

MECHANICAL ENGINEERING

B.Sc Mechanical Engineering

B.Sc Mechanical Engineering Technology



MISSION STATEMENT

To serve the engineering profession by offering high quality education to create professionals that contribute towards society by providing innovative solutions with a focus on research in Mechanical Engineering and allied disciplines.

CECOS
UNIVERSITY

MESSAGE FROM THE HEAD OF DEPARTMENT

At CECOS University, our Department of Mechanical Engineering aims to prepare future leaders with a broad vision, professional ethics, and sound knowledge of mechanical engineering. Our curriculum emphasizes innovation and problem solving skills, with a focus on addressing the challenges of energy, environment, and rapid urbanization. We offer opportunities to join international student societies and strive to create a productive and fulfilling learning environment. Join us to explore the amazing world of mechanical engineering and shape your future with confidence.

Prof. Dr. Muhammad Iqbal

Ph.D in Generalized/Finite Elements
Heriot-Watt University, Edinburgh, UK

FACULTY OF MECHANICAL ENGINEERING

Dr. Naseer Ahmed

Professor / Vice Chancellor
Ph.D Mechanical Engineering
Loughborough University, UK

Dr. Muhammad Iqbal

Professor / Head of Department
Ph.D in Generalized/Finite Elements,
Heriot-Watt University, Edinburgh, UK

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Assistant Professor
M.Sc Mechanical Engineering
Ph.D (In Progress), UET, Peshawar

Engr. M. Imran Hanif

Assistant Professor
M.Sc Industrial Engineering
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UET, Peshawar

Engr. Umair Ali

Lecturer
M.Sc Mechanical Engineering
CECOS University, Peshawar

Engr. Hashim Khan

Lab. Engineer
B.Sc Mechanical Engineering
CECOS University, Peshawar

Sikander Afridi

Lab. Supervisor / Safety Officer
B.Sc Mechanical Engineering Technology
CECOS University, Peshawar

* on Leave

Dr. Irfan Ullah

Professor / Dean
Post Doctorate Mechanical Engineering
University of Michigan, USA

Dr. Saim Safer *

Professor
Ph.D Mechanical Engineering
University of Twente, Netherlands

Engr. M. Irfan Khan

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M.Sc Mechanical Engineering
Sarhad University, Peshawar
Ph.D (In Progress), UET, Peshawar

Amir Siddique

Lab Supervisor
Ms. Mechanical Technology

Gul Nawab

Lab Supervisor
DAE Mechanical

MECHANICAL ENGINEERING LABORATORIES



Engineering Mechanics Lab
Applied Chemistry Lab
Instrumentation & Control Lab
Machine Shop
Material Testing Lab
Thermo Fluid Lab
Wood & Electric Shop
Computer Lab
Drawing Hall

CURRICULUM OF MECHANICAL ENGINEERING

Semester-I

Course Code	Course Title	Credit Hours
CS-109	Computer Programming	2+1
ENG-10	English-I	3+0
MATH-106	Calculus and Analytical Geometry	3+0
ME-111	Engineering Drawing and Graphics	1+1
ME-112	Introduction to Engineering	1+0
NS-101	Applied Physics	3+0
NS-111	Applied Chemistry	2+0
Total Credit Hours		17

Semester-II

Course Code	Course Title	Credit Hours
EE-106	Basic Electrical Engineering	2+1
ENG-102	English-II	3+0
MATH-108	Linear Algebra and Differential Equations	3+0
ME-113	Workshop Practice	0+2
ME-114	Computer Aided Drawing	0+1
ME-115	Engineering Mechanics-I: Statics	3+0
ME-121	Thermodynamics-I	3+0
Total Credit Hours		18

Semester-III

Course Code	Course Title	Credit Hours
MATH-201	Complex Variables and Transforms	3+0
ME-211	Engineering Mechanics-II: Dynamics	3+0
ME-213	Engineering Mechanics Lab	0+1
ME-212	Mechanics of Materials-I	3+0
ME-221	Thermodynamics-II	3+0
ME-222	Thermodynamics Lab	0+1
SS-101	Islamic Studies	2+0
SS-102	Pakistan Studies	2+0
Total Credit Hours		18

Semester-IV

Course Code	Course Title	Credit Hours
EE-201	Fundamentals of Electronics	2+1
MATH-202	Numerical Analysis	3+0
ME-214	Machine Design-I	3+0
ME-215	Mechanics of Materials-II	3+0
ME-216	Mechanics of Materials Lab	0+1
ME-223	Fluid Mechanics-I	3+0
SS-205	Engineering Economics	2+0
Total Credit Hours		18

Semester-V

Course Code	Course Title	Credit Hours
ME-311	Machine Design-II	2+0
ME-312	Instrumentation and Measurement	2+1
ME-313	Manufacturing Processes	3+1
ME-321	Fluid Mechanics-II	3+0
ME-322	Heat and Mass Transfer	3+0
ME-323	Fluid Mechanics Lab	0+1
Total Credit Hours		16

Semester-VI

Course Code	Course Title	Credit Hours
ENG-203	English-III	3+0
MATH-211	Probability and Statistics	3+0
ME-314	Engineering Materials	3+0
ME-315	Mechanics of Machines	3+0
ME-324	Heating, Ventilating and Air Conditioning	3+0
ME-325	Heat Transfer and HVAC Lab	0+1
ME-3XY	Technical Elective-I	2+0
Total Credit Hours		18

Semester-VII

Course Code	Course Title	Credit Hours
ME-401	Health, Safety and Environment	1+0
ME-411	Mechanical Vibrations	3+0
ME-412	Mechanisms and Mechanical Vibrations Lab	0+1
ME-413	Introduction to Finite Element Analysis	2+1
ME-421	Internal Combustion Engines	3+0
ME-498	Final Year Design Project-I	0+3
ME-4XY	Technical Elective-II	2+0
Total Credit Hours		16

Semester-VIII

Course Code	Course Title	Credit Hours
ME-402	Project Management and Entrepreneurship	3+0
ME-414	Control Engineering	3+1
ME-422	Power Plants	3+0
ME-423	IC Engines and Power Plants Lab	0+1
ME-499	Final Year Design Project-II	0+3
ME-4XY	Technical Elective-III	2+0
Total Credit Hours		16

Total Credit Hours = 137

Fact File

Duration: Four Years

Eligibility: a. Minimum 60% marks in Intermediate with Physics, Chemistry and Mathematics or DAE in Mechanical Technology or relevant field. The applicants with minimum 60% marks in Intermediate with Physics, Mathematics and Computer Science are also eligible with Chemistry to be studied and passed as a remedial course in 1st semester after admission.

b. Minimum 33% marks in test conducted by ETEA or any other testing body approved by PEC.

PROGRAM EDUCATIONAL OBJECTIVE (PEOs) OF MECHANICAL ENGINEERING

PEO 1: Demonstrate a blend of engineering and professional skills.

PEO 2: Perform ethically and in a socially responsible manner.

PEO 3: Strive to enhance learning and managerial skills.

PROGRAM LEARNING OUTCOMES (PLOs) OF MECHANICAL ENGINEERING

PLO 1: Engineering Knowledge: An ability to apply knowledge of mathematics, science and engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PLO 2: 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 3: 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 4: 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 5: Modern Tool Usage: An ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering activities, with an understanding of the limitations.

PLO 6: 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 7: 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 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PLO 9: Individual and Team Work: An ability to work effectively, as an individual or in a team, on multifaceted and/or multi-disciplinary 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: 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: An ability to recognize the importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

CURRICULUM OF MECHANICAL ENGINEERING TECHNOLOGY

Semester- I

Course Code	Course Title	Credit Hours
CS-190	Introduction to Computer Fundamentals	1+2
MATH-106	Calculus and Analytical Geometry	3+0
MT-111	Workshop Technology	0+2
NS-100	Introduction to Physics	2+1
NS-110	Introduction to Chemistry	2+1
SS-101	Islamic Studies	2+0
Total Credit Hours		16

Semester- II

Course Code	Course Title	Credit Hours
MATH-108	Linear Algebra and Differential Equations	3+0
MT-102	Basic Electrical and Electronics	2+2
MT-112	Technical Drawing and CAD-1	2+2
MT-121	Applied Thermodynamics- I	2+2
SS-102	Pakistan Studies	2+0
Total Credit Hours		17

Semester- III

Course Code	Course Title	Credit Hours
ENG-103	Communication Skills	3+0
MT-211	CAD - II	0+3
MT-212	Industrial Materials	2+1
MT-213	Mechanics of Materials	2+1
MT-221	Applied Thermodynamics - II	2+1
Total Credit Hours		15

Semester- IV

Course Code	Course Title	Credit Hours
ENG-202	Technical Report Writing	3+0
MATH-211	Probability and Statistics	3+0
MGT-335	Total Quality Management	2+0
MT-214	Machine Design	3+0
MT-215	Engineering Statics	2+1
MT-222	Fluid Mechanics	2+2
Total Credit Hours		18

Semester- V

Course Code	Course Title	Credit Hours
MGT-333	Project Management	3+0
MT-311	Dynamics	2+1
MT-312	Manufacturing Processes	2+1
MT-321	Heat Transfer	2+1
MT-322	IC Engines	2+2
SS-205	Engineering Economics	2+0
Total Credit Hours		16

Semester- VI

Course Code	Course Title	Credit Hours
MT-302	Material Handling and Safety	3+1
MT-313	Instrumentation and Control	2+1
MT-314	Mechanical Vibration	2+1
MT-323	Refrigeration and Air Conditioning	2+1
MT-498	Project-I	0+3
Total Credit Hours		16

Semester- VII

Course Code	Course Title	Credit Hours
MT-400	Supervised Industrial/Field Training	0+16
MT-499	Project-II	
Total Credit Hours		16

Semester- VIII

Course Code	Course Title	Credit Hours
MT-400	Supervised Industrial/Field Training	0+16
Total Credit Hours		16

Total Credit Hours = 137

Fact File

Duration: Four Years

Eligibility: Minimum 50% marks in DAE Mechanical or relevant field or Minimum 50% marks in F.Sc Pre-Engineering

PROGRAM EDUCATIONAL OBJECTIVE (PEOs) OF MECHANICAL ENGINEERING TECH

- PEO 1: Graduates will demonstrate knowledge of Mechanical Engineering Technology appropriate for career pursuits and workplace needs.
- PEO 2: Graduates will have the ability to understand, diagnose, communicate and provide solutions to technical problems/situations for the benefit of the society
- PEO 3: Graduates will demonstrate the intellectual curiosity to actively pursue the acquisition of new knowledge and skills necessary to refine and improve his/her abilities to contribute to the Technology domain
- PEO 4: Graduates will show Ethical commitment that allows them to deal successfully with social, technical and professional situations in their lives and work.

PROGRAM LEARNING OUTCOMES (PLOs) OF MECHANICAL ENGINEERING TECH

- PLO 1: Technology Knowledge: An ability to apply knowledge of mathematics, natural science, technology fundamentals and technology specialization to defined and applied technology procedures, processes, system/sensor methodologies.
- PLO 2: Problem Analysis: An ability to Identify, formulate, research literature and analyze broadly-defined technology problems reaching substantiated conclusions using analytical tools appropriate to the discipline or area of specialization.
- PLO 3: Design/Development of Solutions: An ability to design solutions for broadly- defined technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- PLO 4: Investigation: An ability to conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.
- PLO 5: Modern Tool Usage: An ability to create, select and apply appropriate techniques, resources, and modern technology and IT tools, including prediction and modeling, to broadly-defined technology problems, with an understanding of the limitations.
- PLO 6: The Technologist and Society: An ability to demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to technology practice and solutions to broadly defined technology problems.
- PLO 7: Environment and Sustainability: An ability to understand and evaluate the sustainability and impact of technology work in the solution of broadly defined technology problems in societal and environmental contexts.
- PLO 8: Ethics: Understand and commit to professional ethics and responsibilities and norms of technology practice
- PLO 9: Individual and Team Work: An ability to function effectively as an individual, and as a member or leader in diverse teams.
- PLO 10: Communication: An ability to communicate effectively on broadly defined technology activities with the technologist community and with society at large, by 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 knowledge and understanding of technology management principles and apply these to one's own work, as a member or leader in a team and to manage projects in multidisciplinary environments.
- PLO 12: Lifelong Learning: An ability to recognize the need for, and have the ability to engage in independent and lifelong learning in specialist technologies.