



Universidad  
Tecnológica  
de Pereira

Faculty of Engineering

# Mechanical Engineering

SNIES CODE: 272

**Qualified Registry:**

Resolution N° 01280 / February 2 of 2015. Valid for 7 years

**Accreditation:**

Pending for the accreditation resolution CNA and ARCU-SUR



**Educate leaders in Mechanical Engineering through the development of analytical and research skills.**

**Includes the following areas: Machine design, Energy, Materials & Manufacturing and Processes control**

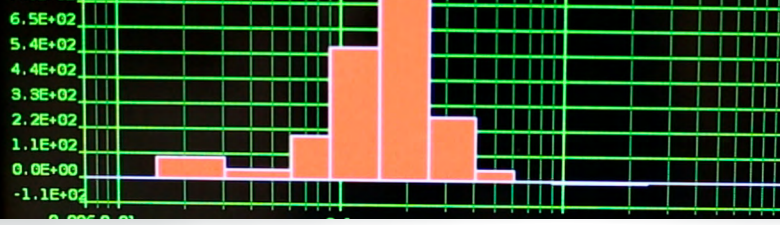
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**Pereira - Colombia**





# Mechanical Engineering

## General Information

The program began its academic activities in 1963, becoming one of the most experienced programs in the entire institution. We have a wide variety of specialized laboratories for our students in all the areas of mechanical engineering.

Our students have the possibility to belong to research groups, make publications of their topics of interest and create a relationship with the industry of the region.

<b>Degree:</b>	Bachelor in Mechanical Engineer
<b>Duration of the program:</b>	10 semesters
<b>SNIES Code:</b>	272
<b>Qualified registry:</b>	Resolution N ° 01280 / February 2 of 2015. Valid for 7 years
<b>Accreditation:</b>	Pending Resolution of accreditation CNA and ARCU-SUR. Peer visit made in May 2018.

## Program Objectives

The objectives of the Mechanical Engineering program are:

1. To prepare professionals with a solid background in concepts, logic, methods and disciplinary and professional theory.
2. To train professionals who act integrally, both in their professional practice and in their life, and who seek to develop their professional potential.
3. To train professionals in Mechanical Engineering with the relevant generic and disciplinary competences, in such a way that they allow them to perform with suitability in different contexts, under ethical and moral principles, with economic, social and environmental responsibility, promoting the sustainable development of the country and the community.

## Mission

Train engineers capable of solving mechanical engineering problems with responsibility and social impact, through the use of knowledge and technology.

## Vision

To be in the year 2025 a program of high academic quality, recognized and accredited nationally and internationally; integrated to the world of knowledge.

## What you require to study Mechanical Engineering

Who wants to study Mechanical Engineering must have the following characteristics:

- To have basic knowledge in physics and math.
- Reading comprehension, as well as ability to express orally and in writing.
- Capabilities of logical reasoning: analysis, synthesis and application of knowledge.
- Basic knowledge of the scientific method.
- Comprehension and application of information formulated in different languages: graphics, symbolic and computational.
- Basic level in reading comprehension of English.
- Provision for laboratory work with specialized instruments.
- Provision for self-learning that promotes their intellectual, emotional and social development.
- Positive attitude to face new situations, achieve improvements and solve problems.
- Availability to work in teams.
- Responsibility, respect, honesty and social solidarity.

## Training Profile

The mechanical engineer of the Technological University of Pereira is a competent person to:

- Use the appropriate principles of the basic sciences (mathematics, physics and natural sciences) and engineering to model, measure, analyze, conceive, design, implement, supervise, maintain and manage systems, processes and components, concerning the areas of design and construction of machines, energy and fluids, materials, manufacturing and dynamic systems and control.
- Identify, formulate and solve complex engineering problems, in particular regional and national problems within the framework of a global interaction

•Manage engineering projects, industrial processes, engineering services and human and physical resources, in multidisciplinary teams, communicating effectively in written, oral and graphic form.

•Investigate, plan and perform experiments, and analyze, evaluate and interpret results.

•Develop and learn to use new tools, techniques and technologies.

•Learn autonomously, personally and professionally, seeking continuous improvement and be a leader in their field of work.

•Take responsibility for their actions, as a subject of the social process.

All this, exhibiting a critical attitude, leadership, creativity, innovation, practical ingenuity, dynamism, professionalism and transforming spirit, to contribute as an agent of social transformation.

19. Manage the mechanical maintenance of machines and industrial equipment so that the processes are carried out with safety and quality, minimizing costs, stops and production times

20. Perform, analytically and by means of computational tools, the functional analysis of mechanical elements and systems

21. Design, model and simulate mechanical and structural elements and systems

22. Design and evaluate machines, installations and thermal and hydraulic networks

23. Select and implement industrial manufacturing processes, taking into account the raw material and industrial requirements, to meet the needs of society, with criteria of quality and economy

24. Select and integrate mechanical, electrical and electronic components that are required for basic applications of measurement, instrumentation and control of industrial equipment

25. Design, control and evaluate basic hydraulic and pneumatic automation systems

## Learning Outcomes

1. Identify and solve problems in the field of engineering
2. Abstract, analyze and synthesize engineering problems and concepts
3. Make decisions in different contexts related to the exercise of engineering
4. Design a system, component or process to meet the desired needs within realistic limitations
5. Design and conduct experiments, as well as analyze and interpret data
6. Work in disciplinary, interdisciplinary and multicultural teams in national and international contexts
7. Think and act critically
8. Demonstrate creativity through the solution of engineering problems
9. Recognize the need to learn and update permanently
10. Learn and work autonomously
11. Demonstrate leadership in the environment in which it develops professionally
12. Solve problems autonomously based on the procedures, laws and languages of the natural sciences and mathematics
13. Apply different humanistic aspects and general culture in the professional practice
14. Solve engineering problems through the rigorous use of research and innovation processes, numerical methods, computer science and statistics
15. Solve practical engineering problems considering environmental impacts and the sustainability of the solutions
16. Formulate and manage projects, resources and processes of the organization, using basic concepts of administration and applying the corresponding laws and codes
17. Communicate ideas properly orally and in writing in the native language and in a second language
18. Apply the principles of ethics, laws, standards and codes of engineering in professional practice responding with sustainable solutions to local and global needs

**Universidad Tecnológica de Pereira**  
**Reacreditada como Institución de Alta Calidad**  
**por el Ministerio de Educación Nacional**  
**2013 - 2021**





# Mechanical Engineering

## Curriculum

SEMESTER	COURSE	AC
<b>1º</b> Semester	<ul style="list-style-type: none"> <li>Mathematics I</li> <li>Introduction to mechanical engineering</li> <li>Fundamentals of Chemistry and Biology</li> <li>Oral and written communication</li> <li>Drawing I</li> </ul>	5 2 3 2 2
<b>2º</b> Semester	<ul style="list-style-type: none"> <li>Mathematics II</li> <li>Linear Algebra</li> <li>Physics I</li> <li>Lab of Physics I</li> <li>Drawing II</li> </ul>	5 3 4 2 2
<b>3º</b> Semester	<ul style="list-style-type: none"> <li>Mathematics III</li> <li>Statics</li> <li>Physics II</li> <li>Lab of Physics II</li> <li>Algorithm and Programming</li> <li>Introduction to Manufacturing</li> </ul>	4 3 4 2 3 2
<b>4º</b> Semester	<ul style="list-style-type: none"> <li>Mathematics IV</li> <li>Dynamics</li> <li>Physics III</li> <li>General Statistics</li> <li>Materials of engineering I</li> <li>Manufacturing I</li> </ul>	3 3 4 3 2 2
<b>5º</b> Semester	<ul style="list-style-type: none"> <li>Theory of Machines and Mechanisms</li> <li>Mechanics of materials I</li> <li>Thermodynamics I</li> <li>Drawing of Machines</li> <li>Materials of engineering II</li> <li>Manufacturing II</li> </ul>	4 3 3 3 2 2

AC Academic Credit

SEMESTER	COURSE	AC
<b>6º</b> Semester	<ul style="list-style-type: none"> <li>Mechanics of materials II</li> <li>Fluid mechanics</li> <li>Thermodynamics II</li> <li>Computational mechanics</li> <li>Lab of Materials</li> <li>Electricity and Electronics</li> <li>Integrative project I</li> </ul>	2 3 3 3 1 2 2
<b>7º</b> Semester	<ul style="list-style-type: none"> <li>Fundamentals of Mechanical Design</li> <li>Lab of Mechanics of materials</li> <li>Heat transfer</li> <li>Management</li> <li>Electromechanical Actuators</li> <li>Lab of Electricity and Electronics</li> </ul>	3 1 3 3 3 1
<b>8º</b> Semester	<ul style="list-style-type: none"> <li>Design of Mechanical Transmissions</li> <li>Hydraulic Machinery</li> <li>Formulation and Project Management</li> <li>Instrumentation and control</li> <li>Integrative project II</li> </ul>	3 3 3 4 2
<b>9º</b> Semester	<ul style="list-style-type: none"> <li>Final Project of career</li> <li>Laboratory of Fluids and Hydraulic Machines</li> <li>Thermal Machines</li> <li>Maintenance</li> <li>Automation</li> <li>Political and Civic Constitution</li> </ul>	1 2 3 4 2
<b>10º</b> Semester	<ul style="list-style-type: none"> <li>Elective courses</li> <li>Lab of thermal sciences</li> </ul>	30 1

Total of courses: 54 / Total of credits: 174

Layout: Computing and Educational Resources CRIE  
CRIE - UTP - Tels: 313 7140

For more information about the program

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**Faculty of Mechanical Engineering - UTP**  
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Email: [mecanica@utp.edu.co](mailto:mecanica@utp.edu.co)  
Tel: (57) (6) 313 7124

## Registration

[www.utp.edu.co/inscripciones/](http://www.utp.edu.co/inscripciones/)

Admissions, Registration and Academic Record's Office - Building 3 – UTP

Email: [inscripcion@utp.edu.co](mailto:inscripcion@utp.edu.co)

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