



Universidad Tecnológica
de Pereira

Faculty
of Technology

**Faculty of
Technology.**

INDUSTRIAL CHEMISTRY



SNIES code: 7943 - **High quality:** : Recognition to be awarded by the officials of the Ministry of Education in the near future.
Qualified register: : Resolution N° 07783, May 10/2018, valid for seven years.

Be a development leader of technological innovation

GENERAL INFORMATION



The Industrial Chemistry undergraduate program came into being from a decision made by the board of regents of the UTP in 2004 (Agreement 08 of the Superior Council of UTP April 12, 2004). Academic activities began the second semester of that year and, since then, the program has been recognized nationally and highlighted as one of high quality in the region. The name given to the program, Industrial Chemistry, stems from the fact that it is very different compared to the traditional programs on Chemistry mostly devoted to science itself instead of industrial concerns.

Teachers who belong to the faculty have reached high academic goals including masters, doctorate and post-doctorate degree. In the same way, a number of national and international teachers/researchers who work for other colleges abroad also support the training of our students.

In the matter of infrastructure, the program operates in a very well layed out building equipped with classrooms, teaching and research labs, and student lounges, in addition to the pieces of hardware needed to develop the skills of our undergraduate and graduate students.



Graduate degree:
Industrial Chemist



Semesters of study:
10



**Academic activities held in
a presence-based modality
along the daytime.**



Admission: Anual

PURPOSE :

To train our students in a way they can reach the highest standards of academic quality, dealing with chemistry from the standpoint of science as well as from the standpoint of the role it plays in the chemical and its industrial application. Our graduates will have skills regarding the being, knowing, doing, and living that allow them to play a key role in the continuous improvement of our society, regarding items such as quality of life, environment, entrepreneurship, and the like.

OBJECTIVES OF THE PROGRAM.

OB1. To train highly qualified professionals in the fields of the unit operations and processes which take place in the chemical industries.

OB2. To allow the students improve their abilities to analyze, direct, and control the different stages concerning physical, chemical, and biological processes.

OB3. To train industrial chemists in a way they act according to moral values, being aware of the dimension of the role they play in society.

OB4. To allow the students to gain the capacity to find and analyze pieces of technical information and to communicate them both orally and in writing using ICTS.

OB5. To facilitate the way in which the students can get ahead in the implementation of chemical processes that are sustainable and ecologically friendly under the principles of the green chemistry.

OB6. To promote the discussion among students of topics that have to do with education for freedom, autonomy, and the man searching for meaning, as a person with higher education and as a member of social group.

OB7. To develop formative processes designed to improve the recently taking part of people in environmental matters such as those dealing with the sustainability of our campus.

OB8. To set theoretical and practical bases for the students and other members of the academic community to be able to identify, analyze, process, and interpret pieces of information in a way that allows them to hold reasonable views in any decision-making process.

LEARNING RESULTS.:

LR1. To solve problems related to physical or chemical transformation of matter, taking into account theories and laws belonging to any of the branches of chemistry (organic, inorganic, analytical, physical chemistry and biochemistry) and exhibiting great care for the environment under the principles of green chemistry.

LR2. To recognize the different industrial processes involved in the transformation of matter from the viewpoint of both the physical and the chemical changes taking place from starting material to the final product. To understand the aspects comprised in the field of unit operations, energy and mass transfer and instrumentation and control of industrial processes.

LR3. To formulate, design, and conduct procedures or analytical methods to identify chemical compounds, using instrumental techniques and following the corresponding validation protocols.

LR4. To discuss, orally and in writing, based on scientific fundamentals, either the results obtained, or the conclusions arrived at, and handling these pieces of information ethically, given the fact that they are the product of the work of a committed group of people.

LR5. To classify the current, available information on the different branches of chemistry in order to conduct preliminary research methods of analysis, inquiry and synthesis of data in an area of interest using ICT'S.

LR6. To act based on the fact that being citizens of our country, all of us have rights and duties, added to the fact that as human beings we should be considerate and respectful when treating our fellow citizens.

LR7. To solve problems that arise in plant operations by applying scientific knowledge.

LR8. To be proficient in English as a second language.

LR9. To be proficient in a native language with a high expertise in oral, in reading and writing communication.

LR10. To be able to work with others exhibiting abilities to lead, negotiate, and communicate.

LR11. To recognize the need to gain new knowledge and to deepen in some portions of it; this considers the fact that learning is an everlasting process.

GRADUATE PROFILE



An industrial chemist who was done his/her undergraduate work at the Technological University of Pereira, is able to:



To make quality analyses of raw materials, intermediate products, and final products, following the guidelines prepared by international organizations in charge of quality management systems.



To take a key part in the tasks involved in the process of certification and in the process of making audits in the chemical sector of the economy.



To develop new processes and products as a result of research, planning and screening of alternatives, observing the environmental standards currently accepted.



To validate techniques and methodologies of analysis having to do with quality throughout the whole production chain.



To take a key part in the leading, running and control of the operations and processes in the chemical industries.



To propose and coordinate proper solutions to technical and pollution problems that arise in the chemical industries.

PROFESSIONAL PROFILE

Our industrial chemist is an integral professional that has a college training which makes it possible for him/her to hold a position in the chemical industries and research groups. The duties comprise evaluating, adapting, modifying, innovating, and controlling production processes as well as carrying out chemical analyses. That person is also involved in the technological development of the chemical industries and takes care of the environment as well as of another concerns related to quality, safety, and occupational health. In addition, this person is able to take part in processes designed to conceive new products and services, all of this under the premises of the sustainable development.

In order to achieve the above said, our industrial chemist has to develop the following abilities and skills and regain the following aptitudes:

Skills and abilities:

- **Mental abilities** including reasoning, analyzing, and synthesizing.
- **Problem solving** by means of the application of theoretical knowledge to abnormal situations encountered in practice.
- **Capacity** to manipulate the hardware employed in doing analytical work.
- **Knowing how to use international and national standards** in the established analyses for quality control.
- **Knowing and getting familiar** with the plants of the different branches of chemical industries.

- **Knowing the fundamentals** of laboratory management.
- Selecting, by means of previous studies, **the best methods of analysis.**

Aptitudes:





- Related to synthesis, in order to pick out of **something only what is useful and beneficial.**
- **Related to communication**, in order to express oneself, take suggestions and instructions into account, and transfer acquired knowledge to others.

Related to execution, in order to do numerical calculations, **to handle situations that are theoretical rather than practical** as well as the real, three-dimensional world.

CURRICULUM



Academic activities held in a presence-based modality along the daytime.

 Semester	 Code	 Subject	 Academic Credit
I	CB115	Mathematics I	5
	IS133	Computer Science I	2
	QI144	Stoichiometry	4
	QI175	Chemistry I	5
	BU101	Sports I	1
II	CB215	Mathematics II	5
	CB223	Linear algebra	3
	CB234	Physics I	4
	CB242	Laboratory of Physics I	2
	QI215	Chemistry II	5
III	CB314	Mathematics III	4
	CB334	Physics II	4
	CB342	Laboratory of Physics II	2
	QI325	Inorganic Chemistry	5
	BA172	Humanities I	2
IV	CB413	Mathematics IV	3
	QI452	Computer Science II	2
	CB434	Physics III	4
	CB442	Laboratory of Physics III	2
	QI465	Analytical Chemistry	5
	BA372	Humanities II	2
V	TQ573	Statistics	3
	TQ463	Physical Chemistry I	3
	TQ562	Laboratory of Physical Chemistry I	2
	QI543	Instrumental Analysis I	3
	QI535	Organic Chemistry I	5
	QI552	Management I	2

Semestre	Código	Asignatura	Crédito académico
VI	QI613	Material and Energy Balances	3
	QI623	Physical Chemistry II	3
	QI762	Laboratory of Physical Chemistry II	2
	QI642	Laboratory of Instrumental Analysis	2
	QI635	Organic Chemistry II	5
VII	QI652	Management II	3
	QI734	Fluids and Solids	4
	QI742	Instrumental Analysis II	2
	QI714	Organic Analysis	4
	QI725	Organic Chemistry III	5
VIII	QI752	Industrial Safety and Occupational Health	2
	QI811	Research Methodology	1
	QI823	Heat Transfer	3
	QI835	Instrumentation and Process Control	5
IX	QI844	Industrial Products	4
	QI990	Senior Project (Base)	8
	QI923	Mass Transfer	3
	QI96	Elective I (Base)	3
X	QI935	Biochemistry	5
	QI854	Environmental Chemistry	4
	BA451	Political Constitution	3
	QI10	Elective II (Base)	3
	BA662	Ethics and Deontology	2
TOTAL OF CREDITS: 167			

Group	Code	Subject	Academic credit
Electives Q196 Q110	QI023	Industrial Microbiology	3
	QI033	Food Technology	3
	QI043	Biotechnology	3
Senior project Base Q1990	TF0F8A	Specialized Seminar	8
	TF0F8B	Propaedeutic Formation	8
	QI998	Senior Project	8
	TF0FOC	Industrial Practice	8

MISSION AND VISION



MISSION OF THE FACULTY OF TECHNOLOGY.

The Faculty of Technology is one of the academic branches belonging to the Universidad Tecnológica de Pereira (Colombia, South America), UTP, committed to offer undergraduate as well as graduate studies of high quality, in order to contribute for both, technological betterment of our industries, and the reaching of higher levels of institutional leadership and drive. These goals are obtained by means of the cooperation with the cooperation of other schools and administrative offices of the University.

VISION OF THE FACULTY OF TECHNOLOGY.

Within five years the school will be a key place in our country concerning to the training and formation of students as well as the developing of new technologies at the national level.

FACULTY OF TECHNOLOGY



More information OF THE PROGRAM:



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Universidad Tecnológica de Pereira
Reacreditada Institucionalmente de Alta Calidad 2021-2031 - Resolución 9597 de 2021 del MEN
Certificada en Gestión de Calidad ISO 9001:2008 – Gestión Pública NTC GP 1000:2009
La Universidad y sus programas académicos son vigilados por el MEN acorde con la Resolución 12220 de 2016