DCI

Ph. D. in Engineering Sciences

(Edition 2018)

First Semester

Code	Name	CL	L	U	CA
GI5017	Assisted Research I	3	0	12	3
GI5018	Assisted Research II	3	0	12	3
GI6035	Integrated Exam	1.5	0	6	1.5
GI6041	Research Seminar I	1	0	2	.5
GI6051	Research Workshop I	1	0	4	1
		9.5	0	36	9

Second Semester

Code	Name	CL	L	U	CA
GI5011	Research Proposal I	3	0	12	3
GI5012	Research Proposal II	3	0	12	3
GI6036	Research Proposal Defense	1.5	0	6	1.5
GI6042	Research Seminar II	1	0	2	.5
GI6052	Research Workshop II	1	0	4	1
		9.5	0	36	9

Third Semester

Code	Name	CL	L	U	CA
GI6021	Doctoral Research I	3	0	12	3
GI6022	Doctoral Research II	3	0	12	3
GI6037	Research Integration I	1.5	0	6	1.5
GI6043	Research Seminar III	1	0	2	.5
GI6053	Research Workshop III	1	0	4	1
		9.5	0	36	9

Fourth Semester

Code	Name	CL	L	U	CA
GI6023	Doctoral Research III	3	0	12	3
GI6024	Doctoral Research IV	3	0	12	3
GI6044	Research Seminar IV	1	0	2	.5
GI6054	Research Workshop IV	1	0	4	1
GI6061	Scientific Product I	1.5	0	6	1.5
		9.5	0	36	9

Fifth Semester

Code	Name	CL	L	U	CA
GI6025	Doctoral Research V	3	0	12	3
GI6026	Doctoral Research VI	3	0	12	3
GI6038	Research Integration II	1.5	0	6	1.5
GI6045	Research Seminar V	1	0	2	.5
GI6055	Research Workshop V	1	0	4	1
		9.5	0	36	9

Sixth Semester

Code	Name	CL	L	U	CA	UDC
GI6027	Doctoral Research VII	3	0	12	3	
GI6028	Doctoral Research VIII	3	0	12	3	
GI6046	Research Seminar VI	1	0	2	.5	0
GI6056	Research Workshop VI	1	0	4	1	
GI6062	Scientific Product II	1.5	0	6	1.5	
		9.5	0	36	9	0

Seventh Semester

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

Eighth Semester

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

Academic credits

CL The letter "CL" indicates the number of class-hours per week.

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

U The letter "U" represents the equivalent time in courses lasting 15 weeks (semester) and 12 weeks (trimester), of weekly work that the student dedicates to the course to meet its objectives. They include the "class hours", as well as the time dedicated to the student's independent work.

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

UDC Load Units

This Ph.D. program has as requirement a master degree program.

Program Outcomes

Program objectives
The objectives of this program are to prepare independent researchers with the capacities, knowledge and skills to:
-- Identify opportunities, and create and manage original research projects at the frontier of knowledge.
-- Disseminate research findings.
-- Apply the knowledge generated for the country's technological development.
-- Conduct high-impact research on engineering in the country's productive, education-academic and social sectors.

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

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

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

Area of specialization
DCI is, by nature, a multidisciplinary environment, covering four areas of knowledge that have been selected from among the strongest lines of research in the School of Engineering and Science. These areas interact with each other through projects, centers and focus groups.

The areas of knowledge serve as a melting pot for the definition of the DCI Program lines of research:

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

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

- Industrial Engineering (II)
Industrial Engineering is related to growing global competitiveness and represents one of the greatest challenges for every country, in particular the institutions and enterprises that will have to face an ongoing process of increased productivity, the efficient use of resources and the generation of value to address rising competition. Research at the frontier of knowledge of the Lines of Knowledge Generation 160 and Application of Industrial Engineering contributes to the search, development and implementation of new ways of operating and improving operating and administrative processes, particularly through the development of new, innovative decision-making models.

- Telecommunications (T)
Telecommunications help to solve fundamental problems in networks and systems that transport data and make it possible to design platforms that drive the digital industry of the future and technologies, such as IoT, Smart Cities, Intelligent Transportation Systems (ITS), smart-grid, Big-Data, e-health, 5G, cognitive radio, white spaces, location systems and sensors, to improve the quality of life of 21st-century

society. Research is conducted to optimize and stochastically model key understanding of fundamental performance in the areas of wireless communications and networks, signal and data processing, the convergence of optical communications networks and wireless networks, vehicular communications, photonic crystals, aspects of physical layer levels, connectivity, modulation, reconfigurable network architecture, sensors and their applications.

Campus that offer this program

Campus	Number of periods offered	From	Closed for new students
Ciudad de México	Complete	Semester Aug - Dec 2018	
Estado de México	Complete	Semester Aug - Dec 2018	Semester Feb - Jun 2023
Guadalajara	Complete	Semester Feb - Jun 2023	
Monterrey	Complete	Semester Aug - Dec 2018	
Puebla	Complete	Semester Feb - Jun 2023	
Querétaro	Complete	Semester Feb - Jun 2023	

Last update: 24/January/2023

Graduate Requirements

To obtain a specialty degree, a master's degree or Ph. D. degree at Tecnológico de Monterrey, students are required to:

1. Have completely finished the undergraduate cycle prior to passing the first course in the curriculum of the specialty, master program, medical residency, or doctoral program.

2. Have fulfilled, in compliance with existing standards, the academic prerequisites of the corresponding program, through proficiency tests or the corresponding remedial courses.

3. Have obtained a bachelor degree--with the antecedent of high school or its equivalent—that is equivalent to those offered by Tecnológico de Monterrey.

4. Have covered all the courses in the given curriculum, either by passing the courses at Tecnológico de Monterrey or by obtaining revalidation or equivalence agreements—in compliance with the standards-- corresponding to part of the courses taken at other institutions, and passed the remaining courses at Tecnológico de Monterrey. Courses taken at foreign universities with which there are agreements are considered, for the effects of this article, as courses taken at Tecnológico de Monterrey, as long as they do not exceed a set percentage of the curriculum established by each graduate program.

5. In those curricula that so specify, to have prepared a research project or thesis that, having been defended before an academic committee, has been approved by said committee.

6. Have taken at least the equivalent of the second half of the corresponding curriculum at Tecnológico de Monterrey , in the case of students with revalidation or equivalence agreements at this level. Flexibility may be exercised in this standard in graduate programs that, under agreement, may be established jointly with other universities.

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

(a) The first paper must be published in a Q1 or Q2 journal, in the corresponding area of study and Scopus category;

(b) The second paper must be published in a Q1, Q2 or Q3 journal.

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

Last update: 19/June/2019.

Previous update: 2/March/2016. Click here.