

# 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 the 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.

## 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 the students a high quality education in Mechanical Engineering and Allied disciplines to maintain a recognition through service to the National and Interactional community.

**Program Offered:** Bachelor of Science in Mechanical Engineering

# Faculty Members, Department of Mechanical Engineering

Engr. Dr. Sohail Gohar	Head of Department	MS Mechanical Engineering, GIKI Swabi
Engr. Abdul Hadi	Associate Professor	MS Mechanical Engineering, Shiraz University, Iran
Engr. Mian Muhammad Asim Zahir	Assistant Professor	MS Mechanical Engineering, NUST, Islamabad
Engr. Muhammad Irfan	Assistant Professor	MS Mechanical Engineering, UET Peshawar
Engr. Muhammad Ilyas	Assistant Professor	MS Engineering Management, Sarhad University, Peshawar
Engr. Zeeshan Wazir	Assistant Professor	MS Engineering Management, Sarhad University, Peshawar
Engr. Riaz Hussain	Coordinator	MS Mechanical Engineering, Sarhad University, Peshawar
Engr. Abdul Samad Khan	Lecturer	MS Mechanical Engineering, GIKI, Swabi
Engr. Mohsin Amin	Lecturer	MS Mechanical Engineering, GIKI, Swabi
Engr. Muhammad Rohan Shafiq	Lab Engineer	MS Mechanical Engineering, GIKI, Swabi

# Bachelor of Science in Mechanical Engineering

Program Code	241
Number of Courses	59
Credit Hours	134

Minimum Duration	8 Semesters, 4 Years
Maximum Duration	14 Semesters, 7 Years
Minimum CGPA Required To Earn Degree	2.00

## Eligibility:

- Candidates who have passed intermediate (Pre-Engineering/ \*Pre-Medical/ \*Computer Science) from a recognized BISE in Pakistan with at least 60% unadjusted marks.  
\*The candidates with an intermediate Pre-Medical or Computer Science background have to study an additional course of remedial Mathematics and Chemistry, respectively, during the initial 1-2 Semesters, in accordance with PEC guidelines.
- Candidates possessing B-Tech (Hons) in the relevant field are also eligible for admission against the 2% reserved seats on open merit
- Candidates possessing 3-years Post-Matric Diploma of Associate Engineer in the relevant technology with at least 60% unadjusted marks.
- All candidates are required to pass an entry test conducted by NTS / ETEA or any registered testing agency or University with at least 33% cumulative score.

Foreign candidates need to pass entry/apptitude test conducted by the University. For further details, see clause 4 in Admission Process.

## Program Educational Objectives (PEOs) :

- PEO-01** To produce graduates with strategic thinking and essential knowledge in diverse areas of Mechanical Engineering & possesses requisite skills for working in industry and solving real life 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 performing and communicating as effective engineering professionals in both individual and team based project environment with a tendency to enhance their knowledge, skills and professional development.

## 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 Mechanical 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 Mechanical 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.

## Scheme of Studies:

### 1st Semester

Course Code	Course Title	Cr. Hrs.18
GS 123/ 240	Islamic Studies/ Ethics	2-0
MA 103	Calculus and Analytical Geometry	3-0
GE 101	Functional English	3-0
GS 115	Applied Physics	2-0
GS 115L	Applied Physics Lab	0-1
CS 100	Applications of ICT	2-0
CS 100L	Applications of ICT Lab	0-1
ME 100	Engineering Drawing & Graphics	1-0
ME 100L	Engineering Drawing & Graphics Lab	0-1
ME 107	Workshop Practice	1-0
ME 107L	Workshop Practice Lab	0-1
CH 105	*Chemistry (Audit Basis)	2-0
QT 100	*Quran-e-Majeed Teaching (Audit Basis)	3-0
MA 112	*Mathematics-I (Audit Basis)	3-0

### 2nd Semester

Course Code	Course Title	Cr. Hrs.18
MA 104	Linear Algebra and Differential Equations	3-0
EE 211	Electrical Engineering	2-0
ME 231	Computer Aided Drawing	0-1
ME 106	Engineering Mechanics-I (Statics)	3-0
ME 130	Thermodynamics-I	3-0
ME 221	Materials Engineering	2-0
GE 303	Civics and Community Engagement	2-0
GE 201	Ideology and Constitution of Pakistan	2-0
MA 113	*Mathematics-II (Audit Basis)	3-0

**3rd Semester**

Course Code	Course Title	Cr. Hrs.18
ME 205	Engineering Mechanics-II (Dynamics)	2-0
ME 301	Mechanics of Materials-I	3-0
CS 116	Computer System & Programming	2-0
CS 116L	Computer System & Programming Lab	0-1
MA 210	Complex Variables & Transforms	3-0
ME 215	Fluid Mechanics-I	3-0
ME 309	Thermodynamics-II	2-0
ME 207	Engineering Mechanics Lab	0-1
ME 310	Thermodynamics Lab	0-1

**4th Semester**

Course Code	Course Title	Cr. Hrs.17
ME 315	Measurement and Instrumentation	2-0
ME 311	Mechanics of Materials-II	3-0
ME 323	Fluid Mechanics-II	2-0
ME 229	Machine Design-I	2-0
EE 130	Electronics Engineering	2-0
EE 214	Electrical and Electronics Engineering Lab	0-1
GE 301	Expository Writing	3-0
ME 325	Fluid Mechanics Lab	0-1
ME 327	Mechanics of Materials Lab	0-1

**5th Semester**

Course Code	Course Title	Cr. Hrs.17
ME 307	Manufacturing Processes	2-0
ME 307L	Manufacturing Processes Lab	0-1
ME 223	Mechanics of Machines	2-0
ME 317	Control Engineering	2-0
ME 347	Heat & Mass Transfer	3-0
CS 215	Applied Artificial Intelligence & Machine Learning	2-0
CS 215L	Applied Artificial Intelligence & Machine Learning Lab	0-1
ME 319	Measurement & Instrumentation and Control Lab	0-1
MA 308	Numerical Analysis	2-0
MA 308L	Numerical Analysis Lab	0-1

**6th Semester**

Course Code	Course Title	Cr. Hrs.16
ECO 307	Engineering Economics	2-0
ME 405	Heating, Ventilating & Air Conditioning	3-0
ME 330	Machine Design-II	2-0
ME 409	Finite Element Methods	2-0
ME 409L	Finite Element Methods Lab	0-1
ME 407	HVAC and H&M Lab	0-1
MA 204	Applied Statistics	3-0
MGT 441	Project Management	2-0

**7th Semester**

Course Code	Course Title	Cr. Hrs.15
ME 336	Mechanical Vibrations	3-0
ME 333	Internal Combustion Engines	2-0
ME 333L	Internal Combustion Engines Lab	0-1
ME 424	Power Plant	2-0
ME 424L	Power Plant Lab	0-1
GE 311	Professional Ethics	2-0
ME 321	Mechanisms and Mechanical Vibration Lab	0-1
RES 491	FYDP-I	0-3

**8th Semester**

Course Code	Course Title	Cr. Hrs.15
ME 418	Reverse Engineering & Inspection Techniques	2-0
ME 418L	Reverse Engineering & Inspection Techniques Lab	0-1
ME 403	Mechatronics & Robotics Engineering	2-0
ME 403L	Mechatronics & Robotics Engineering Lab	0-1
ME 433	Maintenance Engineering	3-0
MGT 270	Entrepreneurship	2-0
CE 440	Occupational Health & Safety	1-0
RES 492	FYDP -II	0-3



## Program Learning Outcomes (PLOs) / Graduating Attributes (Ga's):

<b>GA-01</b>	<b>Engineering Knowledge:</b> Apply knowledge of mathematics, natural science, engineering fundamentals and engineering specialization to the solution of complex engineering problems. (WK-1-WK-4)
<b>GA-02</b>	<b>Problem Analysis:</b> Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK-1-WK-4)
<b>GA-03</b>	<b>Design/Development of Solution:</b> 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. (WK-5)
<b>GA-04</b>	<b>Investigation:</b> Conduct investigation of complex engineering problems using research-based knowledge and research methods, including design of experiments, analysis, and interpretation of data, and synthesis of information to provide valid conclusions. (WK-8)
<b>GA-05</b>	<b>Tool Usage:</b> Create, select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modeling, to complex Engineering problems, with an understanding of the limitations. (WK-2 and WK-6)
<b>GA-06</b>	<b>The Engineer and the World:</b> Analyze and evaluate sustainable development impacts to society, the economy, sustainability, health and safety, legal frameworks, and the environment while solving complex engineering problems. (WK-1, WK-5, and WK-7)
<b>GA-07</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant National & International laws. Demonstrate an understanding of the need for diversity and inclusion. (WK-9)
<b>GA-08</b>	<b>Individual and Collaborative Team Work:</b> Function effectively as an individual, and as a members or leader in diverse and inclusive teams and in multidisciplinary, face-to-face, remote and distributed settings.
<b>GA-09</b>	<b>Communication:</b> Communicate effectively and inclusively 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, and make effective presentations, taking into account cultural, language, and learning differences. (WK-1 and WK-9)

**GA-10** **Project Management and Finance:** Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member & leader in a team, to manage projects in multidisciplinary environments. (WK-2 and WK-5)

**GA-11** **Life-Long Learning:** Recognize the need for, and have the preparation and ability for

- i) independent and life-long learning
- ii) adaptability to new and emerging technologies
- iii) critical thinking in the broadest context of technological change. (WK-8 and WK-9)

### Hierarchical Model of Outcomes at SUIT

Vision and Mission Statements of  
SUIT/Faculty/Department



Program Educational Objectives  
(PEOs)



Program Learning Outcomes  
(PLOs)



Course Learning Outcomes  
(CLOs)