

# ENGINEERING

INNOVATION AND TRANSFORMATION



Tecnológico  
de Monterrey



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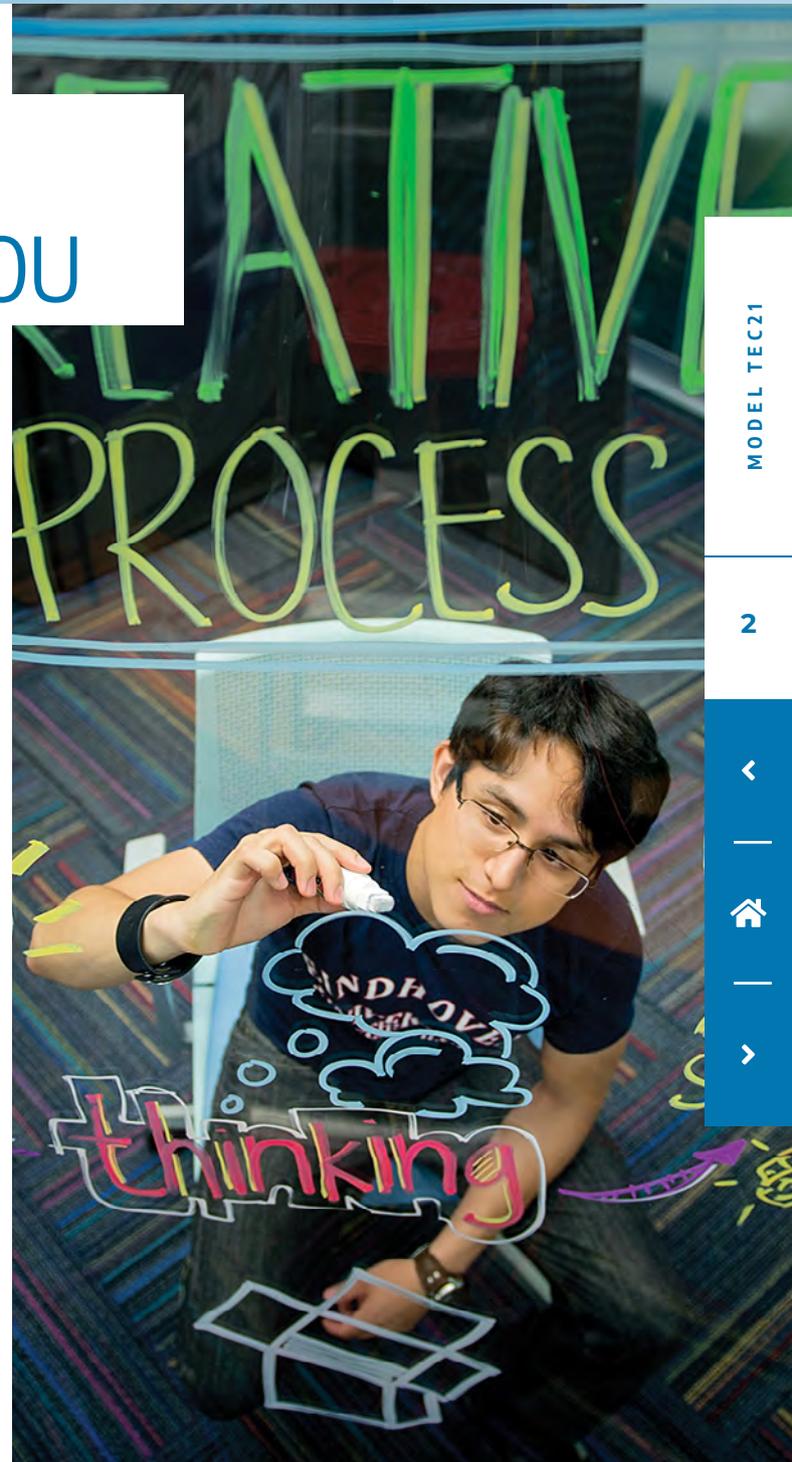
# MODEL TEC21 TEC CHALLENGES YOU

Our **challenge-based educational model** develops the competencies that will enable you to face up to the opportunities and challenges of the 21st century creatively and strategically.

With an education that will accompany you throughout your life, our aim is for you to be aware of the needs of the environment, acquire a systemic vision of problems and develop the capacity to solve them.

Right from the first semester, you will be participating in activities to develop your ability to identify opportunities, find resources, take risks and recover from failure.

In addition, **the model empowers you** to make more decisions about your university studies as you progress, in order to **develop a unique profile**.





## WHAT IS A CHALLENGE?

A challenge is an opportunity to learn something new and reinforce what you already know. **To solve it, you need to apply yourself, investigate and interact in the “real world”.** You won't be on your own: you will have a set of personal and technological resources and tools, as well as the advice of faculty who will accompany you throughout the process. Its resolution implies a certain degree of difficulty and a duration that will awaken your interest and enthusiasm and produce a sense of achievement.

# COMPETENCIES THAT MAKE YOU UNIQUE

At Tecnológico de Monterrey, we have defined, after consulting leaders from diverse sectors and employers, seven competencies that all our students should possess. Regardless of which degree you are studying, the educational model anticipates that you will develop them through diverse challenges, courses and activities related to your university experience. They are:

1. **Self-knowledge and management**
2. **Innovative entrepreneurship**
3. **Social intelligence**
4. **Commitment to ethics and citizenship**
5. **Reasoning for complexity**
6. **Communication**
7. **Digital transformation**

These seven competencies, together the **knowledge, skills, attitudes and values related to the area of engineering and your degree**, will be your letter of introduction and your passport in the professional world.

## STEP-BY-STEP RECORD OF YOUR LEARNING

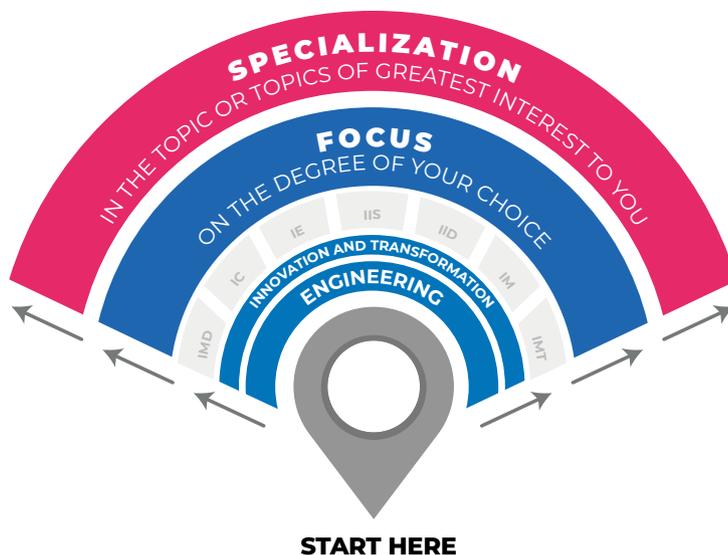
While you are at university, you will keep a record in your competency file of the degree of progress you have made and the supporting evidence. Taking responsibility for creating this file will, from this very moment, be extremely useful when you start work.

## YOU USED TO CHOOSE A DEGREE, NOW YOU CHOOSE A PATH

Your curriculum will be a non-linear educational, dynamic and flexible experience. You will enjoy **more time and more elements** to know and mature your degree choice, as well as to **discover and capitalize all the opportunities** you have to personalize your degree program.

The model is comprised of **three stages** and, from the first semester, you will experience educational units (courses and blocks) that have clearly defined, individual and collaborative project- and task-oriented competency development objectives (knowledge, skills, attitudes and values). In the “blocks”, you will be tackling challenges connected to reality, working collaboratively with the support of a group of faculty who will guide your learning and, at the end, evaluate your competencies together with you and your peers.

These challenges, apart from being attractive, are comprehensive experiences, since they will drive you and your peers to observe reality, map situations, diagnose problems, reflect, dialogue and confront ideas on theories and techniques to solve these problems, while experiencing, designing and producing prototypes and solutions, within a reflective, applicative dynamic in which you can take risks and make mistakes and adjustments to achieve the objective.



- 3 Give a personal touch to your degree program through specialization within or outside your discipline.
- 2 Develop the competencies relevant to your degree through more focused courses and challenges.
- 1 Acquire the basic knowledge of your area, through courses and challenges related to degrees from the area of Engineering - Innovation and Transformation.

# ENGINEERING

## A NEW GENERATION

Engineering is directly linked to innumerable developments, economic changes and technological advancements that we have experienced as a society. By choosing any of the degrees grouped in this track, you will learn how to apply the principles of engineering to design systems, devices and products that will efficiently and sustainably solve problems in industrial, commercial and scientific contexts, in order to contribute to the enhancement of people's quality of life.

Engineers trained at Tec have a renewed profile and a forward-looking vision. You will find them grouped together in four tracks or lines of development: Computer Studies and Information Technologies; Innovation and Transformation; Bioengineering; and Chemical Processes and Applied Science. Each track addresses, from its own environment, society's enormous challenges, which require solutions backed by technology-based knowledge.







# IMD

## B.S. IN BIOMEDICAL ENGINEERING

### Empowering humanity

Biomedical Engineering is growing in leaps and bounds and today more than ever needs professionals with a solid background in medical and biological sciences, capable of proposing technological solutions that address the needs of the healthcare area by developing innovative devices, systems and services.

### Biomedical Engineers will graduate from Tec de Monterrey with the following competencies:

- Sustain the functioning of live organisms and their interaction with biomedical devices, based on the principles of biomedical and chemical-biological science.
- Interpret medical-biological system measurements from a quantitative perspective in healthcare settings.
- Generate solutions to problems related to biological and health systems integrating the principles of engineering, basic science and medical science.
- Develop biomaterials and biomedical devices for the different healthcare stages, using cutting-edge technological tools.
- Develop healthcare technology management, evaluation and transfer processes, considering regulatory aspects.

## WHICH SPECIALIZATIONS ARE AVAILABLE TO YOU?

The educational model enables you to personalize your graduate profile. During the specialization stage, consider a focus based on your post-graduation plans. Tec offers you the means to achieve this through diverse concentrations.

Consult the concentrations this degree offers:



[tec.mx/imd](https://tec.mx/imd)

## CAREER FIELD

Thanks to the integral education you will receive in this degree, on graduating you will be able to work in diverse areas, such as:

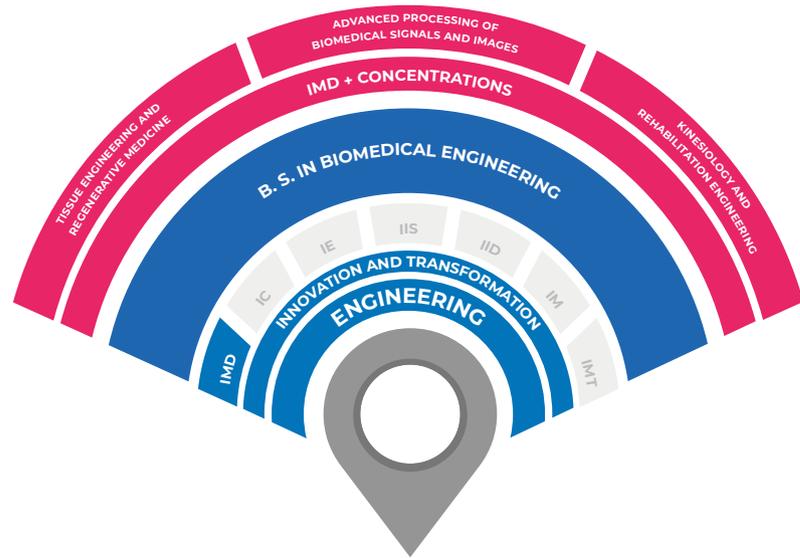
- Hospital administration and clinical engineering
- Development of biomechanical devices, such as prostheses and orthoses, sports and rehabilitation engineering
- Research in biomaterials, molecular and cell engineering, and biological systems
- Development of medical instrumentation systems, biosensors and devices for obtaining and analyzing medical imaging
- Innovation in health services, medical equipment marketing and creation of technology-based companies

## IS THIS RIGHT FOR YOU?

If you want to combine your desire to help improve people's health with your passion for technology and science, you're in the right place.

# CURRICULUM

## CHOOSE YOUR PATH



DEGREES

10

### What you need to know about each stage of your curriculum:

#### Exploration

1. You will open your competency file and add to it throughout your degree program.
2. You will learn the foundations of the area of Engineering - Innovation and Transformation.
3. You will participate in fundamental and exploration challenges from the area of Engineering - Innovation and Transformation, interacting with peers from different degree programs.
4. You will study general education courses, selecting them from a collection.
5. You will participate in a challenge that integrates all the competencies to be developed in this phase.

#### Focus

1. You will acquire the core competencies of your degree, in other words, those that distinguish it.
2. You will participate in more focused challenges to reinforce what you have learned and broaden your basic knowledge.
3. You will have the elements to decide whether to deepen your knowledge or diversify and, subsequently, build your specialization plan.
4. The Tec Weeks, challenges and overall university experiences will enrich your file.

#### Specialization

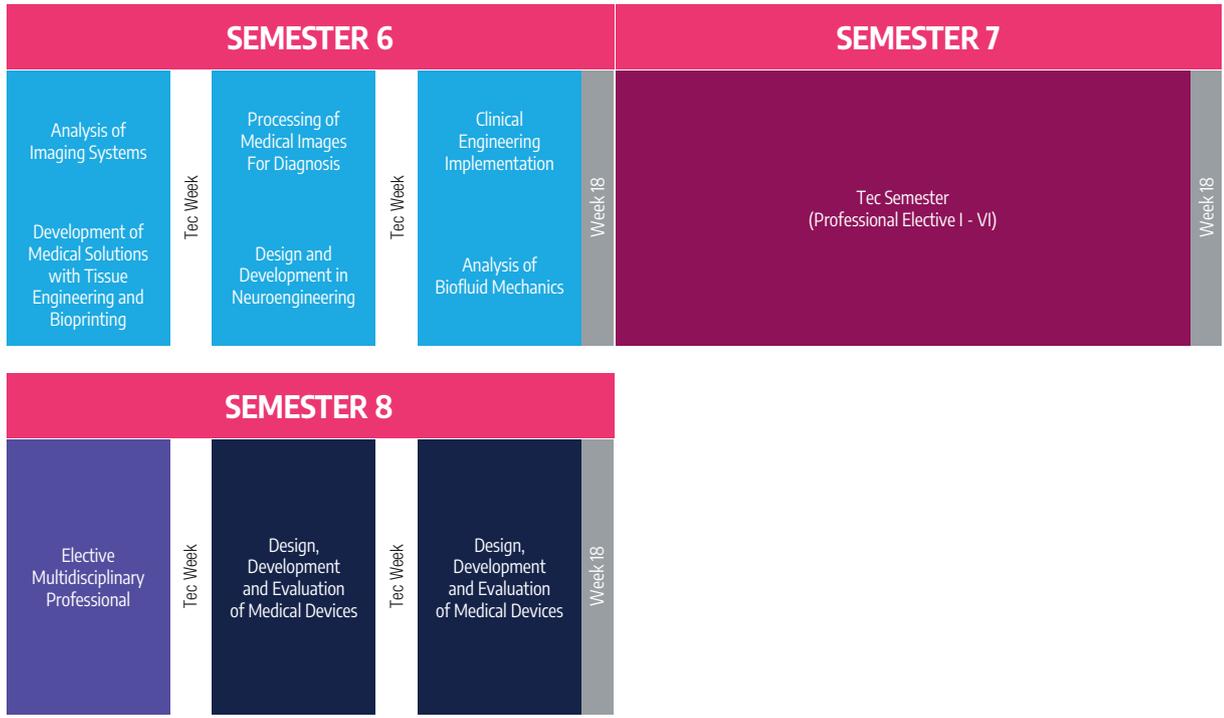
1. You have decided whether to diversify or delve further into your degree, by choosing a concentration, a modality, an internship stay, to mention just a few of your options.
2. You will develop the competencies related to your specialization, increasingly connected to your passions, interests and plans.
3. If you decided to opt for a concentration, on graduating you will obtain a professional concentration certificate.

SEMESTER 1				SEMESTER 2				CHOOSE YOUR PROGRAM		
Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Week 18	Elective Course Humanities and Fine Arts	Tec Week		Elective Course Humanities and Fine Arts	Week 18
Computational Thinking for Engineering		Computational Thinking for Engineering		Analysis of the Structure, Properties and Transformation of Matter		Intermediate Mathematical Modeling			Intermediate Mathematical Modeling	
Mathematical Thinking I	Mathematical Thinking I	Modeling the Movement in Engineering	Modeling in Engineering with Conservation Laws	Physical Experimentation and Statistical Thinking	Chemical Experimentation and Statistical Thinking I	Statistical Analysis	Modeling of Electrical Systems in Engineering		Modeling of Electromagnetic Systems in Engineering	
Engineering and Science Modeling				Thermodynamic Modeling for Engineering	Modeling of Electrical Systems in Engineering					

SEMESTER 3				SEMESTER 4					
Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Week 18	Elective Course Leadership, Entrepreneurship and Innovation	Tec Week	Elective Course Leadership, Entrepreneurship and Innovation	Week 18
Musculoskeletal System		Oxygen Supply and Consumption		Analysis of Electrical Circuits		Analysis of Signals and Biomedical Systems		Analysis of Signals and Biomedical Systems	
Process Modeling Using Linear Algebra	Engineering Modeling Using Dynamic Systems	Engineering Modeling Using Dynamic Systems	Introduction to Data Science Projects	Design of Analog Bioinstrumentation Systems	Design of Digital Bioinstrumentation Systems	Chemical, Biological and Molecular Analysis in Biomedical Engineering			
Exploration Topic	Metabolism and Energy								

SEMESTER 5				CHOOSE YOUR CONCENTRATION	
Elective Course Ethics and Citizenship	Tec Week	Elective Course Ethics and Citizenship	Tec Week		
Development of Biomaterials for Medical Applications		Modeling and Control of Biomedical Systems			
Analysis and Design in Biomechanics	Application of Bioinstrumentation and Biomedical Technologies	Management and Validation of Biomedical Technologies			

- General education course
- Exploration topic (CHALLENGE)
- Integrating disciplinary block (CHALLENGE)
- Area exploration courses
- Track integrating block (CHALLENGE)
- Disciplinary course
- TEC Semester
- Introductory block (CHALLENGE)
- Disciplinary block (CHALLENGE)
- Multidisciplinary professional elective (CHALLENGE)
- Final integrating block (CHALLENGE)
- Area exploration block (CHALLENGE)



DEGREES

12

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- General education course
- Exploration topic (CHALLENGE)
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## MULTI-ENTRY DEGREE

Depending on your interests, you will have the option of choosing between Civil Engineering in the area of **Innovation and Transformation** or **Built Environment**. Each area offers you a unique path, with different challenges and concentrations to personalize your degree according to your plans.

# IC

## B.S. IN CIVIL ENGINEERING

### Our work speaks for us

Civil engineers face diverse challenges, mainly recognizing what society needs for its development, in order to plan, design, build, operate and maintain the build environment, applying cutting-edge technology, adhering to standards and regulations, and with a deep sense of commitment to the environment. Through your work, you will create better places to live, having a direct impact on the life of citizens.

### Civil Engineers will graduate from Tec de Monterrey with the following competencies:

- Design structural systems applying advanced methods, the regulatory framework, technical specification, and efficiency and sustainability criteria.
- Manage construction projects efficiently, complying with current technical standards and economic-financial feasibility.
- Design hydraulic infrastructure systems based on the established standards and considering the integral management of the natural environment.
- Conduct geotechnical studies, in accordance with current scientific and regulatory criteria.
- Design transportation and service infrastructure systems, based on the current needs of a specific region, regulations and development plans.

## WHICH SPECIALIZATIONS ARE AVAILABLE TO YOU?

The educational model enables you to personalize your graduate profile. During the specialization stage, consider a focus based on your post-graduation plans. Tec offers you the means to achieve this through diverse concentrations.

Consult the concentrations this degree offers:



[tec.mx/iciit](https://tec.mx/iciit)

## CAREER FIELD

Thanks to the integral preparation you will receive in this degree, on graduating you will be able to develop professionally in different areas of business, services and research within the built environment development industry, such as:

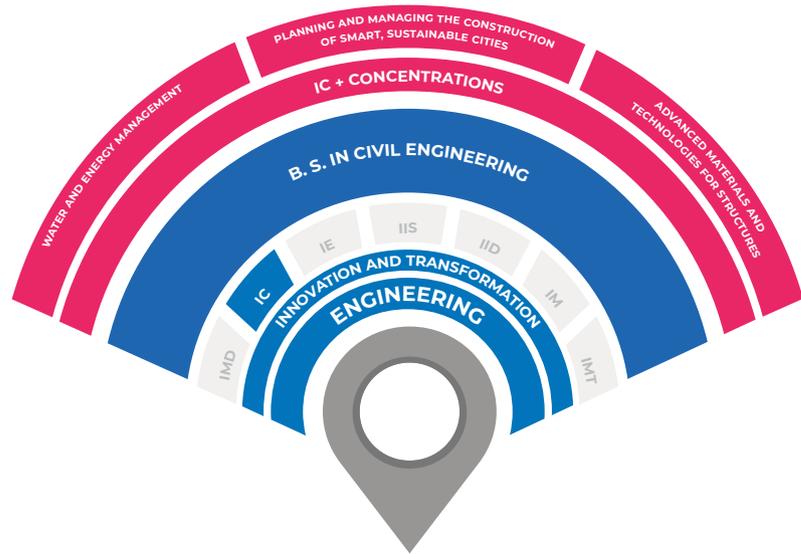
- Construction and real-estate companies
- Structural design firms for building, roadway and transportation projects
- Hydraulic and water treatment system design firms and companies that conduct environmental impact studies
- Management of projects and companies that supervise public and private infrastructure works
- Government public works departments
- Companies that conduct soil mechanics studies
- International graduate programs to pursue a career in research (master's or doctorate)

## IS THIS RIGHT FOR YOU?

If you are inquisitive and analytical, have an affinity for mathematics and physics, and would like to contribute to society's development with major infrastructure works, you're in the right place.

# CURRICULUM

## CHOOSE YOUR PATH



DEGREES

15

### What you need to know about each stage of your curriculum:

#### Exploration

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#### Focus

1. You will acquire the core competencies of your degree, in other words, those that distinguish it.
2. You will participate in more focused challenges to reinforce what you have learned and broaden your basic knowledge.
3. You will have the elements to decide whether to deepen your knowledge or diversify and, subsequently, build your specialization plan.
4. The Tec Weeks, challenges and overall university experiences will enrich your file.

#### Specialization

1. You have decided whether to diversify or delve further into your degree, by choosing a concentration, a modality, an internship stay, to mention just a few of your options.
2. You will develop the competencies related to your specialization, increasingly connected to your passions, interests and plans.
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SEMESTER 1				SEMESTER 2				CHOOSE YOUR PROGRAM		
Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Week 18	Elective Course Humanities and Fine Arts	Tec Week		Elective Course Humanities and Fine Arts	Week 18
Computational Thinking for Engineering		Computational Thinking for Engineering		Analysis of the Structure, Properties and Transformation of Matter		Intermediate Mathematical Modeling			Intermediate Mathematical Modeling	
Mathematical Thinking I	Mathematical Thinking I		Physical Experimentation and Statistical Thinking	Chemical Experimentation and Statistical Thinking I	Statistic Analysis					
Engineering and Science Modeling	Modeling the Movement in Engineering	Modeling in Engineering with Conservation Laws	Thermodynamic Modeling for Engineering	Modeling of Electrical Systems in Engineering	Modeling of Electromagnetic Systems in Engineering					

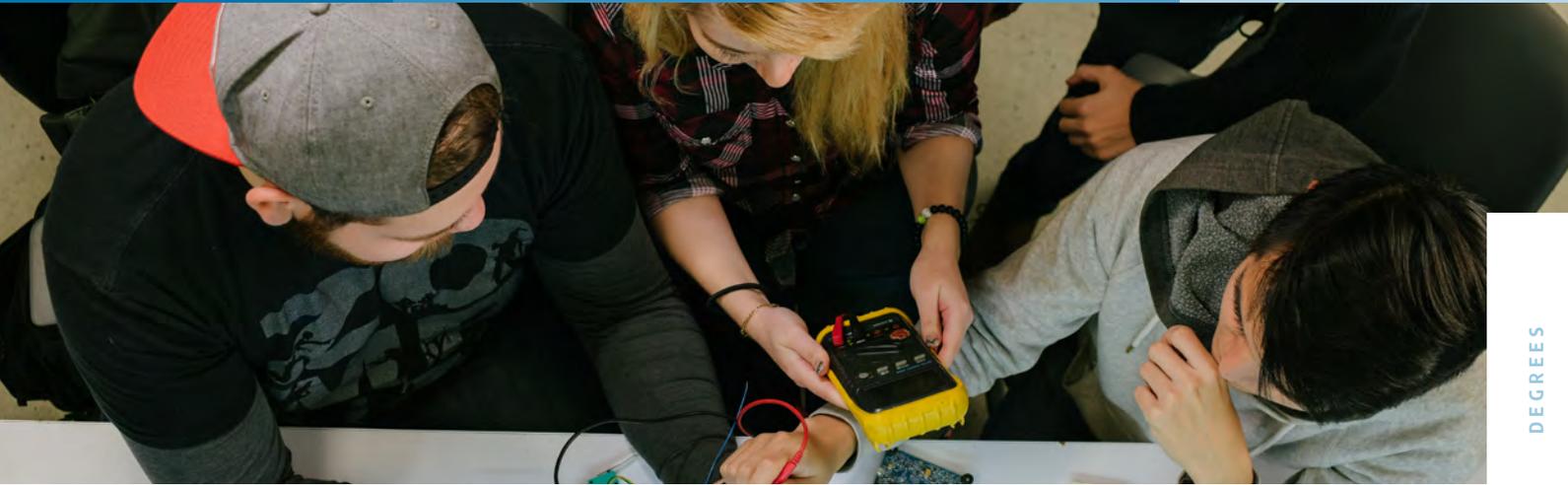
SEMESTER 3				SEMESTER 4					
Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Week 18	Elective Course Leadership, Entrepreneurship and Innovation	Tec Week	Elective Course Leadership, Entrepreneurship and Innovation	Week 18
Static Balance Analysis		Static Balance Analysis		Analysis of Electrical Circuits		Modeling Information in Construction		Cost Management	
Process Modeling Using Linear Algebra	Engineering Modeling Using Dynamic Systems	Engineering Modeling Using Dynamic Systems	Analysis of the Interaction of the Built Environment and the Environment	Evaluation of the Behavior of Materials In Structures	Analysis of the Behavior of Hydraulic Systems				
Exploration Topic	Design and Analysis of Experiments in Engineering Innovation	Introduction to Data Science Projects							

SEMESTER 5				CHOOSE YOUR CONCENTRATION
Elective Course Ethics and Citizenship	Tec Week	Elective Course Ethics and Citizenship	Tec Week	
Project Management		Management of Construction Operations		
Evaluation of the Behavior of Structural Systems	Design of Hydraulic Systems for the Sustainable Use of Water	Design of Roads for Development		

- General education course
- Exploration topic (CHALLENGE)
- Integrating disciplinary block (CHALLENGE)
- Area exploration courses
- Track integrating block (CHALLENGE)
- TEC Semester
- Introductory block (CHALLENGE)
- Disciplinary course
- Multidisciplinary professional elective (CHALLENGE)
- Area exploration block (CHALLENGE)
- Disciplinary block (CHALLENGE)
- Final integrating block (CHALLENGE)



- General education course
- Area exploration courses
- Introductory block (CHALLENGE)
- Area exploration block (CHALLENGE)
- Exploration topic (CHALLENGE)
- Track integrating block (CHALLENGE)
- Disciplinary course
- Disciplinary block (CHALLENGE)
- Integrating disciplinary block (CHALLENGE)
- TEC Semester
- Multidisciplinary professional elective (CHALLENGE)
- Final integrating block (CHALLENGE)



# IE

## B.S. IN ELECTRONICS ENGINEERING

### It all started with a chip

Even though it's not something we think about much, a surprising number of devices we use in our daily lives contain an electronic component: vehicles, smart phones, airplanes, robots. As an electronic engineer, you will be playing a key role in developing technologies that contribute to applying these innovations in more products, seeking to improve people's quality of life and increase the competitiveness of organizations and companies.

### Electronic Engineers will graduate from Tec de Monterrey with the following competencies:

- Develop smart electronic devices that meet quality, reliability and costing standards.
- Design telecommunications systems based on sustainable, efficient and reliable performance requirements.
- Develop efficient energy conversion and adaptation systems in the area of power electronics.



## WHICH SPECIALIZATIONS ARE AVAILABLE TO YOU?

The educational model enables you to personalize your graduate profile. During the specialization stage, consider a focus based on your post-graduation plans. Tec offers you the means to achieve this through diverse concentrations.

## CAREER FIELD

On graduating, you will be able to work in diverse areas of industry, such as:

- Development of smart electronic devices
- Design of telecommunications systems
- Consulting in electronics, telecommunications and energy systems
- Electronics, telecommunication and power electronics research centers

Consult the concentrations this degree offers:

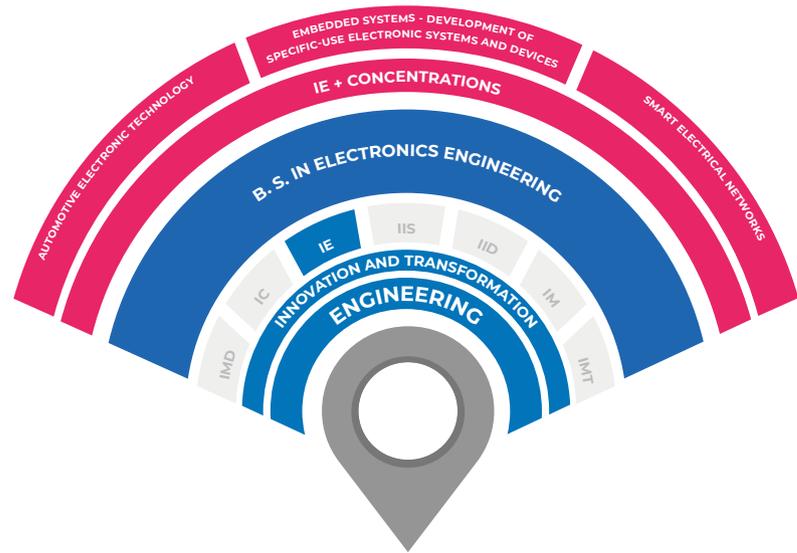


## IS THIS RIGHT FOR YOU?

If you like technology so much that you are one of those people who doesn't just use a device, but wants to know how it works in order to create new equipment later on, this could be the degree for you.

# CURRICULUM

## CHOOSE YOUR PATH



DEGREES

20

### What you need to know about each stage of your curriculum:

#### Exploration

1. You will open your competency file and add to it throughout your degree program.
2. You will learn the foundations of the area of Engineering - Innovation and Transformation.
3. You will participate in fundamental and exploration challenges from the area of Engineering - Innovation and Transformation, interacting with peers from different degree programs.
4. You will study general education courses, selecting them from a collection.
5. You will participate in a challenge that integrates all the competencies to be developed in this phase.

#### Focus

1. You will acquire the core competencies of your degree, in other words, those that distinguish it.
2. You will participate in more focused challenges to reinforce what you have learned and broaden your basic knowledge.
3. You will have the elements to decide whether to deepen your knowledge or diversify and, subsequently, build your specialization plan.
4. The Tec Weeks, challenges and overall university experiences will enrich your file.

#### Specialization

1. You have decided whether to diversify or delve further into your degree, by choosing a concentration, a modality, an internship stay, to mention just a few of your options.
2. You will develop the competencies related to your specialization, increasingly connected to your passions, interests and plans.
3. If you decided to opt for a concentration, on graduating you will obtain a professional concentration certificate.

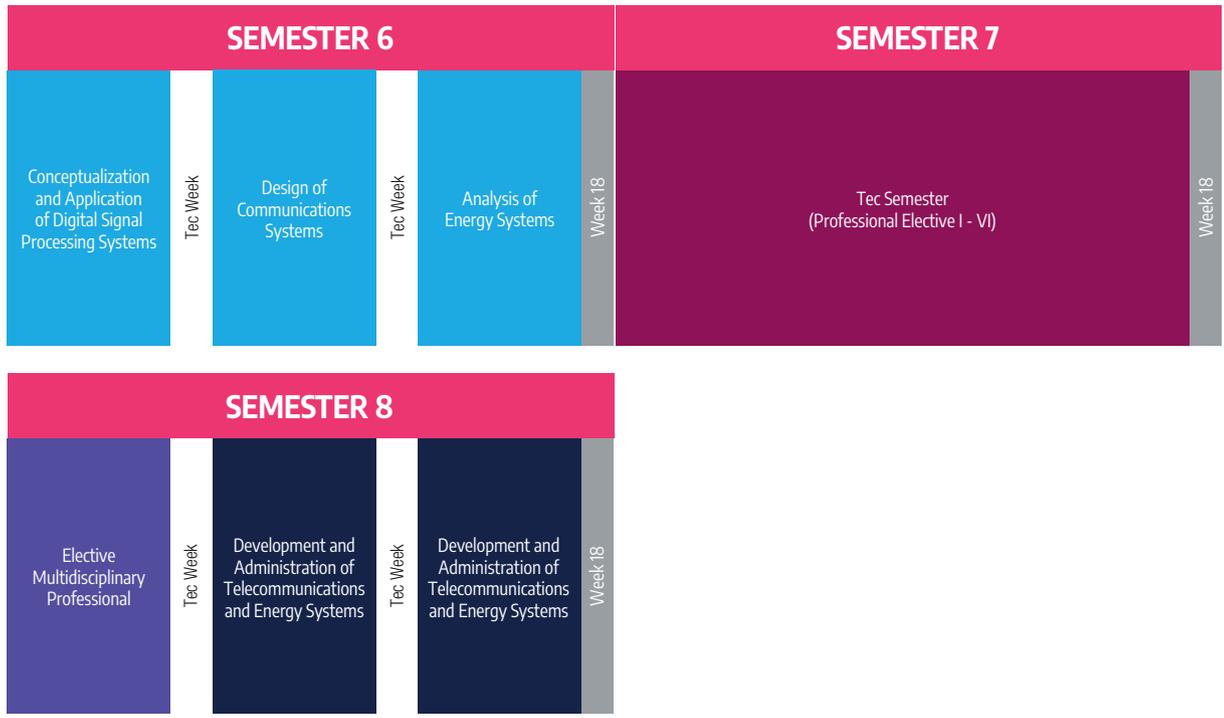


SEMESTER 1				SEMESTER 2				CHOOSE YOUR PROGRAM
Elective Course Mathematics and Science	Elective Course Mathematics and Science	Elective Course Mathematics and Science	Elective Course Humanities and Fine Arts	Elective Course Humanities and Fine Arts	Elective Course Humanities and Fine Arts	Elective Course Humanities and Fine Arts	Week 18	
Computational Thinking for Engineering	Computational Thinking for Engineering	Analysis of the Structure, Properties and Transformation of Matter	Intermediate Mathematical Modeling	Intermediate Mathematical Modeling	Matrix Modeling	Week 18		
Mathematical Thinking I	Mathematical Thinking I	Modeling in Engineering with Conservation Laws	Physical Experimentation and Statistical Thinking	Chemical Experimentation and Statistical Thinking I	Statistic Analysis		Week 18	
Engineering and Science Modeling	Modeling the Movement in Engineering		Thermodynamic Modeling for Engineering	Modeling of Electrical Systems in Engineering	Modeling of Electromagnetic Systems in Engineering	Week 18		
Tec Week	Tec Week	Tec Week	Tec Week	Tec Week	Tec Week		Tec Week	

SEMESTER 3			SEMESTER 4			
Elective Course Social and Behavioral Sciences	Elective Course Social and Behavioral Sciences	Elective Course Social and Behavioral Sciences	Elective Course Leadership, Entrepreneurship and Innovation	Elective Course Leadership, Entrepreneurship and Innovation	Elective Course Leadership, Entrepreneurship and Innovation	Week 18
Static Balance Analysis	Static Balance Analysis	Analysis of Electrical Circuits	Analysis of Electrical Circuits and Alternating Current	Analysis of Logical Systems and Digital Circuits	Foundation of Solid State and Optoelectronics Physics	
Process Modeling Using Linear Algebra	Engineering Modeling Using Dynamic Systems	Engineering Modeling Using Dynamic Systems	Application of Electromagnetic Theory	Evaluation of Electrical Circuits	Application of Electronic Devices	Week 18
Exploration Topic	Design and Analysis of Experiments in Engineering Innovation	Introduction to Data Science Projects				

SEMESTER 5			CHOOSE YOUR CONCENTRATION	
Elective Course Ethics and Citizenship	Elective Course Ethics and Citizenship	Elective Course Ethics and Citizenship		Week 18
Analysis of Signals and Systems	Design of Electronic Circuits	Development of digital systems		
Design Based on Microcontrollers and Computational Architecture	Evaluation of Electronic Devices	Foundation of Electronic Control Systems and Devices		Week 18
Tec Week	Tec Week	Tec Week		

- General education course
- Exploration topic (CHALLENGE)
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- General education course
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# IIS

## B.S. IN INDUSTRIAL ENGINEERING WITH MINOR IN SYSTEMS ENGINEERING

### Engineering Strategy

The improvement, optimization and innovation of organizational processes and systems facilitate competitiveness in a globalized, dynamic environment. As an Industrial and Systems Engineer, you will apply an integral approach to manage projects and processes for change that will increase quality and productivity using mathematical modeling, data analytics and information technologies to make the best decisions.

**Industrial and Systems Engineers will graduate from Tec de Monterrey with the following competencies:**

- Innovate organizational processes with a systemic, sustainable vision.
- Generate comprehensive solutions to complex problems by applying systemic vision and participative approach methodologies.
- Manage multidisciplinary projects, integrating technical, financial and market aspects in line with organizational objectives.
- Make comprehensive decisions in processes with abundant data, using advanced statistics tools.
- Enhance the competitiveness of key organizational systems and processes, implementing quality, productivity and optimization methodologies.

## WHICH SPECIALIZATIONS ARE AVAILABLE TO YOU?

The educational model enables you to personalize your graduate profile. During the specialization stage, consider a focus based on your post-graduation plans. Tec offers you the means to achieve this through diverse concentrations.

## CAREER FIELD

Thanks to the integral preparation you will receive in this degree, on graduating you will be able to work in different types of organizations and productive sectors in areas and topics such as:

- Logistics, quality and manufacturing
- Consulting and processes of change
- Improvement project management
- Strategic planning and decision making using data analysis and information technologies

## IS THIS RIGHT FOR YOU?

If you want to generate solutions that will add value in organizations by integrating processes, people and the use of technologies, this is the degree for you.

Consult the concentrations this degree offers:

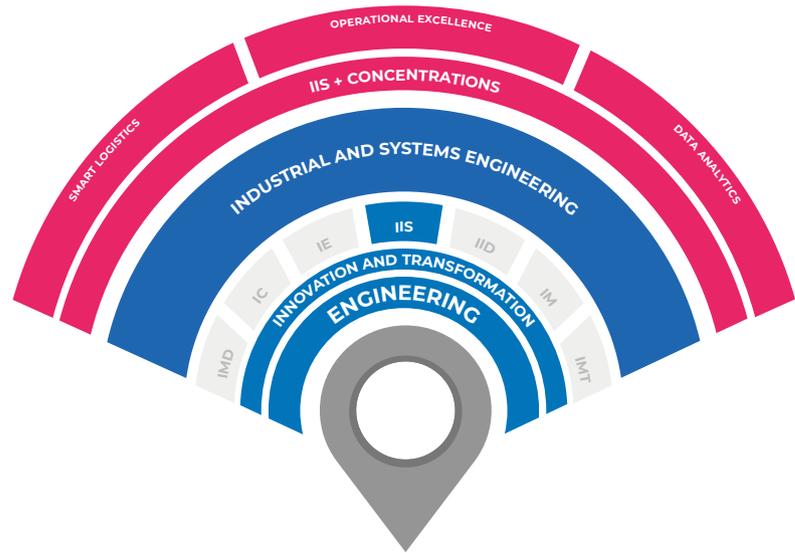


[tec.mx/iis](https://tec.mx/iis)



# CURRICULUM

## CHOOSE YOUR PATH



DEGREES

25

### What you need to know about each stage of your curriculum:

#### Exploration

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SEMESTER 1				SEMESTER 2				CHOOSE YOUR PROGRAM		
Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Week 18	Elective Course Humanities and Fine Arts	Tec Week		Elective Course Humanities and Fine Arts	Week 18
Computational Thinking for Engineering		Computational Thinking for Engineering		Analysis of the Structure, Properties and Transformation of Matter		Intermediate Mathematical Modeling			Intermediate Mathematical Modeling	
Mathematical Thinking I	Mathematical Thinking I	Modeling the Movement in Engineering	Modeling in Engineering with Conservation Laws	Physical Experimentation and Statistical Thinking	Chemical Experimentation and Statistical Thinking I	Statistical Analysis	Modeling of Electrical Systems in Engineering		Modeling of Electromagnetic Systems in Engineering	
Engineering and Science Modeling				Thermodynamic Modeling for Engineering	Modeling of Electrical Systems in Engineering					

SEMESTER 3				SEMESTER 4					
Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Week 18	Elective Course Leadership, Entrepreneurship and Innovation	Tec Week	Elective Course Leadership, Entrepreneurship and Innovation	Week 18
Static Balance Analysis		Static Balance Analysis		Analysis of Electrical Circuits		Statistical Data Analysis		Design of Cyberphysical Systems	
Process Modeling Using Linear Algebra	Engineering Modeling Using Dynamic Systems	Engineering Modeling Using Dynamic Systems	Introduction to Data Science Projects	Implementation of the Systemic Vision in the Development of a Project	Improvement of an Organizational Process with Statistical Methods	Conceptualization of Processes with Innovative Approach			
Exploration Topic	Design and Analysis of Experiments in Engineering Innovation								

SEMESTER 5				CHOOSE YOUR CONCENTRATION	
Elective Course Ethics and Citizenship	Tec Week	Elective Course Ethics and Citizenship	Tec Week		CHOOSE YOUR CONCENTRATION
Visualization of Data for Decision Making		Optimization of Organizational Processes			
Generation of Value with Data Analytics	Organizational Competitiveness Evaluation	Analysis of the Viability of Projects from a Systemic Perspective			

- General education course
- Exploration topic (CHALLENGE)
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- Introductory block (CHALLENGE)
- Disciplinary course
- Multidisciplinary professional elective (CHALLENGE)
- Area exploration block (CHALLENGE)
- Disciplinary block (CHALLENGE)
- Final integrating block (CHALLENGE)



- General education course
- Exploration topic (CHALLENGE)
- Integrating disciplinary block (CHALLENGE)
- Area exploration courses
- Track integrating block (CHALLENGE)
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- Introductory block (CHALLENGE)
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# IID

## B.S. IN INNOVATION AND DEVELOPMENT ENGINEERING

### Transform your vision, expand your design and creativity

Communities and organizations urgently need techniques and processes for improving and/or reinventing their products, services and business models. As an Innovation and Development Engineer, you will systematically capitalize not only new technologies in an area of engineering concentrations, but also your understanding of human experience and need, as a source of innovation for new technology-based products and solutions, thereby improving the quality of life of people and of the systems in which you participate.

**Innovation and Development Engineers will graduate from Tec de Monterrey with the following competencies:**

- Identify innovation opportunities through the systematic questioning of the ways of creating value.
- Create technology-based solutions using systemic and interdisciplinary innovation methodologies.
- Develop innovation ecosystems by creating synergy between the value chain processes and resources.
- Design new technology-based business models using state-of-the-art analytical and methodological tools.
- Manage technology-transfer processes applying the best methodologies and practices.
- Manage innovation portfolios, programs and project in keeping with the organizational strategy.

## WHICH SPECIALIZATIONS ARE AVAILABLE TO YOU?

The educational model enables you to personalize your graduate profile. During the specialization stage, consider a focus based on your post-graduation plans. Tec offers you the means to achieve this through diverse concentrations.

## CAREER FIELD

Thanks to the integral preparation you will receive in this degree, on graduating you will be able to work in diverse settings, such as:

- Innovation-oriented firms
- Creation and development of new technology-based products and services
- Design of new business models for technology-based companies
- Interdisciplinary and technology-transfer innovation projects
- Research centers and consulting

Consult the concentrations this degree offers:



[tec.mx/iid](https://tec.mx/iid)

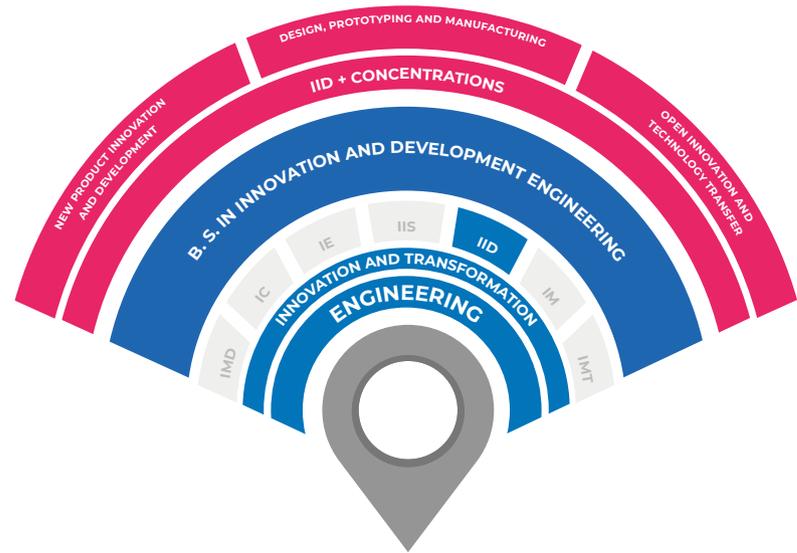
## IS THIS RIGHT FOR YOU?

If you are drawn to the different branches of Engineering and are constantly looking for solutions to different problems, you're in the right place.



# CURRICULUM

## CHOOSE YOUR PATH



DEGREES

30

### What you need to know about each stage of your curriculum:

#### Exploration

1. You will open your competency file and add to it throughout your degree program.
2. You will learn the foundations of the area of Engineering - Innovation and Transformation.
3. You will participate in fundamental and exploration challenges from the area of Engineering - Innovation and Transformation, interacting with peers from different degree programs.
4. You will study general education courses, selecting them from a collection.
5. You will participate in a challenge that integrates all the competencies to be developed in this phase.

#### Focus

1. You will acquire the core competencies of your degree, in other words, those that distinguish it.
2. You will participate in more focused challenges to reinforce what you have learned and broaden your basic knowledge.
3. You will have the elements to decide whether to deepen your knowledge or diversify and, subsequently, build your specialization plan.
4. The Tec Weeks, challenges and overall university experiences will enrich your file.

#### Specialization

1. You have decided whether to diversify or delve further into your degree, by choosing a concentration, a modality, an internship stay, to mention just a few of your options.
2. You will develop the competencies related to your specialization, increasingly connected to your passions, interests and plans.
3. If you decided to opt for a concentration, on graduating you will obtain a professional concentration certificate.

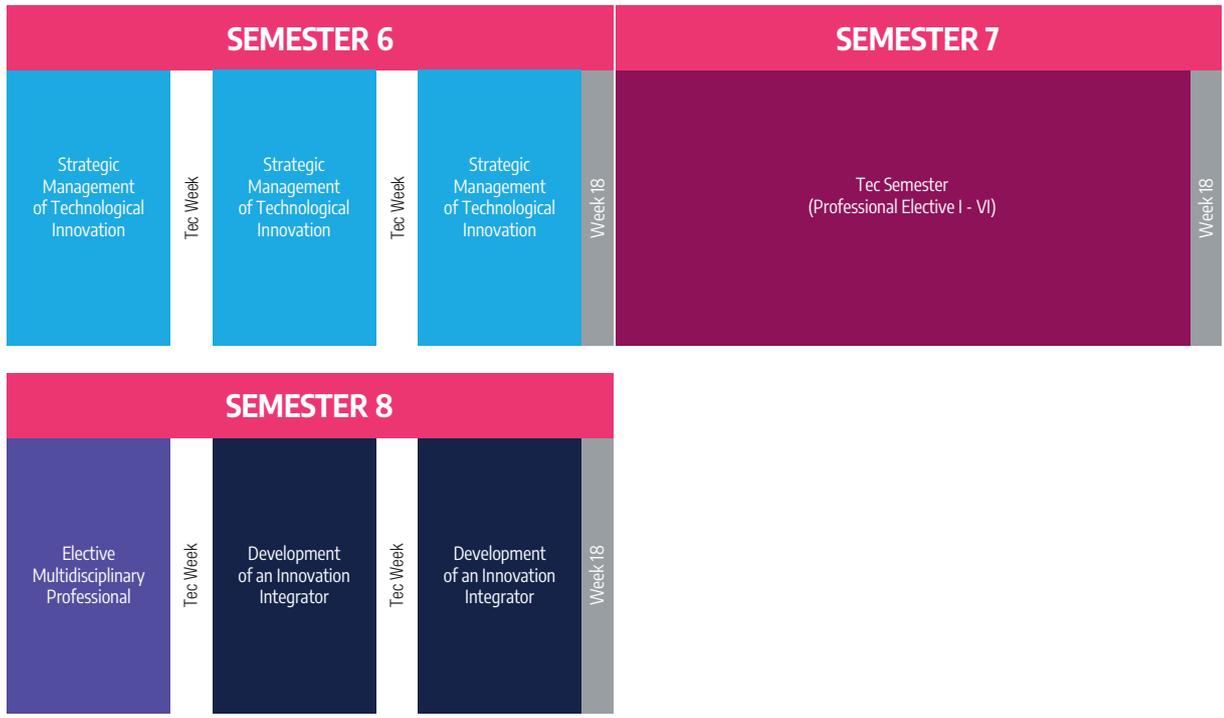


SEMESTER 1				SEMESTER 2				CHOOSE YOUR PROGRAM		
Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Week 18	Elective Course Humanities and Fine Arts	Tec Week		Elective Course Humanities and Fine Arts	Week 18
Computational Thinking for Engineering		Computational Thinking for Engineering		Analysis of the Structure, Properties and Transformation of Matter		Intermediate Mathematical Modeling			Intermediate Mathematical Modeling	
Mathematical Thinking I	Mathematical Thinking I	Mathematical Thinking I	Physical Experimentation and Statistical Thinking	Chemical Experimentation and Statistical Thinking I	Statistic Analysis					
Engineering and Science Modeling	Modeling the Movement in Engineering	Modeling in Engineering with Conservation Laws	Thermodynamic Modeling for Engineering	Modeling of Electrical Systems in Engineering	Modeling of Electromagnetic Systems in Engineering					

SEMESTER 3				SEMESTER 4					
Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Week 18	Elective Course Leadership, Entrepreneurship and Innovation	Tec Week	Elective Course Leadership, Entrepreneurship and Innovation	Week 18
Static Balance Analysis		Static Balance Analysis		Analysis of Electrical Circuits		Engineering Concentration Elective I		Engineering Concentration Elective II	
Process Modeling Using Linear Algebra	Engineering Modeling Using Dynamic Systems	Engineering Modeling Using Dynamic Systems	Desing and Creation of Innovative Solutions	Desing and Creation of Innovative Solutions	Desing and Creation of Innovative Solutions				
Exploration Topic	Design and Analysis of Experiments in Engineering Innovation	Introduction to Data Science Projects	Desing and Creation of Innovative Solutions	Desing and Creation of Innovative Solutions	Desing and Creation of Innovative Solutions				

SEMESTER 5				CHOOSE YOUR CONCENTRATION	
Elective Course Ethics and Citizenship	Tec Week	Elective Course Ethics and Citizenship	Tec Week		Week 18
Engineering Concentration Elective III		Engineering Concentration Elective IV			
Design and Evaluation of Technological Ventures	Design and Evaluation of Technological Ventures	Design and Evaluation of Technological Ventures			

- General education course
- Exploration topic (CHALLENGE)
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- General education course
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- Introductory block (CHALLENGE)
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- Track integrating block (CHALLENGE)
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- Multidisciplinary professional elective (CHALLENGE)
- Final integrating block (CHALLENGE)



# IM

## B.S. IN MECHANICAL ENGINEERING

### Realizing the construction of great designs

Mechanical engineering is as fundamental today as it was when man went to the moon, and the need for professionals in this field has by no means diminished. As a Mechanical Engineer, you will optimize system design, operation and maintenance, manufacturing integration, and production process management, opening up new horizons for product creation to facilitate the daily lives of human beings.

### Mechanical engineers will graduate from Tec de Monterrey with the following competencies:

- Develop electromechanical products or systems according to application requirements.
- Develop manufacturing processes by integrating management, productivity quality, costs and current legislation aspects.
- Design electromechanical maintenance schemes, integrating restrictions and current legislation.
- Analyze faults using mechanical engineering principles and tools, and current legislation, in order to establish improvement actions.
- Develop mechanical energy transformation and generation systems considering thermofluidic and electrical aspects.
- Manage mechanical engineering projects from a multidisciplinary perspective, applying requirement-relevant methodologies.

## WHICH SPECIALIZATIONS ARE AVAILABLE TO YOU?

The educational model enables you to personalize your graduate profile. During the specialization stage, consider a focus based on your post-graduation plans. Tec offers you the means to achieve this through diverse concentrations.

## CAREER FIELD

On graduating, you will be able to work in diverse areas of industry, such as:

- Assembly and production in the automotive industry
- Design and manufacturing in the aeronautics industry
- Metal-mechanic industry
- Development of domestic appliances
- Research and technological development centers
- Design and engineering centers

Consult the concentrations this degree offers:



[tec.mx/im](https://tec.mx/im)

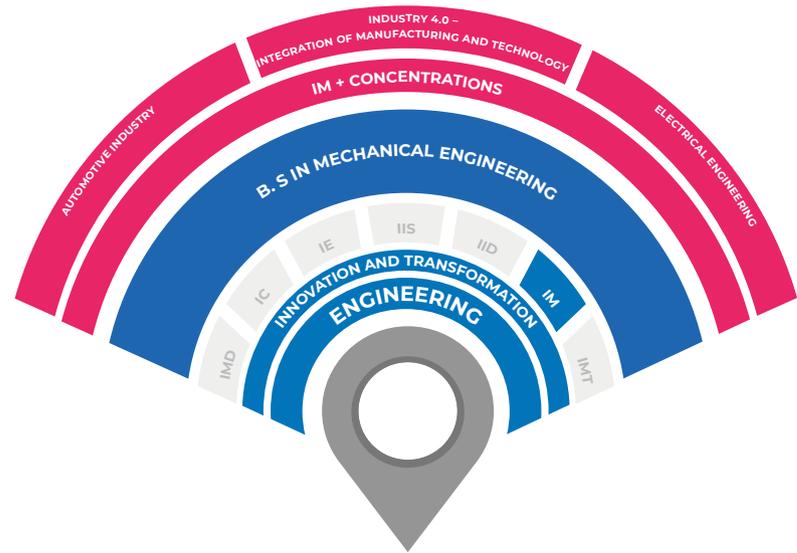
## IS THIS RIGHT FOR YOU?

If you enjoy mathematics and physics, are proactive and also enjoy finding out how things work, you're in the right place.



# CURRICULUM

## CHOOSE YOUR PATH



DEGREES

35

### What you need to know about each stage of your curriculum:

#### Exploration

1. You will open your competency file and add to it throughout your degree program.
2. You will learn the foundations of the area of Engineering - Innovation and Transformation.
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4. You will study general education courses, selecting them from a collection.
5. You will participate in a challenge that integrates all the competencies to be developed in this phase.

#### Focus

1. You will acquire the core competencies of your degree, in other words, those that distinguish it.
2. You will participate in more focused challenges to reinforce what you have learned and broaden your basic knowledge.
3. You will have the elements to decide whether to deepen your knowledge or diversify and, subsequently, build your specialization plan.
4. The Tec Weeks, challenges and overall university experiences will enrich your file.

#### Specialization

1. You have decided whether to diversify or delve further into your degree, by choosing a concentration, a modality, an internship stay, to mention just a few of your options.
2. You will develop the competencies related to your specialization, increasingly connected to your passions, interests and plans.
3. If you decided to opt for a concentration, on graduating you will obtain a professional concentration certificate.

SEMESTER 1				SEMESTER 2				CHOOSE YOUR PROGRAM		
Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Week 18	Elective Course Humanities and Fine Arts	Tec Week		Elective Course Humanities and Fine Arts	Week 18
Computational Thinking for Engineering		Computational Thinking for Engineering		Analysis of the Structure, Properties and Transformation of Matter		Intermediate Mathematical Modeling			Intermediate Mathematical Modeling	
Mathematical Thinking I	Mathematical Thinking I		Physical Experimentation and Statistical Thinking	Chemical Experimentation and Statistical Thinking I	Statistic Analysis					
Engineering and Science Modeling	Modeling the Movement in Engineering	Modeling in Engineering with Conservation Laws	Thermodynamic Modeling for Engineering	Modeling of Electrical Systems in Engineering	Modeling of Electromagnetic Systems in Engineering					

SEMESTER 3				SEMESTER 4					
Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Week 18	Elective Course Leadership, Entrepreneurship and Innovation	Tec Week	Elective Course Leadership, Entrepreneurship and Innovation	Week 18
Static Balance Analysis		Static Balance Analysis		Analysis of Electrical Circuits		Analysis of Stresses and Deformations		Analysis of the Movement of Rigid Bodies	
Process Modeling Using Linear Algebra	Engineering Modeling Using Dynamic Systems	Engineering Modeling Using Dynamic Systems	Design of Products Subjected to Static Charges	Design of Products Subjected to Static Charges	Dynamic Design				
Exploration Topic	Design and Analysis of Experiments in Engineering Innovation	Introduction to Data Science Projects							

SEMESTER 5				CHOOSE YOUR CONCENTRATION	
Elective Course Ethics and Citizenship	Tec Week	Elective Course Ethics and Citizenship	Tec Week		CHOOSE YOUR CONCENTRATION
Fundamentals of the Fluid Mechanics		Analysis of Energy Transformation Processes			
Design of Mechanisms	Design of Mechanisms	Design of Thermofluidic Systems			

- General education course
- Exploration topic (CHALLENGE)
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# IMT

## B. S IN MECHATRONICS ENGINEERING

### Autonomy empowers

Mechatronics combines different disciplines, transforming graduates from this program into experts in the design and creation of products and processes in a wide range of areas, including robotics, production lines, automated systems, and medical, automotive and aerospace devices, among others.

**Mechatronics engineers will graduate from Tec de Monterrey with the following competencies:**

- Integrate mechanical, electronic, control and software components, complying with functional, financial and security requirements.
- Design cutting-edge mechatronic systems, addressing technological needs in diverse settings.
- Automate systems and processes, complying with performance criteria and current legislation.
- Formulate mechatronic system proposals, meeting specifications.

## WHICH SPECIALIZATIONS ARE AVAILABLE TO YOU?

The educational model enables you to personalize your graduate profile. During the specialization stage, consider a focus based on your post-graduation plans. Tec offers you the means to achieve this through diverse concentrations.

## CAREER FIELD

On graduating, you will be able to work in diverse areas of an organization, such as:

- Automated production systems (e.g. automotive, aerospace, manufacturing, petrochemical, agricultural, pharmaceutical sectors, among others)
- Development and application of emergent technologies (e.g. 3D printing, drones, autonomous vehicles, robots and exoskeletons)
- Technology research and development centers
- Specialized consulting

Consult the concentrations this degree offers:



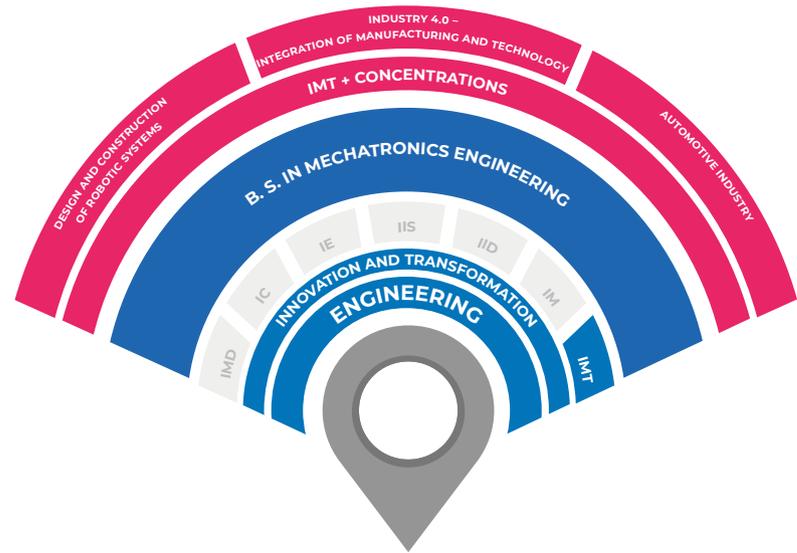
## IS THIS RIGHT FOR YOU?

If you like to combine different disciplines and techniques and are interested in inventing innovative, efficient products, you're in the right place.



# CURRICULUM

## CHOOSE YOUR PATH



DEGREES

40

### What you need to know about each stage of your curriculum:

#### Exploration

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#### Focus

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SEMESTER 1				SEMESTER 2				CHOOSE YOUR PROGRAM		
Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Tec Week	Elective Course Mathematics and Science	Week 18	Elective Course Humanities and Fine Arts	Tec Week		Elective Course Humanities and Fine Arts	Week 18
Computational Thinking for Engineering		Computational Thinking for Engineering		Analysis of the Structure, Properties and Transformation of Matter		Intermediate Mathematical Modeling			Intermediate Mathematical Modeling	
Mathematical Thinking I	Mathematical Thinking I	Modeling the Movement in Engineering	Modeling in Engineering with Conservation Laws	Physical Experimentation and Statistical Thinking	Thermodynamic Modeling for Engineering	Chemical Experimentation and Statistical Thinking I	Modeling of Electrical Systems in Engineering		Statistic Analysis	Modeling of Electromagnetic Systems in Engineering
Engineering and Science Modeling										

SEMESTER 3				SEMESTER 4					
Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Tec Week	Elective Course Social and Behavioral Sciences	Week 18	Elective Course Leadership, Entrepreneurship and Innovation	Tec Week	Elective Course Leadership, Entrepreneurship and Innovation	Week 18
Static Balance Analysis		Static Balance Analysis		Analysis of Electrical Circuits		Analysis of Elements of Mechatronics		Analysis of Mechanisms	
Process Modeling Using Linear Algebra	Engineering Modeling Using Dynamic Systems	Engineering Modeling Using Dynamic Systems	Introduction to Data Science Projects	Mechatronic Integration	Analysis of Materials and Manufacturing	Implementation of Mechatronic Systems			
Exploration Topic	Design and Analysis of Experiments in Engineering Innovation								

SEMESTER 5				CHOOSE YOUR CONCENTRATION
Elective Course Ethics and Citizenship	Tec Week	Elective Course Ethics and Citizenship	Tec Week	
Mechatronic Design		Design of Control Systems		
Troubleshooting Processes	Industrial Automation	Industrial Automation		

- General education course
- Exploration topic (CHALLENGE)
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# ENGINEERING

## INNOVATION AND TRANSFORMATION

With the Engineering entry, you have the option of moving throughout your undergraduate studies to the campus that offers the specialization you would like to pursue.

	Entry Campuses for the area of <b>ENGINEERING</b>	Campuses where you can enter and graduate from the corresponding degrees						
		IMD	IC	IE	IIS	IID	IM	IMT
Aguascalientes	●				●			●
Chiapas	●							
Chihuahua	●				●		●	●
Ciudad de México	●	●		●	●	●	●	●
Ciudad Juárez	●							
Cuernavaca	●				●			●
Estado de México	●		●	●	●	●	●	●
Guadalajara	●	●	●	●	●	●	●	●
Hidalgo	●				●			
Irapuato	●							
Laguna	●				●			●
León	●				●			●
Monterrey	●	●	●	●	●	●	●	●
Morelia	●				●			●
Obregón	●							
Puebla	●		●		●		●	●
Querétaro	●		●		●	●	●	●
Saltillo	●				●			●
San Luis Potosí	●				●		●	●
Santa Fe	●		●		●	●	●	●
Sinaloa	●				●			
Sonora Norte	●				●	●		●
Tampico	●				●			●
Toluca	●				●		●	●
Zacatecas	●							

# UNLEASH YOUR POTENTIAL TO TRANSFORM

At Tecnológico de Monterrey we're looking for students willing to be better for the benefit of others, people with the humility and courage to challenge paradigms, with the ambition to improve, who embrace the most advanced technical knowledge, and with an ethical and humanistic profile, who dare to go forward, more willing to be than to have.

For further information on the degrees from the area of Engineering - Innovation and Transformation, go to

