

Department of Mechanical Engineering

Mechanical engineering is one of the oldest and broadest of all engineering disciplines. Mechanical engineers design, analyze, and manufacture new products and technologies in order to address society's needs. Graduates of this program are employed by government agencies, multinational corporations, consulting firms, and universities. They can work in the areas of research, design, manufacturing, sales, quality assurance, and management.

Since launching the program in year 2008, Sarhad University has developed the required facilities related to faculty, classrooms, library and laboratories, in accordance with the guidelines of the Pakistan Engineering Council.

It is possible for graduates of this program to specialize in the areas of mechanical engineering design, thermo-fluid systems, energy systems, air conditioning and refrigeration, manufacturing engineering, engineering management, mechatronics, building services, and micro and nano technologies.

Program Offered:

Bachelor of Mechanical Engineering

Vision

To nurture academic and economic vitality through teaching, research and outreach in the field of mechanical engineering in order to improve the quality of life.

Mission

To provide Mechanical Engineering students a high quality engineering education and the creation of new knowledge through research in Mechanical Engineering and allied disciplines. In addition, the Department seeks to maintain recognition through scholarly work and service to the University and the external community.

Bachelor of Mechanical Engineering

Minimum Duration : 8 Semesters, 4 Years
 Maximum Duration : 14 Semesters, 7 Years
 Minimum CGPA required to earn degree 2.00

Program Code 072
 Number of Courses 44
 Credit Hours 139

Program Educational Objectives (PEOs) :

- PEO-01 To produce graduates with essential knowledge in diverse areas of mechanical engineering and processing requisite skills for working in industry and solving complex engineering problems.
- PEO-02 To produce graduates who are sensitive to the social, ethical, cultural and the environmental aspects of engineering solutions.
- PEO-03 To produce graduates capable of communicating and performing as effective engineering professionals in both individual and team based project environments.

Outcome Based Education (OBE) System :

OBE is an approach of curriculum design and teaching that focuses on what students should be able to do (attain) at the end of course/ program. The Undergraduate curriculum at Department of Electrical Engineering, Sarhad University was transformed into adopting OBE from Spring 2018 in accordance with requirements from: Pakistan Engineering Council Accreditation Manual 2014 and to satisfy the requirements of Washington Accord 2013. The framework for OBE in the electrical engineering department and the process control mechanism consists of four different phases i.e. design, assess, analyze and review. For each of the phases Program Educational Objectives (PEOs), Program Learning Outcomes (PLOs) and Course Learning Outcomes (CLOs), are defined.

Eligibility :

- I. Candidates who have passed Intermediate (Pre-Engineering Examination) with the subjects of Mathematics, Physics, and Chemistry from a recognized BISE in Pakistan or any other equivalent examination with at least 60% unadjusted marks.
- II. Candidates possessing 3-Year Post-Matric Diploma of Associate Engineer in the relevant Technology with at least 60% unadjusted marks.

All candidates are required to appear in ETEA/centralized entry test.

Foreign students need to pass entry/aptitude test conducted by the University. For further details please see clause 4 in Rules & Regulations.

	Course Code	Course Title	Cr. Hrs.
SEMESTER ONE	MA 103	Applied Maths-I Calculus & Analytical Geometry	3-0
	CH 104	Applied Chemistry	2-0
	GS 115	Applied Physics	2-0
	GS 117	Applied Physics Lab	0-1
	GS 128	Pakistan Studies	2-0
	ENG 102	English-I (Functional English)	1-0
	CS 116	Computer System & Programming	2-0
	CS 116	Computer System & Programming Lab	0-1
	ME 102	Engg Drawing & Graphics	2-0
	ME 104	Engg Drawing & Graphics Lab	0-1
	SEMESTER TWO	GS 123/240	Islamic Studies/Ethics
MA 104		Applied Maths-II Linear Algebra & Ordinary Differential Equations	3-0
ENG 111		English-II (Communication Skills)	2-0
EE 211		Electrical Engineering	2-0
EE 215		Electrical Engineering Lab	0-1
ME 106		Engineering Mechanics-I: Statics	3-0
ME 130		Thermodynamics-I	3-0
ME 150		Workshop Practice	0-2

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Program Learning Outcomes (PLOs) :

- PLO-01 **Engineering Knowledge:** An ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
- PLO-02 **Problem Analysis:** An ability to identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- PLO-03 **Design/Development of Solutions:** An ability to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- PLO-04 **Investigation:** An ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments, analysis, and interpretation of experimental data, and synthesis of information to derive valid conclusions.
- PLO-05 **Modern Tool Usage:** An ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations.
- PLO-06 **The Engineer and Society:** An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems.
- PLO-07 **Environment and Sustainability:** An ability to understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
- PLO-08 **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

SEMESTER THREE

Course Code	Course Title	Cr. Hrs.
EE 130	Electronic Engineering	2-0
EE 132	Electronic Engineering Lab	0-1
ME 140	Engineering Materials	3-0
ME 215	Fluid Mechanics-I	3-0
ME 217	Fluid Mechanics-I Lab	0-1
ME 225	Engineering Mechanics-II: Dynamics	3-0
ME 227	Engineering Mechanics-II: Dynamics Lab	0-1
ME 301	Mechanics of Materials-I	3-0
ME 303	Mechanics of Materials-I Lab	0-1

SEMESTER FOUR

Course Code	Course Title	Cr. Hrs.
MA 210	Applied Maths-III	
	Complex Variables & Transforms	3-0
MGT 230	Engineering Economics	2-0
GS 301	Applied Statistics	3-0
ME 230	Thermodynamics-II	3-0
ME 232	Thermodynamics-II Lab	0-1
ME 312	Mechanics of Machines	3-0
ME 314	Mechanics of Machines Lab	0-1
ME 360	Machine Design & CAD-I	2-0
ME 362	Machine Design & CAD-I Lab	0-1

SEMESTER FIVE

Course Code	Course Title	Cr. Hrs.
MA 210	Applied Maths-IV Numerical Analysis	3-0
ENG 323	English-III Technical Report Writing & Presentation Skills	3-0
ME 235	Fluid Mechanics-II	3-0
ME 237	Fluid Mechanics-II Lab	0-1
ME 347	Heat & Mass Transfer	3-0
ME 349	Heat & Mass Transfer Lab	0-1
ME 455	Precision Engineering & Metrology	2-0
ME 457	Precision Engineering & Metrology Lab	0-1
MGT 476	Safety, Health & Environmental Management	2-0

SEMESTER SIX

Course Code	Course Title	Cr. Hrs.
ME 311	Mechanics of Materials-II	3-0
ME 313	Mechanics of Materials-II Lab	0-1
ME 336	Mechanical Vibrations	3-0
ME 338	Mechanical Vibrations Lab	0-1
ME 351	Manufacturing processes	3-0
ME 353	Manufacturing Process Lab	0-1
ME 411	Machine Design & CAD-II	3-0
ME 413	Machine Design & CAD-II Lab	0-1
ME 406	Power Plants-I	3-0

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- PLO-09 **Individual and Team Work:** An ability to work effectively, as an individual or in a team, on multifaceted and /or multidisciplinary settings.
- PLO-10 **Communication:** An ability to communicate effectively, orally as well as in writing, on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PLO-11 **Project Management:** An ability to demonstrate management skills and apply engineering principles to one's own work, as a member and/or leader in a team, to manage projects in a multidisciplinary environment.
- PLO-12 **Lifelong Learning:** ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

SEMESTER SEVEN

Course Code	Course Title	Cr. Hrs.
ME 352	Control Engineering	3-0
ME 356	Control Engineering Lab	0-1
ME 415	Refrigeration & Air Conditioning	3-0
ME 417	Refrigeration & Air Conditioning Lab	0-1
ME 430	Introduction to Finite Element Analysis	2-0
ME 432	Introduction to Finite Element Analysis Lab	0-1
ME 491	Project Phase-I	0-3
	Technical Elective	3-0

SEMESTER EIGHT

Course Code	Course Title	Cr. Hrs.
ME 445	Power Plants-II	3-0
ME 447	Power Plants Lab-II	0-1
ME 492	Project Phase-II	0-3
	Management Elective	3-0
	Social Sciences Elective	2-0

Electives Technical

Course Code	Course Title	Cr. Hrs.
ME 433	Maintenance Engineering	3-0
ME 435	Mechatronics	3-0
ME 450	Fluid Power: Hydraulics & Pneumatics	3-0
ME 460	Renewable Energy Resource	3-0
ME 464	Gas Dynamics	3-0
ME 468	Aerodynamics	3-0
ME 470	Computational Fluid Dynamics	3-0
ME 474	Tribology	3-0

Management

Course Code	Course Title	Cr. Hrs.
MGT 227	Industrial Management	3-0
MGT 305	Operations Management	3-0
MGT 345	Organizational Behavior	3-0
MGT 410	Project Management	3-0
MGT 430	Business & Entrepreneurship	3-0
MGT 450	Total Quality Management	3-0
CS 355	Operations Research	3-0

Social Sciences Elective

Course Code	Course Title	Cr. Hrs.
GS XYZ	Introduction to Sociology	2-0
GS XYZ	Sociology and Development	2-0
GS XYZ	Social Anthropology	2-0
PSY 319	Understanding Psychology & Human Behavior	2-0
PSY 322	Professional Psychology	2-0
GS 302	Critical Thinking	2-0
GS XYZ	Introduction to Philosophy	2-0
GS 422	Professional Ethics	2-0

OBE Hierarchical Model Followed in the Department

Vision and Mission Statements of SUIT/Faculty/Department



Program Educational Objectives (PEOs)



Program Learning Outcomes (PLOs)



Course Learning Outcomes (CLOs)