

Undergraduate Program Mechanical Engineering (UPMS)

Name of the program (original language)	Program Studi Sarjana Teknik Mesin
Name of the program (English translation)	Undergraduate Program of Mechanical Engineering (UPMS)
Final degree	Sarjana Teknik (S.T.)/Bachelor of Science (B.Sc.)
Standard period of study	4 years
Credit points (according to ECTS)	144 credit points, equivalent 200 ECTS credit points
Type (several can be indicated)	Full time / part time / distance learning / dual degree / cooperative or sandwich course / intensive program/ etc. [yang tidak sesuai diberi streakthrough]
Website of the higher education institution	ftmd.itb.ac.id/program-studi-teknik-mesin/
Programs start date within the academic year	July
Program Inception	1941
Intake rhythm	Fall semester / summer semester / etc.
Expected intake number of students	200 students a year
Faculty/department	Faculty of Mechanical and Aerospace Engineering
Official contact person for publication on the web	Dr.Eng. Sandro Miharadi
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Last accreditation issued by	ASIIN
Duration of the last accreditation	1 Jul 2016 – 30 Sept 2021

The Undergraduate Program of Mechanical Engineering (UPMS) develops the body of knowledge based on mechanical engineering science, defined as design, production/manufacturing, and operation of machines. The scope of mechanical engineering can be broadened to include product life cycle analysis, maintenance, and decommissioning/recycling with the use of mechanical engineering science.

The body of knowledge of mechanical engineering science includes the classical mechanical engineering knowledge such as: Solid Mechanics, Dynamics and Control, Design and Manufacture, Materials Engineering, Production Process and Systems, Thermal-Fluid Sciences, Heat Transfer, and Applied Mechanic; and modern mechanical engineering knowledge such as: advance material, automation and control, mechatronics and robotics, computational mechanics, alternative energies, dan sustainability. These subjects are delivered either by an analytic or an empirical approach to obtain the intended cognitive level, from understanding to application in the design process.

Mechanical engineering requires basic knowledge of the engineering sciences, such as mathematics, physics, chemistry, and information technology, to support the development of expertise of the undergraduate of engineering. Basic engineering science is delivered to obtain the necessary cognitive understanding level. Other knowledge is also provided in order to supply learning outcomes to the students such as: Engineering Economics, Project Management, Entrepreneurship, Indonesian, and English.

Program Educational Objective (PEO)

Referring to the latest curriculum document of curriculum 2019, UPMS is committed to producing graduates who can contribute positively to academic or professional society, both at national and international level, with general qualities that are reflected in the program educational objectives (PEO).

- PEO1 Moral integrity, discipline; respectful, just, and responsible behavior
- PEO2 A good understanding and an ability to apply knowledge and skills of math science, and engineering in various fields of Mechanical Engineering.
- PEO3 An ability to be creative and innovative, to work individually (independently) and in a team effectively, to communicate effectively, to conduct lifelong learning, and to adapt to a career environment.

The PEOs are also relevant with the Indonesian National Qualification Framework (KKNI), as shown in the following table.

Table 1 Relationship between PEOs of the UPMS and Indonesian National Qualification Framework (KKNI)

PEO	Indonesian National Qualification Framework (KKNI)			
	Capable to apply science, technology, and/or art in their expertise and adaptable to various situations faced during solving a problem.	Mastering in-depth general and specific theoretical concepts of a certain knowledge and capable to formulate related problem solving procedure	Capable to make strategic decisions build upon data and information analysis and be able to give a clue in choosing several alternative solutions	Responsible for own work and can be held accountable for the achievement of the organization's work
Objective 1			V	V
Objective 2	V	V	V	
Objective 3	V	V	V	V

Program Learning Outcome (PLO)

Learning outcomes are designed based on the Program Educational Objectives of UPMS. Learning outcomes are targets that must be achieved by students of the UPMS so that by the time they graduate from the UPMS, graduates will have the ability in accordance with the Program Educational Objectives of the UPMS. The learning outcomes of UPMS ITB are published and updated on a regular basis.

The current learning outcomes for graduates from UPMS based on the latest curriculum 2019 document program are:

- An ability to identify, formulate and solve mechanical engineering problems by applying knowledge of mathematics, sciences, and mechanical engineering, and other relevant knowledge.
- An ability to design components, systems, or mechanical processes to meet certain design requirements creatively and innovatively with consideration aspects of environment, social, and economic factor.
- An ability to communicate effectively orally and written, both in Bahasa Indonesia and English.
- An ability to apply ethical principles and demonstrate commitment to professional responsibilities which must consider the impact of engineering solution in global, economic, environment and social contexts.

- E. An ability to contribute effectively either as an individual or as a part of multidisciplinary and multicultural teams.
- F. An ability to plan and conduct experiments, analysed and interpret data as well as drawing conclusions based on engineering judgement.
- G. An ability and willingness to acquire and apply new knowledge and technologies as needed, using appropriate learning strategies.

Each learning outcome should be achieved in order to attain the educational objectives of UPMS. Each point is detailed so that the implementation of each learning outcome becomes more visible. The detailed points are described under 3 points: knowledge, skills, and competences.

The learning outcomes of UPMS are reviewed by the Faculty of Mechanical and Aerospace Engineering at the end of each semester through a course achievement assessment, a student questionnaire, and lecturer portfolios.