

# DBT

## Ph. D. in Biotechnology

(Edition 2011)

**First Semester**

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

**Second Semester**

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

**Third Semester**

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

**Fourth Semester**

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

**Fifth Semester**

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

Sixth Semester

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

Seventh Semester

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

Eighth Semester

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

Ninth Semester

<b>Code</b>	<b>Name</b>	<b>CL</b>	<b>L</b>	<b>U</b>	<b>CA</b>
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 an undergraduate degree program.

## **Program and Learning Outcomes**

### **General Program Objectives**

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

The findings of their discoveries are important outcomes which should be submitted for peer-reviewed and academic publication, patents or conference proceedings. This knowledge transference as well as all of their professional activities follows legal, ethical and official norms.

### **Learning Outcomes**

On completing the program, students will be able to:

- Understand the application of basic sciences and research methodology techniques on areas of cell biology, physiology, biochemistry and bioprocesses engineering.
- Use research skills including translational research, critical evaluation, laboratory safety and experimental planning.
- Design experiments from the identification of the problems to the interpretation of results.
- Analyze critically results and data with advanced statistics tools, such as bioinformatics and data mining.
- Communicate effectively orally and in writing with their peers: mentors, research community, society and grantsmanship.
- Make decisions with scientific judgment and critical thinking in their practice as researchers following legal, ethical and official government regulations.

### **Admission Profile**

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

Undergraduate or Master degree program in an area related to the research lines of the program.

### **Program Outcomes**

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The learning outcomes of this program are the following:

- Understand the application of basic sciences and research methodology techniques on areas of cell biology, physiology, biochemistry and bioprocesses engineering.
- Use research skills including translational research, critical evaluation, laboratory safety and experimental planning.
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Campus that offer this program

<b>Campus</b>	<b>Number of periods offered</b>	<b>From</b>	<b>Closed for new students</b>
<b>Guadalajara</b>	Complete	Semester Feb - Jun 2023	
<b>Monterrey</b>	Complete	Semester Aug - Dec 2011	
<b>Querétaro</b>	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.](#)