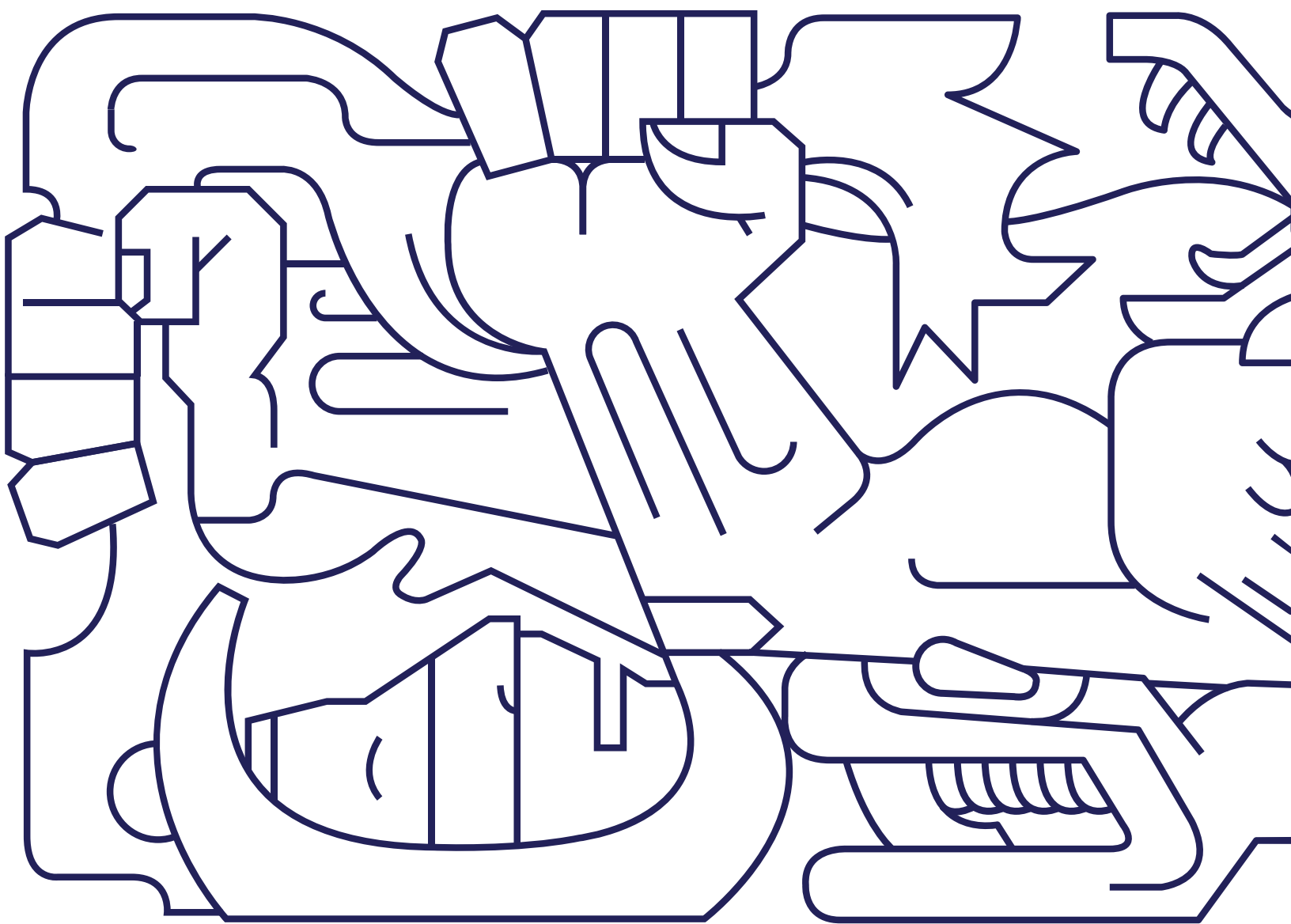
Seventh Semester

Code	Name	CA
NT6109	Doctoral Research IX	3
NT6110	Doctoral Research X	3
NT6111	Doctoral Research XI	3
		9

Eighth Semester

Code	Name	CA
NT6112	Doctoral Research XII	3
NT6113	Doctoral Research XIII	3
NT6114	Doctoral Research XIV	3
NT6120	Doctoral defense	0.3
		9.3

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



Profiles and curricula

School of Medicine and Health Sciences



RAP Residency in Pathological Anatomy

Justification

Pathological Anatomy is, to date, the main tool in the definitive diagnosis of cancer and, just as important, immunohistochemical and biomolecular methods have been developed in the field that determine the treatment and prognosis of many malignant neoplasms. Such important processes are included in our curricular plan.

Specialists in Pathological Anatomy graduated from Tecnológico de Monterrey must be able to promote and contribute to the sustainable development of society by seeking health as an inherent good of Mexicans, as well as collaborating in the professionalization of the Specialization through a constant sense of academic and healthcare competitiveness, from a human point of view.

The Medical Specialization in Pathological Anatomy provides resident physicians with the opportunity to learn during the medical care activities carried out by expert pathologists, applying the knowledge obtained through self-learning and daily theoretical activities, while advising them in the acquisition of the skills and abilities with which they will be in a position to solve a wide variety of situations that they will face in their professional life ulterior.

The skills acquired during their preparation must provide them with the necessary tools to practice the profession with full knowledge in accordance with national and international organizations, be certified and indefinitely preserve the spirit of constant improvement through continuous education and updating, perennial learning and self-confidence, all of which will benefit patients.

Program Objectives

The Specialization in Pathological Anatomy at Tecnológico de Monterrey aims to train excellent specialists, who support patients and doctors in solving diagnostic problems. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The specialists in Pathological Anatomy graduated from this institution are outstanding leaders in the local and international field, who contribute to generating and implementing innovations in strategies and procedures in the prosection of human tissues that allow the most accurate diagnosis possible.

Graduate profile

The doctor graduated from the Medical Specialization Program in Pathological Anatomy is a specialist who is able to:

- Professionally apply the knowledge of Pathological Anatomy to establish definitive diagnoses in pathology.
- Develop critical reasoning from the information at their disposal in order to establish scientific and guiding communication with their colleagues involved in the diagnosis and treatment of the patient.
- Participate in basic and clinical research as a member of the research team.

- Efficiently coordinate teams of professionals and technicians in the health area in the field of Pathological Anatomy.
- Collaborate in inter and multidisciplinary teams exchanging experiences for the improvement of medical care.
- Perform with professionalism, ethics and humanistic vision.

Target audience

The residency in Pathological Anatomy requires physicians who have completed their bachelor's degree and who during their career demonstrated special interest in morphological sciences through their participation in activities as fellows within the department, who have selected Pathology as one of their optional rotations and/or have carried out social service activities within the pathology. The student must have satisfactorily complied with the requirements established by ITESM regarding admission to residences and master's degrees with sufficient knowledge of the English language and an adequate psychological profile.

Lines of research

Mammary Gland Pathology

Histological and immunohistochemical characteristics of malignant and benign breast tumors to try to identify prognostic and predictive factors of response to treatment in patients at the TecSalud Hospitals of Tecnológico de Monterrey, working together with the multidisciplinary team with other related specialties for the treatment of various breast pathologies, such as medical and surgical oncology, radiology, radio oncology, genetics, etc.

General/Surgical Pathology

General/surgical pathology encompasses the different areas of pathology in which multidisciplinary teams from other medical specialties of the TecSalud system collaborate, and research work is carried out in areas such as oncological, infectious, gastrointestinal, nervous system, among others.

RAP Residency in Pathological Anatomy 2013 Plan

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4153	Pathological Anatomy I	3
ME4154	Medical care of pathological anatomy I	3
		7.5

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	1.5
ME4155	Pathological Anatomy II	3
ME4156	Medical care of pathological anatomy II	3
		7.5

Third Semester

Code	Name	CA
ME4142	Quality in clinical care	1.5
ME4157	Pathological Anatomy III	3
ME4158	Medical care of pathological anatomy III	3
		7.5

Fourth Semester

Code	Name	CA
ME4143	Research and innovation methods	1.5
ME4159	Pathological Anatomy IV	3
ME4160	Medical care of pathological anatomy IV	3
		7.5

Fifth Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME5201	Pathological Anatomy V	3
ME5202	Medical care of pathological anatomy V	3
		9

Sixth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5203	Pathological Anatomy VI	3
ME5204	Medical care of pathological anatomy VI	3
		9

Seventh Semester

Code	Name	CA
ME5191	Specialization Optative I	1.5
ME5205	Pathological Anatomy VII	3
ME5206	Medical care of pathological anatomy VII	1.5
		6

Eighth Semester

Code	Name	CA
ME5192	Specialization Optativ II	1.5
ME5207	Pathological Anatomy VIII	3
ME5208	Medical care of pathological anatomy VIII	1.5
ME5266	Thesis defense	0.3
		6.3

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

RCA Residency in Quality of Clinical Care

Justification

There is a growing interest in all health care institutions to investigate and solve problems of quality and safety in the medical care of patients, however they are faced with the absence of medical professionals specialized in this field, so they are forced to introduce specialists from the industrial sector who strive to solve problems of infrastructure and comfort or are empirically trained as daily practice goes their way developing, without managing to impact the clinical and surgical processes of the doctor-patient relationship, leaving precisely the fundamental aspect of patient safety out of the focus of attention of the quality programs that are currently developed in public and private institutions of the health sector.

The Specialization in Quality of Clinical Care responds to the need for professionals who are integrated into a dynamic, evolutionary and renewing process linked to the experience and reality of hospitals and outpatients, inextricably linked to the hospital and health care centers, with knowledge that is deepened and consolidated in various areas of medicine to strengthen the practice of the medical profession immersed in the multidisciplinary team.

The program facilitates the integration of knowledge, skills, abilities, and attitudes concerning the Quality of Clinical Care at a level of depth sufficient to allow the resident and future specialist to have the leadership to lead and assist in the analysis, restructuring, and improvement of the processes of change in medical and surgical care at any of the three levels of care, both outpatient, and hospital and emergency, which affect the physical, mental and social health of individuals. Knowledge related to quality, safety, self-sustainability and the standardization of clinical processes is integrated under the framework of evidence-based medicine that guarantees its application from the patient's first contact to their recovery in any service of the public and private health system.

Program Objectives

The Specialization in Quality of Clinical Care at Tecnológico de Monterrey aims to train excellent medical specialists, who apply knowledge and innovative practices of quality and safety at the macro and micro levels of health care. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The Specialists in Quality of Clinical Care graduated from this institution are outstanding leaders in the local and international field who design, implement and evaluate effective operating strategies in organizations in the health sector, based on research and innovation processes, and lead organizational change processes in this sector.

Graduate profile

Graduates of the Quality of Clinical Care program will be able to:

- Provoke and direct organizational change and innovation through the management of human resources and the infrastructure of health services, to build, transform and operate clinical and administrative processes of health care, which are centered on the patient and their family, always seeking to guarantee the quality, safety and self-sustainability of health services.

- Develop and transform their community through collaborative knowledge building; the permanent development of their skills and abilities; professional development based on ethical values; the development of relevant scientific research in the clinical-systemic interface; and the continuous development of its capacity to function with quality in the national and international arena.

Target audience

It is aimed at doctors who have passed the National Exam for Medical Residency Applicants with an interest and vocation in the Specialization area; with skills and attitudes to evaluate the quality and safety of clinical care processes and lead improvement efforts within the framework of health service organizations; with a sense of commitment to patient safety and quality in the provision of first-contact health services, as well as the ability to read and understand medical literature in English, full-time availability to cover full-time academic and care activities in accordance with current regulations.

To enter the Specialization in Quality of Clinical Care at Tecnológico de Monterrey, applicants must satisfactorily meet the requirements established by ITESM and the Ministry of Health for graduate admission.

Lines of research

Quality Assessment in the 6 resignations of Healthcare: safe care, patient-centered care, timely care, efficient care, effective care, equitable care.

Diagnostic and organizational change processes for the optimization and management of resources.

Quality education and patient safety.

**RCA Residency in Quality of Clinical Care
2013 Plan**

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4177	Gestión de la calidad clínica I	3
ME4178	Hospital Practice I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4179	Clinical Quality Management II	3
ME4180	Hospital Practice II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4181	Clinical Quality Management III	3
ME4182	Hospital Practice III	3
		9

Fourth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5225	Clinical Quality Management IV	3
ME5226	Hospital Practice IV	3
		9

Fifth Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5227	Clinical Quality Management V	3
ME5228	Hospital Practice V	1.5
		6

Sixth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5229	Clinical Quality Management VI	3
ME5230	Hospital Practice VI	1.5
ME5266	Thesis Defense	0.3
		6.3

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

RCR Residency in Cardiology

Justification

Cardiovascular diseases are the leading cause of death in Mexican men and women, and it is one of the main causes of incapacity for work and loss of economic activity. Therefore, specialists trained in the detection of risk factors are required for the diagnosis, prevention and management of these conditions.

Offering high-quality cardiological medical care requires strict discipline in the training of professionals committed to the social, political, economic and cultural development of the community. In accordance with this demand, the Specialization in Cardiology seeks the training of medical professionals in the area of Clinical Cardiology through a high-level teaching model, patient care and research for the generation of new knowledge; that they are people and professionals of integrity and morality in their performance, respectful of life and human dignity, internationally competent and capable of offering complete medical care and excellence, in accordance with the Mission and Vision of Tecnológico de Monterrey.

The Multicenter Cardiology Program of Tecnológico de Monterrey has a university infrastructure of excellence, a competency-based and patient-centered educational model; with well-structured educational and research programs and processes, offered by certified medical specialists, experts in all subspecialties of Cardiology and with teacher training, who converge in a framework of medical care represented by the San José Hospital - Tec de Monterrey, the Zambrano Hellion Medical Center, the "Dr. Bernardo Sepúlveda" Metropolitan Hospital of the Ministry of Health of Nuevo León and international rotations in The Methodist DeBakey Heart Center. Residents have the necessary technological, scientific and methodological support at the cutting edge, they are exposed to different models of care and health administration in a regional, national and international context, which allows them to acquire skills for successful performance in different areas in the area of Cardiology.

Program Objectives

The Specialization in Cardiology at Tecnológico de Monterrey aims to train excellent Cardiologists who contribute to the prevention, detection, treatment, and rehabilitation of cardiovascular diseases, with quality and safety for the patient, in hospital and outpatient settings. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The cardiologists graduated from this program stand out for being leaders in their field, with a high international competitive level, who develop research in the areas of basic sciences in cardiology, clinical cardiology, cardiovascular imaging, electrocardiography, hemodynamics, interventional cardiology and endovascular treatment.

Graduate profile

Through this program, the graduate of the Cardiology program will be able to:

- Provide medical care and attention to patients with cardiovascular problems and diseases.
- Carry out the analysis, research and evaluation of the results of clinical guidelines and medical protocols that are applied in the management of patients with cardiovascular problems and diseases.
- Communicate effectively with patients, family members, teachers, colleagues, and other members of the healthcare team.
- Act with commitment and responsibility in the professional performance of their duties, strictly following the ethical principles of the profession.
- Know and take into account the characteristics of the different health systems and their influence on the medical care of patients with cardiovascular problems and diseases.

The training of the resident in Cardiology in national and international contexts for the treatment of patients allows the construction of specialized knowledge in a thesis project.

Target audience

Applicants to enter the Medical Specialization in Cardiology program at Tecnológico de Monterrey are graduates of the Medical Career, who have accredited at least two years of the Specialization of Internal Medicine in hospital and university institutions of the National System of Residencies in Medical Specialties. Doctors who have the Medical Specialization in Internal Medicine from other countries, from universities that are recognized by the Monterrey Technological System, can also aspire to participate in this program.

To enter the Medical Specialization in Cardiology at the School of Medicine and Health Sciences of Tecnológico de Monterrey, applicants must satisfactorily meet the requirements established by ITESM and the Ministry of Health for admission to Graduate Studies.

Lines of research

- New treatments for ACS and aortic stenosis in octogenarian patients.
- Coronary atherosclerosis and cardiovascular imaging.
- Thrombosis in cardiovascular disease.

RCR Residency in Cardiology 2013 Plan

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4228	Cardiology I	3
ME4229	Cardiology IHealthcare I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4230	Cardiology II	3
ME4231	Cardiology IHealthcare II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4232	Cardiology III	3
ME4233	Cardiology IHealthcare III	3
		9

Fourth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5281	Cardiology IV	3
ME5282	Cardiology IHealthcare IV	3
		9

Fifth Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5283	Cardiology V	3
ME5284	Cardiology IHealthcare V	1.5
		6

Sixth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5266	Thesis Defense	0.3
ME5285	Cardiology VI	3
ME5286	Cardiology IHealthcare VI	1.5
		6.3

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

REA Residency in Anesthesiology

Justification

Advances in Anesthesiology have occurred at an unprecedented speed. Greater knowledge of anaesthetic techniques, as well as the continuous discovery of new drugs used in anaesthesiology and advances in monitoring during anaesthesia are the result of globalisation and technological development, which has made it possible to provide greater safety and benefits to the patient. Today more than ever, the anesthesiologist must practice with scientific bases based on evidence; it will undoubtedly be oriented to medical practice for adequate perioperative management.

Within the framework of the 2015 Mission of Tecnológico de Monterrey, in partnership with the Ministry of Health of Nuevo León together with the educational model of the Multicenter Program of Medical Residencies of the School of Medicine and Health Sciences, in which medical practice is carried out in the field of social institutional medicine as well as private medicine, will make a different profile and with a great sense of the academic and social responsibility of our graduates.

We are deeply convinced of the high ethical and humanistic degree of our residents who must be prepared for the challenges of the future of Anesthesiology, working nationally and internationally in the fields of research as well as in the development of new social opportunities, collaborating to improve the quality of professional life of their colleagues as well as their future students that will be reflected in the benefit that the society in which they participate will receive. In conclusion, our goals are far-reaching, as is to preserve society in the best conditions and opportunities for life.

Program objectives

The Specialization in Anesthesiology at Tecnológico de Monterrey aims to train excellent Anesthesiologists who apply anesthesia and analgesia techniques with the highest safety and quality, in hospital and outpatient settings. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The Anesthesiologists graduated from this institution are outstanding leaders in the local and international arena, who contribute through clinical research to generate innovations in the techniques and procedures of this Specialization, for the benefit of patients, their families, specialists, the health team and medical institutions.

Professional Profile of Graduation

The graduate of this program will be a person trained as a specialist in the area of medical care in Anesthesiology at a level of excellence, capable of applying their knowledge, skills and abilities in a collaborative and multidisciplinary way, within a framework of safety and comprehensive patient care. They must be creative and innovative in developing relevant clinical research and will be able to perform with quality in the national and international arena, strengthening their professional competence activities with good attitudes and values. He will be committed to development and transformation in the political, economic, social and cultural fields with the humility, wisdom and impartiality that should characterize him within his community.

Through a medical practice based on educational methodology focused on problem solving, it is proposed to ensure that the graduate is a highly competent specialist doctor in his specific field of action within medicine with application to the community.

Target audience

Qualified doctors in compliance with all official standards of the Ministry of Education as well as the Ministry of Health. They must have high moral values, be ethical and congruent with the profession they have decided to practice. Likewise, they must be available to work in multidisciplinary teams, interest in the field of research with quality standards, mastery of their native language and another language, a neat presentation and respect for patients, staff and the institution in which they provide their services.

To enter the Medical Specialization in Anesthesiology at the School of Medicine and Health Sciences of Tecnológico de Monterrey, applicants must satisfactorily meet the requirements established by ITESM and the Ministry of Health for graduate admission.

Lines of research

Quality and Safety in Anesthesiology

Our Anesthesiology department sees the investigation and resolution of clinical problems in our environment as imperative. The continuous exploration of the small factors that turn out to be great contributions to anesthetic risk reduction is of vital importance to improve local and regional practice. The team of professors focuses its methodological design on the implementation of methods for assessing the patient's perception of the care received, analysis of exposure to ionizing radiation or volatile agents by anesthesiology staff, determination of the cost-benefit of drug use, current treatment models, review of safety standards in patient management, and repercussions of the establishment of legal guidelines in the regulation of patient care in relation to anesthesiology, are the works derived from this line of research.

Pain Medicine

Perioperative pain, in its acute and chronic qualities, has a multifactorial origin, evolution and clinical outcome. Every week there are advances in the knowledge of each stage, so that the Multicenter Anesthesiology program focuses on the study of regional singularities in terms of pain treatment, and its evolution; as well as in verifying what was reported by other authors in their publications. In this way, an overview of the evidence is obtained with individualization to our area of influence. The focus of the department is directed towards the elaboration of works on the study of the process of reducing pain or induction of states of insensitivity to it by active intervention or by Neuromodulation in the different clinical pharmacological resources administered to the patient in their natural history of disease.

REA Residency in Anesthesiology 2013 Plan

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4234	Anesthesiology I	3
ME4235	Healthcare in Anesthesiology I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4236	Anesthesiology II	3
ME4237	Healthcare in Anesthesiology II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4238	Anesthesiology III	3
ME4239	Healthcare in Anesthesiology III	3
		9

Fourth Semester

Code	Name	CA
ME4240	Anesthesiology IV	3
ME4241	Healthcare in Anesthesiology IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5287	Anesthesiology V	3
ME5288	Healthcare in Anesthesiology V	1.5
		6

Sixth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5289	Anesthesiology VI	3
ME5290	Healthcare in Anesthesiology VI	1.5
		6

Seventh Semester

Code	Name	CA
ME5291	Anesthesiology VII	3
ME5292	Healthcare in Anesthesiology VII	3
		6

Eighth Semester

Code	Name	CA
ME5266	Thesis Defense	0.3
ME5293	Anesthesiology VIII	3
ME5294	Healthcare in Anesthesiology VIII	3
		6.3

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

REC Residency in General Surgery

Justification

The need of society to train general surgeons is evident in the number of outpatient services, surgical procedures and hospital discharges of patients from the public and private health system in our country and our state. Of the five main diagnoses of hospital discharge in public and private hospitals, three are directly related to the Specialization: digestive tract problems, trauma, and benign and malignant tumors (INEGI 2009). In relation to the causes of death in the state of Nuevo León in public and private media, the number one cause is shared by tumors and circulatory diseases, in second place endocrine, nutritional and metabolic diseases, in third place diseases of the respiratory system and as a fourth cause diseases of the digestive tract (2009).

The progress of General Surgery in our country demands specialists trained not only to effectively solve clinical situations, but also to understand and apply technological advances and subsequently develop efficient alternatives in teaching, administration and research, turning them into agents of change in the community. Along with the efficiency required for the performance of General Surgery, it demands the creation of specialists capable of performing as honest leaders and possessing a particular humanistic sense in the performance of their functions.

The General Surgeon must be a complete professional who masters the clinical aspects and who also has the creative capacity to develop programs that have an impact on the progress of the discipline and not only use their training as a way of life.

It is our commitment to generate this model of specialist with a high sense of participation and motivation to promote new models of medical care, which have an impact on the enrichment of General Surgery and shape it as an avant-garde discipline among the various medical specialties.

Program Objectives

The Specialization in Surgery at Tecnológico de Monterrey aims to train excellent Surgeons, who offer high-quality clinical care and safety to patients with surgical pathology. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The Surgeons graduated from this institution are outstanding leaders in the national and international arena, who contribute through research to generate innovations in surgical procedures, in medical care models and in the development of the discipline itself.

Graduate profile

The Specialization of General Surgery at Tecnológico de Monterrey trains medical specialists capable of:

- Perform as experts in the comprehensive and continuous care of surgical patients in relation to diagnosis, selection, preoperative, operative and postoperative care, including the management of pathology and complications in the gastrointestinal tract; the abdomen and its contents; mammary gland and soft tissues; head and neck; endocrine system; surgical oncology; polytraumatized patients and severely ill patients in emergency and intensive care.

- Perform preoperative, operative, and postoperative pediatric, plastic, peripheral vascular, general thoracic, and transplant surgery, as well as in the management of the most common problems of cardiac, gynecological, neurological, orthopedic, urologic surgery, and the administration of anesthetic agents.
- Use endoscopic techniques, particularly laparoscopy and minimally invasive surgical techniques, as well as other relevant diagnostic and therapeutic techniques.
- Perform with professionalism within a framework of honesty and professional ethics with deep respect and sensitivity towards patients and the medical community.
- Establish effective communication with the patient, their relatives and other members of multidisciplinary health teams, orally and in writing.
- Apply analytical reasoning, medical judgment, and decision-making skills to solve problems in their area of Specialization and apply the scientific method to develop research projects that impact better health care.

Target audience

This program is aimed at national or foreign doctors who are looking for a highly competitive training that allows them to have leadership capacity in General Surgery; who demonstrate English language proficiency, computational and research skills. They must demonstrate interest in social commitment, professionalism, leadership and entrepreneurial capacity.

To enter the Specialization in Medical Surgery at the School of Medicine and Health Sciences of Tecnológico de Monterrey, applicants must satisfactorily meet the requirements established by ITESM and the Ministry of Health for graduate admission.

Lines of research

Development and analysis of results of minimally invasive diagnostic and therapeutic approaches to different abdominal, thoracic and vascular pathologies.

Development of surgical, diagnostic and therapeutic skills and abilities through simulators.

Development and analysis of strategies for the prevention, diagnosis and therapeutic approach of neoplastic diseases.

REC Residency in General Surgery 2013 Plan

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4250	General Surgery I	3
ME4251	Medical care in general surgery I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4252	General Surgery II	3
ME4253	Medical care in general surgery II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4254	General Surgery III	3
ME4255	Medical care in general surgery III	3
		9

Fourth Semester

Code	Name	CA
ME4256	General Surgery IV	3
ME4257	Medical care in general surgery IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME4258	General Surgery V	3
ME4259	Medical care in general surgery V	3
		6

Sixth Semester

Code	Name	CA
ME5302	General Surgery VI	3
ME5303	Medical care in general surgery VI	3
		6

Seventh Semester

Code	Name	CA
ME5304	General Surgeryl VII	3
ME5305	Medical care in general surgery VII	3
		6

Eighth Semester

Code	Name	CA
ME5306	General Surgery VIII	3
ME5307	Medical care in general surgery VIII	3
		6

Ninth Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5308	General Surgery IX	3
ME5309	Medical care in general surgery IX	1.5
		6

Tenth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5266	Thesis Defense	0.3
ME5310	General Surgery X	3
ME5311	Medical care in general surgery X	1.5
		6.3

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

REE Residency in Critical Illness Medicine

Justification

The demands of the profession of Specialists in Medicine of the Critically Ill are related to the number of hospital discharges, a total of 35% require assistance in an ICU. In 2010, 1110 patients were treated at the Specialization's head Trimesters, the most frequent diagnoses being: Sepsis, Adult Respiratory Failure Syndrome, Acute Coronary Syndrome, Preeclampsia/Eclampsia and Postoperative Coronary Revascularization.

Offering high-quality medical care to critically ill patients requires strict discipline in the training of professionals committed to the social, political, economic, and cultural development of the community. In accordance with this demand, the Medical Specialization of the Critically Ill seeks the training of highly competent medical specialists in multimodal monitoring and treatment of serious diseases that endanger life; that they are people and professionals of integrity and morality in their performance, respectful of life and human dignity, internationally competent and capable of offering complete and excellent medical care.

The Multicenter Program of Medicine for the Critically Ill has a university infrastructure of excellence, a competency-based and patient-centered educational model; with well-structured educational and research programs and processes, offered by medical specialists with teacher training, who converge in a medical care framework, represented in the program's head Trimesters and sub-head Trimesters hospitals, certified in medical care quality processes, with hospital and outpatient environments, with high-level Intensive Care services. Residents have the necessary technological, scientific and methodological support, they are exposed to different models of care and health administration in a regional, national and international context, which allows them to acquire skills for successful performance in different areas in the area of Critical Medicine.

Program Objectives

The Specialization in Medicine of the Critically Ill at Tecnológico de Monterrey aims to train excellent medical specialists who meet the health needs of critical patients with quality and safety, in public and private settings. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The Specialists in Medicine of the Critically Ill graduated from this institution are outstanding leaders in the local and international arena, who generate innovation with new methodologies and diagnostic and therapeutic technologies and programs for the timely detection of diseases in the population under their jurisdiction.

Graduate profile

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

- To promote, prevent, diagnose, treat and rehabilitate health problems in Critical Medicine.
- Practice Critical Care Medicine in public and private health systems.
- Make medical decisions by applying clinical reasoning, evidence-based medicine, the use of critical

thinking, research methodology, and the comprehensive use of statistics.

- Be creative and innovative and manage uncertainty.
- Interact effectively in multidisciplinary teams, in teaching, research and comprehensive administration activities of an Intensive Care Unit.
- Practice as a specialist in Critical Medicine under the framework of Medical Ethics, with responsibility and respect for the dignity of the human being and the community that provides their services.

Target audience

The Multicenter Program of Medicine of the Critically Ill at Tecnológico de Monterrey is aimed at graduates of Medical Specialties in Internal Medicine, Anesthesiology or Medical-Surgical Emergencies with excellent academic performance, with a vocation and express interest in the discipline, with an innovative spirit committed to continuous learning, with a genuine interest in research and teaching.

To enter the program, applicants must satisfactorily meet the requirements established by the Tecnológico de Monterrey and the Ministry of Health of Nuevo León for admission to Graduate Studies.

Lines of research

Epidemiological studies and assessment of therapeutic methods for critically ill patients.

The increasing incidence of patients with serious pathologies, and the need to optimize the use of medical and human resources and infrastructure of intensive care units, require the continuous evaluation and research of the pathophysiological, epidemiological and therapeutic processes of these, in order to improve the vital, functional prognosis of patients with serious pathologies, as well as quality of life at the end of the pathological process.

The aim is to improve current management strategies based on international management guidelines and protocols in critically ill patients and to implement them early in our patients, with the aim of impacting morbidity and mortality and health costs such as stay in intensive care, days of mechanical ventilation, days of antibiotic therapy, prevention of thrombosis, prevention of healthcare-related infections, early renal replacement, and early nutritional intervention that are generated in the seriously ill.

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

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4197	Critical Care Medicine I	3
ME4198	Medical care in Critical Care Medicine I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4199	Critical Care Medicine II	3
ME4200	Medical care in Critical Care Medicine II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME5191	Specialization Opative I	1.5
ME5245	Critical Care Medicine III	3
ME5246	Medical care in Critical Care Medicine III	1.5
		9

Fourth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5192	Specialization Opative II	1.5
ME5247	Critical Care Medicine IV	3
ME5248	Medical care in Critical Care Medicine IV	1.5
ME5266	Thesis Defense	0.3
		9.3

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

REG Residency in Gynecology and Obstetrics

Justification

The changes that the world is currently experiencing demand new and multiple competencies from professionals, as well as stricter quality requirements in their performance. In the area of Gynecology and Obstetrics in Mexico, there are multiple challenges related to women's health care. Today, out of a total population of 112 million people, there are 57 million women in need of medical care, whose main causes of death and disease are still preventable or curable if detected and treated in a timely manner.

These needs coincide with the high technological and scientific development of the different branches of Gynecology and Obstetrics: Maternal-Fetal Medicine, Reproductive Biology, Reproductive and minimally invasive surgery (endoscopy), Gynecological Oncology, Gynecological Urology, Gynecology of girls and adolescents. However, it is through the active intervention of the professional of this medical Specialization that these challenges and opportunities can truly coincide for the benefit of the health of the community.

Our educational model is state-of-the-art and responds to the current needs of women's health care in our country and in the world, meeting the academic objectives that our graduate profile determines, in a multicenter program with four host hospitals, two in the public sector and two in the private sector.

In this program, the specialist in Gynecology and Obstetrics will find that the opportunity to transcend through the care and attention to the integral health of women is the challenge that is lived day by day.

General Objective of the Curricula

Our Specialization in Gynecology and Obstetrics program aims to train excellent Gynecologists, who solve the health needs of the female population with quality and safety, in hospital and outpatient settings. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The Gynecologists graduated from this institution are outstanding leaders in the local and international arena. They use ultrasound technology to favorably impact the health of their patients through timely and accurate diagnoses, and contribute to generating innovations in the use and research of surgical techniques and the improvement of medical and gynecologic-obstetric treatments, favorably impacting the reduction of morbidity and mortality among the Mexican population.

Graduate profile

Through this program, the graduate will be able to participate in the transformation and development of the health of their community, through their skills to:

- To carry out the prevention, diagnosis and treatment of conditions that affect women's gynecological and reproductive health in the different stages of life, applying their knowledge, skills and clinical judgment.
- To exercise their clinical practice with integrity, ethics and humanistic vision, favoring the health of women in their various socio-cultural environments.

- Collaborate with leadership in multidisciplinary teams, positioning themselves as agents of change for the integral health of women.

- To develop entrepreneurial, inquisitive and innovative capacity, allowing us not only to be identifiers of new scientific trends but also creators of unprecedented and useful knowledge for the direct benefit of society.

Target audience

Potential applicants to the Gynecology and Obstetrics Specialization Residency of the Multicenter Program of Tecnológico de Monterrey - SSNL are graduates of the Medical Surgeon career from different national and international universities, with a high human and professional sense who wish to fulfill the commitment to be agents of change in society.

To enter this program, applicants must satisfactorily meet the requirements established by Tecnológico de Monterrey and the Ministry of Health for graduate admission.

Lines of research

Normal and abnormal obstetrics and their complications. The most common causes of maternal morbidity and mortality are: complications of obstetric hemorrhage, preeclampsia – eclampsia and metabolic alterations of pregnancy, such as gestational diabetes and metabolic syndrome. We consider it of high impact in reducing the effect caused by these problems to know the incidence, detection and immediate actions that must be taken when these complications occur. An important issue at the national level is the impact of teenage pregnancies, which is why the works that concern this special group of the population are included in this line. Therefore, it is important to match this theoretical knowledge with activities that allow the resident to acquire sufficient skills to understand, know and solve these complications and also to be an agent of change by generating new knowledge by conducting research of high positive impact on these topics.

Diseases of the gynecological organs and the breast. This line was created to study the pathophysiological mechanisms, prevalence and interventions of the most frequent pathologies related to benign and malignant gynecological diseases during all stages of a woman's life. Studies and research on the effects of diseases related to metabolism and female hormone regulation are also included. The types of cancer that most often affect women are breast, colon, rectum, endometrial, lung, cervix, skin and ovarian cancers. Four of these are of gynecological origin, and can occur in different stages in women. Because many of these cancers are curable if detected and treated in time, lines of research have been developed for the detection and treatment of these pathologies.

Gynecological and obstetric surgery. This line studies the treatment of different gynecological and obstetric pathologies under different surgical approaches in order to describe new techniques and compare results with traditional surgical techniques. In our Specialization program, the resident is exposed in the different hospital locations during their training to the acquisition of surgical skills in the different types of abdominal, vaginal and minimally invasive approaches.

**REG Residency in Gynecology and Obstetrics
2013 Plan**

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4266	Fundamentals in Gynecology and Obstetrics I	3
ME4267	Gynecology & Obstetrics Care I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4268	Fundamentals in Gynecology and Obstetrics II	3
ME4269	Gynecology & Obstetrics Care II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4270	Outpatient care in gynecology and obstetrics	3
ME4271	Gynecology & Obstetrics Care III	3
		9

Fourth Semester

Code	Name	CA
ME4272	Gynecology and Obstetrics Specialties I	3
ME4273	Gynecology & Obstetrics Care IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5318	Gynecology and Obstetrics Specialties II	3
ME5319	Gynecology & Obstetrics Care V	1.5
		6

Sixth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5320	Gynecology and Obstetrics Specialties III	3
ME5321	Gynecology & Obstetrics Care VI	1.5
		6

Seventh Semester

Code	Name	CA
ME5322	Advances in Gynecology and Obstetrics I	3
ME5323	Gynecology & Obstetrics Care VII	3
		6

Eighth Semester

Code	Name	CA
ME5266	Thesis Defense	0.3
ME5324	Advances in Gynecology and Obstetrics II	3
ME5325	Gynecology & Obstetrics Care VIII	3
		6.3

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

REM Residency in Internal Medicine

Justification

Over the last few decades, the life expectancy of Mexicans has increased considerably, thus increasing chronic-degenerative health problems, including diabetes, hypertension, liver diseases and cancer, among many others that are within the scope of the Internist and related subspecialties. On the other hand, globalization, advances in knowledge of biology, genomics, proteomics, the development of new technologies and communication and computer systems, social networks, changes in epidemiology, advances in therapeutics, and the growing cost of health services, could mean a radical change in the approach to diseases in this generation.

Today more than ever, the Internist must practice with scientific bases and based on evidence; He will undoubtedly focus on the practice of preventive and outpatient medicine, maintaining his position in in-hospital medicine as a leader of a health team and as a trainer of doctors who wish to do a subSpecialization related to internal medicine.

Tecnológico de Monterrey guides the educational process so that students acquire knowledge and develop skills, attitudes, and values that allow them to be formed as people, committed to their community and act as agents of change to improve it in the field of their Specialization and that allow them to stay up to date in a changing environment.

The curricular contents and competencies are developed by the students throughout the four-year program, incorporating during that period the knowledge, skills, attitudes and values that a good internist must possess.

Clinical activities are carried out both in public (Metropolitan Hospital) and private environments (San José de Monterrey Hospital and Zambrano Hellion Medical Center), which allows us to have a broad overview of Medicine in our region, having opportunities for national and/or international rotations to broaden this panorama.

Program Objective

The Specialization in Internal Medicine at Tecnológico de Monterrey aims to train excellent Internists, who attend to the health needs of adult patients in hospital and outpatient settings with quality and safety. Likewise, to train people of integrity, who exercise their clinical practice, teaching and research with a human sense and strict adherence to ethical principles and professionalism.

The Internists graduated from this institution are outstanding leaders at the local and international level, who contribute to the continuous improvement of health care processes and to generate innovations in the primary or secondary prevention of conditions that affect the adult population, particularly chronic-degenerative diseases.

Graduate profile

Internal Medicine is the Specialization of Medicine that is responsible for the medical care of adult patients and from which derive the subspecialties that are dedicated to the care of diseases of the different organs or systems of the human body.

The Specialization Program in Internal Medicine seeks to train people with the following competencies:

- Apply the knowledge of Internal Medicine for the diagnosis, treatment, prevention and rehabilitation of health problems in adult patients.
- Keep their knowledge of Internal Medicine and its subSpecialization areas up to date by consulting relevant sources of information for better medical care.
- Formulate significant clinical questions regarding patient care to be resolved through clinical or bibliographic research.
- Communicate their ideas in clinical care and research effectively and clearly, both orally and in writing.
- Provide medical care to patients with professionalism and high ethical standards.

Target audience

The Multicenter Program of Internal Medicine of Tecnológico de Monterrey is aimed at graduates of a bachelor's degree in Medicine, with excellent academic performance, with a vocation and express interest in the discipline, with a genuine interest in research and teaching.

To enter the Medical Specialization in Internal Medicine at the School of Medicine and Health Sciences of Tecnológico de Monterrey, applicants must satisfactorily meet the requirements established by ITESM and the Ministry of Health for admission to graduate studies.

Lines of research

Gastroenterology.

Motility of the Digestive Tract: Reflux disease, defecation disorders. Research and evaluation of different diagnostic methods, including phmetry, impedance, manometry, biopsy and other studies.

Current diet and lifestyle have increased the frequency of reflux disease, which has a major impact on quality of life and treatment costs. For this reason, we consider it of utmost importance to implement and optimize the protocol for the study and treatment of patients who suffer from it. On the other hand, the increase in life expectancy has made problems that were not paid much attention to become relevant and the center of discussion. Among these are defecation disorders (constipation and incontinence), which, although not exclusive to adults, do have a negative impact on quality of life, work capacity and the use of health services and the cost of medications and treatments. So, through this line of research, we seek to improve the quality of life of our patients for their reintegration into a productive life.

Biomarkers.

It includes scales and their combination, for the identification of risk or severity in different diseases, including clinical, biochemical and molecular markers. For the design of protocols for the diagnostic approach and treatment of various diseases, particularly those with a high potential for the development of complications, it is ideal to have markers for the diagnosis, the establishment of the severity and the potential for the development of complications, so we consider it very relevant to search for scales, markers and combinations of them that help us improve the process of care for patients.

Non-communicable diseases.

Noncommunicable diseases are the cause of 70% of deaths worldwide. Many of these deaths are premature, especially in developing countries. These include cardiovascular disease, cancer, chronic lung disease, and diabetes. Screening, screening and treatment, as well as palliative care, are critical components of the NCD response. This line studies the pathologies that, due to their frequency and importance, require a deeper study of the pathophysiological mechanisms that originate them, thus seeking to solve them through the application of new diagnostic and therapeutic measures.

Communicable diseases.

Communicable diseases include HIV/AIDS infection, sexually transmitted infections (STIs), and viral hepatitis; tuberculosis; malaria and other vector-borne diseases; neglected, tropical and zoonotic diseases; and vaccine-preventable diseases. Up to 34 million people worldwide are currently infected with the human immunodeficiency virus, and more than 250 other communicable diseases are identified worldwide. The increase in communicable diseases and the re-emergence of many of them, such as malaria and tuberculosis, and the growing threat of biological terrorism, it is imminent to promote research and surveillance regarding their presentation and distribution.

REM Residency in Internal Medicine 2013 Plan

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4169	Internal Medicine Healthcare I	3
ME4170	Internal Medicine I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4171	Internal Medicine Healthcare II	3
ME4172	Internal Medicine II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4173	Internal Medicine Healthcare III	3
ME4174	Internal Medicine III	3
		9

Fourth Semester

Code	Name	CA
ME4175	Internal Medicine Healthcare IV	3
ME4176	Internal Medicine IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME5217	Internal Medicine Healthcare V	3
ME5218	Internal Medicine V	3
		6

Sixth Semester

Code	Name	CA
ME5219	Internal Medicine Healthcare VI	3
ME5220	Internal Medicine VI	3
		6

Seventh Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5221	Internal Medicine Healthcare VII	1.5
ME5222	Internal Medicine VII	3
		6

Eighth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5223	Internal Medicine Specialization Care	1.5
ME5224	Specialties in Internal Medicine	3
ME5266	Thesis Defense	0.3
		6.3

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

REN Residency in Pediatrics

Justification

The generation of new specialists in the area of Pediatrics, committed to solving the needs of a growing child population and where the use of new technologies and innovation in diagnosis, treatment and prevention are a constant need, represent the engine that gives rise to the Multicenter program of the Specialization in Pediatrics.

It requires the training of specialists with a broad vision of the various health problems of children with different and complex sociocultural characteristics and who have a high ethical sense in their actions and being, willing to seek new and better alternatives for the approach to the various patients; That is the *raison d'être* of this program.

Program objectives

The main purposes of the Specialization in Pediatrics at Tecnológico de Monterrey are to train excellent Pediatricians, who attend to the health needs of children and adolescents in hospital and outpatient settings with quality and safety. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The pediatricians graduated from this institution are outstanding leaders in the local and international arena, who contribute to generating innovative medical practices through clinical research, related to the care of common and complex health problems of the population between 0 and 21 years of age.

Graduate profile

The specialist doctor graduated from the program of medical specialists in Pediatrics will be able to:

- Apply their knowledge and skills for the care, prevention and promotion of health in children and adolescents.

- To practice medicine with professionalism and responsibility, committing to the continuous improvement of paediatrics.

- Participate in the development of medical practices through teaching aimed at patients, students and colleagues.

- Communicate the results of projects or research to provide possible solutions to cases specific to the Specialization.

- Carry out clinical practices in medical groups of their Specialization and multidisciplinary to share medical experiences.

Target audience

To all those doctors interested in acquiring the knowledge, skills and attitudes necessary to preserve and improve the health of children and adolescents.

People committed to work, self-study, with concern and initiative to solve the serious health problems of children through continuous progress and updating.

Enterprising doctors willing to improve the practice and development of Pediatrics in the environment where they work.

Lines of research

Nutrition and metabolism. Study of the pathophysiological mechanisms, prevalence and interventions in the most frequent pathologies related to nutritional status such as malnutrition and obesity. It also studies the effects of these diseases on metabolism and hormonal regulation involved in these pathologies.

Public health and psychosocial aspects of paediatric diseases. Study of situations related to disease prevention individually and collectively within the community to solve problems in the biological-psychological and social spheres.

Internal medicine. Study of pathologies that occur in the pediatric age that, due to their frequency and importance, require a deeper study of the pathophysiological mechanisms that originate them, thus seeking to solve them through the application of new diagnostic and therapeutic measures.

**REN Residency in Pediatrics
2013 Plan**

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4183	Pediatric Medical Care I	3
ME4184	Pediatrics I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4185	Pediatric Medical Care II	3
ME4186	Pediatrics II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4187	Pediatric Medical Care III	3
ME4188	Pediatrics III	3
		9

Fourth Semester

Code	Name	CA
ME4189	Pediatric Medical Care IV	3
ME4190	Pediatrics IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME5231	Pediatric Medical Care V	3
ME5232	Pediatrics V	3
		6

Sixth Semester

Code	Name	CA
ME5233	Pediatric Medical Care VI	3
ME5234	Pediatrics VI	3
		6

Seventh Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5235	Pediatric Medical Care VII	1.5
ME5236	Pediatrics VII	3
		6

Eighth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5237	Pediatric Medical Care VIII	1.5
ME5238	Pediatrics VIII	3
ME5266	Thesis Defense	0.3
		6.3

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

REO Residency in Ophthalmology

Justification

The accelerated scientific and technological progress of our time, the demand for upright, competent, ethical health professionals with a humanistic vision, who are committed to providing medical care of the highest quality, using state-of-the-art technology in the care of the population's ailments; as well as the need to share, transfer, and contribute knowledge to the scientific community through medical education and research, justify that the Tec Salud, of the Monterrey Technological System, through its Specialization Program in Ophthalmology, has determined in its Mission to focus the educational process on our graduate students acquiring knowledge and developing skills, attitudes and values that allow them to be formed as people of integrity, ethics, committed to the transformation and development of their community and who also act as agents of change to improve the field of their Specialization in all aspects of health, competing internationally and at the same time contributing knowledge to the area.

Both the diagnostic methodology and the surgical team continuously undergo modifications in favor of the care of patients with eye diseases. This has prompted the institution to give great importance to continuing medical education, to the transfer and updating of knowledge and diagnostic and treatment techniques, as well as to the training of human resources for visual health who are committed to providing the best ophthalmological care to their community.

The Multicenter Program in Ophthalmology has an infrastructure where different hospital and medical care areas are exposed, with a high-level Ophthalmology Department that seeks to be at the forefront of the greatest scientific and technological advances of recent decades in the area. It uses a competency-based and patient-centered educational model; with well-structured educational and research programs and processes, offered by medical specialists with teacher training, which converge in a medical care framework.

Program objectives

The Specialization in Ophthalmology at Tecnológico de Monterrey aims to train excellent Ophthalmologists, who provide quality and safety care for the visual health and eye diseases of the population, in hospital and outpatient environments, public and private. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense, a spirit of service and strict adherence to ethical principles and professionalism.

The Ophthalmologists graduated from this institution are outstanding leaders in the local and international arena, who contribute to generating innovations in diagnostic and therapeutic methods and techniques, as well as in the implementation of prevention programs and timely detection of relevant eye diseases in the general population.

Graduate profile

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

- To apply the most up-to-date medical knowledge of Ophthalmology in the comprehensive care of patients with eye problems, with ethics, professionalism and humanistic vision.
- Perform surgical procedures for the care of the main ophthalmological problems that prevail in the community, such as cataracts, strabismus, refractive surgery and application of retinal lasers, with quality and patient safety.

- Evaluate the ocular, systemic and external conditions of each patient and the community, to achieve the optimal state in eye and visual health.
- Collaborate in multidisciplinary teams in the prevention and timely detection of glaucoma, diabetic retinopathy and visual problems in children, among other eye conditions.
- Demonstrate interpersonal and communication skills that facilitate effective information sharing and rapport with patients and colleagues.
- To contribute to the development of Ophthalmology through the development of research and teaching skills.

Target audience

The Ophthalmology Program is aimed at graduates of a bachelor's degree in Medicine, with excellent academic performance, with a specific vocation for the Specialization, who have the following characteristics: ability to apply the understanding of basic, clinical and social sciences as a basis for their medical practice; clinical skills; management of diagnostic and therapeutic resources; health promotion and disease prevention; effective communication; skills for the management of printed and electronic information; reasoning, clinical judgment and decision-making; self-instruction; English language; personal development, incorporation of attitudes and ethical bases; vocation and capacity for study. To enter the Medical Specialization in Ophthalmology at the School of Medicine and Health Sciences of Tecnológico de Monterrey, applicants must satisfactorily meet the requirements established by ITESM and the Ministry of Health for admission to Graduate Studies.

Lines of research

Medications and management of ocular tissues. The importance of the projects derived from this line of research, in addition to training residents simultaneously in clinical practice and translational research, is aimed at solving visual loss caused by alterations in the ocular surface, including the cornea and conjunctiva, in addition to the cellular and tissue regeneration of the retina in pathologies such as diabetic retinopathy and macular and optic nerve degeneration. particularly in glaucoma.

Paediatric ophthalmology. This line of research is aimed at developing more efficient diagnostic techniques, in order to improve the timely detection of various congenital eye diseases with a high visual impact such as congenital glaucoma, retinopathy of prematurity and retinoblastoma, which are the cause of irreversible blindness. On the other hand, it focuses on developing more efficient strategies for the evaluation and early detection of more common diseases, such as refractive errors or strabismus, which are of vital importance since they affect the visual development of children at an early age, causing amblyopia. On the other hand, it also focuses on the development of better therapeutic alternatives for these diseases.

Epidemiology and clinical manifestations of eye diseases. It is aimed at improving knowledge about the epidemiological, demographic and pathogenic features of the most prevalent eye diseases that affect the Mexican population.

**REO Residency in Ophthalmology
2013 Plan**

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4220	Fundamentals of Ophthalmology I	3
ME4221	Ophthalmology Medical and Surgical Care I	3
		9

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	1.5
ME4143	Research and innovation methods	1.5
ME4222	Fundamentals of Ophthalmology a II	3
ME4223	Ophthalmology Medical and Surgical Care II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4224	Oculoplastics, pediatric ophthalmology and strabismus	3
ME4225	Ophthalmology Medical and Surgical Care III	3
		9

Fourth Semester

Code	Name	CA
ME4226	Glaucoma, anterior segment and neuro-ophthalmology	3
ME4227	Ophthalmology Medical and Surgical Care IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME5273	Córnea, enfermedades externas y cirugía refractiva	3
ME5274	Ophthalmology Medical and Surgical Care V	3
		6

Sixth Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5275	Retina and uveitis	3
ME5276	Ophthalmology Medical and Surgical Care VI	1.5
		6

Seventh Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5277	Specialties in ophthalmology	3
ME5278	Ophthalmology Medical and Surgical Care VII	1.5
		6

Eighth Semester

Code	Name	CA
ME5266	Thesis Defense	0.3
ME5279	Diagnostic studies in ophthalmology	3
ME5280	Ophthalmology Medical and Surgical Care VIII	3
		6.3

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

RER Residency in Radiology and Imaging

Justification

Currently, all health institutions have an unmet demand for doctors specializing in Radiology and Imaging trained to perform successfully in this context. In addition to the shortage of qualified specialists available, there are few institutions suitable for this type of postgraduate training. This was one of the several reasons that prompted the creation of the Residency in Diagnostic Radiology at the San José de Monterrey Hospital in 1976, and within the medical specialties of the Tecnológico de Monterrey since 1983. It is currently a Multicenter Program that operates in conjunction with the Ministry of Health of the State of Nuevo León.

The theoretical knowledge and procedures of the Specialization, as well as the technology and diversity of new imaging methods, make our Specialization one of the most dynamic in medicine. The academic program of the Specialization in Radiology is four years long, to maintain the quality of our graduates at a national level and internationally competitive. This program is continuously updated, maintaining the balance between the most modern knowledge and the basic knowledge of the Specialization, so that graduates are able to work, modify and innovate in any health system.

Likewise, we continuously adjust the operational programs and evaluation methods so that they are congruent with the program in the different hospitals of our Multicenter Program, and we try to teach, monitor, and evaluate the attitudes, values, and behavior of our students, making them congruent with the 2015 Mission of Tecnológico de Monterrey.

Program Objectives

The Specialization in Radiology at Tecnológico de Monterrey aims to train excellent Radiologists who meet the health needs of patients in hospital and outpatient settings with quality and safety. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The radiologists graduated from this institution are outstanding leaders in the local and international arena, who remain at the forefront in the practice of their Specialization and generate care models based on research and innovation that allow them to compete in a globalized economy.

Graduate profile

The Radiologist graduated from this program will be able to:

- Recognize the health needs of patients, family members, and society in general, as well as those of medical institutions and third-party payers.
- Carry out their medical practice considering the risks/benefits, costs/benefits, ecological and medical-legal aspects of their professional work; all within the framework of medical ethics.
- Investigate problems in their professional practice in multidisciplinary teams and use the results obtained in their solution.
- Communicate effectively and respectfully with patients, family members, as well as other health professionals.

Target audience

This program is aimed at Medical Surgeons, graduates of national and international universities recognized by Tecnológico de Monterrey, who have excellent academic performance; leadership skills; interest in working as educators and researchers, and with a psychological profile that adapts to change and innovation.

To enter the Specialization in Radiology at the School of Medicine and Health Sciences of Tecnológico de Monterrey, applicants must satisfactorily meet the requirements established by ITESM and the Ministry of Health for graduate admission.

Lines of research

Study and application of interventional diagnostic and therapeutic procedures for the treatment of cardiovascular diseases. In this line of research, associate professors seek to integrate vascular and interventional therapeutic procedures for the treatment of cardiovascular diseases, implementing advanced diagnostics and therapeutics, as well as the development of new treatments and care algorithms. Our faculty includes professors who are subspecialists in interventional radiology as well as professors trained in vascular imaging.

Study and application of interventional diagnostic and therapeutic procedures for the treatment of oncological, chronic degenerative and metabolic diseases. This line of research seeks to integrate advanced diagnostics and therapeutic procedures for oncological, chronic-degenerative and metabolic diseases. Associate professors share a special interest in the area, dedicating specific time to advanced diagnostic studies and interventional therapeutic procedures. Some of our professors actively participate in the Oncology Tumor Board and develop the field of chemoembolization and regional loco ablation at Tec Salud Hospitals.

Study and application of methods for quality and safety management in diagnostic and therapeutic radiology. Radiology today requires its professionals to have a solid knowledge of the risks of radiation use and exposure. The line of research on radiation protection focuses on exploring methods and procedures that demonstrate an optimal balance between the quality of the images, the effectiveness of the diagnostic information that the Radiologist obtains from them, and the radiation dose necessary to acquire them. In this line of research, associate professors have a special interest in the area, dedicating specific time to the analysis of images obtained with current protocols in the departments of radiology and hemodynamics, as well as dosimetry to develop mechanisms for dose reduction and development of low-dose protocols.

RER Residency in Radiology and Imaging 2013 Plan

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4205	Radiology and Imaging I	3
ME4206	Medical care in Radiology and Imaging I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4207	Radiology and Imaging II	1.5
ME4208	Medical care in Radiology and Imaging II	3
ME4209	Advanced physics	1.5
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4210	Radiology and Imaging III	3
ME4211	Medical care in Radiology and Imaging III	3
		9

Fourth Semester

Code	Name	CA
ME4212	Radiology and Imaging IV	3
ME4213	Medical care in Radiology and Imaging IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME5258	Radiology and Imaging V	3
ME5259	Medical care in Radiology and Imaging V	3
		6

Sixth Semester

Code	Name	CA
ME5260	Radiology and Imaging VI	3
ME5261	Medical care in Radiology and Imaging VI	3
		6

Seventh Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5262	Radiology and Imaging VII	3
ME5263	Medical care in Radiology and Imaging VII	1.5
		6

Eighth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5264	Radiology and Imaging VIII	3
ME5265	Medical care in Radiology and Imaging VIII	1.5
ME5266	Thesis Defense	0.3
		6.3

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

REU Residency in Neurology

Justification

Currently, neurological diseases represent a heterogeneous group of conditions of the central and peripheral nervous system that have registered a significant growth in their incidence in Mexico due to the inversion in the population pyramid and an increase in life expectancy, observing a greater increase in neurodegenerative diseases which have age as an important risk factor. In addition to this, we have cerebral vascular disease as the third cause of death in Mexico, which will continue to be an important cause of morbidity and will be generating high economic costs for the rehabilitation and social reintegration that this represents (INEGI 2010).

To face these challenges, it is necessary to train health professionals in Mexico who are experts in neurology committed to society that demands quality medical care as well as humane treatment in the prevention, diagnosis and treatment of this group of pathologies. The Specialization in Neurology responds to this need to train health professionals with aptitude and knowledge, being since its origins a training, updating, teaching, care and innovative program, taking into account that neurology is one of the branches of medicine that has had the greatest growth in the last decade both at the diagnostic level, as well as new lines of basic and clinical research in the search for new treatments.

The Multicenter Neurology Program of Tecnológico de Monterrey has the academic staff and infrastructure that a quality program requires, being an educational model of excellence based on competencies centered on the patient and offered by successful professionals experts in the area of both clinical and experimental teaching, based on this the residents of this program have all the human support, technological and methodological cutting-edge necessary to develop its potential and thus excel in the regional, national and international arena. This program is aimed at any health professional who wishes to pursue a postgraduate degree in the area of clinical neurology.

Program Objectives

The Specialization in Neurology at Tecnológico de Monterrey aims to train excellent Neurologists who meet the health needs of patients with neurological pathologies with quality and safety, in public and private hospital and outpatient settings. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The Neurologists graduated from this institution are leaders with a high international competitive level, who contribute to generating knowledge at the frontiers of Neurology and transfer such knowledge through teaching, and who are committed to continuous medical updating.

Graduate profile

The Medical Specialization in Neurology program seeks to train people as neurologist specialists capable of:

- To carry out diagnosis, treatment and health promotion of patients with neurological diseases in a comprehensive and effective way based on scientific evidence, making appropriate use of resources,

demonstrating research and analysis thinking, with appropriate knowledge and application of the basic and clinical sciences of Neurology to clinical situations.

- Respect the dignity of the human being and the ethical principles of their profession as a neurologist.
- Efficiently coordinate the health team involved in the clinical, rehabilitation, and palliative care of patients with neurological conditions.
- Apply their knowledge in the planning, design, statistical analysis, discussion, conclusion and publication of clinical studies aimed at assessing the diagnostic and therapeutic effectiveness in their area of Specialization.
- Participate in the development of clinical and basic research protocols, especially in the branches of abnormal movements, neurodegenerative diseases, and neoplasms of the central nervous system.
- Communicate their knowledge effectively with patients, family members and medical colleagues, as well as with other health professionals, demonstrating an attitude of information, listening, care, compassion and respect for the patient and their families, including the patient's preferences in the development of disease management plans and exercising their Specialization in a cost-efficient manner without compromising the quality of care.

Target audience

The Neurology Specialization program at Tecnológico de Monterrey is aimed at doctors with a great sense of social responsibility; with availability to receive new knowledge; with the ability and desire to acquire their own skills to gather knowledge in the area of neurological sciences and later have the ability to generate new knowledge within this branch of neurosciences.

The Neurology Program at Tecnológico de Monterrey is aimed at graduates of the Specialization in Internal Medicine, or who have accredited at least two years of Internal Medicine and who have excellent academic performance, with a vocation and express interest in the discipline, with an innovative spirit committed to continuous learning, with a genuine interest in research and teaching.

To enter the Specialization in Neurology at the School of Medicine and Health Sciences of Tecnológico de Monterrey, applicants must satisfactorily meet the requirements established by ITESM and the Ministry of Health for postgraduate admission.

Lines of research

Neurodegenerative diseases. Neurodegenerative diseases are those diseases where there is an increase in the processes of cell death in different regions of the central nervous system, affecting in a chronic and progressive way, producing a variety of symptoms. These diseases, especially Alzheimer's Disease and Parkinson's Disease, have a high prevalence in our community, they represent a serious health problem. The number is estimated to triple by 2030. Currently, they represent the main cause of disability in adults, having a great social impact.

Multiple Sclerosis and other demyelinating diseases of the Central Nervous System. CNS inflammatory demyelinating diseases comprise a group of pathologies of autoimmune etiology, monophasic, recurrent or progressive behavior that affect the central nervous system. These include multiple sclerosis, acute disseminated encephalomyelitis, and neuromyelitis optica. Of all of them, multiple sclerosis is the most prevalent in our country, and it is considered to be one of the leading causes of physical disability due to non-traumatic causes, affecting approximately 30% of patients after 10 years of suffering from the disease.

Study of cerebrovascular diseases. There is a high incidence of diseases that affect the cerebral blood vessels, which represent the fifth cause of disease in our country and the first cause of disability in the world. Due to this, clinical research work has been initiated to evaluate the impact of cerebrovascular disease in our population, through clinical studies of diagnosis and treatment of patients with cerebral circulation involvement.

**REU Specialization in Neurology
2013 Plan**

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4214	Neurology I	3
ME4215	Medical Care in Neurology I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4216	Neurology II	3
ME4217	Medical Care in Neurology II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4218	Neurology III	3
ME4219	Medical Care in Neurology III	3
		9

Fourth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5267	Neurology IV	3
ME5268	Medical Care in Neurology IV	3
		9

Fifth Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5269	Neurology V	3
ME5270	Medical Care in Neurology V	1.5
		6

Sixth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5266	Thesis Defense	0.3
ME5271	Neurology VI	3
ME5272	Medical Care in Neurology VI	1.5
		6.3

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

RGE Residency in Geriatrics

Justification

Currently in our country there are 420 geriatricians who meet the requirements requested by the educational and health authorities, and a population of almost 9,000,000 older adults. International recommendations suggest the existence of one geriatrician for every 2,500 older adults, while with the aforementioned figures, in Mexico there is one for every 22,000 older adults.

It is also predicted that in the next 40 years the age group with the greatest growth will be that of older adults, who present physiological changes and diseases with a high demand for human, social and economic resources, which is why Tecnológico de Monterrey assumes the commitment to train medical specialists in Geriatrics with a humanistic vision. High adherence to ethical principles, committed to the social, educational and economic development of their community, competent on the world stage and in balance with the sustainable use of natural resources.

Program Objectives

The main purposes of the Specialization in Geriatrics at Tecnológico de Monterrey are to train excellent Geriatric Physicians, who attend to the health needs of older adults in hospital, outpatient and long-term care settings with quality and safety. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The Geriatricians graduated from this institution are outstanding leaders at the local and international level, who contribute to designing strategies and generating innovations to solve problems related to the health of the elderly population.

Graduate profile

The specialist doctor graduated from the Geriatrics program at Tecnológico de Monterrey will be able to:

- Develop models of geriatric care in the institutional or private environment, based on the human being and his or her socio-family environment, within the framework of medical ethics.
- Coordinate the actions of interdisciplinary health teams for the medical and gerontological care of their patients, always seeking an improvement in their quality of life.
- Develop clinical research projects in Geriatrics.
- To provide high-quality medical care based on the state of the art of Geriatrics and under a framework of ethics and professionalism.
- Educate health personnel and the community regarding the care and care of the elderly.

Target audience

This program is aimed at general practitioners with a high degree of social commitment, with an interest in providing quality care to the elderly from a comprehensive point of view, identifying the patient himself as the protagonist of this care.

To enter the Specialization in Geriatrics of the School of Medicine and Health Sciences, applicants must satisfactorily meet the requirements established by Tecnológico de Monterrey and the Ministry of Health for postgraduate admission.

Lines of research

Fragility, transitional states and their determinants. Validation of diagnostic methodologies of frailty, the study of the intermediate stages between robustness and frailty to predict those that tend to become fragile, as well as the study of the determinants of frailty: nutrition, physical activity, physical condition, sarcolemma, comorbidity, allostatic load, mental disorders and support networks. The final objective is to determine a series of actions that allow preventing and/or reversing the process of embrittlement.

Altered cognitive state, determinants and consequences. Validation of screening and diagnostic tests for cognitive disorders in our population in the different educational strata (from illiterate to higher education), identification of modifiable risk factors in our population and observation of the response to the modification of these risk factors, as well as determining the individual, family and social consequences of cognitive disorders. The final objective is to determine a series of actions that allow preventing and attenuating the consequences of the different disorders in cognition.

RGE Residency in Geriatrics 2013 Plan

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4170	Internal Medicine I	3
ME4201	Medical care in geriatrics and gerontology I	3
		7.5

Second Semester

Code	Name	CA
ME4142	Quality in clinical care	1.5
ME4172	Internal Medicine II	3
ME4202	Medical care in geriatrics and gerontology II	3
		7.5

Third Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4174	Internal Medicine III	3
ME4203	Medical care in geriatrics and gerontology III	3
		7.5

Fourth Semester

Code	Name	CA
ME4143	Research and innovation methods	1.5
ME4176	Internal Medicine IV	3
ME4204	Medical care in geriatrics and gerontology IV	3
		7.5

Fifth Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME5249	Geriatrics and Gerontology I	3
ME5250	Medical care in geriatrics and gerontology V	3
		9

Sixth Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5251	Geriatrics and Gerontology II	3
ME5252	Medical care in geriatrics and gerontology VI	1.5
		6

Seventh Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5253	Geriatrics and Gerontology III	3
ME5254	Medical care in geriatrics and gerontology VII	3
		9

Eighth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5255	Geriatrics and Gerontology IV	3
ME5257	Medical care in geriatrics and gerontology VIII	1.5
ME5266	Thesis Defense	0.3
		6.3

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

RNE Residency in Neonatology

Justification

The Neonatology Specialization program responds to the need widely recognized internationally since 1930, to train specialists in the care of sick newborns. This programme is fully justified if we understand its contribution to achieving the health goals of the World Summit for Children, which include: reducing the mortality rate in children under one year of age by one third; give all pregnant women access to specialized care for their newborn and reduce the rate of low birth weight to less than 10%.

The profile of the Neonatologist graduate is developed by incorporating activities that support the scientific method, promote evidence-based medicine and develop in the student the culture of being a researcher; The research subjects are the ones that structure this knowledge and skills, as well as those of education, medical ethics and quality, which are ultimately vehicles together with the others to strengthen attitudes and values. A structured internationalization component is also included, focused on ensuring that the physician-in-training knows models of medical care from other countries, and perceives the differences in the process that occur in different sociocultural contexts, and that he not only knows but is able to understand these differences and take advantage of them for the benefit of the patient. It also incorporates a seminar on the Doctor-Patient-Family relationship, which focuses on preparing the clinician to be a positive agent in this context.

That is why the curriculum is based on three years, in order to cover these areas, as well as those of theoretical, technological and practical knowledge of Neonatology, with a particular emphasis on Basic, Clinical and Applied Research, sufficient for the comprehensive training of a Neonatologist with highly developed skills as a Researcher.

Program Objectives

The Neonatology Specialization at Tecnológico de Monterrey aims to train excellent Neonatologists who are experts in newborn medical care with high standards of quality and patient safety, in public and private health institutions. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The Neonatologist graduated from this institution is an outstanding leader who performs with quality in the national and international arena. It is committed to the development and transformation of its community through programs and actions to improve the quality of newborn care. It is creative and innovative, contributing to the generation and development of clinical research that impacts the health of the newborn.

Graduate profile

The Profile comprises three aspects of educational achievements that are expected as a result of the formal education process, these are: professional-humanistic orientation (BEING), intellectual training, evidence-based medicine and the application of the scientific method (KNOW) and the operational performance of the medical specialist (KNOW-HOW). Through a medical practice based on educational methodology focused on problem solving, it is proposed to ensure that the graduate is highly competent in his specific field of action, and that he offers evidence of meeting the specific competencies of the Specialization as well as the transversal competencies of all medical specialists.

Health care. The Resident of the Specialization in Neonatology will be able to:

- To carry out the evaluation, diagnosis and medical care of newborns in critical condition, medical or surgical, with integrity, responsibility and human sense.
- Perform the competent management of evaluation, diagnosis, monitoring and treatment techniques that are used in the clinical care of newborns in critical, medical or surgical conditions.
- To identify the psychosocial implications of the disease in their patients, as well as the repercussions on the family environment and/or substitute caregivers.
- To identify high-risk pregnancies and their consequent repercussions on the birth process, pathologies in the newborn and on the clinical surveillance and follow-up of these patients.
- To use the databases of the patients treated as a guide for the necessary clinical decisions, and to understand the administrative processes that allow for the efficiency of neonatal medical care.

Medical Education. The Resident of the Specialization in Neonatology will be able to:

- Apply and transfer knowledge of basic medical disciplines in their relationship with the pregnancy process, the fetus and the newborn.
- Conduct clinical research in their field of expertise and communicate results efficiently, orally and in writing.

Target audience

This program is aimed at Pediatric Specialists, with the knowledge, skills, attitudes and values expected of a doctor specializing in Pediatrics, with excellent academic performance, who manifests a vocation and interest in Neonatology, with a genuine conviction to enter research and who demonstrates conversational mastery of the English language.

Applicants to enter the Neonatology Specialization of the School of Medicine and Health Sciences must satisfactorily meet the requirements established by the Tecnológico de Monterrey and the Ministry of Health for postgraduate admission.

Lines of research

The lines of research of the Neonatology Residency are:

Nutrition and metabolism of the newborn. Mexico is a very large country with a diversity of population that forces us to know the particular needs of the patients who are treated in our hospitals. The supply of adequate nutrients in quality and quantity, as well as the processing and efficient use of them, are essential for the optimal evolution of the development of the healthy newborn or of those with an underlying pathology. In this group, we will try to find the specific needs of patients in our community, with the aim of adjusting the guidelines and recommendations that already exist to our patient population.

Comprehensive care and management of the newborn with and without special requirements.

The newborn with a pathology or special need has always represented an enormous challenge for the team of doctors who are in their care. The immaturity to a greater or lesser degree of one or more of its structures requires a comprehensive approach to those who are caring for newborns. In the hospitals that neonatology residents attend, between 20 and 25 thousand births are attended per year, so the needs, pathologies and consequent challenges that this implies forces us to know the particular needs of our population in order to individualize and/or adapt the protocols for the care and management of newborns. both term and preterm. This multidisciplinary group includes clinical research on neonatal pathologies that are treated in the hospitals of the Multicenter System formed by the Tec-Salud Hospitals and the Nuevo León Health Services.

**RNE Residency in Neonatology
2013 Plan**

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4191	Medical care in Neonatology I	3
ME4192	Neonatology I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4193	Medical care in Neonatology II	3
ME4194	Neonatology II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4195	Medical care in Neonatology III	3
ME4196	Neonatology III	3
		9

Fourth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5239	Medical care in Neonatology IV	3
ME5240	Neonatology IV	3
		9

Fifth Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5241	Medical care in Neonatology V	1.5
ME5242	Neonatology V	3
		6

Sixth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5243	Medical care in Neonatology VI	1.5
ME5244	Neonatology VI	3
ME5266	Thesis Defense	0.3
		6.3

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

RNP Residency in Paediatric Neurology

Justification

Paediatric Neurology is a clinical speciality aimed at preventing, diagnosing, treating, rehabilitating and investigating neurological disorders that affect children and adolescents in their different stages of growth and development, such as metabolic problems, malformations of the central nervous system, seizures, neuromuscular, motor, language, learning and other problems related to neurodevelopment.

The training of specialists in Pediatric Neurology has relevant significance in society because the neurological pathological processes that have the greatest incidence in the population begin or are typical of childhood and adolescence, such as epilepsy (1.5%), learning and communication disorders (5 to 10%), cerebral palsy (5 / 1000), mental retardation, pervasive developmental disorder (autism) (1/125), congenital malformations, central nervous system infections, head injuries and others. Approximately 33% of the country's population is under 15 years of age (INEGI 2003), while there are currently fewer than 200 pediatric neurologists in the country, so that some states have only one pediatric neurologist and others no specialist in this field.

Training as a pediatric neurologist at the Tecnológico de Monterrey School of Medicine offers residents and future specialists multiple advantages: a competency-based academic program, which highlights both the knowledge, skills, and technical-scientific skills of the Specialization, as well as training as people to act as agents of change and transformation of the community in the field of their Specialization; multidisciplinary training that is based on Neurology, Pediatrics, Neurodevelopment, Neuropsychology and basic Neurosciences such as: neuroanatomy, neurophysiology, molecular genetics, neurochemistry, neuropathology and neuroimaging; multicenter operating model, which has headTrimesters and sub-headTrimesters in different public and private hospitals; internationally competitive state-of-the-art infrastructure and technology at the Zambrano Hellion Medical Center, for training in the areas of Neurorehabilitation, Neuropsychology, Neurophysiology, Neurosurgery and Psychiatry and interaction with neurological pathologies from newborn to adult; Innovative teaching-learning model, centered on the student and the patient, which incorporates well-structured research, medical education and ethics programs, and opportunities to learn about other national and international academic and health care models in this Specialization.

Program Objectives

The main purposes of the Specialization in Pediatric Neurology at Tecnológico de Monterrey are to train excellent Pediatric Neurologists, who attend to the health needs of children and adolescents with neurological disorders with quality and safety, in public or private health institutions. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The Pediatric Neurologists graduated from this institution are outstanding leaders in the local and international arena, who contribute to the development and transfer of knowledge in the area of their Specialization, through publications and active participation in academic and professional forums, and who collaborate with the training of specialists in this discipline, through teaching and continuing education activities.

Graduate profile

Upon completion of the Medical Specialization in Pediatric Neurology program, the resident will be able to:

- To plan, coordinate and execute, with scientific foundations and humanistic orientation, the comprehensive care of children and adolescents suffering from neurological conditions.
- Act as a consultant to other specialists or general practitioners and, after an adequate and complete assessment of the patient in their care, request the collaboration of other specialists in a timely manner if necessary.
- Design, carry out or collaborate in educational programs aimed at their own professional development, the health team of which they are part and the patients in their care and their families.
- Apply the scientific method in the investigation of problems in their professional practice and use the results obtained in their solution.

The particular feature of this program is its emphasis on outpatient pediatric neurology, neuropsychology, and neurorehabilitation. The pediatric neurologist graduated from this program will be able to practice his Specialization in the practice of outpatient neurology and in the different hospitals, with his own patients or as a consultant in the emergency, hospitalization and intensive care services; in prepaid service or health insurance organizations; in paediatric departments of educational institutions or universities, in the government health system; in neurorehabilitation institutions, etc. It will be prepared to serve all sectors of the population in all ecological environments.

Target audience

The Specialization in Pediatric Neurology at Tecnológico de Monterrey is aimed at graduates of the Pediatrics residency, with excellent academic performance, with a vocation and interest in the discipline, research and teaching, and committed to continuous learning. To enter this program, applicants must satisfactorily meet the requirements established by ITESM and the Ministry of Health for admission to postgraduate studies.

Lines of research

Epilepsy. Epilepsy is the most common chronic neurological disorder, it has great implications in terms of costs in health systems and quality of life of patients. The objective of this LGAC is to seek to optimize the treatment of these patients to improve their quality of life, as well as to guide our research on this condition, on epileptic seizures, their comorbidities and their assessment through: anxiety and depression scales, sleep quality, and video electroencephalography and imaging studies.

Pervasive developmental disorders (PDD) and neuromotor disorders. The increase in the frequency of autism spectrum disorders, which has a great impact on the quality of life of the patient and the family due to the costs of treatment in addition to the time spent. For this reason, we consider it of utmost importance to implement study protocols for the early identification and investigation of evaluation instruments, therapeutic and pharmacological treatments of patients who suffer from it.

RNP Residency in Paediatric Neurology 2013 Plan

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4260	Pediatric Neurology I	3
ME4261	Medical care in Pediatric Neurology I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4262	Pediatric Neurology II	3
ME4263	Medical care in Pediatric Neurology II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4264	Pediatric Neurology III	3
ME4265	Medical care in Pediatric Neurology a III	3
		9

Fourth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5312	Pediatric Neurology IV	3
ME5313	Medical care in Pediatric Neurology IV	3
		9

Fifth Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5314	Pediatric Neurology V	3
ME5315	Medical care in Pediatric Neurology V	1.5
		6

Sixth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5266	Thesis Defense	0.3
ME5316	Pediatric Neurology VI	3
ME5317	Medical care in Pediatric Neurology VI	1.5
		6.3

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

RPS Residency in Psychiatry

Justification

The changes that are being experienced in the world demand new and multiple competencies from professionals and increasingly strict quality requirements in their performance. It is evident the enormous diagnostic and therapeutic development in the area of clinical psychiatry, whose diagnostic criteria and therapeutic methods are continuously modified and renewed, so it is important to maintain an updated medical education and in the training of human resources for health, implement the teaching of the most current issues and impact on community health. The multiple advances in the areas of Molecular Genetics, pharmacology, psychotherapeutic techniques, new diagnostic and treatment technologies, and their clinical application show the need to quickly apply these advances to patients.

In order to fully comply with the profile of the declared graduate, subjects have been incorporated that support the scientific method, that promote evidence-based medicine and that develop in the student the culture of being researchers, the basic and advanced research subjects are those that structure this additional knowledge and skills, as well as those of education and medical ethics that are finally vehicles together with the others to strengthen attitudes and values. That is why the curriculum is based on four years in order to cover these areas, as well as those of theoretical, technological and practical knowledge of clinical studies for the comprehensive training of a Psychiatrist.

In the face of the innovation of techniques and procedures, an alternative solution provided by the educational model is student-centered learning and that of the clinical cases of patients so that the knowledge acquired is applied directly to patients and is a direct transfer to the reality of their environment as well as self-learning. which allows continuous medical education to be updated in the development of scientific and technological knowledge of the discipline.

Finally, this is how we see that there is a congruence between the foundation, our educational modality, the areas of training and the discipline itself. The characteristics of the Specialization in diagnostic screening through laboratory analysis are basic the development of new studies, technical advances and new knowledge through research, so the Psychiatrist in this educational model carries in his program the need to acquire theoretical knowledge of the Specialization itself, in education and research techniques, which will be useful to be able to solve in a comprehensive and satisfactory way the diagnostic health problems of patients, performing a professional work of excellence in their areas of work mentioned above (outpatient consultation, hospitalization, community support, preventive education of the general population or specific population groups, remote medical care via the internet for example, etc.).

Program Objectives

The Specialization in Psychiatry at Tecnológico de Monterrey is aimed at training excellent Psychiatrists, who successfully perform in the care of mental health needs of patients in the public or private sector. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

The psychiatrists graduated from this institution are outstanding leaders in the local and international arena. They are creative and innovative, promoting the development of mental health in the community

and conducting relevant clinical research.

Graduate profile

The psychiatrist graduated from the multicenter program of the Tecnológico de Monterrey School of Medicine has the following competencies:

- He has a wide command of psychopathology, psychiatric nosology and treatment methods typical of psychiatry; being able to define, apply, perform and interpret the different diagnostic tests and psychiatric therapeutic methodologies.
- Master each of the basic learning units of the Specialization, including psychopathology, neuroanatomy and neurophysiology, psychopharmacology, psychotherapies, diagnostic and treatment methodologies, and the basic knowledge of the subspecialties of psychiatry (child and adolescent, elderly, addictions, eating disorders, pain management, and cancer patients).
- Performs the administrative management, quality control, and development of a mental health system (from a doctor's office to a clinic) by planning, organizing, coordinating, and supervising the activities of the technical and auxiliary professional staff of a mental health system.
- It collaborates with doctors from other specialties to establish the diagnosis, prognosis and treatment of patients as well as the required preventive measures.
- It develops teaching and medical research activities applied to psychiatry.
- Make decisions based on ethical principles, responsibility, professionalism, and citizenship.

Target audience

This program is aimed at doctors with a vocation for the study of Psychiatry; with high moral values, committed to the ethical exercise of their profession; with availability to work in multidisciplinary teams and interest in the field of research. To enter this program, applicants must satisfactorily meet the requirements established by Tecnológico de Monterrey and the Ministry of Health for graduate admission.

Lines of research

Mental and Behavioral Disorders of Childhood and Adolescence. Mexico's population pyramid has a broad base, that is, the population of children and adolescents is larger compared to other age groups. This generates the need to attend to this type of population, and different types of disorders that generate levels of disability are currently detected.

Severe mental disorders. The degree of functional disability generated by mental disorders is proportional to their severity. Typically, these are diagnosed from the first level of care to the third level of medical care where they usually receive outpatient or inpatient treatment.

RPS Residency in Psychiatry 2013 Plan

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4145	Medical care in Psychiatry I	3
ME4146	Psychiatry I	3
		7.5

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	1.5
ME4147	Medical care in Psychiatry II	3
ME4148	Psychiatry II	3
		7.5

Third Semester

Code	Name	CA
ME4142	Quality in clinical care	1.5
ME4149	Medical care in Psychiatry III	3
ME4150	Psychiatry III	3
		7.5

Fourth Semester

Code	Name	CA
ME4143	Research and innovation methods	1.5
ME4151	Medical care in Psychiatry IV	3
ME4152	Psychiatry IV	3
		7.5

Fifth Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME5193	Medical care in Psychiatry V	3
ME5194	Psychiatry V	3
		9

Sixth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5195	Medical care in Psychiatry VI	3
ME5196	Psychiatry VI	3
		9

Seventh Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5197	Medical care in Psychiatry VII	1.5
ME5198	Psychiatry VII	3
		6

Eighth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5199	Medical care in Psychiatry VIII	1.5
ME5200	Psychiatry VIII	3
ME5266	Thesis Defense	0.3
		6.3

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

RUR Residency in Urology

Justification

The contemporary demands of the medical profession of Urology require great efforts to maintain the constant decrease in morbidity and mortality of urological diseases in Mexico. Diseases of the urinary system represent the fourth most important place with a national average rate of 5.0 (INEGI, 2004). Likewise, it is reported that the most common causes of hospital discharges for the age group of 45 to 64 years are diseases of the genitourinary tract (PAHO, Cap. Mexico), which without adequate care by competent urologists will continue to grow at the same rate as population growth, generating great health problems and unnecessary expenses for the country.

Offering high-quality urological medical care requires strict discipline in the training of professionals committed to the social, political, economic and cultural development of the community. In accordance with this demand, the Medical Specialization in Urology seeks the training of highly competent medical specialists in minimally invasive surgical techniques, as well as other new study methods, medical and surgical treatments for the solution of prostate problems, urinary lithiasis and especially urogenital cancer; that they are people and professionals of integrity and morality in their performance, respectful of life and human dignity, internationally competent and capable of offering complete medical care and excellence, in accordance with the Mission and Vision of Tecnológico de Monterrey.

The Multicenter Urology Program at Tecnológico de Monterrey has a university infrastructure of excellence, a competency-based and patient-centered educational model; with well-structured educational and research programs and processes, offered by medical specialists with teacher training, which converge in a medical care framework, represented by the San José TEC de Monterrey Hospital – School of high specialties as a host hospital, certified in medical care quality processes, with hospital and outpatient environments, with a high-level Urology department. Residents have the necessary technological, scientific and methodological support, they are exposed to different models of care and health administration in a regional, national and international context, which allows them to acquire skills for successful performance in different areas in the area of Urology.

Program Objectives

The Specialization in Urology at Tecnológico de Monterrey aims to train excellent Urologists who meet the health needs of people with urological conditions in hospital and outpatient settings with quality and safety. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism.

Urologists graduated from this institution are highly competitive leaders at the local and international level, who lead the development of preventive action strategies, cost-effective diagnostic strategies and innovative and successful treatments, in public or private health institutions.

Graduate profile

The specialist doctor graduated from the Urology program will be able to:

- To provide medical and surgical care to patients with urological conditions, with professionalism and adherence to ethical principles.

- Apply Urology knowledge, clinical judgment, and contemporary scientific evidence bases to medical decision-making.

- Effectively communicate Specialization knowledge to patients, family members, and medical colleagues, as well as other healthcare professionals.

- Manage hospital clinical information by integrating scientific files for the positive impact on health care in their Specialization.

Target audience

The Multicenter Urology Program at Tecnológico de Monterrey is aimed at graduates of the Bachelor of Medicine, with excellent academic performance, with a vocation and express interest in the discipline, who are born leaders with the capacity for growth and discovery of new frontiers of themselves, of medicine and of their profession; with an innovative spirit committed to continuous learning, daily effort and the strength to maintain high-quality care service; with a genuine interest in research and teaching.

To enter the Medical Specialization in Urology at the School of Medicine and Health Sciences of Tecnológico de Monterrey, applicants must satisfactorily meet the requirements established by ITESM and the Ministry of Health for graduate admission.

Lines of research

Oncological urology. Trials and studies linked to clinical research of renal tumors, testicular tumors, bladder tumors, urothelial tumors, and prostate cancer as well as tumors of the male genital system.

Urological infections and functional urology. Clinical and basic investigation of complicated and uncomplicated infectious conditions of the entire genitourinary tract in men and women, including the male reproductive system on an outpatient, inpatient, and surgical basis. Clinical and urodynamic research in urination disorders that are a consequence of different pathologies such as: benign prostatic hyperplasia, neurogenic bladder and pelvic floor dysfunction. In addition, this branch of urology is responsible for addressing the different types of urinary incontinence and pelvic pain.

Endourology and laparoscopy. Endourology is responsible for diagnosing, treating and preventing the different types of urological pathologies that can be treated through physiological orifices without the need to build an external route to solve the problem with instruments with optical fibers, work channels for the introduction of laser, ultrasonic or mechanical supplies.

RUR Residency in Urology 2013 Plan

First Semester

Code	Name	CA
ME4140	Clinical ethics	1.5
ME4142	Quality in clinical care	1.5
ME4161	Medical care in Urology I	3
ME4162	General Urology I	3
		9

Second Semester

Code	Name	CA
ME4141	Educación en ciencias de la salud	1.5
ME4143	Research and innovation methods	1.5
ME4163	Medical care in Urology II	3
ME4164	General Urology II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4165	Medical care in Urology III	3
ME4166	General Urology III	3
		9

Fourth Semester

Code	Name	CA
ME4167	Medical care in Urology IV	3
ME4168	General Urology IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME5209	Medical care in urología V	3
ME5210	General Urology V	3
		6

Sixth Semester

Code	Name	CA
ME5211	Medical care in urología VI	3
ME5212	General Urology VI	3
		6

Seventh Semester

Code	Name	CA
ME5191	Specialization Opative I	1.5
ME5213	Medical care in urología VII	1.5
ME5214	General Urology VII	3
		6

Eighth Semester

Code	Name	CA
ME5192	Specialization Opative II	1.5
ME5215	Medical care in urología VIII	1.5
ME5216	General Urology VIII	3
ME5266	Thesis Defense	0.3
		6.3

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

MBC Master in Biomedical Sciences

Justification

The Master's program in Biomedical Sciences seeks to contribute to the development of highly specialized knowledge and talents in the area of biomedical sciences, which make possible the implementation of experimental and methodological strategies to develop research with the aim of solving priority health problems in Mexico and in the world.

Program Objective

This program aims to form a parallel structure of researchers in biomedicine – perfectly articulated – who collaborate with experts from different disciplines in the scientific work necessary for a real advance in medical research in all specialties, for the attention of the most pressing health needs of our population.

Admission profile and Target audience

The master's program in Biomedical Sciences is aimed at students who have graduated from bachelor's degrees in Medicine, Biotechnology, Engineering, Biomedicine, Medical Chemistry, Pharmacy, Nutrition, as well as Biologists and Biochemists from Tecnológico de Monterrey or other prestigious universities in areas related to the program, who are interested in continuing their academic training in the path of Research in Applied Medicine.

Admission to the Master in Science in Biomedical Sciences program is granted on a competitive basis, each candidate must meet the established guidelines.

Learning Outcomes

The Master's program in Biomedical Sciences trains researchers in the biomedical area, at the master's level, with the necessary competencies to integrate interdisciplinary research that are necessary for a real advance in medical research in all specialties, validating experimental models, testing new drugs and devices in preclinical models, with immediate application to the needs of the patient.

Scope of action

Graduates of the Master in Biomedical Sciences will be able to collaborate in interdisciplinary groups in areas of molecular diagnosis, design of specific units such as xenografts, cell line management, tumor banking, among other complex competencies that Translational research requires.

MBC Master in Biomedical Sciences 2017 Plan

First Semester

Code	Name	CA
BI4000	Translational Medicine and Experimental Models	3
BI4001	Biostatistics	3
BI5000	Research and innovation methods	1.5
OP4000	Seal Course	1.5
		9

Second Semester

Code	Name	CA
BI4002	Cellular, Molecular and Human Genetics Biology	3
BI4003	Oxidative stress and inflammation	3
BI5001	Thesis I	3
		9

Third Semester

Code	Name	CA
BI5002	Thesis II	3
OP5042	Optative I	3
OP5043	Optative II	3
		9

Fourth Semester

Code	Name	CA
BI5003	Thesis III	3
OP5044	Optative III	3
OP5045	Optative IV	3
		9

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

DBC Ph. D. in Biomedical Sciences

Justification

The Doctoral Program in Biomedical Sciences was born as a response to the need to prepare new generations of cutting-edge scientists with a great human sense committed to basic research that transcends clinical research, in order to address and contribute to solving the priority health problems that afflict our country. In this sense, the preparation of future researchers in biomedical sciences at a level of excellence is considered strategic, who will join forces to find causes, pathophysiological factors, new therapeutic targets and molecular markers for the monitoring of the disease and/or the efficacy of treatment. The proposal to create this program is not only a necessity in the locality, but also in the national and international environment.

Program Objective

To train researchers who collaborate from different perspectives on common medical objectives, working in interdisciplinary research teams that are necessary for real progress in medical research in all specialties, validating experimental models, testing new drugs and devices in preclinical models, with immediate application to the needs of the patient.

Target audience

This program is aimed at students who have graduated from a Master in science in areas related to Biomedical Sciences, Translational Medicine or an equivalent discipline in the biological area, who wish to continue their postgraduate studies in the path of applied medical research. In the case of physicians with an accredited Specialization, this will be considered as equivalent to a master's degree.

Admission profile

Admission to the Doctoral Program in Biomedical Sciences is granted on a competitive basis, each candidate must comply with the established guidelines and have a vocation as a researcher in one of the lines of research proposed by this program.

Learning Outcomes

The Ph. D. program in Biomedical Sciences trains researchers in the preclinical medical area as experts who:

- Be part of interdisciplinary teams that link basic and clinical researchers.
- Be able to propose, based on the care need (the patient's bedside), applied working hypotheses.
- Ideal for validating experimental models in vivo that closely reproduce diseases that are the object of their study or in vitro.
- Interested in investigating pathophysiological mechanisms, to discover therapeutic targets, diagnostic markers, test new drugs, design therapeutic devices.
- Committed to the maximum effort that their findings return to the healthcare application.

- Be able to communicate to the scientific community with rigour, precision and depth the findings obtained that will give rise to publications, scientific articles, patents or technological developments.

Areas of Specialization

En este programa de posgrado, se pretende destacar profesionales que sean capaces de liderar equipos de investigación básicos y clínicos colaborando con grupos de investigación nacionales e internacionales en áreas prioritarias como son:

Applied Molecular Medicine

- Biomarkers in Perinatal Medicine: study of the sTREM1 fraction in neonatal sepsis.
- Involvement of pro-inflammatory cytokines in heart failure.
- Management of intracellular calcium and energy production in the myocardium.
- Ion channels and cardiac arrhythmias.
- Cardiovascular imaging.
- Identification and purification of new molecules of natural origin with cardioprotective activities.
- Biomarkers (proteomics model) of survival, response and resistance in lymphomas, myelomas, gastrointestinal neoplasms and breast cancer.
- Use of natural drugs in pre-clinical models of lymphoma.
- Circadian rhythm and chemoresistance in breast cancer.
- Gene expression and its relationship with survival and resistance to treatment.

Clinical innovation

- Intrauterine growth retardation and polycystic ovary as IGF-1 deficiency conditions: effect of replacement therapy.
- Expression of genes involved in lipid and glucose metabolism under IGF-1 deficiency conditions: an experimental approach to metabolic syndrome.
- Lymphoma clinical trials.
- Immunomodulation for the treatment of inflammatory conjunctivitis and non-infectious uveitis.
- Preventive and therapeutic methods of presbyopia.
- IGF-1 and neuroprotection.

Cell therapy

- Study of differentiated stem cells in animals.
- Application of autologous stem cells to patients with chronic-degenerative diseases.
- Regeneration of Optic Nerve ganglion fibers by means of Progenitor Cells.
- Osteoblasts from adipose tissue stem cells: applications.
- Osteogenesis Imperfecta, Traumatology and Dentistry.
- Differentiation of stem cells to muscle cells on three-dimensional scaffolds.

**DBC Ph. D. in Biomedical Sciences
2017 Plan**

First Semester

Code	Name	CA
BI6000	Directed Research I	3
BI6001	Directed Research II	3
BI6018	Integrative Exam	1.5
GM6000	Research Seminar I	0.5
GM6006	Research Workshop I	1
		9

Second Semester

Code	Name	CA
BI6002	Research Proposal I	3
BI6003	Research Proposal II	3
BI6021	Research Proposal Defense	1.5
GM6001	Research Seminar II	0.5
GM6007	Research Workshop II	1
		9

Third Semester

Code	Name	CA
BI6004	Doctoral Research I	3
BI6005	Doctoral Research II	3
BI6019	Integration of research I	1.5
GM6002	Research Seminar III	0.5
GM6008	Research Workshop III	1
		9

Fourth Semester

Code	Name	CA
BI6006	Doctoral Research III	3
BI6007	Doctoral Research IV	3
GM6003	Research Seminar IV	0.5
GM6009	Research Workshop IV	1
GM6013	Scientific Product I	1.5
		9

Fifth Semester

Code	Name	CA
BI6008	Doctoral Research V	3
BI6009	Doctoral Research VI	3
BI6020	Integration of research II	1.5
GM6004	Research Seminar V	0.5
GM6010	Research Workshop V	1
		9

Sixth Semester

Code	Name	CA
BI6010	Doctoral Research VII	3
BI6011	Doctoral Research VIII	3
GM6005	Research Seminar VI	0.5
GM6011	Research Workshop VI	1
GM6014	Scientific Product II	1.5
		9

Seventh Semester

Code	Name	CA
BI6012	Doctoral Research IX	3
BI6013	Doctoral Research X	3
BI6014	Doctoral Research XI	3
		9

Eighth Semester

Code	Name	CA
BI6015	Doctoral Research XII	3
BI6016	Doctoral Research XIII	3
BI6017	Doctoral Research XIV	3
BI6022	Doctoral defense	0.3
		9.3

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

DCL Ph. D. in Clinical Science

Justification

The Ph. D. in Clinical Sciences contributes to strengthening the development of clinical research, with a focus on the most prevalent pathologies in the Mexican and world population, as well as in the care systems and/or public health. It responds to the need to promote scientific production relevant to the understanding of human health-disease, with solid ethical principles and evidence-based medicine. This program seeks to contribute to improving health with an impact on society as well as an increase in highly qualified human capital in Mexico, which helps reduce the current lag in terms of research projects, publications and patents in the area of Health.

Objetivos generales del programa

The Ph. D. in Clinical Sciences programme trains experts in clinical research who:

- They are recognized nationally and/or internationally for their ability to generate medical knowledge in three possible dimensions: individual, institution or society.
- They generate scientific production based on ethical principles, relevant to the understanding of human health-disease, care systems and/or public health.
- They are leaders in prestigious organizations in the application of strategies aimed at reducing inequity in health care and increasing the use of resources based on the best evidence.

Perfil egreso

Graduates of this program will be able to:

- Apply at an expert level strategies for searching, selecting and analysing relevant knowledge in the area of their speciality in terms of aspects such as: disease mechanisms (etiopathogenesis); detection, diagnosis or history of the disease; therapeutic interventions, including drug or drug trials; primary and secondary prevention and health promotion; human behavior; health services and epidemiology, among others.
- Use qualitative and quantitative research methods as well as statistical tools for the development of scientific research that provides knowledge for regional or national problems in their field of Specialization.
- Obtain results from their research with critical-scientific reasoning, clearly establishing their potential application, as well as each of their limitations and areas of opportunity.
- Transfer knowledge through scientific products such as: articles, patents or technological developments that reduce the gap between valid and relevant scientific knowledge and its application to the patient's side.
- Develop protocols or clinical trials that comply with current regulations on bioethics, quality and safety, guaranteeing the integrity and dignity of patients and their families as well as the intellectual property

of the discoveries.

Target audience

This program is aimed at students who have graduated from a Medical Specialization at Tecnológico de Monterrey, or from other prestigious universities approved by the Interinstitutional Commission for the Training of Human Resources for Health in areas related to the program, who are interested in continuing their academic training in the path of Applied Research in topics such as Cardiology, Haematology and Cancer, Ophthalmology, Neurosciences and Mental Health and, therefore, who wish to train as scientists for the development of clinical research projects in the areas of Health.

Lines of research

The lines of research of this Ph. D. aim to develop clinical research projects in the areas of Health such as:

- Cardiology.
- Hematology and Cancer.
- Ophthalmology.
- Neuroscience.
- Mental health.

**DCL Ph. D. in Clinical Science
2012 Plan**

First Semester

Code	Name	CA
DS4000	Leadership for Sustainable Development	1.5
ME5183	Doctoral Research Proposal I	3
ME5184	Research and innovation methods	1.5
ME6000	Bioethics and regulations in research	3
ME6001	Methodological and statistical structure in biomedical and clinical research	3
		12

Second Semester

Code	Name	CA
ME5185	Doctoral Research Proposal II	3
ME5186	Doctoral Research Proposal III	3
ME5187	Research Seminar I	1
ME6002	Investigación epidemiológica	3
		10

Third Semester

Code	Name	CA
ME6003	Doctoral Research I	3
ME6004	Doctoral Research II	3
ME6005	Doctoral Research III	3
ME6006	Doctoral Research IV	3
		12

Fourth Semester

Code	Name	CA
ME6007	Doctoral Research V	3
ME6008	Doctoral Research VI	3
ME6009	Doctoral Research VII	3
ME6010	Doctoral Research VIII	3
		12

Fifth Semester

Code	Name	CA
ME5188	Research Seminar II	1
ME6011	Doctoral Research IX	3
ME6012	Doctoral Research X	3
ME6013	Doctoral Research XI	3
		10

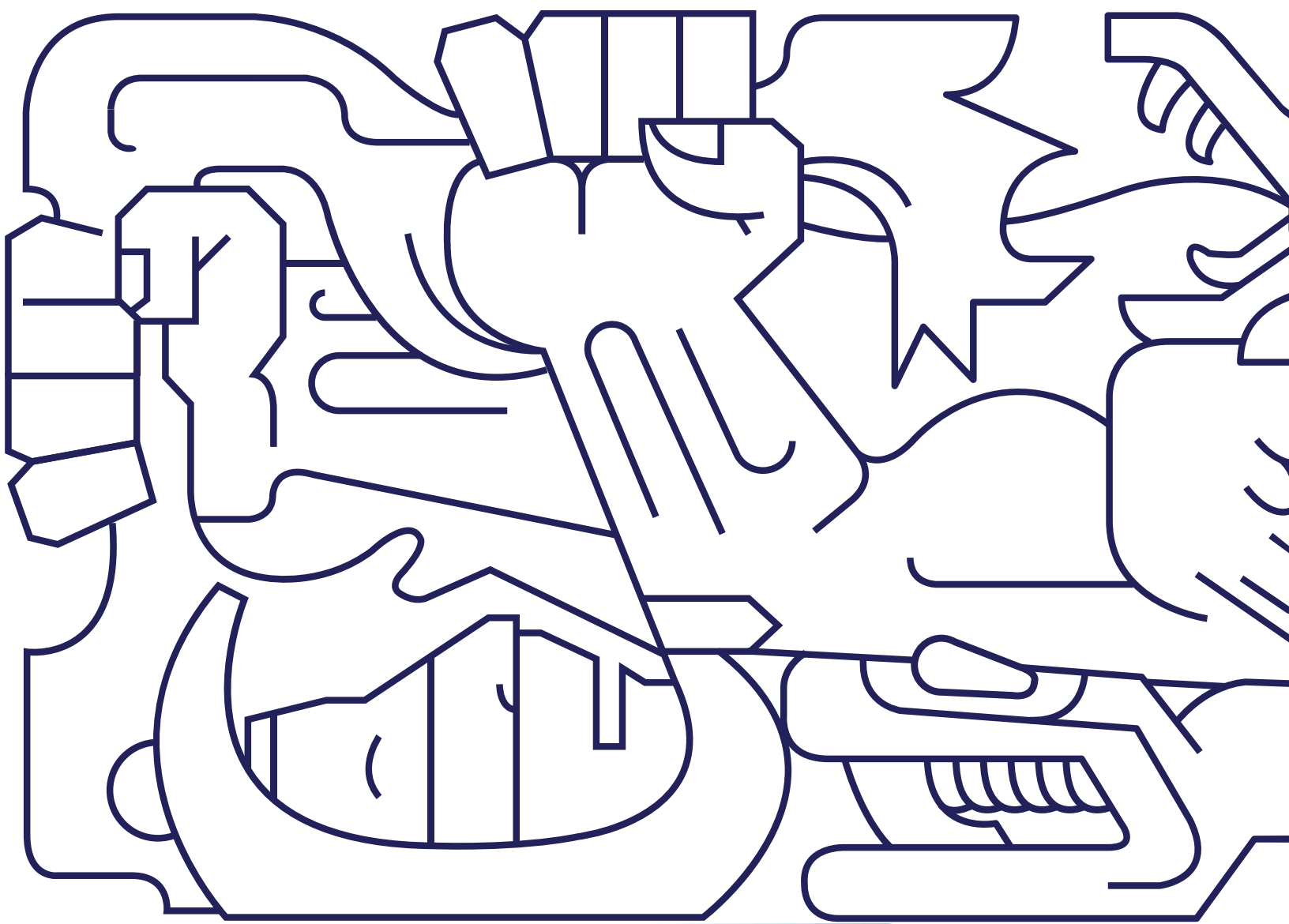
Sixth Semester

Code	Name	CA
ME5189	Research Seminar III	1
ME6014	Doctoral Research XII	3
ME6015	Doctoral Research XIII	3
ME6016	Doctoral Research XIV	3
		10

Seventh Semester

Code	Name	CA
ME6017	Doctoral Research XV	3
ME6018	Doctoral Research XVI	3
ME6019	Doctoral Research XVII	3
ME6020	Doctoral defense	0.3
		9.3

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



Profiles and curricula

School of
Business



EED Specialization in Digital Strategy

Justification

Today's society lives in a world with unprecedented challenges where the exponential advance of technology, the oscillations of the economy, climate change, the scarcity of natural resources, and recurrent health crises, impact the way current and future organizations are managed. These challenges, especially the exponential growth of information generated from mobile phones, social networks, the web, industry 4.0, as well as the immense number of applications and solutions, require the design of flexible and innovative strategies that include digital elements and to be able to transform the management of the organization in a timely manner.

All this enormous amount of structured and unstructured data generated day by day, immediately requires upright leaders, with a high level of interconnectivity, capable of understanding changes in the environment and adapting quickly to them based on strategic thinking, understanding of data analytics and being able to manage multifunctional and multigenerational work teams. To meet the needs of the market described above, the Specialization in Digital Strategy (EDS) is proposed, which seeks to develop both Specialization and transversal competencies in a professional.

Target audience

The program is aimed at professionals who have relevant professional experience and who meet at least one of the following criteria in their professional development profile:

- They occupy leadership positions with prospects for organizational growth, considering the systemic understanding of the organization and methodologies to support decision-making important
- Professionals responsible for defining a digital transformation strategy in their organizations, through the design of a strategy and action plan that includes business elements and cutting-edge technology.
- With work experience who wish to develop and/or strengthen consulting skills to support the continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.
- Have an excellent academic record; vocation in the generation of knowledge; communication fluency; that they work professionally under strict ethical standards; that they are open to new ways of assimilating knowledge and professional practice, in addition to being intellectually curious.

Program objectives

The program of the Specialization in Digital Strategy aims to train professionals agents of change in organizations, capable of innovation, technological development and technology transfer, making use of data analytics, data science, strategic thinking, as well as the management of processes and multifunctional and multigenerational work teams.

Learning Outcomes

Once they have completed their studies, the graduate will be able to:

- Identify opportunities in the changing environment, which allow them to design sustainable business models based on organizational and digital transformation processes. This in order to generate economic, social and environmental value in the community in which it operates.
- Understand the relevance of disruptive technologies and their application in business, in order to respond in a timely manner to the demands of the current environment: volatile, uncertain and complex.
- Understand the needs of stakeholders Lead change processes to ensure the relevance of the organization, in order to exercise leadership with a human sense and congruent with the strategic objectives of the organization.

Entry profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Admission Test to Postgraduate Studies (PAEP).
- The general average of grades of professional level studies.
- Each School may have additional requirements.

EED Specialization in Digital Strategy 2021 Plan

First Trimester

Code	Name	CA
AD4056	Disruptive strategy and digital transformation	3
TC4027	User Experience & Interface Design	3
		6

Second Trimester

Code	Name	CA
AD4058	Leadership and Management for Organizational Transformation	3
AD4060	Integrative project I	1.5
IN4035	Digital transformation and industry 4.0	3
		7.5

Third Trimester

Code	Name	CA
AD4059	Corporate Performance Management	3
AD5158	Integrative project II	1.5
FZ4026	Data Science Applied to Finance	3
		7.5

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

MAF Master in Finance

Justification

Since the 90s, the Mexican economy has been aligned with the global trend of global integration of both production processes, supply chains, as well as mobility of capital, risks and talents. However, as a result of the great crisis of 2008-2010, several economies have begun to reflect on the positive and negative effects of globalization, such as access to more competitive markets on the one hand, as well as concentration of wealth or regulation so intricate or restrictive that it slows down competitiveness; This has left as a side effect a generalized slowdown of the global economy.

In addition, information and communication technologies (ICTs) have modified patterns of behavior among the most atomized decision-makers such as families. This has had an impact on the consumption habits of products and services, on information flows, on the location of opinion poles, which is transforming various industries at various levels (sectors) of economic activity. Examples of these transformations are disintermediation, virtualization, robotization/automation, and the “financialization” of the economy (ILO, 2017). This financialization would manifest itself as the proportion of economic activity measured as international flows, of financial transactions as positions in derivatives or in investment portfolios.

On the other hand, the decrease in the demographic bonus in developed countries opens the possibility of flexibility in the migration policies of these economies, which in principle will seek to attract the most qualified and competitive talent at the international level. However, this possibility also presupposes the challenge of multicultural integration in the spheres of work and society as a whole.

Target audience

The profile of the candidate to enter the Master in Finance at EGADE Business School is characterized by professionals who preferably have two years of relevant work experience and meet at least one of the following criteria in their professional development profile:

- They occupy positions with prospects for organizational growth, considering the systemic understanding of the organization and quantitative methodologies to support decision-making in terms of funding and investment to be important.
- They have sufficient experience and interest in developing new business models, to improve the competitiveness of existing companies or to create new businesses through knowledge and the use of technological tools and advanced financial models.
- They want or need to develop or strengthen consulting or advisory skills, to support the continuous improvement, competitiveness and sustainability of organizations, through diagnostic methodologies designed within diverse frameworks, as well as effective financial solutions and innovative business models.
- They demonstrate a willingness to acquire or improve knowledge, practices and techniques, with critical thinking and an innovative attitude, which impacts their professional field or the communities in which they have influence, through the generation of value in organizations by making use of their creativity, their deep knowledge of financial markets and financing and investment mechanisms. as well as the technologies that allow the realization of these changes.

Program Objective

The main purpose of the Master in Finance (MAF) program is to train leaders with integrity with competencies based on the values of Innovation, Integrity, Collaboration, Empathy, Inclusion and Global Citizenship, as well as fundamental financial competencies of the profession, to interpret macrofinancial and sectoral variables, promote the financial health of organizations and contribute to the transformation of organizations by adapting to a professional and professional environment. dynamic.

Learning Outcomes

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

- Continuously validate the value proposition and performance, based on economic-financial variables and criteria and the best practices of the profession.
- Ethically implement financial management within your organization, in accordance with best practices, within the current and potential local, national and international regulatory framework.
- Make use of creative thinking to design new business models by identifying and taking advantage of financial disruptions of technological origin.
- Communicate with leadership and conviction the optimal financial decisions for the organization.
- Lead effective financial solutions that generate value in organizations and adapt to a changing regulatory and technological environment.
- Proactively challenge the current processes of your financial management or professional practice.
- Select from among various traditional and disruptive financial methodologies, those that allow you to optimize your performance at a professional and even personal level.
- Proactively transform your financial leadership and practice based on world-class financial standards

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Admission Test to Postgraduate Studies (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MAF Master in Finance
2020 Plan

First Trimester

Code	Name	CA
AD4045	Ethics and governance in business	1.5
AD4046	Responsible leadership	1.5
EO4018	Macroeconomics	1.5
FZ4019	Financial Performance Evaluation	1.5
FZ4020	Analytical Foundations for Finance	1.5
FZ4021	Economic-administrative foundations for finance	1.5

9

Second Trimester

Code	Name	CA
FZ5056	Advanced Financial Analysis	1.5
FZ5057	Data Science Applied to Finance	1.5
FZ5058	Macrofinance	1.5
FZ5059	Quantitative Methods in Finance	1.5
OP5085	Optative I	3

9

Third Trimester

Code	Name	CA
FZ5060	Tactical Financial Management	1.5
FZ5061	Financial Engineering	1.5
FZ5062	Fixed income markets and instruments	1.5
FZ5063	Derivative products	1.5
OP5086	Optative II	3

9

Fourth Trimester

Code	Name	CA
FZ5064	Long-term financial strategy	1.5
FZ5065	Investment Strategies	1.5
FZ5066	Equity market and instruments	1.5
FZ5067	Finance Project Planning	1.5
OP5087	Optative III	3

9

Fifth Trimester

Code	Name	CA
AD5137	Management skills	1
FZ5068	Finance Project Execution	1.5
FZ5069	Investment portfolio management	1.5
FZ5070	Risk Management	2

6

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

MAF-V Master in Finance (Online Program)

Justification

Since the 90s, the Mexican economy has been aligned with the global trend of global integration of both production processes, supply chains, as well as mobility of capital, risks and talents. However, as a result of the great crisis of 2008-2010, several economies have begun to reflect on the positive and negative effects of globalization, such as access to more competitive markets on the one hand, as well as concentration of wealth or regulation so intricate or restrictive that it slows down competitiveness; This has left as a side effect a generalized slowdown of the global economy.

In addition, information and communication technologies (ICTs) have modified patterns of behavior among the most atomized decision-makers such as families. This has had an impact on the consumption habits of products and services, on information flows, on the location of opinion poles, which is transforming various industries at various levels (sectors) of economic activity. Examples of these transformations are disintermediation, virtualization, robotization/automation, and the “financialization” of the economy (ILO, 2017). This financialization would manifest itself as the proportion of economic activity measured as international flows, of financial transactions as positions in derivatives or in investment portfolios.

On the other hand, the decrease in the demographic bonus in developed countries opens the possibility of flexibility in the migration policies of these economies, which in principle will seek to attract the most qualified and competitive talent at the international level. However, this possibility also presupposes the challenge of multicultural integration in the spheres of work and society as a whole.

Target audience

The profile of the candidate to enter the Master in Finance at EGADE Business School is characterized by professionals who preferably have two years of relevant work experience and meet at least one of the following criteria in their professional development profile:

- They occupy positions with prospects for organizational growth, considering the systemic understanding of the organization and quantitative methodologies to support decision-making in terms of funding and investment to be important.
- They have sufficient experience and interest in developing new business models, to improve the competitiveness of existing companies or to create new businesses through knowledge and the use of technological tools and advanced financial models.
- They want or need to develop or strengthen consulting or advisory skills, to support the continuous improvement, competitiveness and sustainability of organizations, through diagnostic methodologies designed within diverse frameworks, as well as effective financial solutions and innovative business models.
- They demonstrate a willingness to acquire or improve knowledge, practices and techniques, with critical thinking and an innovative attitude, which impacts their professional field or the communities in which they have influence, through the generation of value in organizations by making use of their creativity, their deep knowledge of financial markets and financing and investment mechanisms. as well as the technologies that allow the realization of these changes.

Program Objective

The main purpose of the Master in Finance (MAF) program is to train leaders with integrity with competencies based on the values of Innovation, Integrity, Collaboration, Empathy, Inclusion and Global Citizenship, as well as fundamental financial competencies of the profession, to interpret macrofinancial and sectoral variables, promote the financial health of organizations and contribute to the transformation of organizations by adapting to a professional and professional environment. dynamic.

Learning Outcomes

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

- Continuously validate the value proposition and performance, based on economic-financial variables and criteria and the best practices of the profession.
- Ethically implement financial management within your organization, in accordance with best practices, within the current and potential local, national and international regulatory framework.
- Make use of creative thinking to design new business models by identifying and taking advantage of financial disruptions of technological origin.
- Communicate with leadership and conviction the optimal financial decisions for the organization.
- Lead effective financial solutions that generate value in organizations and adapt to a changing regulatory and technological environment.
- Proactively challenge the current processes of your financial management or professional practice.
- Select from among various traditional and disruptive financial methodologies, those that allow you to optimize your performance at a professional and even personal level.
- Proactively transform your financial leadership and practice based on world-class financial standards

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Admission Test to Postgraduate Studies (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

**MAF Master in Finance
2020 Plan**

First Trimester

Code	Name	CA
AD4045	Ethics and governance in business	1.5
AD4046	Responsible leadership	1.5
EO4018	Macroeconomics	1.5
FZ4019	Financial Performance Evaluation	1.5
FZ4020	Analytical Foundations for Finance	1.5
FZ4021	Economic-administrative foundations for finance	1.5

9

Second Trimester

Code	Name	CA
FZ5056	Advanced Financial Analysis	1.5
FZ5057	Data Science Applied to Finance	1.5
FZ5058	Macrofinance	1.5
FZ5059	Quantitative Methods in Finance	1.5
OP5085	Optative I	3

9

Third Trimester

Code	Name	CA
FZ5060	Tactical Financial Management	1.5
FZ5061	Financial Engineering	1.5
FZ5062	Fixed income markets and instruments	1.5
FZ5063	Derivative products	1.5
OP5086	Optative II	3

9

Fourth Trimester

Code	Name	CA
FZ5064	Long-term financial strategy	1.5
FZ5065	Investment Strategies	1.5
FZ5066	Equity market and instruments	1.5
FZ5067	Finance Project Planning	1.5
OP5087	Optative III	3

9

Fifth Trimester

Code	Name	CA
AD5137	Management skills	1
FZ5068	Finance Project Execution	1.5
FZ5069	Investment portfolio management	1.5
FZ5070	Risk Management	2

6

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

MBA Master in Business Administration (Part-time)

Justification

Today's society lives in a world with unprecedented challenges in all spheres of human life, such as the exponential advance of technology, economic oscillations, climate change and the scarcity of natural resources, growing income inequality, the aging of the population and the increase in urban concentrations. The proposed MBA Master in Business Administration and Management program will give the student the foundations to develop in a world characterized by constant change, through an experiential educational model focused on the student and his learning process. In this way, students will have a guide throughout the program so that they can effectively develop the Learning Outcomes proposed, working collaboratively on solutions to real business challenges, through the incorporation of innovative teaching techniques based on the use of technology to offer greater flexibility.

Target audience

Applicants are professionals who have at least three relevant years of professional experience and who meet at least one of the following criteria in their professional development profile:

They occupy leadership positions with prospects for organizational growth, considering the systemic understanding of the organization and methodologies to support decision-making important.

Experienced in their professional area and with an interest in developing innovative business models, which seek to increase the competitiveness of the company or create new businesses through the knowledge and use of cutting-edge management tools and models and entrepreneurship.

With work experience who wish to develop and/or strengthen consulting skills to support the continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.

With leadership potential by showing a passion for learning, critical thinking and professional growth that impacts the generation of value in organizations through the use of leadership skills, knowledge, techniques and effective management tools.

Program Objective

The main purpose of the Master in Business Administration and Management (MBA) program is to train upright leaders who generate economic, social and environmental value in the new environments in which they operate, characterized by their volatility, their high level of interconnectivity and disruption due to constant social and technological changes. Likewise, they must be able to make effective decisions based on critical thinking and with a human sense, to help organizations achieve their strategic objectives in a sustainable way.

In this way, and aligned with the vision of Tecnológico de Monterrey, we seek that the leaders who graduate from our program achieve these objectives by proposing business models based on a process of constant innovation, the generation of creative solutions that incorporate elements of shared economies, the development of human talent and social inclusion, as well as collaborative work. to provide answers to complex problems faced by society and companies, with a global vision, that are

sustainable and adhere to ethical principles.

Learning Outcomes

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

- Understand the needs and demands of stakeholders to recognize business opportunities and ensure the successful operation of the company; proposing business models based on a process of constant innovation; and manage the interactions of the actors to integrate resources in the creation of value, in order to generate economic, social and environmental value in highly connected and disruptive environments.
- Generate creative solutions based on scenario analysis using quantitative and qualitative methods; propose improvements in the organization based on internal and external analysis to guarantee the market approach; and demonstrate the feasibility of their proposals in order to implement the best solution with a systemic approach, in order to make effective decisions in the organization based on strategic thinking.
- Communicate effectively with stakeholders; developing human talent through processes of attraction, selection, training, empowerment, evaluation, and retention; to promote interdisciplinary, generational and culturally diverse work teams; and lead change processes to ensure the relevance of the organization, in order to exercise leadership with a human sense and congruent with the strategic objectives of the organization.
- Evaluate information obtained through observation, experience, reflection, reasoning, and communication; convince stakeholders about the feasibility and viability of solutions to complex problems based on evidence, arguments, and coherent conclusions; and implement solutions to complex problems to achieve the organization's objectives, in order to solve complex problems through an iterative process of logical, objective, and autonomous reasoning.

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

**MBA Master in Business Administration (Part-time)
2020 Plan**

First Trimester

Code	Name	CA
EO4016	Business Economics	2
FZ4018	Strategic Financial Management	2
MT4019	Innovative Marketing to Create Value	2
OP4046	Seal Course	3
		9

Second Trimester

Code	Name	CA
AD4043	Global leadership	2
AD4044	Negotiation dynamics and influence	1.5
EM4001	Innovation and future thinking	1.5
EM4002	Entrepreneurial mindset	2
MT4020	Business Intelligence	2
		9

Third Trimester

Code	Name	CA
AD5120	Global Operations Management	2
AD5121	Integrative project I	1
OP5085	Optative I	3
OP5086	Optative II	3
		9

Fourth Trimester

Code	Name	CA
AD5122	Change Management and Organizational Behavior	3
AD5123	Strategy	2
AD5124	Integrative project II	1
OP5087	Optative III	3
		9

Fifth Trimester

Code	Name	CA
AD5125	Senior management	2
AD5126	Integrative project III	1
OP5088	Optative IV	3
		6

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

MBA-G Master in Business Administration

Justification

The current changing and complex environment requires leaders with a strategic vision of organizations and with the ability to make and implement effective, ethical and sustainable decisions. These professionals must be competent in international environments and in methodologies supported by technology that allow them to develop innovative and profitable business models to contribute to the sustainable development of their community.

The Master in Business Administration and Management responds to these needs by training innovative, entrepreneurial, ethical leaders with a global and sustainable vision of business in line with the objectives of Tecnológico de Monterrey.

Program objectives

The Master in Business Administration and Management in its new plan, expects graduates to be professionals who:

- They lead organizations that operate in global environments, through effective and ethical decision-making supported by cutting-edge management techniques and models.
- They lead strategic projects that generate value to the organization and its local, national, and international environment, through the application of leadership skills, systemic knowledge of the organization, and a global vision.
- They identify areas of opportunity in the environment and, accordingly, design and develop innovative and sustainable business models through the application of analytical and financial tools.
- They contribute to the economic, social and environmental development of their community through innovative and sustainable projects.

Graduate profile

The Master in Business Administration and Management trains professionals capable of:

- Make decisions based on ethical reasoning, applying ethical concepts and principles and considering their impact groups. Identify and evaluate opportunities that allow them to innovate and undertake profitable business models through the use of analytical techniques that contribute to the sustainable development of their community.
- Apply knowledge, skills, and abilities for an effective systemic functioning of the organization, through the application of management methodologies in the use of opportunities and the adaptation of environmental challenges.
- Effectively lead work teams, valuing diversity and being competent in management processes that allow the implementation of organizational changes.

- Strengthen a global vision of business that allows them to function in international environments incorporating the cultural, political, economic and social context.

Applicant profile

Applicants are professionals who have at least three years of professional experience and meet at least one of the following criteria in their professional development profile:

- They occupy leadership positions with prospects for organizational growth, considering the systemic understanding of the organization and methodologies to support decision-making important.

- Experienced with an interest in developing innovative business models, seeking to increase the competitiveness of the company or create new businesses through knowledge and the use of cutting-edge management tools and models.

- With work experience who wish to develop and/or strengthen consulting skills to support the continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.

- With leadership potential by showing a passion for learning, critical thinking and professional growth that impacts the generation of value in organizations through the use of leadership skills and knowledge, techniques and effective management tools.

MBA-G Master in Business Administration 2017 Plan

Remedial Trimester

Code	Name	CA
AD4024	Analytical Fundamentals for Business	3
		3

First Trimester

Code	Name	CA
AD4025	Competencies for senior management I	1
AD4026	Business Intelligence	1.5
AD4027	Corporate governance and ethics	1.5
MT4016	Consumer Behavior and Marketing Strategies	3
RH4003	Leadership and management of people in organizations	3
		10

Second Trimester

Code	Name	CA
AD4028	Operations Management	3
EC4005	Economy for decision-making	3
FZ4001	Corporate Finance	3
		9

Third Trimester

Code	Name	CA
AD5086	Strategy in organizations	3
AD5087	Strategy and negotiation in multicultural environments	3
AD5088	Service Management	1.5
DS4005	Corporate Sustainability	1.5
		9

Fourth Trimester

Code	Name	CA
AD5089	Innovation and entrepreneurship	3
AD5090	Competencies for senior management II	1
OP5053	Optative I	3
OP5054	Optative II	3
		10

Fifth Trimester

Code	Name	CA
AD5107	Field Project	3
OP5055	Optative III	3
		6

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

MBA-I Master in Business Administration

(Full-time)

Justification

The MBA-I with a concentration in Innovation and Entrepreneurship is distinguished by its accelerated one-year format; It seeks to promote corporate innovation (intrapreneurship) to achieve organizational transformation, as well as the creation of high-impact companies. The program is aimed at both leaders who want to contribute to the innovation and transformation of their organization, as well as entrepreneurs who want to turn their business idea into reality or scale their current business.

The Master in Business Administration and Management responds to these needs by training innovative, entrepreneurial, ethical leaders with a global and sustainable vision of business in line with the objectives of Tecnológico de Monterrey.

Program objectives

The Master in Business Administration and Management in its new plan, expects graduates to be professionals who:

- They lead organizations that operate in global environments, through effective and ethical decision-making supported by cutting-edge management techniques and models.
- They lead strategic projects that generate value to the organization and its local, national, and international environment, through the application of leadership skills, systemic knowledge of the organization, and a global vision.
- They identify areas of opportunity in the environment and, accordingly, design and develop innovative and sustainable business models through the application of analytical and financial tools.
- They contribute to the economic, social and environmental development of their community through innovative and sustainable projects.

Graduate profile

The Master in Business Administration and Management trains professionals capable of:

- Make decisions based on ethical reasoning, applying ethical concepts and principles and considering their impact groups. Identify and evaluate opportunities that allow them to innovate and undertake profitable business models through the use of analytical techniques that contribute to the sustainable development of their community.
- Apply knowledge, skills, and abilities for an effective systemic functioning of the organization, through the application of management methodologies in the use of opportunities and the adaptation of environmental challenges.
- Effectively lead work teams, valuing diversity and being competent in management processes that allow the implementation of organizational changes.

- Strengthen a global vision of business that allows them to function in international environments incorporating the cultural, political, economic and social context.

Applicant profile

Applicants are professionals who have at least three years of professional experience and meet at least one of the following criteria in their professional development profile:

- They occupy leadership positions with prospects for organizational growth, considering the systemic understanding of the organization and methodologies to support decision-making important.
- Experienced with an interest in developing innovative business models, seeking to increase the competitiveness of the company or create new businesses through knowledge and the use of cutting-edge management tools and models.
- With work experience who wish to develop and/or strengthen consulting skills to support the continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.
- With leadership potential by showing a passion for learning, critical thinking and professional growth that impacts the generation of value in organizations through the use of leadership skills and knowledge, techniques and effective management tools.

**MBA-I Master in Business Administration (Full-time)
2017 Plan**

Remedial Trimester

Code	Name	CA
AD4024	Analytical Fundamentals for Business	3
		3

First Trimester

Code	Name	CA
AD4025	Competencies for senior management I	1
AD4026	Business Intelligence	1.5
AD4027	Corporate governance and ethics	1.5
MT4016	Consumer Behavior and Marketing Strategies	3
RH4003	Leadership and management of people in organizations	3
		10

Second Trimester

Code	Name	CA
AD4028	Operations Management	3
EC4005	Economy for decision-making	3
FZ4001	Corporate Finance	3
		9

Third Trimester

Code	Name	CA
AD5086	Strategy in organizations	3
AD5087	Strategy and negotiation in multicultural environments	3
AD5088	Service Management	1.5
DS4005	Corporate Sustainability	1.5
		9

Fourth Trimester

Code	Name	CA
AD5089	Innovation and entrepreneurship	3
AD5090	Competencies for senior management II	1
OP5053	Optative I	3
OP5054	Optative II	3
		10

Fifth Trimester

Code	Name	CA
AD5107	Field Project	3
OP5055	Optative III	3
		6

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

MBA-V Master in Business Administration (Online Program)

Justification

The current changing and complex environment requires leaders with a strategic vision of organizations and with the ability to make and implement effective, ethical and sustainable decisions. These professionals must be competent in international environments and in methodologies supported by technology that allow them to develop innovative and profitable business models to contribute to the sustainable development of their community.

The Master in Business Administration and Management responds to these needs by training innovative, entrepreneurial, ethical leaders with a global and sustainable vision of business in line with the objectives of Tecnológico de Monterrey.

Program objectives

The Master in Business Administration and Management in its new plan, expects graduates to be professionals who:

- They lead organizations that operate in global environments, through effective and ethical decision-making supported by cutting-edge management techniques and models.
- They lead strategic projects that generate value to the organization and its local, national, and international environment, through the application of leadership skills, systemic knowledge of the organization, and a global vision.
- They identify areas of opportunity in the environment and, accordingly, design and develop innovative and sustainable business models through the application of analytical and financial tools.
- They contribute to the economic, social and environmental development of their community through innovative and sustainable projects.

Applicant profile

Applicants are professionals who have at least three years of professional experience and meet at least one of the following criteria in their professional development profile:

- They occupy leadership positions with prospects for organizational growth, considering the systemic understanding of the organization and methodologies to support decision-making important.
- Experienced with an interest in developing innovative business models, seeking to increase the competitiveness of the company or create new businesses through knowledge and the use of cutting-edge management tools and models.
- With work experience who wish to develop and/or strengthen consulting skills to support the continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.
- With leadership potential by showing a passion for learning, critical thinking and professional growth that impacts the generation of value in organizations through the use of leadership skills and knowledge, techniques and effective management tools.

**MBA-V Master in Business Administration (Online Program)
2019 Plan**

Remedial Trimester

Code	Name	CA
AD4024	Analytical Fundamentals for Business	3
		3

First Trimester

Code	Name	CA
AD4025	Competencies for senior management I	1
AD4026	Business Intelligence	1.5
AD4027	Corporate governance and ethics	1.5
MT4016	Consumer Behavior and Marketing Strategies	3
RH4003	Leadership and management of people in organizations	3
		10

Second Trimester

Code	Name	CA
AD4028	Operations Management	3
EC4005	Economy for decision-making	3
FZ4001	Corporate Finance	3
		9

Third Trimester

Code	Name	CA
AD5086	Strategy in organizations	3
AD5087	Strategy and negotiation in multicultural environments	3
AD5088	Service Management	1.5
DS4005	Corporate Sustainability	1.5
		9

Fourth Trimester

Code	Name	CA
AD5089	Innovation and entrepreneurship	3
AD5090	Competencies for senior management II	1
OP5053	Optative I	3
OP5054	Optative II	3
		10

Fifth Trimester

Code	Name	CA
AD5107	Field Project	3
OP5055	Optative III	3
		6

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

MBD Master in Business Analytics

Justification

The exponential growth of information that is generated day after day through the use of mobile phones, social networks, the web, industry 4.0 in gestation, as well as the immense number of applications and solutions, requires professionals who are experts in topics related to the Internet of Things and autonomous mobility. This enormous amount of structured and unstructured data generated day by day immediately requires professionals with the necessary technical knowledge to know how to process it intelligently and extract that information hidden from traditional direct analysis, but vital for the proposal of innovative and creative solutions.

The digitization of information and the mobility of business operations to the cloud requires trained personnel to face this new global trend. This transformation will not be exclusive to large companies or research centers, but involves any type of company, hence the great demand for professionals who know how to intelligently analyze their databases.

Companies need to analyze, process and extract relevant information from all these groups of data that are generated day by day through the pages and applications of companies, their own internal manufacturing processes or through the different work dynamics of employees, or through the opinions expressed by consumers through social networks. However, such information extraction must be carried out intelligently through tools and algorithms of the so-called data science, which based on the information obtained from the past, new creative solutions to present problems are obtained, as well as innovative ideas for future planning.

The Master's program in Business Analytics is presented as an option to enrich the academic offerings currently available at Tecnológico de Monterrey, particularly in the convergence of the areas of data science, software engineering, and business management.

Target audience

The program is aimed at professionals who have relevant professional experience and who meet at least one of the following criteria in their professional development profile:

- They occupy leadership positions with prospects for organizational growth, considering the systemic understanding of the organization and methodologies to support decision-making important.
- Professionals interested in solving data science and digital transformation problems within their area of work in a multidisciplinary and innovative way.
- With work experience who wish to develop and/or strengthen consulting skills to support the continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.
- Have an excellent academic record; vocation in the generation of knowledge; communication fluency; that they work professionally under strict ethical standards; that they are open to new ways of assimilating knowledge and professional practice, in addition to being intellectually curious.

Program objectives

The Master's program in Business Analytics aims to train professionals who:

- Have technological tools that help identify and direct data science, intelligent manufacturing, and software engineering projects, to respond in a timely and innovative way to the particular needs of organizations in today's era of digitalization.
- They have technical knowledge of engineering and management, as well as the necessary skills to face real problems in a multidisciplinary and innovative way within a large company in constant transformation, always keeping in mind the support of the technological and economic development of the country.

Learning Outcomes

Once they have completed their studies, the graduate will be able to:

- Identify opportunities in the changing environment, which allow them to design sustainable business models based on organizational and digital transformation processes. This in order to generate economic, social and environmental value in the community in which it operates.
- Understand the needs of stakeholders to lead change processes and ensure the relevance of the organization, in order to exercise leadership with a human sense and congruent with the strategic objectives of the organization.
- Understand the relevance of the effective use of data in management processes and business strategy, in order to respond in a timely manner to the demands of an environment such as the current one: volatile, uncertain and complex.
- Design descriptive, prescriptive and predictive models to support agile, effective and dynamic decision-making.

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

**MBD Master in Business Analytics
2021 Plan**

First Trimester

Code	Name	CA
AD4046	Responsible leadership	1.5
AD4056	Disruptive strategy and digital transformation	3
TC4027	User Experience & Interface Design	3
		7.5

Second Trimester

Code	Name	CA
AD4045	Ethics and governance in business	1.5
AD4057	Data Analytics Applications to Business I	3
IN4036	Data analysis and mining for decision-making	3
		7.5

Third Trimester

Code	Name	CA
AD4058	Leadership and Management for Organizational Transformation	3
IN4037	Simulation Models and Applications	3
OP5085	Optative I	3
		9

Fourth Trimester

Code	Name	CA
AD4059	Corporate Performance Management	3
OP5086	Optative II	3
TC4028	Artificial Intelligence and Machine Learning	3
		9

Fifth Trimester

Code	Name	CA
AD5156	Data Analytics Applications to Business II	3
AD5157	Integrative project	3
OP5087	Optative III	3
		9

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

MBE Master in Global Business Management

Justification

The update of the Master in Global Business Management responds to the urgent need to validate the skills and abilities that are currently being developed in our students, so that they are in line with what is demanded by decision-making in today's global business world. In this sense, it deepens the development of capacities and skills to carry out a critical and strategic analysis and evaluation of business situations in a changing and uncertain global economic, social, political and technological environment.

Target audience

Applicants to the program are executives, experienced entrepreneurs, and active business owners or directors taking on a global leadership role in their organizations.

Participants must be willing and able to travel to the international residencies of South America (Brazil), North America (Mexico-USA), Asia (China-India) and Europe (Netherlands-Poland) that the program offers for four periods of up to 9 days over the course of the program.

Applicants must have at least 7 years of professional experience and meet at least one of the following criteria in their professional development profile:

- They occupy management positions with high growth potential to reach management positions.
- They have work experience and seek to increase their international competitiveness.
- They have high potential to develop their skills as responsible global leaders.
- They seek to strengthen their global critical thinking, their exposure to multicultural decision-making, work in face-to-face and virtual global teams, and the development of global business strategies.

Candidates carry out the EGADE admissions process through a holistic review of their academic and professional background. All candidates are interviewed by the Program Management. It is sought that they have the ability to meet the academic requirements of the program and can perform in global teams. It requires strength and command of the English language, ability to participate in global residencies and to be able to lead multicultural teams.

Program Objective

The Master's program in Global Business Management, aligned with the vision of Tecnológico de Monterrey, has as its fundamental purpose to train responsible leaders who have the ability to understand and anticipate changes in the economic-financial, technological, and social environment in such a way that they make strategic decisions.

This program fosters the development of capacities and skills to carry out a critical and strategic analysis and evaluation of business situations in a changing and uncertain global economic, social, political and technological environment; and incorporates the development of capacities and skills required to participate in and lead global teams, both face-to-face and virtual.

This global executive program is geared toward developing responsible strategic leaders who can navigate their organizations through the challenges facing the current and future global business community.

Learning Outcomes

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

- Exercises responsible leadership with the global environment and coherence with the organization.
- Develop competitive global business strategies
- Strategically incorporate innovation and technological change into the organization.
- It solves complex problems through an iterative process of logical, objective, and autonomous reasoning.

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MBE Master in Global Business Management 2020 Plan

First Semester

Code	Name	CA
AD4051	Leadership, Organization, and Change	3
AD4052	International Residency I	2
FZ4022	Corporate finance in a global environment	3
		8

Second Semester

Code	Name	CA
AD4053	Accelerated Leadership Development I	1
AD4054	Ethics and corporate social responsibility	3
AD4055	International Residency II	2
OP5090	Optative I	3
		9

Third Semester

Code	Name	CA
AD5139	Accelerated Leadership Development II	1
AD5140	International Residency III	2
AD5141	Strategy in a global environment	3
OP5091	Optative II	3
		9

Fourth Semester

Code	Name	CA
AD5142	Global Business Management	2
AD5143	International Residency IV	2
CD5001	Analytical tools for comprehensive value creation	1.5
OP5092	Optative III	3
		8.5

Fifth Semester

Code	Name	CA
AD5144	Technology-based transformation	1.5
AD5145	Multicultural Management and Strategic Negotiation	1.5
AD5146	Accelerated Leadership Development III	1
AD5147	Global Business Fundamentals	2
EM5005	Corporate Entrepreneurship & Venture Capital	1.5
		7.5

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

MBM Master in Business Management

Justification

Currently companies and other organizations are inclined to operate with a more horizontal structure, this points to the need for people prepared in business, competent to perform a self-regulated job that adds value to the company and strengthens the profiles of high potentials from the beginning of their work.

In response to this need, the Master in Business Management (MBM) program is proposed to be updated, which in line with the Tec21 Model of Tecnológico de Monterrey seeks to develop Code competencies in professionals who are in an early stage of their working life.

The updated curriculum incorporates the Tec21 pedagogical model based on challenges (Practicums) with partner organizations that allow students to face existing problems, in order to identify effective ways of execution and possible solutions. The above is planned with the guidance and accompaniment of expert professors in the area of business and professionals recognized for their trajectory in the different related organizations, in charge of implementing solutions to relevant and current problems.

Target audience

The Master in Business Management (MBM) program is aimed at professionals from diverse careers who are in the early stages of their working life and who are looking for:

Aspire to take leadership positions with prospects for organizational growth, considering the systemic understanding of the organization and methodologies to support decision-making important.

Develop and implement innovation and digital transformation strategies through in-depth knowledge of new technologies and what it means to achieve an approved adaptation in the company.

Develop in consulting areas to support the development of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.

Empower your professional career and stand out in your professional life through the development of Code leadership and digital competencies.

Links with companies and institutions.

Solve real problems in business environments.

Program Objective

The main purpose of the Master in Business Management (MBM) program is to train upright leaders who focus on managing projects and initiatives within the organization, in order to make effective decisions to help organizations achieve their strategic objectives in a sustainable way.

Learning Outcomes

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

- Participate effectively in collaborative networks (national and international) valuing diversity and new trends, promoting knowledge exchange and interaction.
- Constantly identify new ways of doing things, promoting the creation of knowledge and business innovation through the design of innovative projects that contribute to the sustainable development of the organization.
- Prioritize and solve complex projects, evaluate various solution alternatives through the analysis, interpretation and evaluation of existing resources, organizational processes and their impact on the environment.
- Seek the development of others in favor of the productivity of the team.
- Understand the digital impact on business and industry, identify and evaluate new technologies that help rethink new business models, new ways of operating that contribute to the efficiency and survival of the organization

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Admission Test to Postgraduate Studies (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

**MBM Master in Business Management
2020 Plan**

First Trimester

Code	Name	CA
AD4042	Fundamentals for Management	3
AD4047	Leadership and Human Capital Management	3
CF4011	Accounting	1.5
EO4017	Global economy	1.5
MT4021	Consumer behavior	3
		12

Second Trimester

Code	Name	CA
AD4048	Technology-based business models	3
AD4049	Corporate Immersion Project I	3
MT4022	Marketing	2
OP5085	Optative I	3
		11

Third Trimester

Code	Name	CA
AD5132	International Business Environments	3
AD5133	Corporate Immersion Project II	3
OP4046	Seal Course	3
OP5086	Optative II	3
		12

Fourth Trimester

Code	Name	CA
AD5134	Change management	1.5
AD5135	Professional Skills	2
AD5136	Immersion Project III	2
OP5087	Optative III	3
		8.5

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

MBM-V Master in Business Management (Online Program)

Justification

Currently companies and other organizations are inclined to operate with a more horizontal structure, this points to the need for people prepared in business, competent to perform a self-regulated job that adds value to the company and strengthens the profiles of high potentials from the beginning of their work.

In response to this need, the Master in Business Management (MBM) program is proposed to be updated, which in line with the Tec21 Model of Tecnológico de Monterrey seeks to develop Code competencies in professionals who are in an early stage of their working life.

The updated curriculum incorporates the Tec21 pedagogical model based on challenges (Practicums) with partner organizations that allow students to face existing problems, in order to identify effective ways of execution and possible solutions. The above is planned with the guidance and accompaniment of expert professors in the area of business and professionals recognized for their trajectory in the different related organizations, in charge of implementing solutions to relevant and current problems.

Target audience

The Master in Business Management (MBM) program is aimed at professionals from diverse careers who are in the early stages of their working life and who are looking for:

Aspire to take leadership positions with prospects for organizational growth, considering the systemic understanding of the organization and methodologies to support decision-making important.

Develop and implement innovation and digital transformation strategies through in-depth knowledge of new technologies and what it means to achieve an approved adaptation in the company.

Develop in consulting areas to support the development of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.

Empower your professional career and stand out in your professional life through the development of Code leadership and digital competencies.

Links with companies and institutions.

Solve real problems in business environments.

Program Objective

The main purpose of the Master in Management (MBM) program is to train upright leaders who focus on managing projects and initiatives within the organization, in order to make effective decisions to help organizations achieve their strategic objectives in a sustainable way.

Learning Outcomes

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

- Participate effectively in collaborative networks (national and international) valuing diversity and new trends, promoting knowledge exchange and interaction.
- Constantly identify new ways of doing things, promoting the creation of knowledge and business innovation through the design of innovative projects that contribute to the sustainable development of the organization.
- Prioritize and solve complex projects, evaluate various solution alternatives through the analysis, interpretation and evaluation of existing resources, organizational processes and their impact on the environment.
- Seek the development of others in favor of the productivity of the team.
- Understand the digital impact on business and industry, identify and evaluate new technologies that help rethink new business models, new ways of operating that contribute to the efficiency and survival of the organization

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Admission Test to Postgraduate Studies (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

**MBM-V Master in Management (Online Program)
2020 Plan**

First Trimester

Code	Name	CA
AD4042	Fundamentals for Management	3
AD4047	Leadership and Human Capital Management	3
CF4011	Accounting	1.5
EO4017	Global economy	1.5
MT4021	Consumer behavior	3
		12

Second Trimester

Code	Name	CA
AD4048	Technology-based business models	3
AD4049	Corporate Immersion Project I	3
MT4022	Marketing	2
OP5085	Optative I	3
		11

Third Trimester

Code	Name	CA
AD5132	International Business Environments	3
AD5133	Corporate Immersion Project II	3
OP4046	Seal Course	3
OP5086	Optative II	3
		12

Fourth Trimester

Code	Name	CA
AD5134	Change management	1.5
AD5135	Professional Skills	2
AD5136	Immersion Project III	2
OP5087	Optative III	3
		8.5

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

MDE Executive Master in Business Administration

Justification

The current changing and complex environment requires leading executives with a strategic vision of organizations and with the ability to make and implement effective, ethical and sustainable decisions. These professionals must be competent in international environments and in methodologies supported by technology that allow them to develop innovative and profitable business models to contribute to the sustainable development of their community.

The Executive Master in Business Administration responds to these needs by training innovative, entrepreneurial, ethical leaders with a global and sustainable vision of business in line with the objectives of Tecnológico de Monterrey.

The updating of the curriculum of the MDE responds to a need of the market to which this program is directed. In its last version in 2009, the environment, the community and the Institute had other characteristics. Today (2019), technological advances and the demographic characteristics of our students and the companies in which they work, make it imperative to review and update the mesh.

Target audience

Applicants are professionals who have at least three relevant years of professional experience and who meet at least one of the following criteria in their professional development profile:

They occupy leadership positions with prospects for organizational growth, considering the systemic understanding of the organization and methodologies to support decision-making important.

Experienced in their professional area and with an interest in developing innovative business models, which seek to increase the competitiveness of the company or create new businesses through the knowledge and use of cutting-edge management tools and models and entrepreneurship.

With work experience who wish to develop and/or strengthen consulting skills to support the continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.

With leadership potential by showing a passion for learning, critical thinking and professional growth that impacts the generation of value in organizations through the use of leadership skills, knowledge, techniques and effective management tools.

Program Objective

The Master in Global Business Administration program in its new plan expects graduates to be professionals who:

They lead organizations that operate in global environments, through effective and ethical decision-making supported by cutting-edge management techniques and models.

They lead organizations that operate in global environments, through effective and ethical decision-making supported by cutting-edge management techniques and models.

They lead strategic projects that generate value to the organization and its local, national, and international environment, through the application of leadership skills, systemic knowledge of the organization, and a global vision.

They identify areas of opportunity in the environment and, accordingly, design and develop innovative and sustainable business models through the application of analytical and financial tools.

They contribute to the economic, social and environmental development of their community through innovative and sustainable projects.

Learning Outcomes

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

- Understand the needs and demands of stakeholders to recognize business opportunities and ensure the successful operation of the company; proposing business models based on a process of constant innovation; and manage the interactions of the actors to integrate resources in the creation of value, in order to generate economic, social and environmental value in highly connected and disruptive environments.

- Generate creative solutions based on scenario analysis using quantitative and qualitative methods; propose improvements in the organization based on internal and external analysis to guarantee the market approach; and demonstrate the feasibility of their proposals in order to implement the best solution with a systemic approach, in order to make effective decisions in the organization based on strategic thinking.

- Communicate effectively with stakeholders; developing human talent through processes of attraction, selection, training, empowerment, evaluation, and retention; to promote interdisciplinary, generational and culturally diverse work teams; and lead change processes to ensure the relevance of the organization, in order to exercise leadership with a human sense and congruent with the strategic objectives of the organization.

- Evaluate information obtained through observation, experience, reflection, reasoning, and communication; convince stakeholders about the feasibility and viability of solutions to complex problems based on evidence, arguments, and coherent conclusions; and implement solutions to complex problems to achieve the organization's objectives, in order to solve complex problems through an iterative process of logical, objective, and autonomous reasoning.

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Admission Test to Postgraduate Studies (PAEP).
- The general average of grades of professional level studies.

Each School may have additional requirements.

MDE Executive Master in Business Administration 2020 Plan

First Semester

Code	Name	CA
AD4054	Ethics and corporate social responsibility	3
EO4019	Macroeconomics and Global Business	3
MT4023	Marketing	3
RH4004	Organizational behavior	3
		12

Second Semester

Code	Name	CA
AD5148	Global Operations Management	3
AD5149	Leadership and change management	3
EO4020	Microeconomics	1.5
FZ4023	Financial Accounting	1.5
FZ4024	Corporate Finance	3
		12

Third Semester

Code	Name	CA
CD4002	Statistics and data analysis	3
OP5090	Optative I	3
OP5091	Optative II	3
		9

Fourth Semester

Code	Name	CA
AD5150	International Practice	1.5
CF5001	Administrative accounting	1.5
MT4024	Business Intelligence	3
OP5092	Optative III	3
		9

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

MGN-V Master in Management (Online Program)

Program Objective

The objective of the Master in Management is to train organizational management professionals who develop:

- Strategic thinking and skills to make assertive and valuable decisions.
- Skills for the design and implementation of solutions with an ethical and socially responsible perspective to complex business problems, through the use of analytical methods and innovative technologies.
- Ability to interact with specialists from all functional areas of the company in order to define strategies, guidelines and organizational objectives.
- Character to lead change processes in complex environments that strengthen organizational transformation.
- Understanding of the design and entrepreneurship of innovative business models that add value to the organization.

Graduate profile

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

- Visualize and create the future of organizations, or companies, identifying innovative opportunities to generate value.
- Generate sustainable and innovative solutions to institutional problems, through skills, ideas, and new forms of entrepreneurship within an ethical framework.
- Generate results that add value through the design of innovative business models.
- Use technological business intelligence tools that allow an analytical decision-making process.
- Apply and promote interdisciplinary and collaborative work through the formation and guidance of high-performance teams.
- Communicate, interact and influence effectively with the different stakeholders inside and outside the organization.
- Perform in virtual environments without the limitations of time and space.
- Be resilient to different organizational dynamics.
- Interact in multicultural and global environments by taking advantage of the richness of diversity.

Applicant profile

The Master in Business Administration is aimed at two types of audiences, according to their interest:

- Executives with a desire to enrich their training with a global perspective of the business world and apply this knowledge in companies in the private sector, public sector and non-profit organizations. This in order to progress in their career and occupy managerial and executive positions.
- Consultants, entrepreneurs and owners who want to participate in high-level projects, and who want to grow in the field of administration to start or strengthen their business in an innovative way.

Lines of research

This program is professionalizing and focuses on the development of its students in the following concentrations:

- Finance.
- Marketing.
- Strategy and Senior Management.
- Innovation and Entrepreneurship.

MGN-V Master in Management (Online Program)
2017 Plan

Remedial Trimester

Code	Name	CA
AD4035	Quantitative methods for decision-making	3
FZ4017	Analysis and interpretation of financial information	3
		6

First Trimester

Code	Name	CA
AD4036	Social responsibility, ethics and sustainability	3
AD4037	Administration and business philosophy	3
		6

Second Trimester

Code	Name	CA
AD4038	Human Capital Management and Direction	3
EC4019	Managerial economics	3
		6

Third Trimester

Code	Name	CA
AD4039	Financial Management	3
MT4017	Strategic Marketing Management	3
		6

Fourth Trimester

Code	Name	CA
AD4040	Value chain management	3
AD5109	Strategic planning	3
		6

Fifth Trimester

Code	Name	CA
AD5110	Business Intelligence	3
AD5111	Entrepreneurship and business model design	3
		6

Sixth Trimester

Code	Name	CA
OP5053	Optative I	3
OP5054	Optative II	3
		6

Seventh Trimester

Code	Name	CA
AD5112	Business Integration Project	3
OP5055	Optative III	3
		6

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

DCA Ph. D. in Administrative Sciences

Justification

Today's society lives in a world with unprecedented challenges in all spheres of human life, such as the exponential advance of technology, increasingly frequent changes in economic cycles, climate change and the scarcity of natural resources, growing income inequality, an aging population and the increase in urban concentrations. These challenges directly or indirectly affect all types of organizations, both public and private, as well as the business environment.

The fundamental purpose of the Ph. D. program in Administrative Sciences is to train upright research leaders who generate value through the generation of cutting-edge applied knowledge in the fields of administrative sciences. This knowledge will contribute to the design of effective decisions for organizations, based on critical thinking and with a human sense.

In this way, and aligned with the Vision of Tecnológico de Monterrey, we seek that the graduates of our program generate cutting-edge knowledge that provides answers to complex problems faced by society and companies, with a global vision, sustainable and attached to ethical principles.

Target audience

The Doctoral Program in Administrative Sciences is designed for professionals who have a Master in the areas of management, administration and social sciences. For example:

- Master in Business Administration and Management.
- Master in Global Business Management.
- Master in Finance.
- Master in Administration.
- Master in Business Analytics.

Candidates must be interested in conducting high-impact applied research, to contribute to the knowledge of one of the Specialization areas of Administrative Sciences. Students who enter this program must have excellent academic records both undergraduate and graduate, vocation in the generation of knowledge, fluency in oral and written communication, command of the English language, work professionally under strict ethical standards, be open to new ways of assimilating knowledge and professional practice and be intellectually curious.

Program Objective

The Ph. D. in Administrative Sciences is committed to the advancement of knowledge in administrative sciences. In accordance with Tecnológico de Monterrey's research strategy "Research that transforms lives", the doctoral program offers those with a great curiosity for science, generators of ideas and in search of intellectual challenges, the opportunity to be able to carry out quality research and have an impact in an applied way to transform the country's organizations.

The program is strongly aligned with the development strategy of the EGADE Business School and with the vision towards 2030, through the following strategies:

- Promote research as a source of opportunities and innovative solutions to the planet's challenges: create and promote research networks that share and develop content that is transferred and applicable to entrepreneurship.
- Develop an open community of entrepreneurs and researchers that generates economic, social and environmental value in a diverse and inclusive environment: Encourage plurality and open discussion to generate innovative ideas.

The Ph. D. in Administrative Sciences lasts 4 years and has three areas of research:

- Marketing.
- Strategy and organizational studies.
- Finance.

Each area offers students guidance to an academic discipline, as well as the opportunity to develop conceptual, analytical, and research development skills

Learning Outcomes

The Ph. D. program in Administrative Sciences trains professionals capable of:

- Develop theoretical and empirical models of the administrative sciences to generate applied research projects, based on original critical knowledge.
- Publish the products of their research in different high-quality academic media.
- Develop research projects aimed at the transformation of organizations with ethical awareness and social responsibility.
- To generate effective environments for collaboration in research groups and high-level teaching in higher education institutions.

Graduates of the Ph. D. in Administrative Sciences will have the ability to perform professionally in the field of research and teaching. Our graduates historically work in the vast majority (86%) in higher education institutions in the country, 4% in foreign higher education institutions and 10% in the private sector/public service but strongly linked to academia as teachers.

Admission profile

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

Therefore, for admission, the applicant participates in a comprehensive selection process that considers:

- The result of the Graduate Studies Admission Test (PAEP).
- The general average of grades of professional level studies. Each School may have additional requirements.

Lines of generation and/or application of the program's knowledge

By its nature, the Ph. D. is multidisciplinary in scope, covering several lines of generation and/or application of knowledge (LGAC), which have been selected for being the strongest within EGADE and the Business School.

The lines of generation and/or application of knowledge that serve as a crucible for the definition of research in the doctoral programme are the following:

Marketing. This line of research responds to the need to train human research resources, with a high level of preparation in the disciplines related to retail marketing processes and in the understanding of consumer behavior processes through the creation of value in conscious marketing processes.

Strategy and organizational studies. This line of research responds to the need to train human research resources, with a high level of preparation in the disciplines related to organizational strategy, focusing on multi- and transdisciplinary processes. From the study of business creation processes (entrepreneurship) to the strategic management of large corporations in the field of emerging economy, this LGAC responds to the complex management problems of all types of organizations.

Finance. This line of research responds to the need to train human resources in frontier research in finance, contributing to the search, development and implementation of new forms of financial management mainly through the development of innovative knowledge through decision-making models that incorporate new emerging technologies.

**DCA Ph. D. in Administrative Sciences
2020 Plan**

First Semester

Code	Name	CA
GD6030	Directed Research I	3
GD6031	Directed Research II	3
GD6032	Directed Research III	3
		9

Second Semester

Code	Name	CA
GD6033	Research Proposal I	3
GD6034	Research Proposal II	3
GD6036	Research Seminar I	.5
GD6042	Integration of research I	1.5
GD6046	Integrative Exam	1.5
GD6047	Research Workshop I	1
		10.5

Third Semester

Code	Name	CA
GD6017	Doctoral Research I	3
GD6018	Doctoral Research II	3
GD6035	Research Proposal Defense	1.5
GD6037	Research Seminar II	.5
GD6048	Research Workshop II	1
		9

Fourth Semester

Code	Name	CA
GD6019	Doctoral Research III	3
GD6020	Doctoral Research IV	3
GD6038	Research Seminar III	.5
GD6044	Scientific Product I	1.5
GD6049	Research Workshop III	1
		9

Fifth Semester

Code	Name	CA
GD6021	Doctoral Research V	3
GD6022	Doctoral Research VI	3
GD6039	Research Seminar IV	.5
GD6043	Integration of research II	1.5
GD6050	Research Workshop IV	1
		9

Sixth Semester

Code	Name	CA
GD6023	Doctoral Research VII	3
GD6024	Doctoral Research VIII	3
GD6040	Research Seminar V	.5
GD6045	Scientific Product II	1.5
GD6051	Research Workshop V	1
		9

Seventh Semester

Code	Name	CA
GD6025	Doctoral Research IX	3
GD6026	Doctoral Research X	3
GD6027	Doctoral Research XI	3
GD6041	Research Seminar VI	.5
GD6052	Research Workshop VI	1
		10.5

Eighth Semester

Code	Name	CA
GD6000	Doctoral defense	.3
GD6028	Doctoral Research XII	3
GD6029	Doctoral Research XIII	3
		6.3

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

DCF Ph. D. in Financial Science

Justification

The challenges inherent in globalization and dynamism of financial markets make it necessary to have researchers equipped with analytical skills, economic-financial knowledge, the ability to model phenomena in the field of finance to make decisions that allow improving the management of companies, markets and financial institutions, which contribute to the sustainable development of the regional economy. national and international.

The DCF is a research program with a scientific focus, which aims to train people with solid knowledge in the field of financial theory, ethical values and critical thinking, trained in the use of sophisticated financial analysis models and techniques to make the best financial decisions and solve sophisticated problems of investment, financing, working capital management, risk management, both of companies and financial institutions, government entities and other bodies.

In this way, the institution delivers to the community scientists with a high 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 allow a more efficient, transparent and equitable performance of economic agents that concur with or supervise the financial markets. This makes it a relevant program at the regional and national level, which is demonstrated by the recognitions received by its graduates in terms of research and contribution to financial management and management of business and financial markets risks at the national and international level.

Program objectives

In their professional career, a DCF graduate develops applied research, higher education activities and/or consulting, extending the frontiers of knowledge in financial and economic sciences, for the solution of complex problems in the areas of risk management and corporate finance within companies, organizations and institutions, as advisors to them or as decision makers in senior management in business development Sustainable.

Graduate profile

The competencies of the DCF graduate are listed below.

- Theoretical knowledge and ability to generate innovative financial models that add value to organizations, markets and/or the economic system, considering the complexity and uncertainty inherent to financial activity.
- Ability to analyze business and financial information to diagnose and propose innovative business models and financial strategies in organizations that compete in globalized markets, to improve their efficiency, sustainability and competitiveness.
- Ability to use information technologies intensively, for the diagnosis, simulation and generation of solutions to problems that compromise or put at risk the competitiveness and/or sustainable development of organizations and to improve their financial management.

- Ability and ability to interact effectively and efficiently with people who have different cultural characteristics and who work in characterized organizations that operate in globalized environments.

Target audience

DCF is for people with:

- Desire and ability to investigate and expand the frontiers of knowledge in the fields of financial sciences.
- The discipline and intellectual curiosity to ask fundamental questions and conduct research that contributes to the creation and dissemination of original and innovative knowledge and/or practices in the field of financial theory, management and economics.
- The intention is to pursue a career that positions them as opinion leaders and generators of currents of thought in the financial and economic areas.
- Desire to participate in research, teaching and consulting in the financial sciences.

Lines of research associated with the programme

- Financial risk management.
- Corporate Finance.

**DCF Ph. D. in Financial Science
2011 Plan**

First Semester

Code	Name	CA
AD4018	Business Policy, Ethics and Corporate Social Responsibility	3
GF5019	Research Proposal I	3
MA4016	Calculus and Linear Algebra	3
OP5062	Optative I	3
		12

Second Semester

Code	Name	CA
FZ5024	Investment theory	3
GF5020	Research Proposal II	3
MA4017	Probability and statistics	3
OP5063	Optative II	3
		12

Third Semester

Code	Name	CA
EO4009	Open Macroeconomics	3
EO4011	Advanced Microeconomics	3
GF5021	Research Proposal III	3
OP5064	Optative III	3
		12

Fourth Semester

Code	Name	CA
FZ5002	Financial information and decision-making	3
FZ5026	Mathematics for Finance	3
GF5022	Research Seminar I	1
GF6027	Doctoral Research I	3
OP5065	Optative IV	3
		13

Fifth Semester

Code	Name	CA
AD4020	Research methodology	3
GF6028	Doctoral Research II	3
GF6029	Doctoral Research III	3
OP5066	Optative V	3
		12

Sixth Semester

Code	Name	CA
GF5023	Research Seminar II	1
GF5025	Directed Research I	3
GF6030	Doctoral Research IV	3
GF6031	Doctoral Research V	3
		10

Seventh Semester

Code	Name	CA
GF5026	Directed Research II	3
GF6032	Doctoral Research VI	3
GF6033	Doctoral Research VII	3
		9

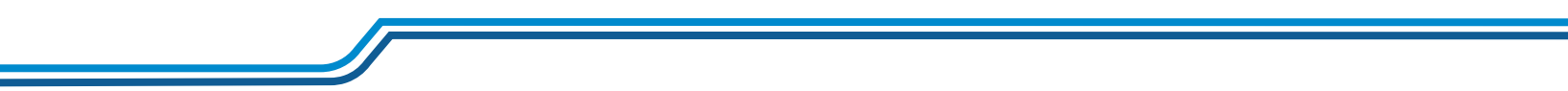
Eighth Semester

Code	Name	CA
GF5024	Research Seminar III	1
GF5027	Directed Research III	3
GF6034	Doctoral Research VIII	3
GF6035	Doctoral Research IX	3
		10

Noveno Semestre

Code	Name	CA
GF6000	Doctoral defense	0.3
GF6036	Doctoral Research X	3
GF6037	Doctoral Research XI	3
GF6038	Doctoral Research XII	3
		9.3

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



Course content by academic discipline

The description of the courses that make up the curricula of the graduate programs offered by Tecnológico de Monterrey are published online at the following electronic address:

http://sitios.itesm.mx/va/planes_de_estudio/3_3ES.htm

This book presents information about Tecnológico de Monterrey's **GRADUATE PROGRAM CATALOGUE 2021**.
Its content reflects the information available in official media at the time of its publication.

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The edition is the responsibility of the Office of the Vice-Rector for Academic and Educational Innovation of Tecnológico de Monterrey and is available on the My Space Portal (<https://miespacio.itesm.mx>).

Responsible for editing and publishing:
Directorate of Academic Regulations of the Office of the Vice-Rector for Academic and Educational Innovation.

