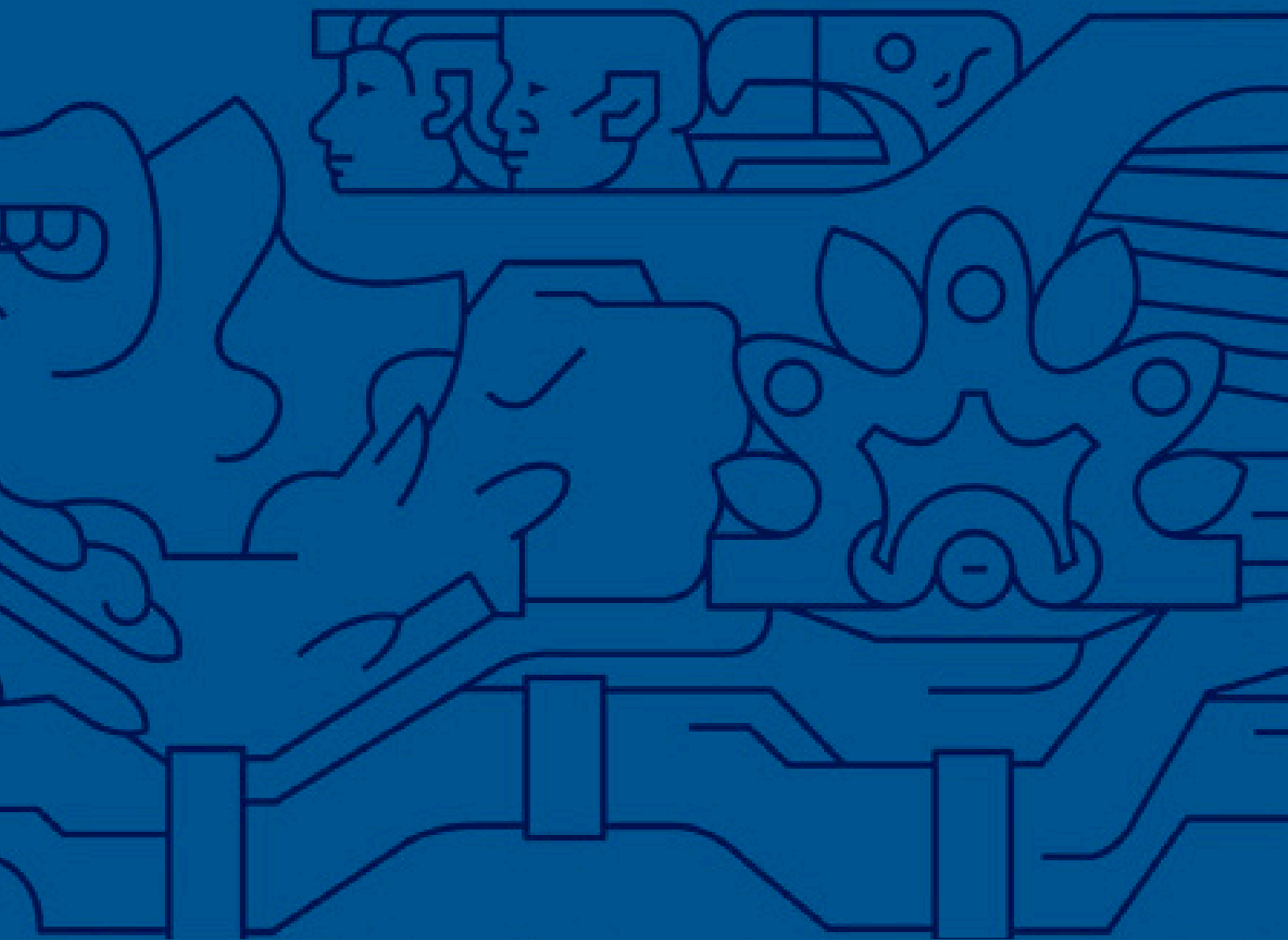
Graduate Programs Catalogue

TECNOLÓGICO DE MONTERREY



GRADUATE PROGRAMS CATALOGUE

INSTITUTO TECNOLÓGICO Y DE ESTUDIOS SUPERIORES DE MONTERREY

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

Notice on the use of inclusive language

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

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

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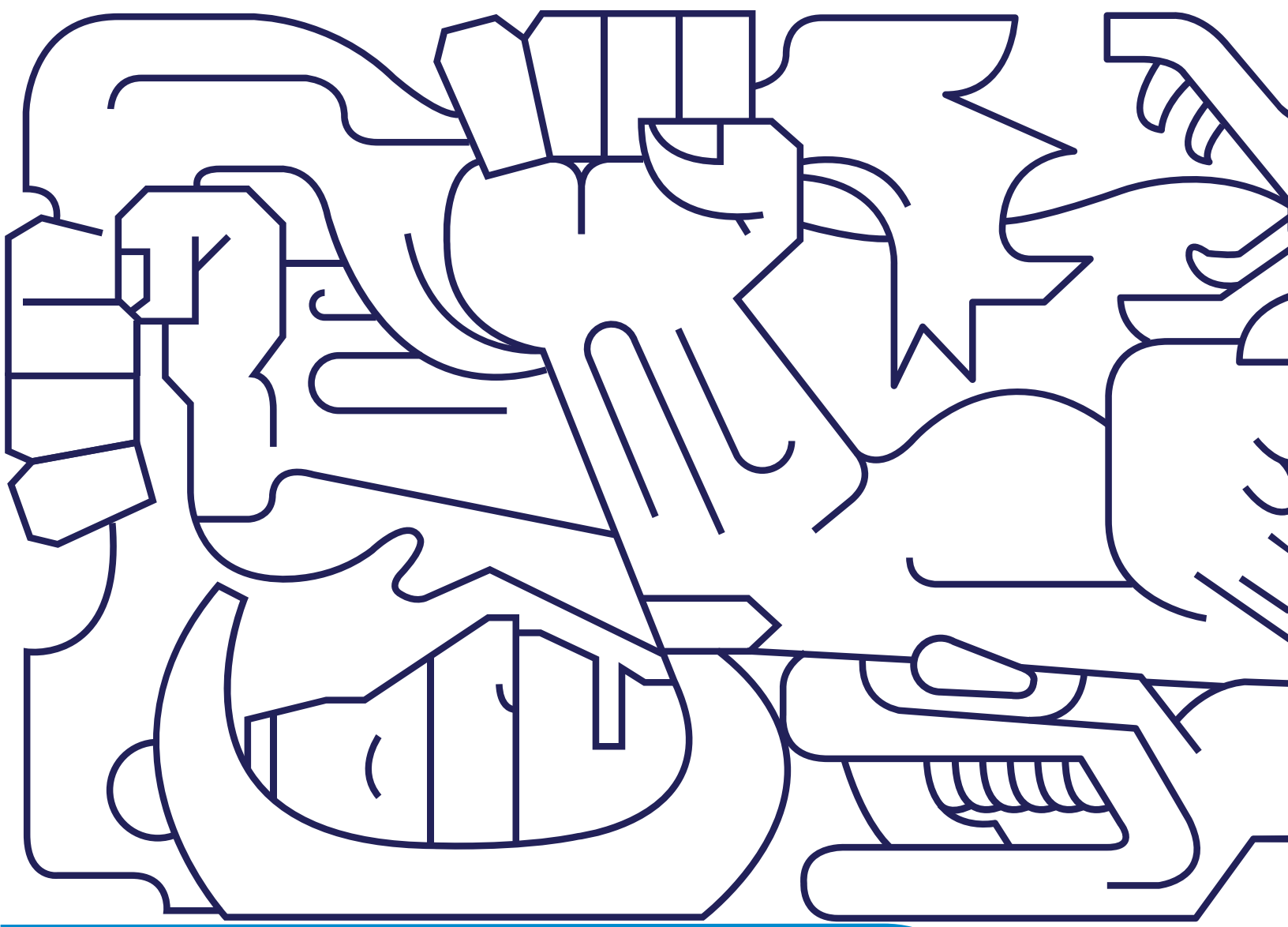
The description of the courses for all the undergraduate programs offers at Tecnologico de Monterrey is available in the Academic Vice-Rectory official web site: http://sitios.itesm.mx/va/planes_de_estudio/3_3EN.htm

INTRODUCTION

This document describes the extensive range of academic programs offered by the Institute in the Graduate Schools. A brief description is included of our Educational Model, the structure of the curricula, the resources and media available to all our students, student life, the academic policies and regulations.

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

Marzo 2024



I. TECNOLÓGICO DE MONTERREY

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History and Evolution

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

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

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

Every year, the board members of these associations meet to define the goals that will guide the major decisions which will help Tecnológico de Monterrey to meet its objective of driving the development of communities and the nation.

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

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

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

les acontecimientos históricos que distinguen a nuestra Institución.

Beginning

1944 The number of students enrolled at Tecnológico de Monterrey increases from 350 to 452, while the total number of faculty members, all full-time, grows from 14 to 33. This year sees the initiation of extracurricular activities: the first student association is formed, the first basketball and soccer teams are created, and "Onda", the institution's first magazine, is published.

1945 The students adopt "El Borrego" (The Ram) as their mascot.

1947 The Monterrey Campus is inaugurated and has one thousand students this year. The first undergraduate degrees are awarded to eight students from the BS in Chemical Engineering program. The first raffle, known as Sorteo Tec, is held.

1950 Tecnológico de Monterrey is accredited by the Southern Association of Colleges and Schools (SACS), a US accrediting agency.

1954 Tecnológico de Monterrey. This mural represents the triumph of culture and work with motifs taken from pre-Cortés mythology. Later on, the Library building will become the Offices of the Presidency of Tecnológico de Monterrey.

Growth

1960 Tecnológico de Monterrey has 4,458 students from 19 countries in America and all the states of Mexico.

1963 At the beginning of this year, the first master's degree is awarded in Chemical Sciences. Twenty years after its foundation, Tecnológico de Monterrey begins to delve into two educational facets that will be of paramount importance: the use of electronic computers and educational television.

1967 The first campus outside the city of Monterrey is founded: the Guaymas Campus.

1968 This year sees the launch of the first doctoral program: the PhD in Chemistry, specializing in Organic Chemistry.

1973 Two new campuses open in other Mexican cities: the Mexico City Campus and the Ciudad Obregón Campus.

1974 The Saltillo Campus is founded.

1975 Operations start at the Eugenio Garza Sada Campus in Monterrey; and the Laguna, Querétaro and San Luis Potosí Campuses.

1976 The Chihuahua, Estado de México and Irapuato Campuses are inaugurated.

1978 Tecnológico de Monterrey now has more than 25 thousand students in 14 units throughout Mexico. The Ignacio A. Santos School of Medicine is opened next to the Hospital San José building. The León Campus becomes operational.

1980 Personal computers are introduced as a higher education tool in Mexico. The Colima, Chiapas, Guadalajara, Hidalgo and Morelos (nowadays called Cuernavaca) Campuses are opened.

1981 The Central de Veracruz and Tampico Campuses are inaugurated.

1982 The Toluca Campus begins operating.

1983 The Ciudad Juárez, Mazatlán, Sinaloa and Sonora Norte Campuses begin operating.

1985 The Zacatecas Campus is inaugurated.

Consolidation

1986 The mission "to prepare professionals with levels of excellence in their area of specialization" is defined, together with the general statutes. Tecnológico de Monterrey is formally incorporated as a multi-campus university with a new organizational structure.

Tecnológico de Monterrey is connected to the international inter-university communication network known as BITNET. The satellite telecommunications network is launched.

1989 The Center for Advanced Technology for Production (CETEC) is opened on the Monterrey Campus. Satellite transmissions are used to teach the Master's in Education with diverse specializations.

1990 The Center for Strategic Studies (CEE) is created. Courses from the master's degrees in Business Administration and Computer Studies are transmitted by satellite for Tecnológico de Monterrey faculty members, as well as three core courses, related to sociocultural values and professional practice.

Transformation

1996 Tecnológico de Monterrey defines its Mission toward 2005: To prepare individuals who are committed to the development of their communities; who are internationally competitive in their area of knowledge; and who conduct relevant research and extension studies for the development of Mexico.

1997 Universidad Virtual is created. Tecnológico de Monterrey offers its academic and continuing education programs in Mexico and Latin America. The teaching-learning redesign process begins.

1998 The Aguascalientes Campus is inaugurated. The rule was laid down that undergraduate students' social service must benefit the community.

2001 Tecnológico de Monterrey, in conjunction with diverse national and international organizations and foundations, creates the Community Learning Centers. Two new campuses begin their activities: the Cumbres Campus, in Monterrey; and the Santa Fe Campus, in Mexico City.

2002 The Morelia Campus is inaugurated.

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

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

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

2007 The Business Accelerator Network began operations. It was created by the Institute for Sustainable Social Development to support society in the areas of education and business creation and development; academic programs in health, nutrition and housing; and professional consulting services.

2008 At the initiative of Tecnológico de Monterrey alumni, the ENLACE E+E Network was created to drive Tecnológico de Monterrey's business incubators and accelerators. The FEMSA Biotechnology Center was opened at the Monterrey Campus, focusing on three areas: Bioprocess Engineering, Food Biotechnology and Pharmaceutical Biotechnology.

2009 With FEMSA's support, the Strategic Technology Observatory opened its doors to promote business innovation and a spirit of research. Community Learning Centers were created to take quality education to underprivileged and geographically remote communities.

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

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

2011 As of October 3, Salvador Alva Gómez took over as the new Chancellor of the Tecnológico de Monterrey. On January 1, David Noel Ramírez Padilla was appointed President of Tecnológico de Monterrey.

2012 The Zambrano Hellion Medical Center was opened in January. This new hospital center seeks to transform private medical practice in Mexico.

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

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

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

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

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

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

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

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

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

The Protein Development Research Center was created.

The Eugenio Garza Sada Institute for Entrepreneurship was founded.

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

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

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

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

2018 QS World University Rankings classifies Tecnológico de Monterrey as the top private university.
The progress of the fulfillment of Vision 2020 was reviewed and the five values that characterize and represent the Tecnológico de Monterrey community were identified.

2020 Appointment of Juan Pablo Murra Lascurain as Rector of Undergraduate and Graduate Studies of the Tecnológico de Monterrey.

2024 Integration of the Office of the Rector for Operations and the Office of the Rector for Undergraduate and Graduate Programs into a single Office of the Rector at

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 Mon- terrey 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 respon- sibility to provide a valid response to the country's foremost challenges.

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

Values

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

Tecnológico de Monterrey is guided by five values:

Innovation

We are passionate about disruption that generates value.

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

Integrity

We exercise freedom with responsibility.

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

Colaboration

Together, we fulfill the Vision.

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

Empaty and Incluiton

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.

Educational Model

The graduate educational model of Tecnológico de Monterrey is a comprehensive proposal aimed at impacting education through the training of professional and scientific talent. This approach focuses on key aspects such as leadership, innovation, and entrepreneurship, and it is designed to provide specialized education after completing a bachelor's degree. The primary objectives of the graduate programs are updating knowledge, expanding understanding, and generating new insights, which translates into a significant influence at both individual and institutional levels.

This educational model is based on various reflections and conclusions resulting from collaborative workshops and diagnostics that identified areas of opportunity in both academic and administrative processes. The graduate programs are structured according to clearly defined educational levels: specialty, master's, and doctoral degrees, which align with the official education regulations in Mexico. This establishes a formative proposal that not only characterizes the institution but also distinguishes it from other educational models.

Regarding delivery modalities, Tecnológico de Monterrey offers its graduate programs in various formats. The in-person modality requires a synchronous interaction of time and space between students and instructors, while the online modality uses technological tools and digital environments, necessitating a high degree of self-direction from students. The graduate model is based on four pillars: cutting-edge options, impactful experience, a community of leaders, and transcendent learning. These pillars allow the educational offerings to be stratified according to different orientations, covering programs that range from professional impact and executive training to scientific research and medical specialties. Additionally, it is complemented by Alternative Credentials that certify specific skills and competencies.

Finally, updating the programs is a priority within the educational model. Criteria and quality standards are established to govern the opening and closing of programs, ensuring that the offerings continue to innovate and meet the demands of the audiences they serve. The effectiveness of these programs is evaluated annually to guarantee they comply with the established standards and remain relevant in a constantly 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/).

Research

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

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

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

Strategic Foucs Area:
I. Architecture
II. Biotechnology
III. Humanities and Education
IV. Mechatronics
V. Medicine
VI. Business
VII. Public politics y Social Sciences
VIII. Information Technologies, Electrónica and Communications
IX. Sustainable Technologies

The strategic focus of research in these areas seeks to:

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

In order to fulfill these scientific objectives, the institution has created 43 strategic groups that support the academic and research activities of the Schools and of the research-oriented academic programs.

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

The 43 grfocus groups enjoy the participation of 12 international and national leaders, 714 professors, 460 doctoral students and 79 postdoctoral researchers.

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

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

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

Of the more than 1,745 faculty members who teach the master's and doctoral students at Tecnológico de Monterrey, 570 are research professors who belong to the National System of Researchers (SNI). The aim of this system is to recognize the work of people who are dedicated to producing scientific and technological knowledge in Mexico by appointing them as "National Researchers", which symbolizes the quality and prestige of their scientific contributions.

The institution offers 11 doctoral programs, 34 master's programs, 5 pecializations and 17 medical residencies, 70% dof which have been awarded accreditation by the National Program for Quality Graduate Studies (PNPC) of the National Council of Science and Technology (CONACyT). In addition, the 17 edical specializations have been endorsed and approved by the Inter-institutional Commission for the Education of Human Resources in Healthcare, of the Mexican Department of Health (CIFRHS).

In the first period of 2019 e enrollment was: 398 doctoral students, 101 specialization students, 278 amedical residency students, and 5400 aace-to-face and online master's students. Approximately 1,779 graduate students enjoy a maintenance grant awarded by the National Council for Science and Technology (CONACyT).

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

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

Tecnológico de Monterrey is:

- **#178** in the world
- **#67** for employers
- **#30** private university in the world
- **#1** private university in Mexico
- **#5** in Latinoamérica in the QS Latin American Universities Ranking

QS world University Rankin

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

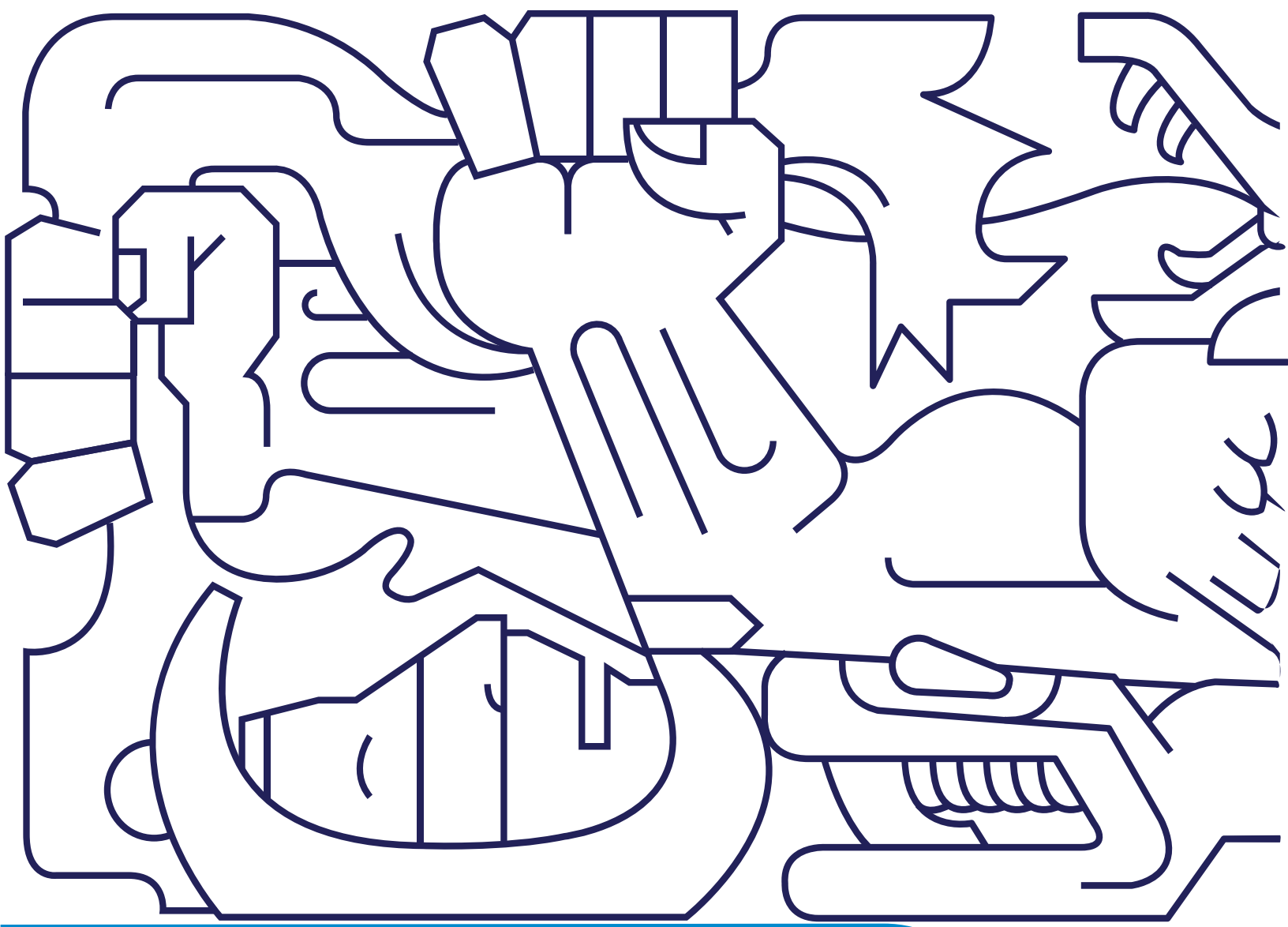
We have been recognized as **#10** in **entrepreneurship on the global level** in The Princeton Review ranking, the only university outside the United States.

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

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

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

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



II. CURRICULA

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.

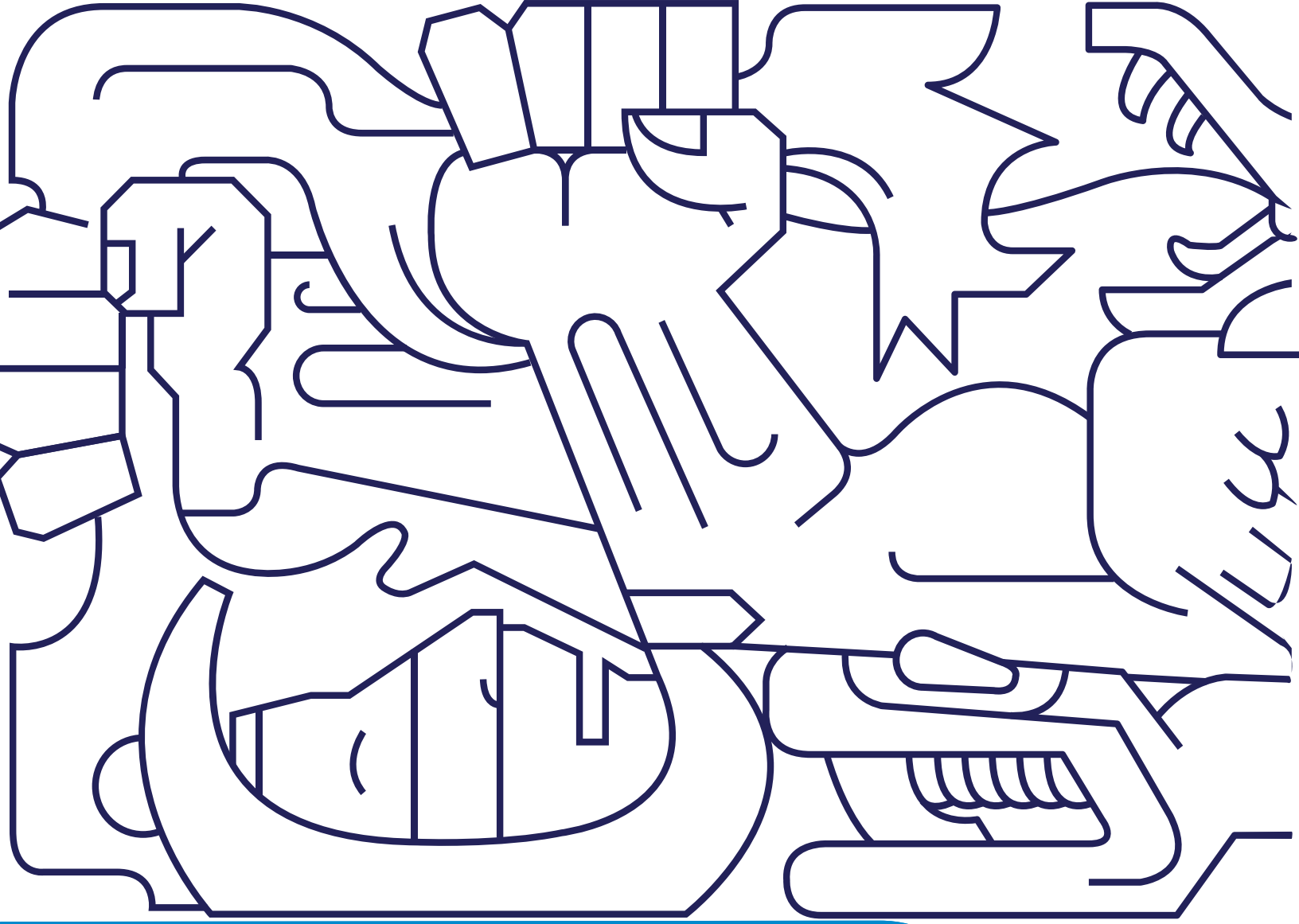
The course descriptions are presented by academic discipline. The letters in the course codes indicate the discipline associated to the course and can be used to locate the description of the courses in the corresponding section of this document.

Course code	Course	CA
MA4005	Applied Statistics	3

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

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

This subject consists of 3 academic credits.



School of Architecture, Art, and Design

MAM-L Master in Creative Media and Digital Art

Program and Learning Outcomes

Admission Profile

Professionals with a bachelor's degree and fundamental knowledge in disciplines such as digital art, animation and interactive media. Graduates from areas such as communication, cultural management, architecture, design and engineering such as computer systems. Professionals who wish to focus on an interdisciplinary study of creative media and the relationship between art, science and technology if they demonstrate interest or have experience in the topics related to the program.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Recognise the world of art and digital art, its socio-economic, cultural, legal and business model aspects, using specific theory and methodologies.

b) Identify opportunities of innovation for the production, reproduction, promotion, dissemination and marketing of goods, services and activities with cultural, artistic or heritage content.

c) Design an artistic project through an approach that demonstrates knowledge for its realization.

d) Develop an artistic project using digital technologies, either in the production process, in its exhibition or in both.

e) Manage artistic projects in collaboration with visual arts production agents, spaces, services, stakeholders and other participants in the creative environment.

Graduation Profile

Professional capable of recognizing the global context of digital art, understanding its socioeconomic, cultural, legal and business aspects. The graduate has the ability to identify innovation opportunities for the creation, promotion and commercialization of cultural and artistic projects, prioritizing inclusion, equity and addressing social challenges. He is competent in the design, development and management of artistic projects that integrate digital technologies and foster interdisciplinary collaboration. Furthermore, it assumes a critical, adaptable and ethical stance in the face of technological changes, understanding art to promote diversity, social transformation and collective well-being.

MAM-L Master in Creative Media and Digital Art
Edition 2024

First Trimester

Code	Name	CA
AT4002	The Meanings of Interaction & Prototyping Interactions	2
AT4003	New Media a Historical Approach, Philosophy and Technology	2
		4

Second Trimester

Code	Name	CA
AT4004	Aesthetic Dimension of New Media	2
AT4005	Digital Society, Plurimedia Management & Creativity	2
		4

Third Trimester

Code	Name	CA
AT4006	Design for Games and Interactive Media	2
EM4003	Transversal Pathways I	2
OP4048	Complementary Elective	2
		6

Fourth Trimester

Code	Name	CA
AT5001	New Paradigms of Media Art	2
OP5100	Elective I	2
		4

Fifth Trimester

Code	Name	CA
AT5002	Digital Art Project Planning	2
AT5003	Digital Art and New Media Projects I	2
		4

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

MDU-M Master in Urban Design and Architecture

Program and Learning Outcomes

Admission Profile

Professionals who have architecture, urbanism, sustainability and environment, ecology, and civil engineering disciplinary foundations. It is also planned for sociology, management, economics, political science, engineering, and community administration professionals, when they have developed a minimum two-year experience in Program related subjects to focus on an interdisciplinary urban problems study and their interventions.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Carry out innovative proposals to actively design, plan, and build sustainable cities.

b) Use state-of-the-art urban design methodologies and tools.

c) Play leadership roles within their organizations.

Graduation Profile

The graduate will be a promoter of change in the transformation of cities based on a critical- purposeful understanding of the challenges and opportunities of the environment. The graduate will be a professional who develops urban scale projects, thus taking advantage of the use of technological, participatory and creative tools in the formulation of strategies or projects applicable to different scales and contexts.

MDU-M Master in Urban Design and Architecture
Edition 2022

First Trimester

Code	Name	CA
AR4021	Theories in Urban Development	3
AR4022	Spatial Analysis and GIS	3
AR4027	Urban Design and Architecture Project	3
		9

Second Trimester

Code	Name	CA
AR4026	Social Participation in Urban Planning and Mapping	3
OP4046	Quality Development Course	3
OP5085	Elective I	3
		9

Third Trimester

Code	Name	CA
AR4024	Critical Thinking of the Urban Model	3
AR4025	Governance for Urban Management	3
OP5086	Elective II	3
		9

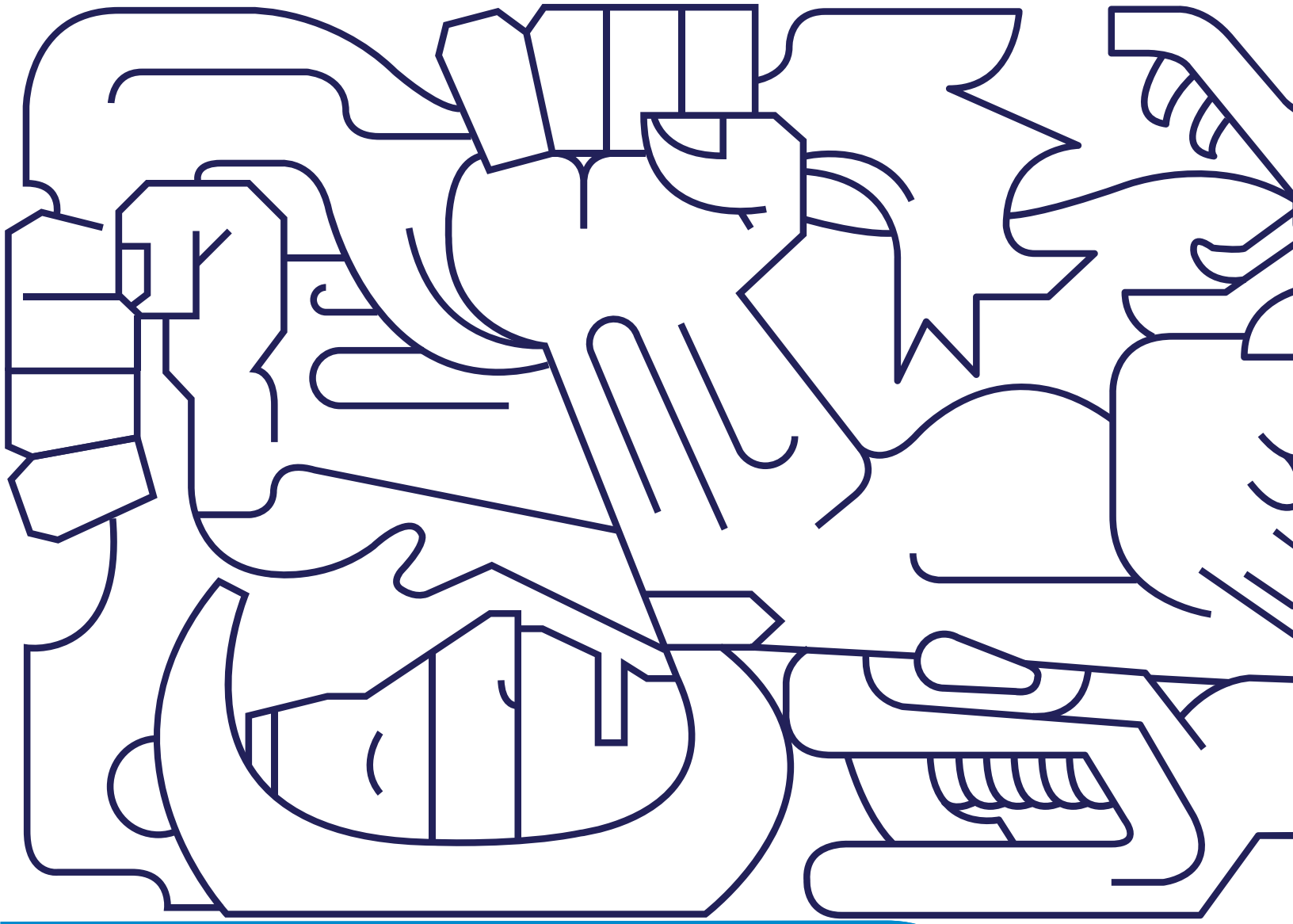
Fourth Trimester

Code	Name	CA
AR4023	Methodologies for Environmental Assessment	3
OP5087	Elective III	3
OP5088	Elective IV	3
		9

Fifth Trimester

Code	Name	CA
AR5034	Capstone Project	3
OP5089	Elective V	3
		6

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



School of Social Sciences and Government

MEK Master in Applied Economics

Program and Learning Outcomes

Admission Profile

Bachelor's degree graduates who are immersed in strategic planning processes, are dedicated to the design of public policy and finance, analyze consumer and stock markets, in addition to analyzing economic and social problems. The program is aimed at professionals who offer consulting in the public, private and social sectors, carry out statistical work and data analysis in large companies and financial institutions. Additionally, individuals who carry out project evaluation and make decisions in companies, non-governmental organizations and governments.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Systematically analyze complex economic problems considering not only the economic environment but the local, national and international sociopolitical context.

b) Propose public policy solutions based on a solid and rigorous analysis, which increases the chances of positive impact on society.

c) Rigorously evaluate any public policy, determining its impact and economic, financial and social viability.

d) Use rigorous methodologies to analyze the decisions of agents in an economy, to propose innovative solutions.

Graduation Profile

Professionals who are leaders within public, private, and social organizations, capable of solving the challenges these organizations face. They also design and map out the critical path for implementing economic and social public policies with a high likelihood of positive impact. Graduates are recognized across Latin America as references in the study and application of economic analysis to improve society and public service.

MEK Master in Applied Economics
Edition 2020

First Trimester

Code	Name	CA
EO4021	Quantitative Methods for Inference	3
OP5085	Elective I	3
TC4025	Data Science	3
		9

Second Trimester

Code	Name	CA
EO4024	Prices and Agent Behavior	3
EO4025	Econometrics	3
TC5030	Guaranteed Data Science	3
		9

Third Trimester

Code	Name	CA
AP4041	Ethical Dilemmas of Public Leadership	3
EO4022	Macroeconomy	3
RE4020	Economy for Development	3
		9

Fourth Trimester

Code	Name	CA
EO4023	Public Finance and Budgeting	3
EO4026	Microeconometrics	3
OP5086	Elective II	3
		9

Fifth Trimester

Code	Name	CA
AP4040	Applied Public Election	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

Program and Learning Outcomes

Admission Profile

Bachelor's degree graduates who are immersed in strategic planning processes, are dedicated to the design of public policy and finance, analyze consumer and stock markets, in addition to analyzing economic and social problems. The program is aimed at professionals who offer consulting in the public, private and social sectors, carry out statistical work and data analysis in large companies and financial institutions. Additionally, individuals who carry out project evaluation and make decisions in companies, non-governmental organizations and governments.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Systematically analyze complex economic problems considering not only the economic environment but the local, national and international sociopolitical context.

b) Propose public policy solutions based on a solid and rigorous analysis, which increases the chances of positive impact on society.

c) Rigorously evaluate any public policy, determining its impact and economic, financial and social viability.

d) Use rigorous methodologies to analyze the decisions of agents in an economy, to propose innovative solutions.

Graduation Profile

Professionals who are leaders within public, private, and social organizations, capable of solving the challenges these organizations face. They also design and map out the critical path for implementing economic and social public policies with a high likelihood of positive impact. Graduates are recognized across Latin America as references in the study and application of economic analysis to improve society and public service.

MEK-V Master in Applied Economics
Edition 2021

First Trimester

Code	Name	CA
EO4021	Quantitative Methods for Inference	3
OP5085	Elective I	3
TC4025	Data Science	6

Second Trimester

Code	Name	CA
EO4024	Prices and Agent Behavior	3
EO4025	Econometrics	3
TC5030	Guaranteed Data Science	3
		9

Third Trimester

Code	Name	CA
AP4041	Ethical Dilemmas of Public Leadership	3
EO4022	Macroeconomy	3
RE4020	Economy for Development	3
		9

Fourth Trimester

Code	Name	CA
EO4023	Public Finance and Budgeting	3
EO4026	Microeconometrics	3
OP5086	Elective II	3
		9

Fifth Trimester

Code	Name	CA
AP4040	Applied Public Election	3
EO5021	Integrative Project	3
		6

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

MLP-L Master in Public Administration

Program and Learning Outcomes

Admission Profile

Government officials who seek to enhance their leadership capacity and the effectiveness of their policies; NGO leaders who collaborate with government entities; private sector professionals who maintain a constant interaction with the government, such as those in charge of government affairs, public relations, corporate sustainability, or similar positions; consultants and policy advisors who guide governments, private organizations and NGOs. In short, this program is presented as a comprehensive proposal for professionals from various sectors that work in a government-related field and want to strengthen and broaden their competencies.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Understand objectively and deeply the challenges and opportunities in the field of public administration.

b) Apply a transdisciplinary approach to solving complex problems in public policy.

c) Create, implement and evaluate public policies at any level of government.

d) Understand the approaches used in public policy management and analysis and know how to use advanced technological tools, such as artificial intelligence and data analysis, to improve efficiency and effectiveness in public administration.

e) Undertake advocacy and collaboration initiatives with government to solve public problems, from the private sector or non-governmental organizations.

f) Develop critical thinking skills to understand complex problems.

g) Use technology and data to inform and improve public administration.

h) Lead teams and projects in governmental and non-governmental settings, guiding the implementation of high-impact policies and projects.

i) Have a strong commitment to public service and social welfare.

j) Innovate and entrepreneurial skills within the public sector, generating change and value.

k) Propose solutions to complex problems and projects by integrating knowledge, experiences and methodologies from other disciplines, interest groups and cultures.

Graduation Profile

Highly trained professional to design, implement and evaluate public policies based on evidence, using advanced data science and statistical analysis tools. Has skills to integrate large volumes of information, develop predictive models and propose innovative solutions to complex social problems. The graduate has a solid interdisciplinary training, combining knowledge in economics, public policy, programming and data analysis to lead strategic projects in government sectors, international organizations, private companies and NGOs. In addition, it has an ethical approach and social commitment, aimed at generating positive and sustainable impact on its environment.

MLP-L Master in Public Administration
Edition 2024

First Trimester

Code	Name	CA
AP4051	Applied Public Administration	2
AP4052	Analysis and Design of Public Policies	2
OP4048	Complementary Elective	2
		6

Second Trimester

Code	Name	CA
EO4028	Statistics for Public Administration	2
EO4029	Economics for Public Administration	2
TC4035	Artificial Intelligence for the Public Sector	2
		6

Third Trimester

Code	Name	CA
AP4063	Anticipatory Government	2
NB4010	Leadership and Crisis Magement	2
OP5100	Elective I	2
P4002	Evaluation of Public Policies	2
		8

Fourth Trimester

Code	Name	CA
AP5049	Public Finances and Budgeting	2
EM4003	Transversal Pathways I	2
OP5101	Elective II	2
		6

Fifth Trimester

Code	Name	CA
AP5055	Strategic Planning Project for the Public Sector	2
EM4004	Transversal Pathways II	2
		4

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

MPP Master in Public Policy

Program and Learning Outcomes

Admission Profile

Graduates of any discipline with a desire to learn about public policy and develop skills that allow them to transform society. Profiles that come from the public sector; candidates that want leader public positions; social entrepreneurs and activists; researchers and academics, as well as professionals from the private sector, who have the interest and motivation to have an impact on the public sector.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Understand the complexity of public problems and the approaches to propose transdisciplinary solutions.

b) Design and implement effective policies and evaluate the effectiveness of existing ones.

c) Use technological tools and innovative approaches to public policy management and analysis, including data science and artificial intelligence.

d) Make evidence-based public problem-solving decisions.

e) Have advanced knowledge of applied economics, artificial intelligence for public policy, strategic foresight, or in selected public policy topics, depending on the area of interest.

f) Use analytical and methodological tools for data analysis, policy evaluation, and evidence-based decision making (quantitative and qualitative analysis).

g) Collaborate and propose solutions from a transdisciplinary perspective.

h) Lead for service by understanding the role of public policy in serving the community.

i) Distinguish the ethical implications of public policy and develop and implement policies that are equitable, and socially responsible.

j) Introduce innovative changes in the field of public policy, whether through new policies, programs, or initiatives.

Graduation Profile

The graduate has skills and knowledge necessary to develop, implement and evaluate public policies, as well as use tools to understand and propose robust solutions to complex public problems. The professional will be able to solidly understand how public policies work and how they can influence the transformation of public space.

MPP Master in Public Policy
Edition 2024

First Trimester

Code	Name	CA
AP4053	Science for Future Decision Makers	2
AP4054	Public Policy: Lifecycle I	2
OP4048	Complementary Elective	2
		6

Second Trimester

Code	Name	CA
AP4055	Modern Quantitative Methods for Public Policies	2
EM4003	Transversal Pathways I	2
EO4030	Macroeconomics in the Real World	2
		6

Third Trimester

Code	Name	CA
AP5047	Public Policy: Lifecycle II	2
EM4004	Transversal Pathways II	2
TC4036	Data Science for Public Policy	2
		6

Fourth Trimester

Code	Name	CA
EO4031	Microeconomics for Public Policy	2
OP5100	Elective I	2
OP5101	Elective II	2
		6

Fifth Trimester

Code	Name	CA
AP5048	Public Policy Project: Strategic Development	2
OP5102	Elective III	2
OP5103	Elective IV	2
		6

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

MXP Master in Data Science and Public Policy

Program and Learning Outcomes

Admission Profile

Graduates with an interest and commitment to public policy, willing to learn to program, and with an inclination to study topics such as sustainability, social equity, economics and complex problems at the local, regional or global level; professionals with quantitative skills or experience in fields related to mathematics, statistics, economics, physics, engineering, computer science or related fields. Also, applicants for positions as public policy analysts, data specialists or evidence-based policy advisors in the public sector; data strategy consultants, market research analysts or corporate policy specialists in the private sector; or policy researchers, data analysts for development and specialists in public policy with social impact in the non-governmental sector. Profiles interested in applying skills and knowledge to make a difference in the world, motivated by the idea of using data science and modeling to inform and improve public policy and make a positive impact, from the public, private or non-governmental sector.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Have in-depth knowledge of the latest technologies and approaches used in the management and analysis of public policy. Apply knowledge in the use of advanced tools, such as artificial intelligence and data analysis, to improve the efficiency and effectiveness of public policies.

b) Know the techniques and tools of data science. Understand the underlying fundamentals and how they work in order to be able to apply these methods effectively and critically.

c) Know the concept and application of the new economy with a range of factors including environmental sustainability, social equity and human welfare.

d) Know and understand the complexities of public policy and how it interacts with the economy, society and the environment.

e) Understand complex problems that cut across disciplinary boundaries and require solutions that take into account a multitude of factors.

f) Understand how data and models are used to forecast the consequences of different policies and know how the decision-making process is guided.

g) Be familiar with programming languages, mainly Python and R.

h) Develop a deep mastery of data science methods and techniques: handle large datasets, perform sophisticated analysis and extract meaningful insights from data.

i) Identify relevant problems related to public policy, understand their context and apply analytical and computational approaches to their study.

j) Address and analyze wicked problems: as well as multifaceted problems that transcend disciplinary boundaries and require a systems approach.

k) Informed decision making, using data and models to make the best public policy decisions.

l) Strong effective communication skills to explain complex technical concepts to non-technical audiences.

m) Present results of analysis clearly and convincingly to decision makers, stakeholders and the general public.

Graduation Profile

Highly qualified professionals in the application of data science, statistics, economics, systems modeling, and decision-making under uncertainty, to solve complex public problems, using tools machine learning, Bayesian statistics, and scientific thinking. The graduate has a broad understanding of the challenges and opportunities of public policies, as well as practical projects that allow you to gain experience in real cases.

MXP Master in Data Science and Public Policy
Edition 2024

First Trimester

Code	Name	CA
AP4053	Science for Future Decision Makers	2
OP4048	Complementary Elective	2
TC4040	Introduction to Data Science	2
TC4041	Introduction to Programming for Public Policies	2
		8

Second Trimester

Code	Name	CA
EM4003	Transversal Pathways I	2
EM4004	Transversal Pathways II	2
TC4042	Machine Learning for Public Policy I	2
TC4043	Computer Science for Public Policy	8

Third Trimester

Code		CA
OP5100	Elective I	2
TC4044	Research Methods and Communication in Data Science	2
TC4045	Introduction to Probabilistic Programming	2
TC5039	Machine Learning for Public Policy II	2
		8

Fourth Trimester

Code	Name	CA
OP5101		2
OP5102	Elective III	2
TC4039	Systems Modeling I	2
TC4046	Deep Learning and its Uses in Public Policy	2
		8

Fifth Trimester

Code	Name	CA
OP5103	Elective IV	2
OP5104	Elective V	2
OP5105	Elective VI	2
TC5040	Data Science Research and Communication Project	2
		8

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

DPP Ph. D. in Public Policy

Program and Learning Outcomes

Admission Profile

Public officials from different orders and levels of government interested in deepening their knowledge in the areas of public administration and public policy. Private sector professionals seeking to specialize in government-business relations. Likewise, researchers and professionals in the social area interested in generating cutting-edge knowledge in the fields of administration and public policy.

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

Student Learning Outcomes

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

b) Propose government-civil society-enterprise liaison strategies.

c) Propose and execute leadership in research related to the field of public policy based on their theoretical, analytical, and instrumental grounding in public policy processes, with a multidisciplinary approach underpinned by legal, economic and public administration insights.

Graduate Profile

Professionals with solid analytical, critical and ethical skills, capable of addressing the complex challenges facing contemporary societies. Graduates of the program are prepared to lead research and projects focused on the creation, implementation and evaluation of public policies in various areas, such as social well-being, the economy, security, health and the environment. Their multidisciplinary training allows them to combine approaches from social sciences, economics, public administration and other relevant areas to develop innovative and sustainable solutions, in addition to being prepared to analyze and transform public systems through the use of data science tools and artificial intelligence, used with an ethical commitment and a strategic vision that will allow us to influence the improvement of social well-being and sustainable development at a national and international level.

DPP Ph. D. in Public Policy
Plan 2011

Firts Semester

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

Second Semester

Code	Name	CA
GP5000	Research Proposal I	3
OP4037	Quality Development Course	3
OP5062	Elective I	3
OP5063	Elective II	3
		12

Third Semester

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

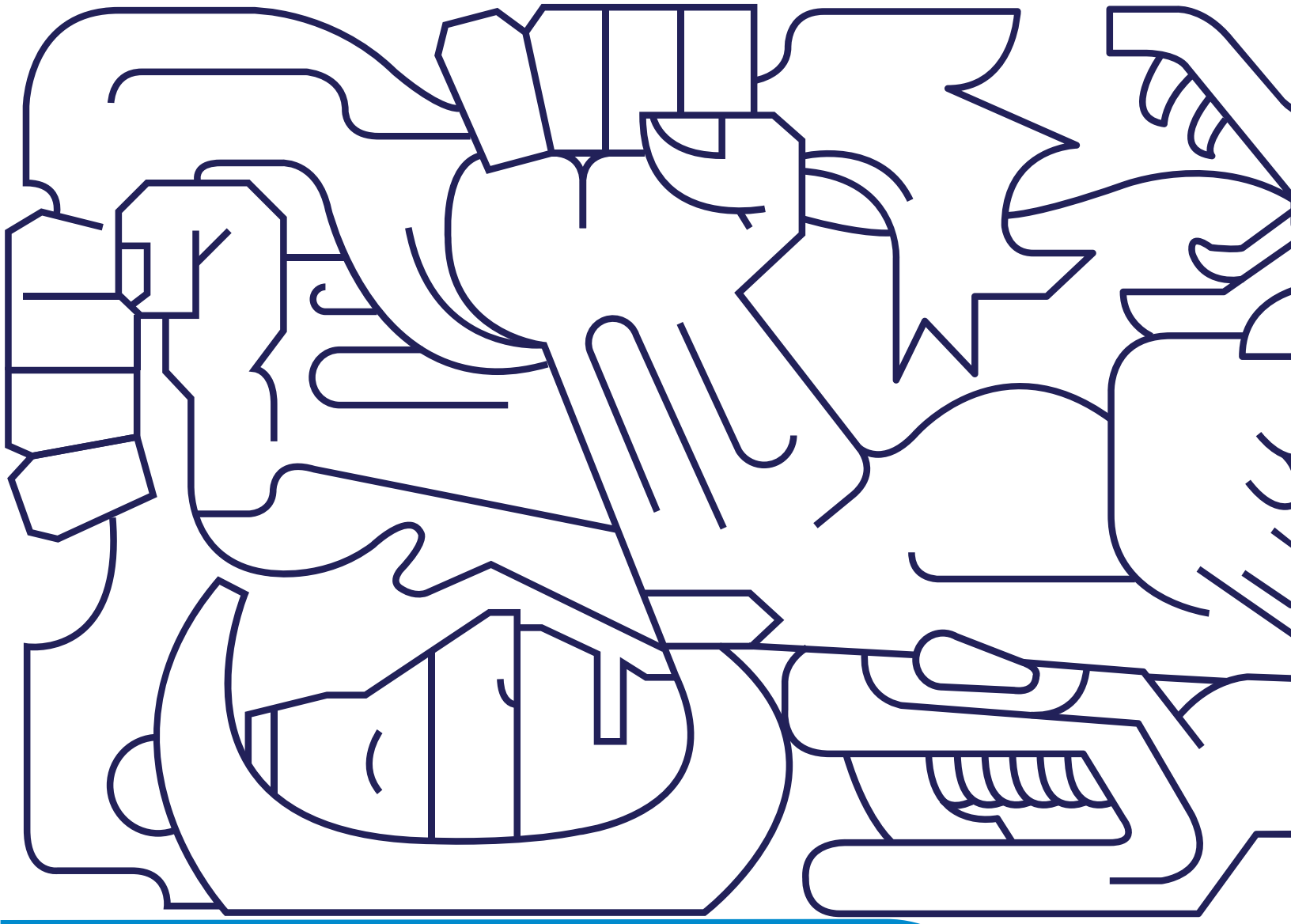
Code	Name	CA
GP6028	Doctoral Research VIII	3
GP6029	Doctoral Research IX	3
GP6030	Doctoral Research X	3
		9

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
		10

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

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



School of Humanities and Education

EEE-V Specialization in Teaching and Assessment of English as a Second Language

Program and Learning Outcomes

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 to the well-being 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.

The program is aimed at:

- Professional educators teaching English in elementary and junior high schools.

- Graduate professionals with a bachelor's degree in humanities, such as Applied Linguistics and English Teaching, among others.

- Elementary and high school teachers who have a bachelor's or master's degree in another discipline, but who, due to their high level of proficiency in English, seek to teach this subject.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Design and teach English courses in public and private educational institutions in elementary, junior, and senior high school levels.

b) Assess, according to international standards, the level of proficiency in English as a foreign or second language of participants and candidates who wish to be accepted in formal and informal educational programs, as well as of applicants in job positions which require the mastery of English language.

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

Graduate Profile

Professionals that are highly trained, and who know and use the most up to date and advanced pedagogy in the teaching and assessment of English as a foreign language at various school levels as well as in public and private institutions. In addition, professionals that integrate the use of technological tools applied to the teaching and assessment of English as a foreign language in his/ her teaching practice.

EEE-V Specialization in Teaching and Assessment of English as a Second Language
Edition 2021

First Trimester

Code	Name	CA
ED4043	Entrepreneurship and Innovation	3
ED4058	Fundamentals for the Design of TESOL Educational Programs	3
		6

Second Trimester

Code	Name	CA
ED4059	Evaluation of Learning	3
ED4060	Technological Innovation in Teaching, Learning and Evaluation of Foreign Languages	3
OP5085	Elective I	3
		9

Third Trimester

Code	Name	CA
ED5124	Assessment of Linguistic Competence	3
OP5086	Elective 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

Program and Learning Outcomes

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 to the well-being 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.

The program is aimed at:

- Directors and coordinators who wish to enrich their educational institution by strengthening their leadership and linking them with avant-garde tools for schools and applying this knowledge in institutions of the private and public sector and organizations.

- Future directors and coordinators who wish to obtain a view of the directive function in the educational field.

- Education professionals with the aspiration of serving as consultants in the private or public sector to guide projects related to the evaluation of institutions, human capital development and institutional management.

- Owners and entrepreneurs who wish to participate in high-level educational projects linked to educational services for institutions. Social entrepreneurship, indispensable in new globalized and digital contexts.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Design and implement educational solutions to complex problems in educational centers, with an ethical and socially responsible perspective, using scientific methods and innovative technologies.

b) Interact with specialists from all the functional areas of the educational centers in order to define the

strategies, guidelines and organizational objectives for the institution, in an atmosphere of respect and inclusion.

c) Lead processes of change in complex environments that strengthen the organizational transformation of educational centers promoting transparency and equity.

Graduate Profile

Professionals with the necessary competencies to strategically manage their respective schools and take them effectively to the next level of educational quality.

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

First Trimester

Code	Name	CA
ED4042	Strategic Leadership	3
OP4046	Quality Development Course	3
OP5085	Elective I	3
		9

Second Trimester

Code	Name	CA
ED4044	Empowerment of Teams for Transformation	3
ED5104	Partnerships for Financial Management	3
OP5086	Elective II	3
		9

Third Trimester

Code	Name	CA
ED5110	Traveling Seminar for Innovative Management	3
		3

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

MEE-V Master in Education

Program and Learning Outcomes

Admission Profile

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

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) To solve challenges of contemporary, local, regional and global educational reality, contributing to processes of educational change.

b) To Apply the knowledge of Educational Sciences in teaching and learning processes within multiple contexts.

c) To Carry out applied educational research as a work tool in their professional practice in business or educational settings, both formal and non-formal.

d) To generate new ideas, procedures and techniques in order to identify areas of opportunity and implement solutions jointly with various social actors.

e) To incorporate their conception of education into their own intervention project.

Graduation Profile

Professionals who are leaders in the field of education, proposing and executing innovative educational projects and programs that contribute to improving the services provided in their institutions. The graduate is a professional who carries out their teaching practice using teaching and learning strategies to achieve curriculum objectives effectively and efficiently. They also apply their research skills to solve current educational challenges. Graduates of the Master's in Education are professionals who conduct themselves according to ethical standards, demonstrating through their teaching practice a respect for the dignity of their students, parents, and colleagues, whether they are members of the educational community or the broader community.

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

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	Elective Course I	3
OP5042	Elective I	3
		6

Third Semester

Code	Name	CA
ED4034	Applied Research Project I: Identifying Study-Problems	3
OP5043	Elective II	3
		6

Fourth Semester

Code	Name	CA
ED4035	Applied-Research Project II: Methodological Approaches	3
OP5044	Elective 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 Humanistics Studies

Program and Learning Outcomes

Admission Profile

People seeking to begin their training as researchers in the interdisciplinary field of humanities. Likewise, graduates and professionals from different disciplines who wish to complement their academic and professional training with a broad, solid, and updated perspective that adds value to their professional profiles.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Develop high-quality research, which proposes new approaches to the study of the interdisciplinary field of the humanities, from perspectives aligned with the Sustainable Development Goals (SDG 2015-2030) defined by the UN, which demonstrates its ability to continue its studies at the PhD level.

b) Design and develop analysis strategies for contemporary social and cultural phenomena, from a critical humanistic perspective, with knowledge of the environment and purposeful attitude to identify relevant issues in their field of research.

c) Manage and evaluate projects of a social and cultural nature, in public and private institutions, as well as in the academic field, which allow it to contribute to the solution of the main challenges facing contemporary societies.

Graduation Profile

Researchers with the knowledge, skills, and abilities to apply a critical and proactive approach in identifying the most relevant issues for research within contemporary social and cultural contexts, from a humanistic perspective. They are also prepared to propose new approaches to studying specific phenomena in the interdisciplinary field of the humanities, demonstrating a critical vision of culture based on a solid theoretical and conceptual foundation, along with the application of the most suitable research techniques and methods for each case study. Likewise, they are equipped to participate in the design, development, management, and evaluation of projects and programs related to the work of public, private, and academic institutions, aiming to impact social and cultural well-being and contribute to addressing the main challenges faced by contemporary societies.

MEH Master in Humanistics Studies
Plan 2009

First Semester

Code	Name	CA
H4012	Research Methods	3
OP4002	Basic Course I	3
OP5042	Elective I	3
		9

Second Semester

Code	Name	CA
H5022	Research Seminar	3
OP4003	Basic Course II	3
OP5043	Elective II	3
		9

Third Semester

Code	Name	CA
OP4004	Basic Course III	3
OP4037	Quality Development Course	3
OP5044	Elective III	3
		9

Fourth Semester

Code	Name	CA
OP4005	Basic Course IV	3
OP4018	Basic Course V	3
OP5045	Elective IV	3
		9

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

MHD-V Master in Digital Humanities

Program and Learning Outcomes

Admission Profile

Graduates from a bachelor's degree and professionals from humanities, communication, social sciences or information technologies, as well as cultural managers, community managers, editors, journalists, publicists, creators, information analysts, librarians, graphic designers, visual artists, educators and academics. The applicant for the program must have skills in searching for information in bibliographic databases, be familiar with the use of information and communication technologies and the dissemination of knowledge in digital media and be capable of locating information and tools on the web for the development of the activities proposed in the courses. In addition, the applicant must possess medium and high-performance reading comprehension skills, as well as be able to understand the English language at a medium-high level, allowing an adequate understanding of bibliographic materials.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Integrate the humanist tradition with the digital methods and tools to generate new approaches and knowledge in the humanities.

b) Create cultural entrepreneurship projects on digital platforms for the dissemination of cultural heritage.

c) Critically analyze social behavior and its trends in digital society.

Graduation Profile

Professionals with the necessary skills to create humanistic knowledge within the complex environment of a digital society through the development of digital projects, the analysis of trends in social networks and cultural and creative entrepreneurship products.

MHD-V Master in Digital Humanities
Plan 2019

First Trimester

Code	Name	CA
EH4001	Digital Humanities Fundamentals	3
OP4046	Quality Development Course	3
		6

Second Trimester

Code	Name	CA
EH4002	Information Architecture for Digital Content	3
OP5085	Elective I	3
		6

Third Trimester

Code	Name	CA
EH4003	Digital Methods	3
EH5001	Digital Project I	3
OP5086	Elective II	3
		9

Fourth Trimester

Code	Name	CA
EH4004	Digital Technologies	3
EH5002	Digital Project II	3
OP5087	Elective III	3
		9

Fifth Trimester

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

Sixth Trimester

Code	Name	CA
EH4005	Philosophy of Technology	3
OP5089	Elective V	3
		6

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

MTE-V Master in Educational Technology

Program and Learning Outcomes

Admission Profile

Graduates from a bachelor's degree related to the areas of education, administration or related fields and, preferably, that they have reading comprehension skills in English. Likewise, it is desirable that they are working in a position that allows them to approach organizational or school settings at various educational levels.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Design learning environments by selecting the appropriate technologies.

b) Apply educational technology in their courses as a teacher of a basic, upper or higher level, or as a training instructor and manager of human talent.

c) Implement and evaluate projects of technology applied to education.

d) Design curricular plans based on current teaching paradigms.

e) Carry out applied research in the area of technology-mediated education.

Graduation Profile

Professionals who are leaders in the field of education propose and implement innovative educational and technological projects and programs that contribute to improving the services provided in their institutions and organizations. They carry out their teaching practice through effective and efficient teaching and learning strategies to achieve curriculum objectives, particularly by incorporating and implementing technology in education. They also apply their skills in applied research to address current educational challenges. Furthermore, they conduct themselves according to ethical standards, demonstrating respect for the dignity of their students, parents, collaborators, and colleagues, whether they are part of the educational community or the broader community.

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

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	Elective Course I	3
OP5042	Elective I	3
		6

Third Semester

Code	Name	CA
ED4034	Applied Research Project I: Identifying Study-Problems	3
OP5043	Elective II	3
		6

Fourth Semester

Code	Name	CA
ED4035	Applied-Research Project II: Methodological Approaches	3
OP5044	Elective 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 Education Entrepreneurship

Program and Learning Outcomes

Admission Profile

Teachers and educators regardless of their level of experience or area of expertise, as well as entrepreneurs, future entrepreneurs and professionals who wish to venture into the education sector. Additionally, the applicant 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. Likewise, understand the English language at a medium-high level, allowing an adequate understanding of bibliographic materials.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Identify areas of opportunity in an education environment.

b) Develop proposals that translate into real projects in the field of education through interaction with specialists in the areas of education, business, entrepreneurship, technology.

c) Carry out a process of strategic communication of a product or service with the intention of sales or investment.

d) Develop online marketing strategies for educational products or services.

e) Implement negotiation strategies with different audiences and in different contexts.

f) Identify trends and do prospective education.

Graduation Profile

Professionals with the necessary skills to undertake innovative educational projects that contribute to the transformation of their communities in social and economic aspects. The graduate will be able to identify areas of opportunity in an education environment, with the purpose of develop proposals that translate into real projects in the field of education through interaction with specialists in the areas of education, business, entrepreneurship, technology.

MTO-V Master in Education Entrepreneurship
Plan 2020

First Trimester

Code	Name	CA
ED4046	Organizational Change for Entrepreneurship in Education	3
ED4047	Prospective Studies in Education	3
ED4050	Educational Entrepreneurship Internship 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 Internship II	1.5
OP4046	Quality Development Course	3
		10.5

Third Trimester

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

Fourth Trimester

Code	Name	CA
ED4053	Educational Entrepreneurship Internship IV	1.5
ED4056	Educational Entrepreneurship Project III	1.5
OP5086	Elective II	3
		6

Fifth Trimester

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

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

DEE Ph. D. in Educational Innovation

Program and Learning Outcomes

Admission Profile

Academics at the postgraduate level 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 to educational administrators in higher education institutions interested in pursuing an administrative career in institutions that require a completed doctorate from their administrators.

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

Student Learning Outcomes

a) Generate and implement innovative and valuable solutions to educational problems through a symbiotic process that incorporates research, application, and knowledge transfer.

b) Develop meaningful scientific research that provides new and relevant knowledge for the field of educational innovation, considering both national and international contexts and a commitment to societal impact.

c) Exercise leadership skills in innovative projects that deliver concrete and sustainable improvements in education for the benefit of society.

d) Generate new projects that positively impact processes, products, and services within the educational context to promote social well-being.

e) Uphold ethical principles in their actions as researchers and educators, demonstrating a strong sense of social responsibility.

f) Apply critical and integrative thinking in addressing complex issues, using scientific methodologies to help solve national and international educational challenges.

g) Cultivate an appreciation for diverse cultures and ways of life, fostering a cosmopolitan and integrative spirit that embraces the plurality of human experience, particularly in formal and non-formal educational settings.

Graduate Profile

The graduate is an educational researcher who proposes innovative solutions based on data and high value to solve problems in the educational environment, in which a cyclical process that incorporates both research and the application of knowledge follows. It is an educational scientist who contributes new relevant knowledge, both for the line of research and for the field of educational innovation, considering audiences from national and international environments and public

commitment to society. He is a leader of innovation projects that provide significant and sustainable improvements to address situations analyzed with proven methods supported by data and which include the complexity approach and apply national and international quality scientific methodologies. As a researcher, he handles himself ethically when developing sustainable, inclusive and diverse projects that address different learning styles. In addition, he is a teacher who positively impacts the processes, products and services related to the educational phenomenon in his community. The graduate is an educator who appreciates and respects diverse cultures and ways of life, safeguarding the plurality of the human experience, particularly in formal and non-formal educational settings.

DEE Ph. D. in Educational Innovation
Edition 2022

First Semester

Code	Name	CA
ED6047	Doctoral Research I	3
ED6048	Doctoral Research II	3
ED6061	Research and Educational Innovation Workshop I	1
ED6067	Research Methodology I	3
		12

Second Semester

Code	Name	CA
ED6049	Doctoral Research III	3
ED6050	Doctoral Research IV	3
ED6068	Research Methodology II	3
ED6069	Research Seminar I	.5
ED6075	Research Integration I	1.5
		11

Third Semester

Code	Name	CA
ED6051	Doctoral Research V	3
ED6052	Doctoral Research VI	3
ED6062	Research and Educational Innovation Workshop II	1
ED6070	Research Seminar II	.5
ED6076	Research Integration II	1.5
		9

Fourth Semester

Code	Name	CA
ED6053	Doctoral Research VII	3
ED6063	Research and Educational Innovation Workshop III	1
ED6071	Research Seminar III	.5
ED6077	Research Integration III	1.5
ED6080	Doctoral forum	3
		9

Fifth Semester

Code	Name	CA
ED6054	Doctoral Research VIII	3
ED6064	Research and Educational Innovation Workshop IV	1
ED6072	Research Seminar IV	.5
ED6078	Research Integration IV	1.5
ED6081	Linkage to society	3
		9

Sixth Semester

Code	Name	CA
ED6055	Doctoral Research IX	3
ED6056	Doctoral Research X	3
ED6073	Research Seminar V	.5
ED6079	Research Integration V	1.5
		8

Seventh Semester

Code	Name	CA
ED6057	Doctoral Research XI	3
ED6058	Doctoral Research XII	3
ED6065	Research and Educational Innovation Workshop V	1
ED6074	Research Seminar VI	.5
		7.5

Eighth Semester

Code	Name	CA
ED6059	Doctoral Research XIII	3
ED6060	Doctoral Research XIV	3
ED6066	Research and Educational Innovation Workshop VI	1
ED6082	Dissemination of research	1.5
ED6083	Doctoral Defense	.3
		8.8

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

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

DEH Ph. D. in Humanistic Studies

Program and Learning Outcomes

Admission Profile

Professionals who seek to develop, from an interdisciplinary perspective, 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:

- Academicians who creatively and appropriately face the challenges and needs of social entrepreneurship, which is essential in the new globalized and digital contexts.

- Leaders and collaborators of non-governmental organizations that promote understanding of society and its current processes to lead their course of action.

- Professionals who work in the private, public, and social sectors, whose interests or work needs require to develop an innovative, humanistic, and social profile.

- People interested in strengthening the higher educational system through teaching and research.

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

Student Learning Outcomes

a) Demonstrate a high level of theoretical and methodological knowledge of the humanities, enabling them to participate and play a prominent role in interdisciplinary debates.

b) Conduct research in their area of specialization that will contribute new, relevant knowledge to the advancement of the humanities.

c) Apply and generate interdisciplinary knowledge in the program's fields of study through complex thinking with a critical and comprehensive vision of cultural and social phenomena.

d) Design strategies that will impact social life through consultancy for the public, private and civil sectors.

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

Graduate Profile

Research professionals who debate in interdisciplinary settings with a high content of advanced knowledge applied in the humanities, cultural studies and argumentation. They are scientists who develop academic texts in which they clearly and rigorously present new knowledge after having applied theories that have been analyzed with objective criteria in which they make contributions from

various disciplines. At the same time, they are designers and implementers of collaboration strategies in disciplinary groups dedicated to high-impact research. Graduates are people who implement educational developments in formal environments, who strictly follow development plans in which applied knowledge is deployed, who organize and execute high-impact scientific dissemination activities in international forums.

DEH Ph. D. in Humanistic Studies
Plan 2018

First Semester

Code	Name	CA
GH6001	Research Mentoring I	3
GH6002	Methodology of Interdisciplinary Research	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 Mentoring II	3
GH6007	Research Protocol Presentation	1
GH6008	Research Integration I	1
GH6009	Methodology of Interdisciplinary Research II	3
GH6010	Strategic Research Seminar II	1
		9

Third Semester

Code	Name	CA
GH6011	Doctoral Student Conference	3
GH6012	Doctoral Research I	3
GH6013	Communicating Scientific Production I	1.5
GH6014	Strategic Research Seminar III	1
GH6015	Research Tutoring I	0.5
		9

Fourth Semester

Code	Name	CA
GH6016	Research Integration 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 Tutoring II	0.5
GH6026	Research Tutoring III	0.5
		9

Sixth Semester

Code	Name	CA
GH6027	Research integration III	1
GH6028	Doctoral Research V	3
GH6029	Doctoral Research VI	3
GH6030	Communicating Scientific Production II	1.5
GH6031	Strategic Research Seminar VI	1
		9.5

Seventh Semester

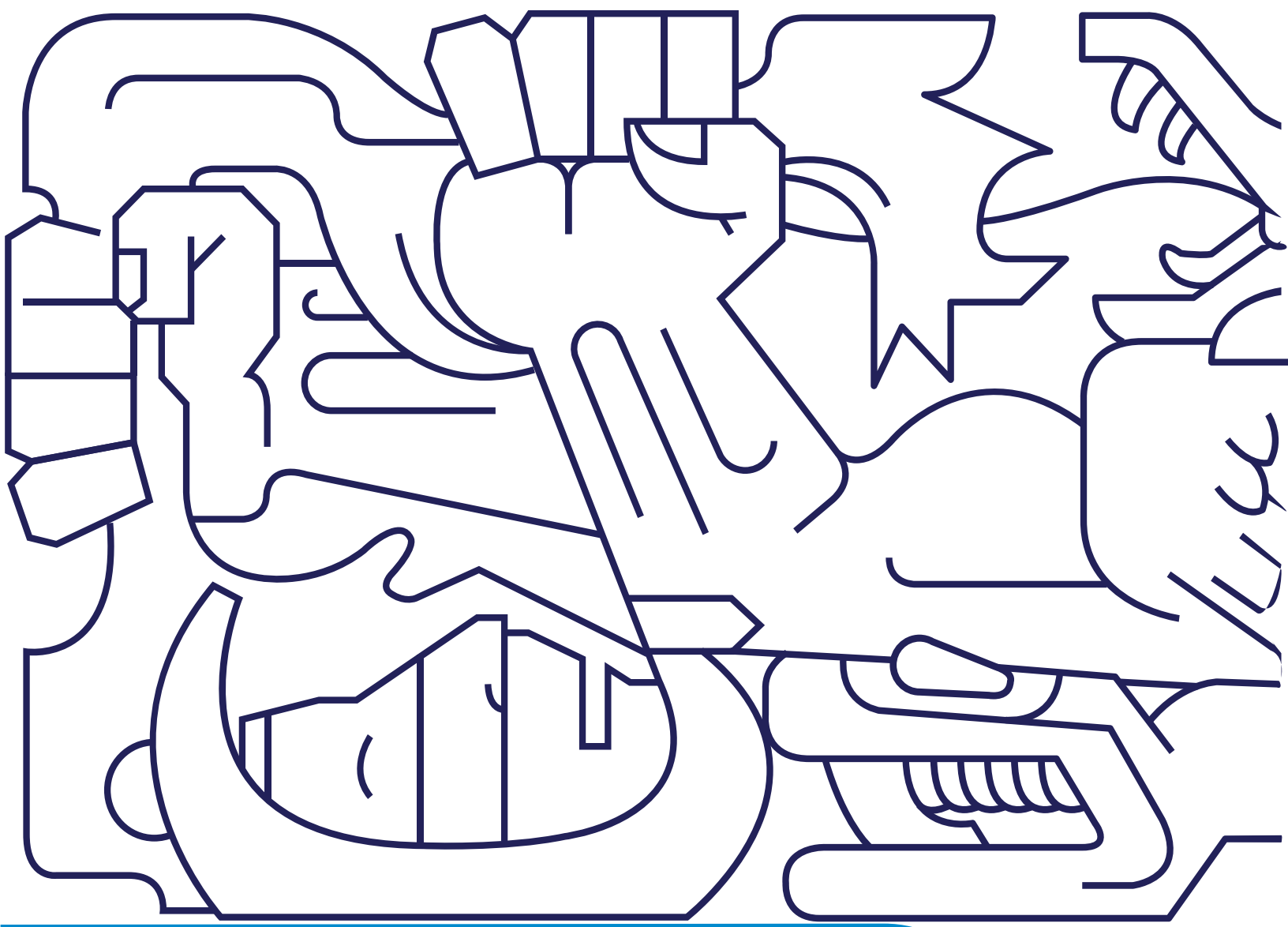
Code	Name	CA
GH6032	Doctoral Research VII	3
GH6033	Doctoral Research VIII	3
GH6034	Strategic Research Seminar VII	1
GH6035	Research Workshop V	1
GH6036	Research tutoring IV	0.5
GH6037	Research tutoring V	0.5
		9

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 Predefense)	0.5
GH6043	Doctoral defense	0.3
		8.8

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

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



School of Engineering and Sciences

ELS Specialization in Logistics and Supply Chain

Program and Learning Outcomes

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 to the well-being 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.

The program is aimed at people who wish to join the productive sector creating solutions for Logistics and Supply Chain problems from their design, analysis, development and implementation.

Academic background for admission: Students graduated from a bachelor's degree with deep knowledge of probability and statistics and operations research.

Student Learning Outcomes

a) Design supply chains, addressing the issues related to the location of facilities, transportation of goods, routing and inventory management.

b) Strategically and efficiently manage the organizational and technological resources in the supply chain.

c) Diagnose and solve supply chain management problems.

d) Design efficient return flow collection models to collaborate with environmental conservation.

Graduate Profile

Specialists who use their leadership in an organization to improve an organization's competitiveness through innovations in supply chain management, as well as optimize an organization's logistics and supply chain processes through technological and administrative innovations.

ELS Specialization in Logistics and Supply Chain
Plan 2011

First Trimester

Code	Name	CA
AD4001	Statistical Analysis in Organizations	3
AD5003	Value Creation, Business and Network Models	3
		6

Second Trimester

Code	Name	CA
IN5096	Transportation and Third Party Logistics	3
OP5053	Elective I	3
OP5054	Elective II	3
		9

Third Trimester

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

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

ENA-V Specialization in Applied Artificial Intelligence

Program and Learning Outcomes

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 to the well-being 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.

The program is aimed at:

- Professionals from any area interested in acquiring specialized knowledge of AI as a means to consolidate and transform their company through solutions supported by 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 issues associated with emerging technologies such as data visualization and science, intelligent software, autonomous mobility, the internet of things, among others.

- Professionals in the engineering area who wish to enter into solutions based on some emerging technology and supported by artificial intelligence, to transform any of the processes or activities of the organization.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Use specialized knowledge and business intelligence with emerging technologies to propose solutions to real and complex problems that arise in companies.

b) Analyze, manage, direct, and propose solutions to processes and problems that come from any of the areas of their specialty: software engineering, smart manufacturing, autonomous mobility, or in general from any process that arises from a company with technologies involved in Industry 4.0.

c) Communicate clearly, effectively, and efficiently the results of your work as a specialist. This communication capacity includes both the traditional oral and written way, as well as the visualization of data and information. This effective and contextual communication should be applicable when addressing both colleagues in your work group, as well as your superiors or clients.

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

Graduate Profile

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.

ENA-V Specialization in Applied Artificial Intelligence
Edition 2021

First Trimester

Code	Name	CA
OP5085	Elective I	3
TC4029	Analytics and Data Science	3
TC5032	Data Display	3
		9

Second Trimester

Code	Name	CA
OP4046	Quality Development Course	3
OP5086	Elective II	3
		6

Third Trimester

Code	Name	CA
OP5087	Elective 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

Program and Learning Outcomes

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 to the well-being 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.

Academic background for admission: Students graduated from a Bachelor of Science such as engineering or a Bachelor of Arts with a background in probability and statistics.

Student Learning Outcomes

a) Initiate, plan, execute, control and close projects correctly.

b) Make the best project leadership decisions according to the circumstances.

c) Form, integrate and develop effective project management work teams.

Graduate Profile

Specialists who use their leadership in an organization to plan, execute, control, close and evaluate projects, managing human and material resources efficiently.

EPY Specialization in Project Management
Plan 2011

First Trimester

Code	Name	CA
AD4004	Competitive Strategy and Business Design	3
AD5034	Project Management	3
		6

Second Trimester

Code	Name	CA
FZ5011	Economic Engineering	3
OP5053	Elective I	3
OP5054	Elective II	3
		9

Third Trimester

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

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

MBI Master of Science in Biotechnology

Program and Learning Outcomes

Admission Profile

Professionals with a high affinity for the task of research, technological development and/or high-tech business entrepreneurship; graduates from a bachelor's degree from areas related to biotechnology, biology, chemistry, biochemistry, chemical engineering, biochemical engineering, food engineering, medicine, and nutrition, among others.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Work in the areas of new biotechnological products and process research and development.

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

Graduation Profile

Professional with transversal and disciplinary skills necessary to function successfully in academic, scientific, professional and industrial environments, both in areas of research and development of new products, biotechnological processes or leadership, since they have the necessary skills both for the application and for the generation of knowledge. Likewise, the graduate, if he or she so wishes, is prepared to continue with doctoral studies in areas related to biotechnology.

MBI Master of Science in Biotechnology
Plan 2009

First Semester

Code	Name	CA
BT4005	Cell Biology and Physiology	3
BT5006	Genetic Engineering	3
GI5000	Research and Innovation Methods	1.5
OP4000	Quality Development 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	Elective I	3
OP5043	Elective II	3
		9

Fourth Semester

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

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

MCC-I Master of Science in Computer Science

Program and Learning Outcomes

Admission Profile

Professionals mainly from the areas of informatics, engineering and exact sciences, who are interested in conducting high-impact research in one of the specialization areas of Computer Science.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Demonstrate a high level of theoretical and methodological knowledge of Computer Science in any professional situation.

b) Conduct research in their area of expertise to provide knowledge relevant to the advancement of Computer Science.

c) Communicate results of their professional work in a clear, effective and efficient manner.

d) Work in the professional community in their area of specialty with leadership in an efficient, collaborative and ethical way in the manufacturing industry.

Graduation Profile

Professionals capable of carrying out scientific research following the principles of replicability, absence of trends in experiments, and in general the application of scientific rigor. Likewise, the graduate has the ability to express their results both in terms of rigorous scientific communications, typical of the discipline's journals, and in popular terms for the purposes of science dissemination. The graduate has the qualities of ethical behavior, civic and environmental awareness, leadership and teamwork that our institution promotes in students.

MCC-I Master of Science in Computer Science
Plan 2016

First Semester

Code	Name	CA
CS4000	Intelligent Systems	3
CS4012	Computing Fundamentals	3
GI5000	Research and Innovation Methods	1.5
OP4000	Quality Development 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	Elective I	3
OP5043	Elective II	3
		9

Fourth Semester

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

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

MCI Master of Science in Engineering

Program and Learning Outcomes

Admission Profile

Graduates from areas of engineering and exact sciences interested in conducting high-impact research to contribute to the knowledge of one of the specialty areas of Engineering Science.

Academic background for admission: bachelor's degree in engineering.

Student Learning Outcomes

a) Demonstrate a high level of basic knowledge in fundamental engineering areas including, but not limited to, mathematics, statistics and computing.

b) Dominate the theoretical and methodological knowledge of the Engineering Sciences in any professional situation.

c) Model engineering problems using appropriate mathematical language.

d) Accomplish research in his/her area of specialization that contributes with relevant new knowledge for the advancement of Engineering Sciences under the supervision of the direct advisor and the thesis committee.

e) Develop solutions to engineering problems using technological tools.

f) Communicate results of their professional work in a clear, effective and efficient manner.

Graduation Profile

Specialists with the potential to become agents of change for the industrial and academic sectors, taking leadership in strategic areas, with the ability to carry out applied research, technological development and technology transfer in the areas of engineering. In addition, graduates have the possibility of entering a doctorate in engineering sciences.

MCI Master of Science in Engineering
Plan 2017

First Semester

Code	Name	CA
CS4015	Applied Computing	3
F4005	Mathematical Physical Modeling	3
GI5000	Research and Innovation Methods	1.5
OP4000	Quality Development Course	1.5
		9

Second Semester

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

Third Semester

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

Fourth Semester

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

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

MCY-L Master in Cybersecurity

Program and Learning Outcomes

Admission Profile

Graduates of a bachelor's degree in engineering or science who have experience in professional engineering work, specifically in information technologies and telecommunications. Professionals with solid knowledge in the area of computing, coding and programming, data networks, communications, protocols, operating systems and computer processes.

Academic background for admission: a bachelor's degree in engineering.

Student Learning Outcomes

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

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

c) Analyze cybersecurity issues using appropriate reference models.

d) Carry out innovation in your area of specialty that provides new knowledge of relevance to the advancement of Cybersecurity.

e) Develop solutions to cybersecurity problems using technological tools.

f) Communicate results of your professional work in a clear, effective, and efficient manner.

Graduation Profile

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.

MCY-L Master in Cybersecurity
Plan 2024

First Trimester

Code	Name	CA
OP4046	Quality Development Course	3
TI4020	Cybersecurity Frameworks Outline	3
TI4021	Functional Cybersecurity Structure 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	Elective I	3
TC5028	Cybersecurity Project	3
TI4025	Innovation and Leadership in Cybersecurity Management	3
		9

Fourth Trimester

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

Fifth Trimester

Code	Name	CA
OP5089	Elective V	3
TC5029	Business Cibersecurity Project	3
		6

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

MEM Master in Engineering Management

Program and Learning Outcomes

Admission Profile

Graduates of a bachelor's degree in science or engineering, who have a keen interest in the development of engineering skills in project management and key business processes in management technology or entrepreneurship. Future technological leaders in industrial management, high technology management, R & D or business management with high technology and start-up companies. Professionals in engineering who require, in their work areas, identify critical issues, generate solutions, evaluate alternatives, make decisions, and implement actions, leading multidisciplinary teams.

Academic background for admission: a bachelor's degree in engineering.

Student Learning Outcomes

a) Demonstrate and use a high level of theoretical and methodological knowledge of engineering management solution for engineering projects.

b) Analyze, manage and lead improvement processes that can be applied to areas such as information technology, process optimization, statistical engineering, supply chain, logistics, among others.

c) Communicate results of their professional work in a clear, effective and efficient manner.

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

Graduation Profile

Professionals capable of managing complex engineering projects, with a strategic focus in a global environment. Graduates master both management methodologies and technological tools, as well as management skills (power skills) mandatory to meet the needs of the current market.

MEM Master in Engineering Management
Plan 2016

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	Quality Development Course	3
		9

Second Trimester

Code	Name	CA
IN4028	Statistical Methods and Visualization	3
IN4031	Economic Analysis for Business	1.5
IN4032	Risk Analysis 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 Managing Engineering	1.5
IN5121	Business Innovation Project I	1.5
OP5053	Elective I	3
OP5054	Elective 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	Elective III	3
		9

Fifth Trimester

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

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

MEM-L Master in Engineering Management

Program and Learning Outcomes

Admission Profile

Graduates of a bachelor's degree in science or engineering, who have a keen interest in the development of engineering skills in project management and key business processes in management technology or entrepreneurship. Future technological leaders in industrial management, high technology management, R & D or business management with high technology and start-up companies. Professionals in engineering who require, in their work areas, identify critical issues, generate solutions, evaluate alternatives, make decisions, and implement actions, leading multidisciplinary teams.

Academic background for admission: a bachelor's degree in engineering.

Student Learning Outcomes

a) Demonstrate and use a high level of theoretical and methodological knowledge of engineering management solution for engineering projects.

b) Analyze, manage and lead improvement processes that can be applied to areas such as information technology, process optimization, statistical engineering, supply chain, logistics, among others.

c) Communicate results of their professional work in a clear, effective and efficient manner.

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

Graduation Profile

Professionals capable of managing complex engineering projects with a strategic focus in a global environment. Graduates master technological management methodologies and tools, mandatory in the digital environment.

MEM-L Master in Engineering Management
Plan 2024

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	Quality Development Course	3
		9

Second Trimester

Code	Name	CA
IN4028	Statistical Methods and Visualization	3
IN4031	Economic Analysis for Business	1.5
IN4032	Risk Analysis 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 Managing Engineering	1.5
IN5121	Business Innovation Project I	1.5
OP5053	Elective I	3
OP5054	Elective 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	Elective III	3
		9

Fifth Trimester

Code	Name	CA
IN5126	Business Innovation Project VI	1.5
IN5127	Business Innovation Project VII	1.5
OP5056	Elective 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

Program and Learning Outcomes

Admission Profile

Professionals interested in specializing in energy management and energy efficiency processes, developing strategic schemes in the organization that contribute to the sustainable energy vision at global level. Professionals from any area interested in solving problems in the use of energy to transform cities and communities. Engineering professionals interested in developing and managing energy innovation technology projects to achieve the efficient and effective use of renewable resources.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Generate value in organizations with broad leadership based on the application of energy strategies.

b) Identify the impact of energy efficiency projects based on renewable energy systems through the analysis of available natural resources.

c) Understand the model, structure, conditions, and perspectives of the industry and unify the global energy strategy and the organization's strategy under an innovative scheme.

Graduation Profile

Qualified professionals for energy management, including the use of alternative and conventional sources.

MER-V Master in Energy Management and Renewable Sources (On line Program)
Plan 2022

First Trimester

Code	Name	CA
TE4018	Energy Analysis Tools	3
TE4019	Energy Management Systems	3
		6

Second Trimester

Code	Name	CA
DS4007	Environmental Assessment	3
DS4008	Renewable Energy Applications	3
		6

Third Trimester

Code	Name	CA
DS4009	Regulation, Acquisition, and Financing of Energy Resources	3
TE4020	Efficient Use of Energy	3
		6

Fourth Trimester

Code	Name	CA
OP4046	Quality Development Course	3
OP5085	Elective I (A)	3
		6

Fifth Trimester

Code		CA
OP5086	Elective II (B)	3
OP5087	Elective III (C)	3
		6

Sixth Trimester

Code	Name	CA
OP5088	Elective IV (D)	3
TE5027	Energy Project I	3
		6

Seventh Trimester

Code	Name	CA
OP5089	Elective V (E)	3
TE5028	Energy Project II	3
		6

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

MID-V Master in Innovation for Enterprise Development

Program and Learning Outcomes

Admission Profile

Profesionales de diferentes áreas interesados en desarrollar las competencias necesarias para potenciar la innovación en las organizaciones. Profesionales que buscan hacer realidad sus ideas innovadoras en emprendimientos que generen un alto valor agregado tanto en industrias actuales como emergentes.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Generate original and quality ideas, which can be expressed in a formal way and defend in situations and / or problems both known and emerging.

b) Propose changes and solutions to given situations and / or problems, based on methodologies appropriate to the relevant context.

c) Carry out projects on their own initiative, committing certain resources in order to exploit an opportunity, and assuming the risk that this entails.

Graduation Profile

Professionals who promote innovation within their areas of responsibility by developing, envisioning, generating, and proposing original ideas and projects in ventures that create high added value in current and emerging industries. They also integrate interdisciplinary teams, managing the mobilization of resources for project execution. Likewise, they undertake projects on their own initiative, committing specific resources to seize an opportunity and assuming the associated risks.

MID-V Master in Innovation for Enterprise Development (On line Program)
Plan 2021

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	Elective I	3
		6

Fourth Trimester

Code	Name	CA
IN4044	Products and Services Development	3
OP5086	Elective II	3
		6

Fifth Trimester

Code	Name	CA
OP4046	Quality Development Course	3
OP5087	Elective III	3
		6

Sixth Trimester

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

Seventh Trimester

Code	Name	CA
IN5129	Innovation Project II	3
OP5089	Elective V	3
		6

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

Program and Learning Outcomes

Admission Profile

Professionals from different areas interested in developing the necessary skills to promote continuous improvement and operational excellence in organizations. As well as professionals who work in industrial or service environments, with mathematical and technological skills, interested in developing competencies for the transformation of organizations to new competitive and international levels.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Design, manage, evaluate and improve management systems for service and production areas based on principles and philosophies of quality, innovation, digital transformation and competitiveness.

b) Design, manage, execute and evaluate experimental processes that generate tangible solutions for the optimization of operations.

c) To comprehensively lead the process of continuous improvement, innovation and digital transformation in the production systems of a company that allow it to be internationally competitive.

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

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

Graduation Profile

Professionals who are agents of change in organizations with the integral management of processes through quality, operational excellence, innovation and digital transformation, putting the person as a key element in the development of competitive and sustainable organizations.

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

(On line Program)
Edition 2022

First Trimester

Code	Name	CA
MA4020	Statistics and Data Analytics	3
OP4046	Quality Development Course	3
		6

Second Trimester

Code	Name	CA
IN4052	Quality and Competitiveness in the Digital Age	3
IN4053	Smart Supply Chain	3
		6

Third Trimester

Code	Name	CA
IN5130	Intelligent Systems of Statistical Process Control	3
IN5131	Production Management and Smart Factories	3
		6

Fourth Trimester

Code	Name	CA
IN4054	Project Management and Agile Methods	3
OP5085	Elective I (A)	3
		6

Fifth Trimester

Code	Name	CA
OP5086	Elective II (B)	3
OP5087	Elective III (C)	3
		6

Sixth Trimester

Code	Name	CA
IN4055	Integrating Quality and Productivity Project I	3
OP5088	Elective IV (D)	3
		6

Seventh Trimester

Code	Name	CA
IN5132	Integrating Quality and Productivity Project II	3
OP5089	Elective V (E)	3
		6

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

MNA-V Master in Applied Artificial Intelligence

Program and Learning Outcomes

Admission Profile

Professionals from any area who are 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 based on 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 explore solutions based on emerging technologies and supported by artificial intelligence to transform the processes and activities of the organization.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) 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.

b) 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.

c) Communicate clearly, effectively, and efficiently the results of your professional work orally, in writing, and through data visualization. This effective and contextualized communication should be applicable when informing both colleagues in your work group, as well as your superiors or clients.

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

Graduation Profile

Agents of change in organizations, who carry out innovation, technological development, and technology transfer through solutions based on artificial intelligence and emerging technologies.

MNA-V Master in Applied Artificial Intelligence (On line Program)
Edition 2021

First Trimester

Code	Name	CA
OP5085	Elective I	3
TC4029	Analytics and Data Science	3
TC5032	Data Display	3
		9

Second Trimester

Code	Name	CA
OP5086	Elective II	3
TC4030	Artificial Intelligence and Machine Learning	3
TE4017	Iot and Sensors Networks	3
		9

Third Trimester

Code	Name	CA
OP4046	Quality Development Course	3
OP5087	Elective III	3
OP5088	Elective IV	3
		9

Fourth Trimester

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

Fifth Trimester

Code	Name	CA
OP5098	Elective 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

Program and Learning Outcomes

Admission Profile

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

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Demonstrate a high level of theoretical and methodological knowledge of Nanotechnology in any professional situation.

b) Perform research in their area of expertise to provide knowledge relevant to the advancement of nanotechnology.

c) Communicate their professional work results in a clear, effective and efficient manner.

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

Graduation Profile

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

MNT Master in Nanotechnology
Edition 2016

First Semester

Code	Name	CA
F4002	Computer Simulations	3
GI5000	Research and Innovation Methods	2
MA4007	Partial Differential Equations	3
OP4000	Quality Development Course	2
		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	Elective I	3
OP5043	Elective II	3
		9

Fourth Semester

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

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

MSM Master of Science in Manufacturing Systems

Program and Learning Outcomes

Admission Profile

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.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

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

b) Plan, manage and execute technological development projects in the area of high added-value product design and manufacturing, taking into consideration their technical, economic and social impact.

c) Interact with national and international multidisciplinary working groups for research, development and innovation in relation to new products and manufacturing processes.

d) Independently update their knowledge in order to continue to be an agent of technological change and development in the manufacturing industry.

Graduation Profile

Professionals for industry, who, as agents of change, will be capable of technological development, innovation and technology transfer, in new products, manufacturing materials and productive process design settings.

MSM Master of Science in Manufacturing Systems
Edition 2009

Remedial Semester

Code	Name	CA
M1002	Computerized Drawing	3
M2010	Materials Behavior	3
M4000	Analysis and Synthesis of Mechanical Systems	3
		9

First Semester

Code	Name	CA
GI5000	Research and Innovation Methods	2
M4009	Advanced Materials in Manufacturing	3
OP4000	Quality Development Course	2
OP4006	Elective Course I	3
		9

Second Semester

Code	Name	CA
M4008	Product Design	3
M4010	Automation in Manufacturing Systems	3
OP5042	Elective I	3
		9

Third Semester

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

Fourth Semester

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

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

MTI-V Master in Information Technology Management

Program and Learning Outcomes

Admission Profile

Professional in three different disciplines:

- Information Technologies, in order to specialize in technology management, understanding the value of technologies for organizations and becoming proficient in the necessary techniques for their management and the search for business opportunities.

- Business Administration, to understand the complexity of technology and become proficient in company management techniques in the new paradigm implied by the knowledge society.

-Engineering, to delve into information and communications technologies as a tool for transforming an organization's processes and activities.

Academic background for admission: a bachelor's degree in the areas of information technology, business administration or engineering.

Student Learning Outcomes

a) Generate value in organizations with leadership based on the application of information emerging technologies.

b) Understand the business model and unify the global strategy and IT strategy under an innovative scheme.

c)Identify IT projects and required resources, as well as lead to the changes necessary to increase competitiveness in a globalized environment.

Graduation Profile

Professionals capable of enhancing value generation through information and communication technologies with a strategic vision of the organization. Graduates able to serve as the communication bridge between decision-makers and growth strategy designers using new technologies.

MTI-V Master in Information Technology Management (On line Program)
Edition 2021

First Trimester

Code	Name	CA
AD4050	Project, Program and Portfolio Management	3
RH4005	Human Talent Development	3
		6

Second Trimester

Code	Name	CA
TI4029	Technological Architecture Models	3
TI4030	Information Technology Governance	3
		6

Third Trimester

Code	Name	CA
TI4031	Strategic Enterprise Performance Management	3
TI4032	Digital Transformation of Organizations	3
		6

Fourth Trimester

Code	Name	CA
OP4046	Quality Development Course	3
OP5085	Elective I	3
		6

Fifth Trimester

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

Sixth Trimester

Code	Name	CA
OP5088	Elective IV	3
TC5036	Capstone Project I	3
		6

Seventh Trimester

Code	Name	CA
OP5089	Elective V	3
TC5037	Capstone Project II	3
		6

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

DBT Ph. D. in Biotechnology

Program and Learning Outcomes

Admission Profile

Graduates of Master's degree in areas related to biotechnology, biology, chemistry, biochemistry, chemical engineering, biochemical engineering, food engineering, medicine, nutrition, among others.

Academic background for admission: Undergraduate or Master degree program in an area related to the research lines of the program.

Student Learning Outcomes

a) Understand the application of basic sciences and research methodology techniques in areas of cell biology, physiology, biochemistry, and bioprocesses engineering.

b) Use research skills including translational research, critical evaluation, laboratory safety and experimental planning.

c) Design experiments from the identification of the problems to the interpretation of results.

d) Analyze critically results and data with advanced statistics tools, such as bioinformatics and data mining.

e) Communicate effectively orally and in writing with their peers: mentors, research community, society and grantsmanship.

f) Make decisions with scientific judgment and critical thinking in their practice as researchers following legal, ethical and official government regulations.

Graduate Profile

Scientists who create biological knowledge establish novel and innovative technologies that are relevant for the food and pharmaceutical sectors and understand basic phenomena within the field of life sciences. They work as leaders or as collaborators within national and international research groups, in areas such as nutraceuticals, biopharmaceuticals, bioinformatics, bioprocesses, cancer, cardiovascular sciences, stem cell biology, biomedical devices, biophysics, immunology and metabolism, among others. The findings of their discoveries are important outcomes which should be submitted for peer-reviewed and academic publication, patents, or conference proceedings. This knowledge transference as well as all of their professional activities follows legal, ethical and official norms.

DBT Ph. D. in Biotechnology
Edition 2011

First Semester

Code	Name	CA
GI5000	Research and Innovation Methods	1.5
OP4000	Quality Development Course	1.5
OP5062	Elective I	3
OP5063	Elective II	3
OP5064	Elective III	3
		12

Second Semester

Code	Name	CA
GI5011	Research Proposal I	3
OP5065	Elective IV	3
OP5066	Elective V	3
OP5067	Elective VI	3
		12

Third Semester

Code	Name	CA
GI5012	Research Proposal II	3
GI5014	Research Seminar I	1
OP5068	Elective VII	3
OP5069	Elective VIII	3
OP5070	Elective IX	3
		13

Fourth Semester

Code	Name	CA
GI5013	Research Proposal III	3
GI5017	Assisted Research I	3
OP5071	Elective X	3
OP5072	Elective XI	3
		12

Fifth Semester

Code	Name	CA
GI5018	Assisted Research II	3
GI5019	Assisted 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

Ninth 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

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

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

DCC PH. D. in Computer Sciences

Program and Learning Outcomes

Admission Profile

Professional with proven academic ability, creativity, motivation and potential to carry out research projects that culminate in original works that contribute to enrich the field of information technology and computer science.

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

Student Learning Outcomes

a) Generate new knowledge, contributing to the development of the state of the art in their respective areas.

b) Work in research, teaching, development, and technology management.

c) Explore the border of the state of the art of their specialty.

Graduate Profile

Researchers with competence, knowledge, and skills to identify opportunities, develop and conduct original research projects at the frontier of knowledge. Disseminate the results of research and apply the generated knowledge in the technological development of the country. To be recognized as a Computer Science program with high impact on the productive, educational/academic, and social sectors of the country.

DCC PH. D. in Computer Sciences
Edition 2016

First Semester

Code	Name	CA
CS6021	Guided Research I	3
CS6022	Guided Research II	3
CS6025	Integrated 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	Research Integration 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	Research Integration 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

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

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

DCI Ph. D. in Engineering Sciences

Program and Learning Outcomes

Admission Profile

Professional with proven academic ability, creativity, motivation and potential to carry out research that manifest itself in original work that contributes to enriching the field of technology.

Academic background for admission: Master's degree in an area of study related to engineering sciences or exact sciences.

Student Learning Outcomes

a) Identify opportunities and create and manage original research projects at the frontier of knowledge.

b) Disseminate research findings.

c) Apply the knowledge generated for the country's technological development.

d) Conduct high-impact research on engineering in the country's productive, education-academic and social sectors.

Graduate Profile

Professionals with a high level of basic knowledge in fundamental areas of engineering including, but not limited to, mathematics, statistics and computing. Likewise, they master the theoretical and methodological knowledge of engineering sciences in any professional situation. Graduates are capable of modeling engineering problems using appropriate mathematical language, as well as conducting research in their area of specialty that provides new knowledge of relevance to the advancement of engineering sciences, under the supervision of the direct advisor and the committee thesis. Finally, they have the ability to develop solutions to engineering problems using technological tools and to communicate the results of their professional work in a clear, effective and efficient manner.

DCI Ph. D. in Engineering Sciences
Edition 2018

First Semester

Code	Name	CA
GI5017	Assisted Research I	3
GI5018	Assisted Research II	3
GI6035	Integrated 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	Research Integration 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	Research Integration 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

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

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

DNT Ph. D. in Nanotechnology

Program and Learning Outcomes

Admission Profile

The candidates with proven academic ability, creativity, motivation and potential to carry out investigations revealed in original works that contribute to enriching the field of nanotechnology.

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

Student Learning Outcomes

a) Understand the application of basic sciences and research methodology techniques on areas of Nano materials, Nano sensors and Nano photonics.

b) Use research skills including materials preparation, characterization, critical evaluation, laboratory safety and experimental planning

c) Design experiments from the identification of the problems to the interpretation of results.

d) Communicate effectively orally and in writing with their peers: mentors, research community, society, and grant proposals.

e) Make decisions with scientific judgment and critical thinking in their practice as researchers following legal, ethical and government regulations.

Graduate Profile

Scientists who create knowledge to establish novel and innovative technologies that are relevant for the materials and manufacturing sectors and understand basic phenomena within the field of Nano sciences. They work as leaders or as collaborators within national and international research groups, on areas such as Nano materials, Nano sensors and Nano photonics, among others. The findings of their discoveries are important outcomes which should be submitted for peer-reviewed and academic publication, patents, or conference proceedings. This knowledge transference as well as all their professional activities follows legal, ethical, and official norms.

DNT Ph. D. in Nanotechnology
Plan 2016

First Semester

Code	Name	CA
GI6041	Research Seminar I	0.5
GI6051	Research Workshop I	1
NT6021	Guided Research I	3
NT6022	Guided Research II	3
NT6025	Integrated 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	Research Integration I	1.5
NT6101	Doctoral Research I	3
NT6102	Doctoral Research II	3
		9

Fourth Semester

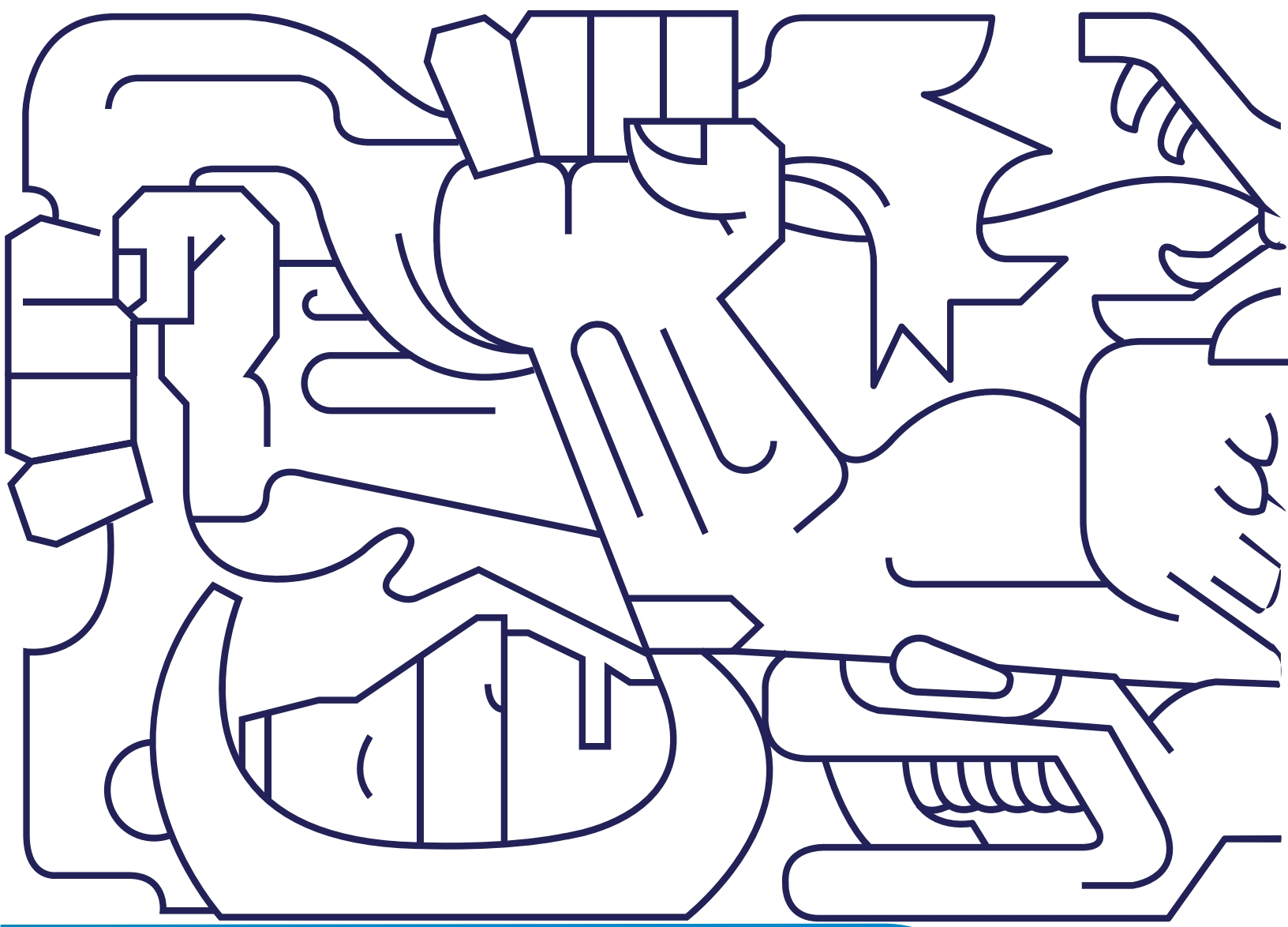
Code	Name	CA
GI6044	Research Seminar IV	0.5
GI6054	Research Workshop IV	1
GI6061	Scientific Product I	1.5
NT6103	Doctoral Research III	3
NT6104	Doctoral Research IV	3
		9

Fifth Semester

Code	Name	CA
GI6045	Research Seminar V	0.5
GI6055	Research Workshop V	1
NT6042	Research Integration II	1.5
NT6105	Doctoral Research V	3
NT6106	Doctoral Research VI	3
		9

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

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



School of Medicine and Health Science

RAP Residency in Anatomic Pathology

Program and Learning Outcomes

Admission Profile

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

Academic background for admission: have a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

a) Apply with professionalism their knowledge of Anatomical Pathology in order to establish definitive diagnoses in pathology.

b) Develop a critical rationale of the information available to communicate in a scientific, orientating manner with their colleagues who are involved in the patient's diagnosis and treatment.

c) Participate in basic and clinical research as a member of a research team.

d) Efficiently coordinate healthcare teams of practitioners and technicians in relation to Anatomical Pathology.

e) Collaborate in inter-and multi-disciplinary teams exchanging experiences to enhance medical attention.

f) Act with professionalism, ethics, and a humanistic outlook.

Graduate Profile

Specialist practitioners who support patients and physicians in solving diagnostic problems. It also seeks to prepare individuals with integrity and a humanistic outlook in their clinical, teaching and research practice, while strictly adhering to ethical principles and the standards of professional. Anatomical Pathology Residents who graduate from this institution are outstanding leaders in local and international settings who contribute to the generation and implementation of innovations in human-tissue prosection strategies and procedures that will result in the most accurate diagnosis possible.

RAP Residency in Anatomic Pathology
Edition 2013

First Semester

Code	Name	CA
ME4140	Clinical Ethics	1.5
ME4153	Anatomic Pathology I	3
ME4154	Clinical Practice in Anatomic Pathology I	3
		7.5

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	1.5
ME4155	Anatomic Pathology II	3
ME4156	Clinical Practice in Anatomic Pathology II	3
		7.5

Third Semester

Code	Name	CA
ME4142	Quality Health Care	1.5
ME4157	Anatomic Pathology III	3
ME4158	Clinical Practice in Anatomic Pathology III	3
		7.5

Fourth Semester

Code	Name	CA
ME4143	Research and Innovation Methods	1.5
ME4159	Anatomic Pathology IV	3
ME4160	Clinical Practice in Anatomic Pathology IV	3
		7.5

Fifth Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME5201	Anatomic Pathology V	3
ME5202	Clinical Practice in Anatomic Pathology V	3
		9

Sixth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5203	Anatomic Pathology VI	3
ME5204	Clinical Practice in Anatomic Pathology VI	3
		9

Seventh Semester

Code	Name	CA
ME5191	Elective Specialty I	1.5
ME5205	Anatomic Pathology VII	3
ME5206	Clinical Practice in Anatomic Pathology VII	1.5
		6

Eighth Semester

Code	Name	CA
ME5192	Elective Specialty II	1.5
ME5207	Anatomic Pathology VIII	3
ME5208	Clinical Practice in Anatomic Pathology VIII	1.5
ME5266	Thesis Defense	.3
		6.3

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

RCA Residency in Health Care Quality

Program and Learning Outcomes

Admission Profile

This program is aimed at physicians who have passed the national Medical Residency Applicant Examination and who have an interest and vocation in this specialty; the skills and attitudes for evaluating the quality and safety of healthcare processes and for leading improvement efforts within the framework of health organizations and services; a sense of commitment to patient safety and the provision of quality first-contact healthcare services; the capacity to read and comprehend medical literature in English. They must also be available full-time to cover academic and healthcare activities in compliance with the regulations in effect. In order to be admitted to the Residency in Healthcare Quality of Tecnológico de Monterrey, applicants must satisfactorily meet the graduate admission requirements stipulated by ITESM and the Mexican Ministry of Health.

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

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

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

Graduate Profile

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

RCA Residency in Health Care Quality
Edition 2013

First Semester

Code	Name	CA
ME4140	Clinical Ethics	1.5
ME4142	Quality Health Care	1.5
ME4177	Management in Clinical Care I	3
ME4178	Hospital Practice I	3
		9

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	1.5
ME4143	Research and Innovation Methods	1.5
ME4179	Management in Clinical Care II	3
ME4180	Hospital Practice II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4181	Management in Clinical Care III	3
ME4182	Hospital Practice III	3
		9

Fourth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5225	Management in Clinical Care IV	3
ME5226	Hospital Practice IV	3
		9

Fifth Semester

Code	Name	CA
ME5191	Elective Specialty I	1.5
ME5227	Management in Clinical Care V	3
ME5228	Hospital Practice V	1.5
		6

Sixth Semester

Code	Name	CA
ME5192	Elective Specialty II	1.5
ME5229	Management in Clinical Care 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

Program and Learning Outcomes

Admission Profile

The Cardiology Program of the Tecnológico de Monterrey is aimed at graduates of the Specialty 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 a committed innovative spirit. with continuous learning, with a genuine interest in research and teaching. To be admitted to the Cardiology Program, the applicant must have a Surgeon degree, an average equal to or greater than 80, completed social service and have accredited at least two years of Internal Medicine. Also, candidates must have passed the ENARM (national exam for applicants to medical residencies), and participation as authors or co-authors of published works, presentation of works at conferences, leadership activities and social participation are valued.

Academic background for admission: a Bachelor's Degree in Physician and Surgeon and at least two years of Internal Medicine Residency.

Student Learning Outcomes

a) Acquire the medical foundations in quality Clinical Cardiology considering the updated pathophysiological, biomolecular, and clinical bases.

b) Provide care and medical care to patients with cardiovascular diseases.

c) Carry out the analysis, research and evaluation of the new evidence that emanates through clinical guidelines and phase III research studies.

d) Effective and safe intervention through diagnostic and therapeutic procedures in the different subspecialties of Cardiology.

Graduate Profile

Medical specialists, who attend to the needs of cardiological health with quality and safety, in public and private settings. Likewise, 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 cardiology specialists who graduate from this institution are outstanding leaders at the local and international levels, who generate innovation with new diagnostic and therapeutic methodologies and technologies, and programs for the timely detection of diseases in the population under their competence.

RCR Residency in Cardiology
Edition 2023

First Semester

Code	Name	CA
ME4276	Research and Innovation Methodology	1.5
ME4277	Medical Bioethics	1.5
ME4312	Pathophysiological Bases in Clinical Cardiology	3
ME4313	Cardiovascular Emergency Care Clinic	3
		9

Second Semester

Code	Name	CA
ME4314	Ethiopathogenic Bases in Clinical Cardiology	3
ME4315	Hospitalization and Cardiovascular Emergencies	3
OP4047	Quality Development Course	3
		9

Third Semester

Code	Name	CA
ME4283	Applied Statistics	1.5
ME4316	Echocardiography and Non-Invasive Studies	3
ME4317	Cardiovascular Intensive Therapy	3
OP5099	Innovation and Health Education Elective	1.5
		9

Fourth Semester

Code	Name	CA
ME4280	Applied Research Project I	1.5
ME5369	Advanced Cardiovascular Imaging	3
ME5370	Intensive Therapy and Coronary Unit	3
		7.5

Fifth Semester

Code	Name	CA
ME4286	Scientific Writing and Analysis Workshop	1.5
ME5333	Elective for Attention and Rotation in Subspecialty I	1.5
ME5371	Cardiac Electrophysiology	3
ME5372	High Specialty Ambulatory Consultation in Cardiology I	1.5
		7.5

Sixth Semester

Code	Name	CA
ME4287	Applied Research Project II	1.5
ME5336	Elective for Attention and Rotation in Subspecialty II	1.5
ME5373	Hemodynamics and Interventional Cardiology	3
ME5374	High Specialty Ambulatory Consultation in Cardiology II	1.5
		7.5

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

REA Residency in Anesthesiology

Program and Learning Outcomes

Admission Profile

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

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

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

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

Graduate Profile

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

REA Residency in Anesthesiology
Plan 2013

First Semester

Code	Name	CA
ME4140	Clinical Ethics	2
ME4142	Quality Health Care	2
ME4234	Anesthesiology I	3
ME4235	Medical Care in Anesthesiology I	3
		9

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	2
ME4143	Research and Innovation Methods	2
ME4236	Anesthesiology II	3
ME4237	Medical Care in Anesthesiology II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4238	Anesthesiology III	3
ME4239	Medical Care in Anesthesiology III	3
		9

Fourth Semester

Code	Name	CA
ME4240	Anesthesiology IV	3
ME4241	Medical Care in Anesthesiology IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME5191	Elective Specialty I	2
ME5287	Anesthesiology V	3
ME5288	Medical Care in Anesthesiology V	2
		6

Sixth Semester

Code	Name	CA
ME5192	Elective Specialty II	2
ME5289	Anesthesiology VI	3
ME5290	Medical Care in Anesthesiology VI	2
		6

Seventh Semester

Code	Name	CA
ME5291	Anesthesiology VII	3
ME5292	Medical Care in Anesthesiology VII	3
		6

Eighth Semester

Code	Name	CA
ME5266	Thesis Defense	0
ME5293	Anesthesiology VIII	3
ME5294	Medical Care in Anesthesiology VIII	3
		6

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

REC Residency in General Surgery

Program and Learning Outcomes

Admission Profile

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

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

a) Perform as experts in the comprehensive, ongoing care of surgical patients in relation to diagnoses, selection, preoperative, operative, and postoperative care, including managing the pathology and complications in the gastrointestinal tract; abdomen and its contents; mammary glands and soft tissue; head and neck; endocrine system; surgical oncology; polytraumatized patients and severely ill patients in the ER or ICU.

b) Provide preoperative, operative, and postoperative care for pediatric, plastic, peripheral vascular, general thoracic and transplant surgery, and handle the most common problems in cardiac, gynecological, neurological, orthopedic and urological surgery, as well as in the administering of anesthetic agents.

c) Use endoscopic techniques, in particular laparoscopy and minimally invasive surgical techniques, as well as other relevant diagnostic and therapeutic techniques.

d) Act with professionalism within a framework of honesty and professional ethics, with a profound sense of respect and sensitivity toward patients and the medical community.

e) Communicate effectively with the patient, family members and other members of multidisciplinary healthcare teams, orally and in writing.

f) Apply the analytical skills of reasoning, medical judgment and decision making to solve problems in their specialty and use scientific method to conduct research projects that will have an impact on improving healthcare.

Graduate Profile

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

REC Residency in General Surgery
Plan 2013

First Semester

Code	Name	CA
ME4140	Clinical Ethics	1.5
ME4142	Quality Health Care	1.5
ME4250	General Surgery I	3
ME4251	Medical Care in General Surgery I	3
		9

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	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 Surgery 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	Elective Specialty I	1.5
ME5308	General Surgery IX	3
ME5309	Medical Care in General Surgery IX	1.5
		6

Tenth Semester

Code	Name	CA
ME5192	Elective Specialty 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 Care Medicine

Program and Learning Outcomes

Admission Profile

The program 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.

Academic background for admission: a Bachelor's Degree in Physician and Surgeon, and graduate from medical specialties in Internal Medicine, Anesthesiology or Medical-Surgical Emergencies.

Student Learning Outcomes

a) Make medical decisions applying clinical reasoning, evidence-based medicine, the use of critical thinking, research methodology and the comprehensive use of statistics.

b) Prevent, diagnose, treat, and rehabilitate health problems in critical care medicine.

c) Interact effectively in multidisciplinary teams, in teaching, research and comprehensive management of an intensive care unit.

d) Exercise the clinical practice of critical care medicine in a wide variety of contexts with different available resources, including public and private health systems.

Graduate Profile

Medical specialists, who attend with quality and safety the health needs of critically ill patients, in public and private settings. Likewise, to train people of integrity, who exercise their clinical, teaching and research practice with human sense and strict adherence to ethical principles and professionalism. Specialists in critical care medicine who graduate from this institution are outstanding leaders at the local and international level, who generate innovation with new diagnostic and therapeutic methodologies and technologies and programs for the timely detection of diseases in the population under their competence.

REE Residency in Critical Care Medicine
Edition 2023

First Semester

Code	Name	CA
ME4277	Medical Bioethics	1.5
ME4288	Cardiovascular and Respiratory Critical Medicine	3
ME4289	Cardiovascular and Respiratory Clinic in Critical Medicine	3
ME5341	Advanced Statistics	1.5
		9

Second Semester

Code	Name	CA
ME4290	Metabolic, Neurological and Infectious Critical Medicine	3
ME4291	Metabolic, Neurological and Infectious Clinic in Critical Medicine	3
ME5342	Advanced Research I	1.5
		7.5

Third Semester

Code	Name	CA
ME5333	Elective for Attention and Rotation in Subspecialty I	1.5
ME5343	Hematology, Nutrition and Polytrauma in Critical Medicine	3
ME5344	Nutrition, Hematology and Polytrauma Clinic in Critical Medicine	1.5
ME5345	Advanced Scientific Writing and Analysis Workshop	1.5
OP5099	Innovation and Health Education Elective	1.5
		9

Fourth Semester

Code	Name	CA
ME5336	Elective for Attention and Rotation in Subspecialty II	1.5
ME5346	Ginecoobstetric Critical Medicine, Transplants and Administrative Processes	3
ME5347	Ginecoobstetric, Transplant Clinic and Administrative Processes in Critical Medicine	1.5
ME5348	Advanced Research II	1.5
OP4047	Quality Development Course	3
		10.5

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

REG Residency in Obstetrics and Gynecology

Program and Learning Outcomes

Admission Profile

The program is aimed at graduates from the Medicine and Physical undergraduate program with a high human and professional sense who wish to meet the commitment to be agents of change in society. They must demonstrate interest in research and knowledge development, and preferably have international experience during their academic training. They must be people who guide their actions according to our institutional values: innovation, integrity, collaboration, empathy, inclusion, and global citizenship. We seek to have the talent that Mexico requires to continue facing the challenges of the future through our leadership, innovation, and entrepreneurship skills.

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

a) Apply their knowledge, skills, and clinical judgment to participate in the prevention, diagnosis, and treatment of conditions that affect the gynecological and reproductive health of women at different stages of life.

b) Promoting human dignity, respect and promoting gender perspectives.

c) Carry out their clinical practice with integrity, ethics, and a humanistic vision, based on the most current medical knowledge and surgical trends, favoring the health and human flourishing of women in their diverse socio-cultural environments.

d) Collaborate with leadership in multidisciplinary teams, positioning themselves as an agent of change for comprehensive women's health.

e) Develop the capacity for entrepreneurship and innovation allowing them to be identifiers of new scientific trends, as well as creators of useful knowledge for the direct benefit of society.

f) Promote human dignity, respect, and promotion of gender perspective.

Graduate Profile

Professionals who meet the health needs of the female population with quality and safety, in hospital and outpatient settings. Likewise, to train people with integrity, who exercise their clinical, teaching and research practice with a human sense and strict adherence to ethical principles and professionalism, through the application of their leadership, entrepreneurship and innovation skills that will allow them to achieve human flourishing, with a focus on an innovative future and centered on the well-being of the community.

REG Residency in Obstetrics and Gynecology
Edition 2023

First Semester

Code	Name	CA
ME4276	Research and Innovation Methodology	1.5
ME4277	Medical Bioethics	1.5
ME4296	Gynecologic and Obstetrics Basis	3
ME4297	Basic Clinic in Obstetrics and Gynecology I	3
		9

Second Semester

Code	Name	CA
ME4280	Applied Research Project I	1.5
ME4298	Anatomophysiological Aspects in Gynecology and Obstetrics	3
ME4299	Basic Clinic in Obstetrics and Gynecology II	3
		7.5

Third Semester

Code	Name	CA
ME4283	Applied Statistics	1.5
ME4300	Comprehensive Management in Outpatient Gynecology and Obstetrics	3
ME4301	Clinic in Gynecology and Obstetrical High Risk I	3
OP5099	Innovation and Health Education Elective	1.5
		9

Fourth Semester

Code	Name	CA
ME4302	Fundamentals in Maternal Fetal Medicine and Human Reproduction	3
ME4303	Clinic in Gynecology and Obstetrical High Risk II	3
		6

Fifth Semester

Code	Name	CA
ME4286	Scientific Writing and Analysis Workshop	1.5
ME5353	Gynecology at the Extremes of Life and Urogynecology	3
ME5354	Intermediate Procedures and Outpatient Management of Gynecologic Specialties I	3
		7.5

Sixth Semester

Code	Name	CA
ME4287	Applied Research Project II	1.5
ME5333	Elective for Attention and Rotation in Subspecialty I	1.5
ME5355	Minimally Invasive Gynecologic Surgery	3
ME5356	Intermediate Procedures and Outpatient Management of Gynecologic Specialties II	1.5
		7.5

Seventh Semester

Code	Name	CA
ME5357	Oncology in Obstetrics and Gynecology I	3
ME5358	Advanced Procedures and Outpatient Management of Gynecologic Specialties I	3
OP4047	Quality Development Course	3
		9

Eighth Semester

Code	Name	CA
ME5336	Elective for Attention and Rotation in Subspecialty II	1.5
ME5359	Oncology in Obstetrics and Gynecology II	3
ME5360	Advanced Procedures and Outpatient Management of Gynecologic Specialties II	1.5
		6

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

REM Residency in Internal Medicine

Program and Learning Outcomes

Admission Profile

This program is aimed at graduates of the Physician and Surgeon with excellent academic performance, patient centered service vocation, interest in learning and teaching, capacity for clinical research, and social leadership skills.

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

a) Carry out an updated clinical practice, focused on the patient's circumstances and preferences and responsibly use the available resources.

b) Identify relevant evidence, critically evaluate it, and contribute to the dissemination and creation of knowledge.

c) Decide, execute, and adequately interpret the auxiliary studies and diagnostic or therapeutic procedures necessary in patient care.

d) Completely document the patient's condition, interventions performed, diagnostic plans and prognosis in the clinical file and legal documents.

e) Apply science and knowledge efficiently to achieve individualized treatment goals for the patient and their environment.

f) Establish effective and empathic communication, actively listening to the patient's experience to make shared decisions.

g) Promote healthy communities and populations, not only mitigating diseases, but also preventing and promoting healthy lifestyles, seeking comprehensive well-being and longevity.

h) Apply the knowledge of Internal Medicine for the diagnosis, treatment, prevention, and rehabilitation of health problems in adult patients, in the outpatient and hospital environment.

i) Synthesize the most relevant information and present it in an organized manner to other medical teams, the patient, and their families.

j) Adapt to changes with a resilient and reflective character.

k) Practice digital health, through connectivity and information technologies for the benefit of their patients and their community.

Graduate Profile

Medical specialists with ethical and conscientious leadership, guiding the practice of preventive and outpatient medicine, taking into account the social impact it generates on patients; and maintains their position in in-hospital medicine as head of the health team, being empathetic and training doctors who wish to pursue a specialty related to internal medicine.

REM Residency in Internal Medicine
Edition 2023

First Semester

Code	Name	CA
ME4276	Research and Innovation Methodology	1.5
ME4277	Medical Bioethics	1.5
ME4304	Gastroenterology and Cardiology	3
ME4305	Symptomatology in Internal Medicine	3
		9

Second Semester

Code	Name	CA
ME4280	Applied Research Project I	1.5
ME4306	Nephrology and Infectious Diseases	3
ME4307	Hospital Clinical Practice	3
		7.5

Third Semester

Code	Name	CA
ME4283	Applied Statistics	1.5
ME4308	Hematology, Oncology and Dermatology	3
ME4309	In-hospital Diagnostic Approach	3
OP5099	Innovation and Health Education Elective	1.5
		9

Fourth Semester

Code	Name	CA
ME4310	Neurology and Geriatrics	3
ME4311	Emergencies in Internal Medicine	3
		6

Fifth Semester

Code	Name	CA
ME4286	Scientific Writing and Analysis Workshop	1.5
ME5361	Mental and Metabolic Health	3
ME5362	Clinic of the Critically Ill Patient	3
		7.5

Sixth Semester

Code	Name	CA
ME4287	Applied Research Project II	1.5
ME5363	Neumology and Rheumatology	3
ME5364	Internal Medicine Subspecialties	3
		7.5

Seventh Semester

Code	Name	CA
ME5333	Elective for Attention and Rotation in Subspecialty I	1.5
ME5365	Integrative Medicine and Integral Health	3
ME5366	Internal Medicine Consultation I	1.5
OP4047	Quality Development Course	3
		9

Eighth Semester

Code	Name	CA
ME5336	Elective for Attention and Rotation in Subspecialty II	1.5
ME5367	Palliative Care	3
ME5368	Internal Medicine Consultation II	1.5
		6

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

REN Residency in Pediatrics

Program and Learning Outcomes

Admission Profile

This program is aimed at graduates of the Physician and Surgeon who wish to be trained in the area of pediatrics and who are willing to complete four years of full-time postgraduate studies, showing interest in research and knowledge generation with publications in high-impact journals. Doctors with a humanitarian sense and concern to work and to be trained to solve health problems of the different population groups of the country. It is required to seek internationalization by increasing the exchange of knowledge with partner universities from different parts of the world.

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

a) Apply their knowledge and skills in health care, prevention and promotion in children and adolescents.

b) Participate in the development of medical practices through teaching aimed at patients, students and colleagues.

c) Communicate the results of projects or investigations to provide possible solutions to cases of the specialty.

d) Perform clinical practices in medical groups of their specialty and multidisciplinary to share medical experiences.

e) Solve pediatric health problems of the different sociocultural groups in the country.

f) Carry out outpatient and inpatient pediatric consultations.

Graduate Profile

Strengthening the skills that allow to detect developmental disorders, prevention of obesity and its comorbidities and, of course, solving age-related diseases, through daily clinical exposure in hospitals, public and private consultation areas, monitoring of the academic program and participation in the generation of knowledge in the lines of research that are aimed at solving the problems that our childhood presents, applying technology and scientific advances in private hospitals, all of this favoring the generation of updated knowledge. We train professionals capable of solving the wide range of problems of our population in different social strata and we seek to distribute them in the coming years in different parts of the country, to bring better pediatric medical care to our compatriots.

REN Residency in Pediatrics
Plan 2023

First Semester

Code	Name	CA
ME4274	Ambulatory and Hospitalary Pediatrics I	3
ME4275	Hospitalization and Emergency Pediatrics I	3
ME4276	Research and Innovation Methodology	1.5
ME4277	Medical Bioethics	1.5
		9

Second Semester

Code	Name	CA
ME4278	Ambulatory and Hospitalary Pediatrics II	3
ME4279	Hospitalization and Emergency Pediatrics II	3
ME4280	Applied Research Project I	1.5
		7.5

Third Semester

Code	Name	CA
ME4281	Ambulatory Pediatrics, Neurology and Cardiology	3
ME4282	Pediatric Critical Patient Clinic I	3
ME4283	Applied Statistics	1.5
OP5099	Innovation and Health Education Elective	1.5
		9

Fourth Semester

Code	Name	CA
ME4284	Gastroenterology and Pediatric Psicology	3
ME4285	Pediatric Critical Patient Clinic II	3
		6

Fifth Semester

Code	Name	CA
ME4286	Scientific Writing and Analysis Workshop	1.5
ME5327	Pediatric Endocrinology and Nefrology	3
ME5328	Consultation and Subspecialty Care I	3
		7.5

Sixth Semester

Code	Name	CA
ME4287	Applied Research Project II	1.5
ME5329	Pediatric Oncology and Palliative Care	3
ME5330	Consultation and Subspecialty Care II	3
		7.5

Seventh Semester

Code	Name	CA
ME5331	Pediatric Rheumatology and Immunology	3
ME5332	Pediatric Medical Clinic I	1.5
ME5333	Elective for Attention and Rotation in Subspecialty I	1.5
OP4047	Quality Development Course	3
		9

Eighth Semester

Code	Name	CA
ME5334	Genetics in Pediatrics	3
ME5335	Pediatric Medical Clinic II	1.5
ME5336	Elective for Attention and Rotation in Subspecialty II	1.5
		6

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

REO Residency in Ophthalmology

Program and Learning Outcomes

Admission Profile

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

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

a) Apply the most up-to-date medical knowledge of Ophthalmology to the comprehensive care of patients with ocular problems, with ethics, professionalism, and a humanistic outlook.

b) Perform surgical procedures to attend to the principal ophthalmological problems prevailing in the community, such as cataracts, strabismus, refractive surgery, and retinal laser surgery, assuring quality care and patient safety.

c) Evaluate the ocular, systemic and external conditions of each patient and of the community, to achieve the best ocular and visual health.

d) Collaborate in multidisciplinary teams in the prevention and early detection of glaucoma, diabetic retinopathy, and visual problems in children, among other ocular diseases.

e) Demonstrate interpersonal and communication skills that facilitate the effective exchange of information and good relations with patients and colleagues.

f) Contribute to the development of Ophthalmology through the consolidation of research and teaching skills.

Graduate Profile

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

REO Residency in Ophthalmology
Plan 2013

First Semester

Code	Name	CA
ME4140	Clinical Ethics	1.5
ME4142	Quality Health Care	1.5
ME4220	Fundamentals in Ophthalmology I	3
ME4221	Medical Care and Surgery in Ophthalmology I	3
		9

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	1.5
ME4143	Research and Innovation Methods	1.5
ME4222	Fundamentals in Ophthalmology II	3
ME4223	Medical Care and Surgery in Ophthalmology II	3
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4224	Oculoplastic, Pediatric Ophthalmology and Strabismus	3
ME4225	Medical Care and Surgery in Ophthalmology III	3
		9

Fourth Semester

Code	Name	CA
ME4226	Glaucoma, Anterior Segment and Neurophtalmology	3
ME4227	Medical Care and Surgery in Ophthalmology IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME5273	Cornea, External Diseases and Refractive Surgery	3
ME5274	Medical Care and Surgery in Ophthalmology V	3
		6

Sixth Semester

Code	Name	CA
ME5191	Elective Specialty I	1.5
ME5275	Retina and Uveitis	3
ME5276	Medical Care and Surgery in Ophthalmology VI	1.5
		6

Seventh Semester

Code	Name	CA
ME5192	Elective Specialty II	1.5
ME5277	Ophthalmology Specialties	3
ME5278	Medical Care and Surgery in Ophthalmology VII	1.5
		6

Eighth Semester

Code	Name	CA
ME5266	Thesis Defense	0.3
ME5279	Diagnostic Procedures in Ophthalmolgy	3
ME5280	Medical Care and Surgery in Ophthalmology VIII	3
		6.3

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

RER Residency in Radiology and Imaging

Program and Learning Outcomes

Admission Profile

This program is aimed at graduates of the Physician and Surgeon whose academic performance is outstanding, who display leadership skills, an interest in serving as educators and researchers, and a psychological profile that can adapt to change and innovation.

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

a) Recognize the health needs of patients, family members and society in general, as well as those of medical and third-party payer institutions.

b) Perform their medical practice taking into consideration the risks/benefit, costs/benefit, environmental and legal medical aspects of their professional tasks, within the framework of medical ethics.

c) Investigate problems related to their professional practice in multidisciplinary teams and use the findings obtained to solve them.

d) Communicate effectively and respectfully with patients, family members and other healthcare professionals.

Graduate Profile

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

RER Residency in Radiology and Imaging
Plan 2013

First Semester

Code	Name	CA
ME4140	Clinical Ethics	1.5
ME4142	Quality Health Care	1.5
ME4205	Radiology and Image I	3
ME4206	Medical Care in Radiology and Image I	3
		9

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	1.5
ME4143	Research and Innovation Methods	1.5
ME4207	Radiology and Image II	1.5
ME4208	Medical Care in Radiology and Image II	3
ME4209	Advanced Physics	1.5
		9

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4210	Radiology and Image III	3
ME4211	Medical Care in Radiology and Image III	3
		9

Fourth Semester

Code	Name	CA
ME4212	Radiology and Image IV	3
ME4213	Medical Care in Radiology and Image IV	3
ME5190	Thesis Project II	3
		9

Fifth Semester

Code	Name	CA
ME5258	Radiology and Image V	3
ME5259	Medical Care in Radiology and Image V	3
		6

Sixth Semester

Code	Name	CA
ME5260	Radiology and Image VI	3
ME5261	Medical Care in Radiology and Image VI	3
		6

Seventh Semester

Code	Name	CA
ME5191	Elective Specialty I	1.5
ME5262	Radiology and Image VII	3
ME5263	Medical Care in Radiology and Image VII	1.5
		6

Eighth Semester

Code	Name	CA
ME5192	Elective Specialty II	1.5
ME5264	Radiology and Image VIII	3
ME5265	Medical Care in Radiology and Image 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

Program and Learning Outcomes

Admission Profile

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

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

a) Diagnose, treat, and promote the health of patients with neurological diseases in a comprehensive, effective manner based on scientific evidence, using appropriate resources, demonstrating research- and analysis-oriented thought, with knowledge and applications specific to basic and clinical neurological sciences in the face of clinical situations.

b) Respect the dignity of human beings and the ethical principles of their profession as neurologists.

c) Effectively coordinate the healthcare team that participates in the clinical, rehabilitation and palliative care of the patient with neurological disorders.

d) Apply their knowledge to the planning, design, statistical analysis, discussion, conclusion, and publication of clinical studies aimed at assessing diagnostic and therapeutic effectiveness in their specialization.

e) Participate in the development of clinical research and basic protocols, particularly in the areas of abnormal movements, neurodegenerative diseases, and neoplasia of the central nervous system.

f) Communicate their knowledge effectively to patients, family members and medical colleagues, as well as to other healthcare professionals, displaying an attitude of information, listening, caring, compassion and respect toward the patient and his or her family members, including the patient´s preference in the formulation of disease management plans and practicing their specialty in a cost-efficient manner, without compromising the quality of the care provided.

Graduate Profile

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

REU Residency in Neurology
Plan 2013

First Semester

Code	Name	CA
ME4140	Clinical Ethics	1.5
ME4142	Quality Health Care	1.5
ME4214	Neurology I	3
ME4215	Medical Care in Neurology I	3
		9

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	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	Elective Specialty I	1.5
ME5269	Neurology V	3
ME5270	Medical Care in Neurology V	1.5
		6

Sixth Semester

Code	Name	CA
ME5192	Elective Specialty 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

Program and Learning Outcomes

Admission Profile

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

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

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

b) Coordinate the actions of interdisciplinary healthcare teams for the medical and gerontological care of their patients, constantly seeking to improve their quality of life.

c) Conduct clinical research projects in geriatrics.

d) Provide the highest quality healthcare based on state-of-the-art geriatrics within a framework of ethics and professionalism.

e) Educate healthcare personnel and the community on the attention and care of elderly patients.

Graduate Profile

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

RGE Residency in Geriatrics
Plan 2013

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 Health 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	Health Sciences Education	1.5
ME4174	Internal Medicine III	3
ME4203	Medical Care in Geriatrics and Gerontology III	3
		9
		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
		9
		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	Elective Specialty 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

Eight Semester

Code	Name	CA
ME5192	Elective Specialty II	1.5
ME5255	Geriatrics and Gerontology IV	3
ME5257	Medical Care in Geriatrics and Gerontology VIII	1.5
ME5266	Thesis Defense	.3
		6.3

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

RNE Residency in Neonatology

Program and Learning Outcomes

Admission Profile

The program is aimed at graduates from the residency in pediatrics with the knowledge, skills, attitudes, and values expected of a Pediatric specialist, with excellent academic performance, with vocation and interest in Neonatology, with a genuine conviction to enter research and demonstrating conversational command of the English language.

Academic background for admission: a Bachelor's Degree in Physician and Surgeon, and have graduated from pediatrics.

Student Learning Outcomes

a) Identify high-risk pregnancies and their consequent repercussions in the birth process, pathologies in the newborn and in the clinical surveillance and follow-up of such patients.

b) Take advantage of the clinical field for the generation of new knowledge, adhering to the highest international standards of good clinical practice.

c) Perform clinical research in their field of specialty and communicate the results efficiently, orally and in writing, thus contributing to the advancement of Neonatology.

d) Perform competent management of assessment, diagnostic, monitoring, and treatment techniques used in the clinical care of the newborn in critical, medical, or surgical condition.

e) Innovate in their professional practice by maintaining high quality and integrating the combination of scientific and academic activities into their health care work.

f) Influence in promoting, maintaining, and recovering the health of the newborn by selecting the human and technical resources available to them.

Graduate Profile

Specialists in neonatology, physicians with leadership skills and competence for the comprehensive management of healthy to critically ill neonates in different socio-cultural scenarios. Likewise, train people with an interest in innovation and scientific research, always with a high sense of duty and professional ethics, as well as with the ability to transmit knowledge to other health professionals and the general population. Neonatology specialists graduated from this institution are outstanding leaders in clinical practice in private and institutional settings, also in teaching with health personnel in training, as well as in health education for the general population, generating innovation with new diagnostic and therapeutic methodologies and technologies and timely detection of diseases in the population under their competence.

RNE Residency in Neonatology
Plan 2023

First Semester

Code	Name	CA
ME4277	Medical Bioethics	1.5
ME4292	Early Fetal an Neonatal Medicine	3
ME4293	Fetal and Early Neonatal Clinic	3
ME5341	Advanced Statistics	1.5
		9

Second Semester

Code	Name	CA
ME4294	Neonatal Medicine	3
ME4295	Neonatal Clinic	3
ME5342	Advanced Research I	1.5
		7.5

Third Semester

Code	Name	CA
ME5333	Elective for Attention and Rotation in Subspecialty I	1.5
ME5345	Advanced Scientific Writing and Analysis Workshop	1.5
ME5349	Critical Neotal Medicine	3
ME5350	Critically Ill Neonate Clinic	1.5
OP5099	Innovation and Health Education Elective	1.5
		9

Fourth Semester

Code	Name	CA
ME5336	Elective for Attention and Rotation in Subspecialty II	1.5
ME5348	Advanced Research II	1.5
ME5351	Neonatal and Neurodevelopmental Medicine	3
ME5352	Neonatal Follow-up Clinic	1.5
OP4047	Quality Development Course	3
		10.5

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

RNP Residency in Pediatric Neurology

Program and Learning Outcomes

Admission Profile

The program is aimed at graduates from the residency in pediatrics, whose academic performance is outstanding and who have a vocation for and interest in the discipline, research and teaching, in addition to being committed to lifelong learning.

Academic background for admission: a Bachelor's Degree in Physician and Surgeon, and have graduated from pediatrics.

Student Learning Outcomes

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

b) Act as a consultant to other specialists or general practitioners and, after a full, appropriate evaluation of their patient, immediately request the collaboration of other specialists if necessary.

c) Design, implement or collaborate in educational programs aimed at their own professional development, the healthcare team to which they belong, and the patients and their family members.

d) Apply the scientific method when researching problems in their professional practice and use the findings obtained to solve them.

Graduate Profile

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

RNP Residency in Pediatric Neurology
Edition 2013

First Semester

Code	Name	CA
ME4140	Clinical Ethics	1.5
ME4142	Quality Health Care	1.5
ME4260	Pediatric Neurology I	3
ME4261	Medical Care in Pediatric Neurology I	3

Second Semester

Code	Name	CA
ME4141	Health Sciences Education	1.5
ME4143	Research and Innovation Methods	1.5
ME4262	Pediatric Neurology II	3
ME4263	Medical Care in Pediatric Neurology II	3

Third Semester

Code	Name	CA
ME4144	Thesis Project I	3
ME4264	Pediatric Neurology III	3
ME4265	Medical Care in Pediatric Neurology III	3

Fourth Semester

Code	Name	CA
ME5190	Thesis Project II	3
ME5312	Pediatric Neurology IV	3
ME5313	Medical Care in Pediatric Neurology IV	3

Fifth Semester

Code	Name	CA
ME5191	Elective Specialty I	1.5
ME5314	Pediatric Neurology V	3
ME5315	Medical Care in Pediatric Neurology V	1.5

Sixth Semester

Code	Name	CA
ME5192	Elective Specialty II	1.5
ME5266	Thesis Defense	.3
ME5316	Pediatric Neurology VI	3
ME5317	Medical Care in Pediatric Neurology VI	1.5

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

RPS Residency in Psychiatry

Program and Learning Outcomes

Admission Profile

The program is aimed at graduates from the bachelor's degree in Medicine who have a vocation for studying Psychiatry; display the highest moral values; are committed to the ethical practice of their profession; are willing to work in multidisciplinary teams; and display an interest in the field of research.

Academic background for admission: a Bachelor's Degree in Physician and Surgeon.

Student Learning Outcomes

a) Proficiency in psychopathology, psychiatric nosology, and psychiatric treatment methods; the ability to define, apply, perform and interpret diverse psychiatric diagnostic tests and therapeutic methodologies.

b) Proficiency in each of the basic learning units related to the specialty, including psychopathology, neuroanatomy and neurophysiology, psychopharmacology, psychotherapies, diagnostic and treatment methodologies, and basic knowledge related to psychiatric subspecialties (children and adolescents, the elderly, addictions, eating disorders, and the oncological patient).

c) The capacity to manage administrative issues, quality control and development of a mental health system (from the consulting room to the clinic), planning, organizing, coordinating, and supervising the activities of the professional technical and auxiliary staff of a mental health system.

d) The capacity to collaborate with practitioners from other specialties to establish the diagnosis, prognosis, and treatment of patients, as well as the required preventive measures; the ability to carry out teaching and research activities applied to psychiatry.

e) Decision-making skills based on ethical principles, responsibility, professionalism, and citizenship.

Graduate Profile

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

RPS Residency in Psychiatry
Plan 2013

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 Health 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	Elective Specialty I	1.5
ME5197	Medical Care in Psychiatry VII	1.5
ME5198	Psychiatry VII	3
		6

Eighth Semester

Code	Name	CA
ME5192	Elective Specialty 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. Therefore, this specialty has become essential in medical practice at all levels of care. Society suffers from common and complex urological diseases, some recurrent and some one-time, and yet deadly in their biological behavior. Minimally invasive techniques have been developed with excellent results; percutaneous surgeries, nephron-sparing surgeries, extracorporeal shock wave lithotripsy, laparoscopic surgeries, and lately robotic surgery; all practiced and in contact with the residents who attend this postgraduate academic training program.

Program Objective

The Specialty in Urology of the Tecnológico de Monterrey aims to train excellent Urologists, who attend to the health needs of people with urological conditions in hospital and outpatient settings with quality and safety, in order to recover the state of health and increase its quality of life through the exercise of their clinical, teaching and/or research practice, with strict adherence to ethical principles and professionalism for the benefit of patients and the community, with solid conceptual and clinical foundations and that in turn successfully undertake projects of subspecialty, continuing education and/or teaching. Likewise, that they be outstanding leaders in the national and international sphere, through the development of preventive action strategies, cost-effective diagnostic strategies and innovative and successful treatments that contribute to recovering the patient's health status and promoting the development of the discipline itself.

Graduate Profile

Through this academic-care program, the graduate of the Specialty in Urology will be able to:

KNOWLEDGE

- Apply the knowledge of Urology, clinical judgment, and the bases of contemporary scientific evidence for medical decision making.

- Recognize the impact and its limits of professional action.

- Promote disease prevention in their practice and be able to refer to contribute in a multidisciplinary way with the patient's condition.

SKILLS

- Provide medical and surgical care to patients with urological conditions.

- Manage hospital clinical information integrating scientific files for a positive impact on health care in their specialty.

- Effectively communicate the knowledge of the specialty to patients, relatives, and medical colleagues, as well as other health professionals.

- Be at the forefront of trends in the specialty, promoting their permanent training (continuous and self-taught medical education), having judgment of the quality of recent medical information, and at the same time contributing to the knowledge of the specialty through publications. of research papers or books through teaching.

- Demonstrate interpersonal and communication skills that facilitate effective information exchange and rapport with patients and colleagues.

- Interact professionally and efficiently, showing the ability to adapt to different health systems: organizational macrosystems, public, private, and private health institutions, providing excellent medical care, resolving difficulties, limitations, and deficiencies in favor of the patient's health.

- Apply surgical abilities and skills efficiently in the surgical resolution of the disease, analyzing the risk-benefit balance of the indication in an accurate and professional manner.

ATTITUDES

- Exercise the specialty with professionalism and adherence to ethical and moral principles and respect for human dignity.

- Ethically use medical knowledge for the effective and comprehensive care of their patients, interacting with the community in a professional and humanistic manner.

Target Audience

The Multicentric Urology Program of the Tecnológico de Monterrey is aimed at graduates of a Bachelor's degree in Medicine, with accreditation from the National Examination for Applicants to Medical Residencies (ENARM), who have completed a full year and accredited general surgery in an institution endorsed by the Interinstitutional Commission for the Training of Human Resources for Health (CIFRHS), 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, medicine and their profession; with an innovative spirit committed to continuous learning, daily effort and the strength to maintain high quality care service; with genuine interest in research and teaching.

Candidates must meet the requirements for admission to master's studies at Tecnológico de Monterrey, which are:

- Logical reasoning exam PAEP (Postgraduate Studies Admission Test).
- TOEFL English exam (Test of English as a Foreign Language).
- Psychometric exam, which demonstrates characteristics of the student's profile suitable for the specialty and emotional stability.

Candidates must also have passed the ENARM (national exam for applicants to medical residencies) and undergo an interview with the academic faculty of professors. During the latter, the applicant's curriculum is evaluated, giving higher scores to those who have participated as authors or co-authors of published works, exhibition of works in congresses, leadership activities and social participation. All these are characteristics that candidates to enter the specialty must have.

Research Areas

Considering the objectives of the program, the demands of the environment, and the academic trajectory of the faculty members, three lines of research were defined that address the priority needs in the health of the population. These three lines of research are the following:

- Urological Infections and Functional Urology
- Urologic Oncology
- Endourology and Laparoscopy

RUR Residency in Urology
Plan 2023

First Semester

Code	Name	CA
ME4276	Research and Innovation Methodology	1.5
ME4277	Medical Bioethics	1.5
ME4318	Basic Principles and Practice in Urology	3
ME4319	Urological Patient Clinic	3
		9

Second Semester

Code	Name	CA
ME4320	Adrenal Disorders, Trauma and Inflammations	3
ME4321	Urological Diagnosis and Treatment	3
		6

Third Semester

Code	Name	CA
ME4283	Applied Statistics	1.5
ME4322	Urological Infectious Diseases	3
ME4323	Endourology and Minimal Invasion	3
OP5099	Innovation and Health Education Elective	1.5
		9

Fourth Semester

Code	Name	CA
ME4280	Applied Research Project I	1.5
ME4324	Functional and Gynecological Urology	3
ME4325	Open Surgical Procedures in Urology	3
		7.5

Fifth Semester

Code	Name	CA
ME4286	Scientific Writing and Analysis Workshop	1.5
ME5375	Urinary Calculi and Obstructive Uropathy	3
ME5376	Professional Behavior in Surgery and Renal Transplant	3
		7.5

Sixth Semester

Code	Name	CA
ME4287	Applied Research Project II	1.5
ME5377	Pediatric Urological Pathology	3
ME5378	Pediatric Urological Surgery	3
		7.5

Seventh Semester

Code	Name	CA
ME5333	Elective for Attention and Rotation in Subspecialty I	1.5
ME5379	Oncology and Geriatric Urology	3
ME5380	Laparoscopy and Robotics in Urology	1.5
OP4047	Quality Development Course	3
		9

Eighth Semester

Code	Name	CA
ME5336	Elective for Attention and Rotation in Subspecialty II	1.5
ME5381	Mens Health, Andrology and Late Hypogonadism	3
ME5382	Trauma and Damage Control in Urology	1.5
		6

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

MBC Master in Biomedical Sciences

Program and Learning Outcomes

Admission Profile

Graduated from a bachelor's degree in Medicine, Biotechnology, Engineering, Biomedicine, Medical Chemistry, Pharmacy, Nutrition, as well as Biologists and Biochemists, who are interested in continuing their academic training in the path of Research in Applied Medicine.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Demonstrate a high level of theoretical and methodological knowledge of Biomedical Sciences in any professional situation.

b) Perform research in their area of expertise to provide knowledge relevant to the advancement of Biomedical Sciences.

c) Communicate their professional work results in a clear, effective and efficient manner.

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

Graduation Profile

Researchers in the biomedical area with the necessary skills to integrate interdisciplinary research 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.

MBC Master in Biomedical Sciences
Plan 2017

First Semester

Code	Name	CA
BI4000	Translational Medicine and Experimental Models	3
BI4001	Biostatistics	3
BI5000	Research and Innovation Methods	2
OP4000	Quality Development Course	2
		9

Second Semester

Code	Name	CA
BI4002	Cellular and Molecular Biology and Human Genetics	3
BI4003	Oxidative Stress and Inflammation	3
BI5001	Thesis I	3
		9

Third Semester

Code	Name	CA
BI5002	Thesis II	3
OP5042	Elective I	3
OP5043	Elective II	3
		9

Fourth Semester

Code	Name	CA
BI5003	Thesis III	3
OP5044	Elective III	3
OP5045	Elective IV	3
		9

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

DBC PH. D. in Biomedical Sciences

Program and Learning Outcomes

Admission Profile

Graduates of a master's degree 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 along the path of applied medical research.

Academic background for admission: a bachelor's degree in medicine, biomedicine, biotechnology, bioscience, nutrition, biomedical engineering, pharmacy, biology, nursing, chemistry, physics, or related fields.

Student Learning Outcomes

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

b) Use research skills for validating experimental models in vivo that reproduce an approximation of the diseases under their study or in vitro.

c) Design experiments from the identification of a problem to the interpretation of results.

d) Communicate effectively orally and in writing with their peers: mentors, research community, society, and grant proposals.

e) Make decisions with scientific judgment and critical thinking in their practice as researchers following legal, ethical and government regulations.

Graduate Profile

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

DBC Ph. D. in Biomedical Sciences
Plan 2017

First Semester

Code	Name	CA
BI6000	Guided Research I	3
BI6001	Guided Research II	3
BI6018	Integrated 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	Research Integration 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	Research Integration 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

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

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

DCL PH. D. in Program in Clinical Sciences

Program and Learning Outcomes

Admission Profile

Graduates from a Medical Specialty at the 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, Hematology and Cancer, Ophthalmology, Neurosciences and Mental Health and, therefore, wish to train as scientists for the development of clinical research projects in the areas of Health.

Academic background for admission: Medical residency programs.

Student Learning Outcomes

a) Apply in expert level strategies of search, selection, and analysis of relevant knowledge in the area of expertise regarding aspects such as: mechanisms of disease (pathogenesis); detection, diagnosis or history of disease; therapeutic interventions, including trials with medicines or drugs; primary and secondary prevention and health promotion; human behavior; health services and epidemiology, among others.

b) Use qualitative and quantitative research methods and statistical tools for the development of scientific research to provide knowledge for regional or national issues in their field of expertise.

c) Obtain results of their research with critical - scientific thinking clearly establishing the potential application, as well as each of its limitations and areas of opportunity.

d) Transfer knowledge through scientific products such as: articles, patents or technological developments that allow reducing the gap between scientific knowledge relevant and valid and its application at the patient´s bedside.

e) Develop protocols or clinical trials that comply with current regulations in bioethics, quality and safety, ensuring the integrity and dignity of patients and their families as well as the intellectual property of the findings.

Graduate Profile

Experts in clinical research are recognized nationally and / or internationally for their ability to generate medical knowledge in three possible dimensions: individual, institution or society. Generate scientific production based on ethical principles, relevant to understanding human - health and disease, care systems and / or public health. In addition, leaders in prestigious organizations in the implementation of strategies to reduce inequity in health care and increase the use of resources based on best evidence.

DCL Ph. D. in Program in Clinical Sciences
Plan 2012

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 Structure and Statistics 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	Epidemiological Research	3
		10

Third Semester

Code	Name	CA
ME6003	Doctoral Research I	3
ME6004	Doctoral Research	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

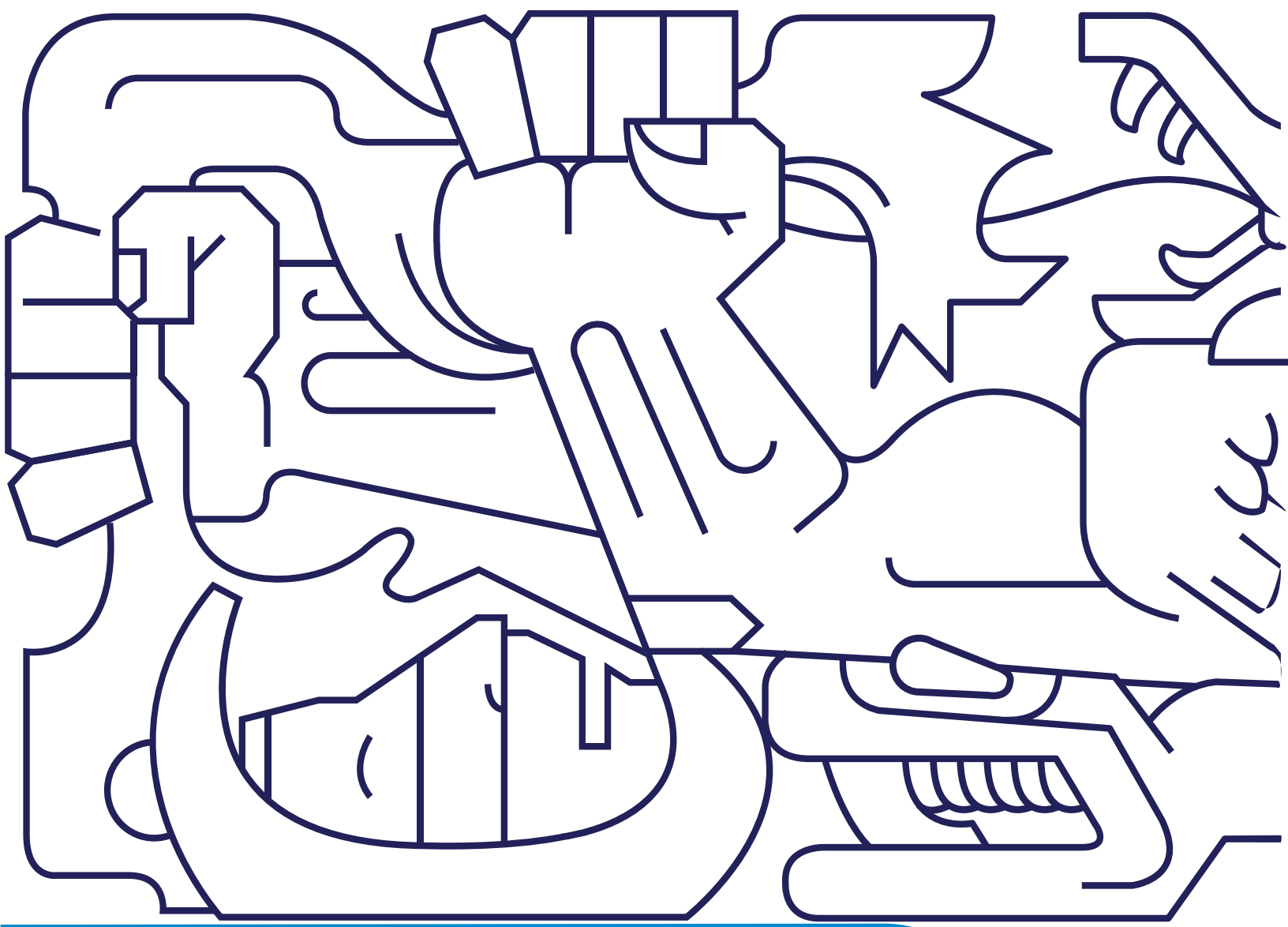
Code	Name	CA
ME5189	Research Seminar III	1
ME6014	Doctoral Research XII	3
ME6015	Doctoral Research XIII	3
ME6016	Doctoral Research XIV	3
		10

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

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

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



School of Business

MAF Master in Finance

Program and Learning Outcomes

Admission Profile

Professionals with work experience in labor that seek to transform their professional profiles and update themselves with cutting-edge content in the discipline. Professionals that hold decision-making and people management positions, with perspectives for organizational growth, considering a systemic understanding of the organization and methodologies that support decision-making as crucial. Individual that are experienced in their professional domains and are interested in developing innovative business models aimed at enhancing company competitiveness or creating new businesses through the knowledge and use of cutting-edge management tools and entrepreneurship models. Likewise, applicants to the program are people with work experience who wish to develop and/or strengthen consultancy skills to support continuous improvement, competitiveness, and sustainability of regional organizations by applying diagnostic methodologies that generate innovative and effective solutions.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Demonstrate knowledge of corporate finance, financial markets, and financial institutions; propose innovative financial models focused on achieving an appropriate risk-return relationship that supports effective decision-making, seeking the sustainability of the business in the long term.

b) Understand the business model and strategy, as well as the opportunities and risks presented by the competitive environment, applying their economic and financial knowledge in the development of quantitative analysis and estimates that provide visibility into future scenarios, their implications, and striving to achieve the strategic objectives of the organization.

c) Enhance their team's performance by exercising responsible leadership, committed to generating economic and social value, and applying the highest ethical standards in the profession.

d) Detect the impact generated by new technologies on the operation, strategy, and competition of organizations; to capitalize on business opportunities through data modeling and the use of artificial intelligence technologies, enabling the development of innovative financial strategies and creating a competitive advantage through incremental or disruptive improvements in the business model.

e) Act as finance experts with a holistic understanding of the global environment and analytical capacity to incorporate cutting-edge technology, allowing them to lead an organization to financial sustainability in an uncertain environment through a professional practice adhering to high personal conduct standards and accountability towards the profession and society.

f) Anticipate and innovate: Create and implement business models that generate value for the

organization and society based on an entrepreneurial mindset, future vision, and constant innovation.

g) Transform and mobilize: Lead and execute business transformation processes to ensure adaptation to the market and survival in the medium and long term through visionary leadership, purpose, human sensibility, strong ethical principles, and commitment to sustainable development.

Graduation Profile

Professional leaders with competencies based on values of innovation, integrity, collaboration, empathy, inclusion, and global citizenship, along with fundamental financial competencies in the profession. These competencies equip them to interpret macro-financial and sectoral variables, promote the financial health of organizations, and contribute to organizational transformation by adapting to a professional and dynamic environment. The goal is for graduates of the Master's in Finance (MAF) program to become finance experts, understand the global environment, and possess the analytical capacity to incorporate cutting-edge technology that enables organizations to achieve financial sustainability in an uncertain environment.

MAF Master in Finance
Plan 2024

First Trimester

Code	Name	CA
FZ4031	Mathematics and Statistics for Finance	2
FZ4032	Managerial Economics	2
FZ4033	Financial Markets	2
FZ4034	Strategic Financial Information	2
		8

Second Trimester

Code	Name	CA
FZ4035	Financial Management	2
FZ4036	Macrofinance	2
FZ4037	Corporate Finance	2
FZ4038	Financial Econometrics	2
		8

Third Trimester

Code	Name	CA
EM4003	Transversal Pathways I	2
FZ4039	Derivative Products and Corporate Risk Management	2
FZ4040	Data Science	2
OP5100	Elective I	2
		8

Fourth Trimester

Code	Name	CA
FZ5089	Portfolio Management	2
OP5101	Elective II	2
		4

Fifth Trimester

Code	Name	CA
FZ5090	Finance Project	2
OP5102	Elective III	2
		4

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

MAF-L Master in Finance

Program and Learning Outcomes

Admission Profile

Professionals with experience in the work field, who seek to transform their professional profile and update themselves with cutting-edge content in the discipline. Professionals who have knowledge in the financial work field, who seek to transform their professional profile and update themselves with cutting-edge content in the discipline. It is intended that they preferably have reading comprehension skills in the English language.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Demonstrate knowledge of corporate finance, financial markets, and financial institutions; propose innovative financial models focused on achieving an appropriate risk-return relationship that supports effective decision-making, seeking the sustainability of the business in the long term.

b) Understand the business model and strategy, as well as the opportunities and risks presented by the competitive environment, applying their economic and financial knowledge in the development of quantitative analysis and estimates that provide visibility into future scenarios, their implications, and striving to achieve the strategic objectives of the organization.

c) Enhance their team's performance by exercising responsible leadership, committed to generating economic and social value, and applying the highest ethical standards in the profession.

d) Detect the impact generated by new technologies on the operation, strategy, and competition of organizations; to capitalize on business opportunities through data modeling and the use of artificial intelligence technologies, enabling the development of innovative financial strategies and creating a competitive advantage through incremental or disruptive improvements in the business model.

e) Act as finance experts with a holistic understanding of the global environment and analytical capacity to incorporate cutting-edge technology, allowing them to lead an organization to financial sustainability in an uncertain environment through a professional practice adhering to high personal conduct standards and accountability towards the profession and society.

f) Anticipate and innovate: Create and implement business models that generate value for the organization and society based on an entrepreneurial mindset, future vision, and constant innovation.

g) Transform and mobilize: Lead and execute business transformation processes to ensure adaptation to the market and survival in the medium and long term through visionary leadership, purpose, human sensibility, strong ethical principles, and commitment to sustainable development.

Graduation Profile

Leaders with competences based on the values of Innovation, Integrity, Collaboration, Empathy, Inclusion and Global Citizenship, as well as fundamental financial skills of the profession, to understand the macro-financial and sectoral variables, promote the financial health of the company and contribute to the transformation of the organization by adapting to a professional and dynamic environment.

MAF-L Master in Finance (On line Program)
Edition 2024

First Trimester

Code	Name	CA
FZ4031	Mathematics and Statistics for Finance	2
FZ4032	Managerial Economics	2
FZ4034	Strategic Financial Information	2
		6

Second Trimester

Code	Name	CA
FZ4033	Financial Markets	2
FZ4035	Financial Management	2
FZ4038	Financial Econometrics	2
		6

Third Trimester

Code	Name	CA
FZ4036	Macrofinance	2
FZ4037	Corporate Finance	2
FZ4039	Derivative Products and Corporate Risk Management	2
		6

Fourth Trimester

Code	Name	CA
EM4003	Transversal Pathways I	2
FZ4040	Data Science	2
OP5100	Elective I	2
		6

Fifth Trimester

Code	Name	CA
FZ5089	Portfolio Management	2
FZ5090	Finance Project	2
OP5101	Elective II	2
OP5102	Elective III	2
		8

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

MBA-A Master in Business Administration

Program and Learning Outcomes

Admission Profile

Applicants are professionals with at least three years of professional experience and are interested in one of the following criteria for their professional development profile:

- Occupy leadership positions with organizational growth opportunities, considering as important the systematic understanding of the organization and the use of methodologies to support the decision-making process.

- Experienced professionals with interest in developing innovative business models, seeking to increase the competitiveness of the company or create new business through the knowledge application, use of tools and cutting-edge management models.

- With work experience who wish to develop and/or strengthen consulting skills to support continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.

- With leadership potential showing passion for learning, critical thinking and professional growth to impact value creation in organizations, using leadership skills and knowledge, techniques and effective management tools.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Define and enhance an organization's business processes to achieve its objectives through effective decision-making.

b) Design and execute strategies to enhance competitiveness.

c) Create and implement business models that generate value for both the organization and society.

d) Lead and execute business transformation processes to ensure adaptation to the market and survival in the medium and long term.

e) Make decisions by rational utilization of business resources, applying management tools, and integrating different functional areas of the company.

f) Comprehend the business environment and employ cutting-edge technology.

g) Manage talent, diversity, and sustainable practices.

h) Demonstrate visionary leadership with purpose, human sensitivity, strong ethical principles, and commitment to sustainable development.

i) Act with an entrepreneurial mindset and constant innovation.

j) Apply critical thinking in decision-making.

Graduation Profile

Graduates have the necessary tools for successful business management, through which they help their organizations achieve their strategic objectives in the medium and long term. Likewise, they have the necessary skills to face the challenges they face as business leaders, based on effective decision making, constant innovation, a strategic vision, critical thinking, sustainable thinking and human sense.

MBA-A Master in Business Administration
Edition 2024

First Trimester

Code	Name	CA
AD4065	Operations and Competitivity	2
FZ4027	International Economic Outlook	2
FZ4028	Financial Analysis	2
MT4025	Consumer Behavior	2
		8

Second Trimester

Code	Name	CA
AD4066	Leadership and Teams	2
FZ4029	Corporate Finance	2
MT4026	Data Analytics & Decision Making	2
MT5048	User Experience (UX) and Omnichannel Marketing	2
		8

Third Trimester

Code	Name	CA
AD4067	Organizational Behavior and Change Management	2
EM4003	Transversal Pathways I	2
EM4005	Innovation and Future Thinking	2
EM4006	Digital Business and Emerging Technologies	2
		8

Fourth Trimester

Code	Name	CA
AD5164	Strategy	2
OP5100	Elective I	2
		4

Fifth Trimester

Code	Name	CA
AD4068	Organizational Alignment	2
EM4007	Capstone Project	2
OP5101	Elective II	2
		6

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

MBA-B Master in Business Administration

Program and Learning Outcomes

Admission Profile

Applicants are professionals with at least three years of professional experience and seek to transform their professional profile and/or update their knowledge with cutting-edge content in the field of management from an international, practical, and highly experiential perspective. Professionals with strategic thinking, critical thinking, as well as verbal and mathematical reasoning skills. This is to ensure they can infer, analyze, and synthesize information for decision-making and the generation of innovative and sustainable strategies. They should be familiar with the use of information and communication technologies and their application in business. They are expected to have sufficient skills to attend classes in English, given the international focus of the program's experiences. Likewise, they are expected to be individuals willing to unlearn and relearn; proactive, curious, enthusiastic, and committed people to the development of their environment and the well-being of society; individuals with resilience and perseverance, with the potential to successfully complete their graduate program and become leaders with an entrepreneurial spirit, a human touch, and high international competitiveness.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Design business strategies to provide solutions to current and future organizational challenges, creating value for stakeholders using innovative methodologies.

b) Support the implementation of corporate strategies in multicultural environments through the management of human capital to address the dynamics of global business.

c) Propose innovative and corporate entrepreneurship projects focused on generating shared value for organizations. Graduates have a strategic mindset.

d) Propose strategic alternatives based on the effective management of organizational activities and business intelligence to generate greater economic profitability based on ethics and sustainability.

Graduation Profile

Highly creative and resourceful professional to provide viable solutions to current organizational challenges. It is distinguished for being highly innovative, avant-garde and for having a global vision of business. Likewise, he has solid self-knowledge, is capable of leading teams in times of great uncertainty, as well as making ethical decisions based on sustainability.

MBA-B Master in Business Administration
Edition 2024

First Trimester

Code	Name	CA
AD4075	Self-awareness and Change Management	2
EM4006	Digital Business and Emerging Technologies	2
FZ4041	Analytical Foundations of Business	2
FZ4042	Economics for Decision Making	2
MT4025	Consumer Behavior	2
		10

Second Trimester

Code	Name	CA
AD4076	Strategy and Negotiation in Multicultural Environments	2
AD4077	Innovation and Entrepreneurship	2
FZ4029	Corporate Finance	2
MT4026	Data Analytics & Decision Making	2
OP5100	Elective I	2
		10

Third Trimester

Code	Name	CA
AD4065	Operations and Competitivity	2
AD4078	Leadership and Organizational Behavior	2
AD4079	Business Models Based on Circular Economy	2
OP5101	Elective II	2
OP5102	Elective III	2
		10

Fourth Trimester

Code	Name	CA
AD4080	Skills for Senior Management	2
AD5179	Capstone Project	2
EM4003	Transversal Pathways I	2
		6

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

MBA-L Master in Business Administration

Program and Learning Outcomes

Admission Profile

Applicants are professionals with at least three years of professional experience and are interested in one of the following criteria for their professional development profile:

- Occupy leadership positions with organizational growth opportunities, considering as important the systematic understanding of the organization and the use of methodologies to support the decision-making process.

- Experienced professionals with interest in developing innovative business models, seeking to increase the competitiveness of the company or create new business through the knowledge application, use of tools and cutting-edge management models.

- With work experience who wish to develop and/or strengthen consulting skills to support continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.

- With leadership potential showing passion for learning, critical thinking and professional growth to impact value creation in organizations, using leadership skills and knowledge, techniques and effective management tools.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Define and enhance an organization's business processes to achieve its objectives through effective decision-making.

b) Design and execute strategies to enhance competitiveness.

c) Create and implement business models that generate value for both the organization and society.

d) Lead and execute business transformation processes to ensure adaptation to the market and survival in the medium and long term.

e) Make decisions by rational utilization of business resources, applying management tools, and integrating different functional areas of the company.

f) Comprehend the business environment and employ cutting-edge technology.

g) Manage talent, diversity, and sustainable practices.

h) Demonstrate visionary leadership with purpose, human sensitivity, strong ethical principles, and commitment to sustainable development.

i) Act with an entrepreneurial mindset and constant innovation.

j) Apply critical thinking in decision-making.

Graduation Profile

Graduates have the necessary tools for successful business management, through which they help their organizations achieve their strategic objectives in the medium and long term. Likewise, they have the necessary skills to face the challenges they face as business leaders, based on effective decision making, constant innovation, a strategic vision, critical thinking, sustainable thinking and human sense.

MBA-L Master in Business Administration
Edition 2024

First Trimester

Code	Name	CA
AD4066	Leadership and Teams	2
FZ4027	International Economic Outlook	2
FZ4028	Financial Analysis	2
		6

Second Trimester

Code	Name	CA
AD4065	Operations and Competitivity	2
MT4025	Consumer Behavior	2
MT4026	Data Analytics & Decision Making	2
		6

Third Trimester

Code	Name	CA
AD5164	Strategy	2
EM4005	Innovation and Future Thinking	2
FZ4029	Corporate Finance	2
		6

Fourth Trimester

Code	Name	CA
OP5100	Elective I	2
OP5101	Elective II	2
		4

Fifth Trimester

Code	Name	CA
AD4069	Ethics, Governance and Sustainability	2
EM4006	Digital Business and Emerging Technologies	2
MT5048	User Experience (UX) and Omnichannel Marketing	2
		6

Sixth Trimester

Code	Name	CA
AD4067	Organizational Behavior and Change Management	2
AD4068	Organizational Alignment	2
EM4007	Capstone Project	2
		6

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

MBD Master in Business Analytics

Program and Learning Outcomes

Admission Profile

Professionals with work experience who seek to expand their skills in data analytics and digital transformation strategy in business. Graduates in business, engineering, medicine, humanities, law or architecture. Likewise, individuals who demonstrate a series of competencies such as leadership, integrity and communication, which are evidenced through their work history and social impact. And, finally, professionals who have a proactive attitude towards teamwork and openness to sharing their professional experiences in the classroom with the rest of their colleagues.

Academic background for admission: a bachelor's degree in business, engineering, medicine, humanities, law or architecture.

Student Learning Outcomes

a) Identify opportunities in the changing environment that allow them to design sustainable business models based on organizational and digital transformation processes. This is in order to generate economic, social and environmental value in the community.

b) Understand the needs of stakeholders to lead change processes and ensure the relevance of the group, in order to exercise leadership with a human sense and consistent with the strategic objectives of the organization.

c) Understand the importance of disruptive technologies and their business application in order to respond to the demands of the current environment: volatile, uncertain and complex.

d) Design descriptive, prescriptive, and predictive models to support agile, effective, and dynamic decision making.

Graduation Profile

Professionals who will be agents of change in organizations, capable of promoting innovation, technological development and technology transfer, making use of data analytics, data science, strategic thinking, as well as process management and multifunctional and multigenerational work teams. The graduate will be able to develop and solve projects, which are expected to be problems that the graduate is developing in the organization in which he or she works. In addition, you will be able to solve real practical problems, making use of both traditional and frontier knowledge, while at the same time knowing how to develop and present innovative proposals and hardware and software integration, all in support of the growth of smart industry 4.0. evolving.

MBD Master in Business Analytics
Edition 2024

First Trimester

Code	Name	CA
AD4090	Disruptive Strategy and Digital Transformation	2
AD4091	Applications of Data Analytics to Business I	2
AD4092	Leadership in Data Product Development and Analytics	2
AD4093	Corporate Performance Management	2
		8

Second Trimester

Code	Name	CA
AD5186	Applications of Data Analytics to Business II	2
MT4032	Database Management and Cloud Computing	2
MT5060	Digital Marketing Strategy	2
MT5063	Data Mining Analysis for Decision Making	2
		8

Third Trimester

Code	Name	CA
EM4003	Transversal Pathways I	2
MT4033	Artificial Intelligence and Machine Learning	2
MT4034	Applications, Management and Governance of Artificial Intelligence	2
OP5100	Elective I	2
		8

Fourth Trimester

Code	Name	CA
AD5187	Capstone Project	2
MT4035	Applications of Data Analytics - Retail, E-commerce & Supply Chain	2
OP5101	Elective II	2
		6

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

MBM Master in Business Management

Program and Learning Outcomes

Admission Profile

Recent graduates or young professionals with relevant work experience of less than three years, who seek to transform their professional profile, enhance their business skills and competencies, as well as acquire cutting-edge knowledge. Professionals that aspire to take on leadership roles, whether within a family business or an organization, pondering a systemic understanding of the organization and supportive methodologies for decision-making. Individuals that aim to develop and implement strategies of innovation and digital transformation through a profound understanding of new technologies and the implications of achieving standardized adaptation within the company. Likewise, people who aim to excel in consultancy roles to support the development of regional organizations by applying novel methodologies to generate innovative and effective solutions.

Student Learning Outcomes

a) Participate effectively in collaborative networks (national and international) appreciating diversity and new trends, promoting knowledge exchange and interaction.

b) Identify constantly new ways of doing things, promoting knowledge creation and business innovation through the design of innovative projects that contribute to the sustainable development of the organization.

c) Prioritize and solve complex projects, evaluate diverse solution alternatives through the analysis, the interpretation and the evaluation of existing resources, organizational processes and their impact on the environment.

d) Seek the development of other colleagues for the greater good.

e) Understand the digital impact on business and industry, identify and evaluate new technologies that help rethink new business models and new ways of operating that contribute to the efficiency and su

Graduation Profile

Leaders who focus on managing projects and initiatives within the organization, in order to make

effective decisions and help organizations achieve their strategic objectives in a sustainable way.

MBM Master in Business Management
Edition 2024

First Trimester

Code	Name	CA
AD4083	Strategic Management	2
AD4084	Personal Development Planning	2
EM4008	Business Innovation and Value Creation	2
FZ4044	Management Core	2
MT4025	Consumer Behavior	2
		10

Second Trimester

Code	Name	CA
AD4085	Business Law	2
AD4086	Disruptive Technologies and Business Inteligence	2
AD5184	Immersion Project I	2
OP5100	Elective I	2
OP5101	Elective II	2
		10

Third Trimester

Code	Name	CA
AD4065	Operations and Competitivity	2
AD4087	Change Management	2
AD4088	Immersion Project II	2
MT4026	Data Analytics & Decision Making	2
OP5102	Elective III	2
		10

Fourth Trimester

Code	Name	CA
AD4089	Leadership and Human Capital Management	2
AD5185	Immersion Project III	2
EM4003	Transversal Pathways I	2
		6

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

MDE Executive Master in Business Administration

Program and Learning Outcomes

Admission Profile

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 have leadership positions with perspectives of organizational growth, considering important the systemic understanding of the organization and support methodologies for decision making.

- They have experience in their professional area and with 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 state-of-the-art management and entrepreneurship tools and models.

- Applicants who wish to develop and / or strengthen consultancy 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 to show 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.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Understand the needs and demands of stakeholders to recognize business opportunities and ensure the successful operation of the company; propose business models based on a constant innovation process; 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 high connectivity and disruptive environments.

b) Generate creative solutions based on the analysis of scenarios using quantitative and qualitative methods; propose improvements in the organization based on internal and external analysis to guarantee the market approach; and demonstrate the viability of their proposals in order to implement the best solution with a systemic approach, with the aim of making effective decisions in the organization based on strategic thinking.

c) Communicate effectively with stakeholders; develop human talent through processes of attraction, selection, training, empowerment, evaluation, and retention; strengthen interdisciplinary, generational and culturally diverse work teams; and lead change processes to assure the relevance of the organization, in order to exercise their leadership with a human sense and in line with the strategic objectives of the organization.

d) Evaluate the information obtained through observation, experience, reflection, reasoning and communication; convince stakeholders about the viability of solutions to complex problems based on consistent evidence, arguments and conclusions; and implement solutions to problems to achieve the objectives of the organization, in order to solve those problems through an iterative process of logical, objective and autonomous reasoning.

Graduation Profile

Professionals who lead organizations that operate in global environments, through effective and ethical decision-making supported by cutting-edge management techniques and models. They also lead strategic projects that generate value for 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. Likewise, they contribute to the economic, social and environmental development of their community through innovative and sustainable projects.

MDE Executive Master in Business Administration
Edition 2020

First Semester

Code	Name	CA
AD4054	Roles & Responsibilities for Managers / Business Ethics	3
EO4019	Economic Context of Global Business	3
MT4023	Strategy for Customer Development	3
RH4004	Leadership & Power in Organizations	3
		12

Second Semester

Code	Name	CA
AD5148	Supply Chain & Improvement for Global Companies	3
AD5149	Transformational Leadership	3
EO4020	Microeconomics	1.5
FZ4023	Financial Accounting / Reporting Analytics	1.5
FZ4024	Corporate Finance	3
		12

Third Semester

Code	Name	CA
CD4002	Data Analytics for Decision Making	3
OP5090	Elective I	3
OP5091	Elective II	3
		9

Fourth Semester

Code	Name	CA
AD5150	International Practicum	1.5
CF5001	Intrafirm Analytics for Decision Making	1.5
MT4024	Data Analytics for Business Value Creation	3
OP5092	Elective III	3
		9

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

MGN-L Master in Management

Program and Learning Outcomes

Admission Profile

Professionals who have obtained a degree in any field of knowledge and seek to learn or deepen their knowledge in business topics to achieve a professional development, transitioning from technical roles within their company to roles more closely related to various areas of administration within the same. Professionals who have knowledge in the work field of Business Management, who seek to transform their professional profile and update themselves with cutting-edge content in the discipline.

The candidate is expected to be familiar with the use of information and communication technologies, so that they are able to search for data and reports, as well as use these tools to send and receive valuable information. In addition, they are expected to have reading comprehension skills in the English language.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Demonstrate knowledge in business management, markets, and financial institutions; proposing innovative models focused on achieving an adequate risk-return relationship that supports effective decision-making, seeking business sustainability in the long term.

b) Understand the business model and strategy, as well as the opportunities and risks presented by the competitive environment, applying economic and financial knowledge in the development of analysis and quantitative estimations, providing visibility of future scenarios, their implications, and aiming to achieve the organization's strategic objectives.

c) Enhance the performance of their work team, exercising responsible leadership with the commitment to generate economic and social value; applying the highest standards of ethics in the profession.

d) Detect the impact generated by new technologies on the operation, strategy, and competition of organizations; to seize business opportunities through data modeling and the use of artificial intelligence technologies, allowing them to develop and manage innovative strategies, creating a competitive advantage through incremental or disruptive improvements in the business model.

e) Act as an expert in Management, with an understanding of the global environment and analytical capacity to incorporate cutting-edge technology that allows an organization to become financially and functionally sustainable in an uncertain environment, through a professional exercise adhering to high standards of personal conduct and accountability towards the profession and society.

Graduation Profile

Innovative, entrepreneurial, ethical professionals with a global and sustainable vision of business. It offers the opportunity to deepen business topics for individuals seeking a professional development change from technical roles within their company to functions related to various areas of management, adapting to a professional and dynamic environment. The graduates will be experts in various functional areas of the company, enabling them to visualize and manage the future of organizations with an understanding of the global environment and analytical capacity to incorporate cutting-edge technology that allows an organization to become financially sustainable in an uncertain environment.

MGN-L Master in Management (On line Program)
Edition 2024

First Trimester

Code	Name	CA
AD4070	Entrepreneurship and Innovation	2
AD4071	Business Financial Analysis	2
EM4003	Transversal Pathways I	2
		6

Second Trimester

Code	Name	CA
AD4072	Talent Management	2
FZ4030	Corporate Finance	2
MT4027	Marketing and Consumer Behavior	2
		6

Third Trimester

Code	Name	CA
AD4073	Strategic Business Management	2
EM4004	Transversal Pathways II	2
EO4039	Managerial Economics	2
		6

Fourth Trimester

Code	Name	CA
AD4074	Operation Management for Value Creation	2
OP5100	Elective I	2
		4

Fifth Trimester

Code	Name	CA
OP5101	Elective II	2
TI4041	Digital Transformation in Business	2
		4

Sixth Trimester

Code	Name	CA
AD5166	Capstone Project	2
OP5102	Elective III	2
		4

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

MMT Master in Marketing

Program and Learning Outcomes

Admission Profile

Professionals who have at least three relevant years of professional experience, who have obtained a professional degree from a national or international higher education institution of recognized prestige, and who meet at least one of the following criteria in their professional development profile:

- Occupy decision-making and people management positions, with prospects for organizational growth, considering important the systemic understanding of the organization and support methodologies for decision making.

- Experienced in their professional area and with interest in developing innovative business models, seeking to increase the company's competitiveness 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 continuous improvement, competitiveness and sustainability of organizations in the region through the application of diagnostic methodologies generating innovative and effective solutions.

Academic background for admission: a bachelor's degree.

Student Learning Outcomes

a) Create and implement marketing strategies aligned with the values of the company, focused on generating value for the customer and taking care of all stakeholders of the company.

b) Analyze the technological environment, environmental trends and available data to apply them in business decision making and develop innovative solutions.

c) Measure and manage the profitability and metrics of marketing strategies to maximize the company's profitability in a competitive business context.

d) Successfully lead marketing strategy in a highly competitive and constantly evolving environment.

e) Understand and apply multidisciplinary knowledge to solve complex marketing problems.

f) Enhance the performance of their work team, exercising responsible leadership.

g) Be a leader with an entrepreneurial spirit, human sense and internationally competitive.

Graduation Profile

Professionals who are specialists to be able to design and implement effective and innovative strategies focused on customer experience that generate sustainable value to maximize revenue and meet current market needs. This will be using advanced tools for data analysis based on consumer behavior and market research to make informed decisions, in order to create brand and product management experiences, as well as identify opportunities to build strong customer relationships.

MMT Master in Marketing
Edition 2024

First Trimester

Code	Name	CA
FZ4043	Financial Analysis for Marketing Decision Making	2
MT4025	Consumer Behavior	2
MT4028	Fundamentals of Marketing and Data Analysis	2
MT5059	Market Research and Understanding	2
		8

Second Trimester

Code	Name	CA
MT4029	Branding and Innovation Strategic Management	2
MT4030	Pricing Strategy and Behavioral Economics	2
MT5048	User Experience (UX) and Omnichannel Marketing	2
MT5060	Digital Marketing Strategy	2
		8

Third Trimester

Code	Name	CA
AD4082	Leadership for Human Flourishing	2
EM4003	Transversal Pathways I	2
MT4031	Marketing Budgets and Metrics	2
MT5061	Prosocial Behavior of Individuals, Brands and Companies	2
		8

Fourth Trimester

Code	Name	CA
MT5062	Capstone Project	2
OP5100	Elective I	2
OP5101	Elective II	2
OP5102	Elective III	2
		8

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

DCA PH. D. in Business Administration

Program and Learning Outcomes

Admission Profile

Professionals who have a master's degree in the areas of management, administration and social sciences. Interested in carrying out high-impact applied research, to contribute to the knowledge of any of the specialty areas of Administrative Sciences.

Academic background for admission: Master's degree in the areas of management, administration and social sciences.

Student Learning Outcomes

a) Develop theoretical and empirical models typical of administrative sciences to generate applied research projects, based on original critical knowledge.

b) Publish research products in different high-quality academic media.

c) Develop research projects aimed at transforming organizations with ethical awareness and social responsibility.

d) Generate effective collaborative environments in high-level research and teaching groups in higher education institutions.

Graduate Profile

Research leaders who generate value through the generation of state-of-the-art 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 human sense.

DCA PH. D. in Business Administration
Edition 2020

First Semester

Code	Name	CA
GD6030	Guided Research I	3
GD6031	Guided Research II	3
GD6032	Guided 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	Research Integration I	1.5
GD6046	Integrated 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	Research Integration 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

Eighth Semester

Code	Name	CA
GD6000	Doctoral Defense	.3
GD6028	Doctoral Research XII	3
GD6029	Doctoral Research XIII	3
		6.3

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

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

DCF Ph. D. in Financial Science

Program and Learning Outcomes

Admission Profile

Professionals who have the desire and capacity for conducting research and expanding the borders of knowledge in the field of financial science, as well as the discipline and intellectual curiosity to ask fundamental questions and conduct research that will contribute to creating and disseminating original, innovative knowledge and/or practices in the context of financial theory, management and economics. We are looking for individuals with the intention of studying a program that will position them as opinion leaders and generators of trends of thought in the areas of finance and economics. In addition to people who wish to participate in research, teaching and consulting in the financial sciences.

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

Student Learning Outcomes

a) Develop theoretical and empirical financial models typical to generate applied research projects, based on original critical knowledge.

b) Develop research projects aimed at the transformation of organizations with ethical awareness and social responsibility.

c) Generate effective collaborative environments in research and teaching groups, whether in public or private organizations, in interaction with higher education institutions.

d) Publish research products in high quality academic journals but also in finance industry reports or practitioner-oriented journals.

Graduate Profile

Integrity research leaders who promote applied research in finance as a source of innovative solutions to the challenges posed by the dynamics of organizations. In addition, they create and strengthen research networks, where economic-financial phenomena are analyzed to develop knowledge that is transferred to different audiences, not only companies but to society. And, finally, professionals who develop an open community of researchers in the field of finance that generates economic and social value in a plural, diverse and inclusive environment.

DCF Ph. D. in Financial Science
Edition 2022

First Semester

Code	Name	CA
GF5025	Assisted Research I	3
GF5026	Assisted Research II	3
GF5027	Assisted Research III	3
		9

Second Semester

Code	Name	CA
GF5019	Research Proposal I	3
GF5020	Research Proposal II	3
GF6039	Integrated Exam	1.5
GF6041	Research integration I	1.5
GF6049	Research Seminar I	.5
GF6050	Research Workshop I	1
		10.5

Third Semester

Code	Name	CA
GF6027	Doctoral Research I	3
GF6028	Doctoral Research II	3
GF6040	Research Proposal Defense	1.5
GF6046	Research Seminar II	.5
GF6051	Research Workshop II	1
		9

Fourth Semester

Code	Name	CA
GF6029	Doctoral Research III	3
GF6030	Doctoral Research IV	3
GF6043	Scientific Product I	1.5
GF6047	Research Seminar III	.5
GF6052	Research Workshop III	1
		9

Fifth Semester

Code	Name	CA
GF6031	Doctoral Research V	3
GF6032	Doctoral Research VI	3
GF6042	Research Integration II	1.5
GF6048	Research Seminar IV	.5
GF6055	Research Workshop IV	1
		9

Sixth Semester

Code	Name	CA
GF6033	Doctoral Research VII	3
GF6034	Doctoral Research VIII	3
GF6044	Scientific Product II	1.5
GF6053	Research Seminar V	.5
GF6056	Research Workshop V	1
		9

Seventh Semester

Code	Name	CA
GF6035	Doctoral Research IX	3
GF6036	Doctoral Research X	3
GF6037	Doctoral Research XI	3
GF6054	Research Seminar VI	.5
GF6057	Research Workshop VI	1
		10

Eighth Semester

Code	Name	CA
GF6000	Doctoral Defense	.3
GF6038	Doctoral Research XII	3
GF6045	Doctoral Research XIII	3
		6.3

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

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

Course content by academic discipline

The description of the courses for all the undergraduate programs offers at Tecnologico de Monterrey is available in the Academic Vice-Rectory official web site: http://sitios.itesm.mx/va/planes_de_estudio/3_3EN.htm

This catalogue presents information on the **Graduate Programs Catalogue 2024** of Tecnológico de Monterrey. Its content reflects the information available in official media at the time of its publication.

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