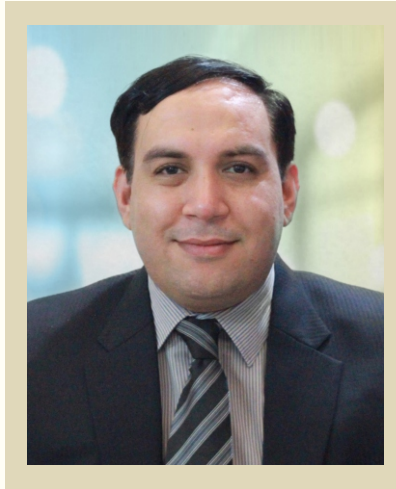


**DEPARTMENT
OF
MECHANICAL ENGINEERING**

HOD'S MESSAGE



Dr. Muhammad Mahabat Khan

At Mechanical Engineering department, an excellent educational experience is designed to sharpen the students' talents and skills through a cutting edge course work. Department allows its students to build knowledge across the breadth of the discipline while concentrating in depth, on a particular area of specialization. The infrastructure of the department is pivotal to its vision of multi-disciplinary education and research. It comprises state of the art and well equipped teaching and research laboratories, workshops, lecture halls and faculty offices. The department offers a 4-year BS degree in Mechanical Engineering along with MS and PhD in Mechanical Engineering and a MS degree in Engineering Management with different specializations in all graduate programs. As Mechanical Engineering is

closely intertwined with the industry and business, these programs are aimed to provide opportunities to create industrial linkages and act as a bridge for flow of the cross-disciplinary knowledge among all departments.

The phenomenal growth observed in automobile and aerospace industry, in recent past, is primarily based on the advancement of Mechanical Engineering knowledge. A degree in Mechanical Engineering gives knowledge and skills to be involved in the design, development and manufacturing of products, machines and mechanical engineering systems, including engines and turbines, land transport vehicles, ships, aircrafts, building services (air conditioning, pumps, fans), refrigeration systems, manufacturing processes and industrial plants.

BS Mechanical Engineering

■ Program Educational Objectives (PEOs)

The BS Mechanical Engineering Program aims to produce leading professionals who will:

- (i) Apply knowledge and skills to provide sustainable solutions to challenging Mechanical Engineering problems in industry and academia.
- (ii) Demonstrate professional growth and exhibit continual improvement in learning modern engineering techniques and their applications in practice.
- (iii) Make positive contribution towards society by strong ethical values, communication skills and leadership.

■ Program Learning Outcomes (PLOs)

At the time of graduation, the graduates of BS(ME) program will possess the following attributes:

- (i) **Engineering Knowledge:** An ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
- (ii) **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.
- (iii) **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.

- (iv) **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.
- (v) **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.
- (vi) **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.
- (vii) **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.
- (viii) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
- (ix) **Individual and Team Work:** An ability to work effectively, as an individual or in a team, on multifaceted and /or multidisciplinary settings.
- (x) **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.

- (xi) **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.
- (xii) **Lifelong Learning:** An ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

■ Admission Requirements

- (i) Higher Secondary School Certificate (FSc Pre-Engineering) or Equivalent with Physics,

Chemistry and Mathematics securing at least 60% marks in aggregate

OR

Diploma of Associate Engineer Examination in relevant discipline securing at least 60% marks in aggregate (upto 2% of maximum allowed seats)

- (ii) CUST Admission Test/HEC Approved Test

■ Degree Requirements

Each candidate for the BS Mechanical Engineering degree is required to successfully earn 136 credit hours (Cr. Hrs.) as per the following detail:

Area	Cr. Hrs.
(a) Foundation Courses	33
(b) Natural Science Courses	20
(c) Computing Courses	03
(d) Breadth Courses	25
(e) Depth Courses	14
(f) Humanities Courses	15
(g) Management Science Courses	05
(h) Inter Departmental Engineering Electives (IDEE)	06
(i) Mechanical Engineering Electives	09
(j) Design Project	06
(k) Internship	00
(l) Community Work	00
Total	136

■ Foundation Courses (33 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Engineering Materials	ME1413	3
Workshop-I	ME1801	1
Workshop-II	ME1811	1
Thermodynamics-I	ME1113	3
Engineering Drawing & Graphics	ME1011	1
Engineering Drawing & Graphics Lab	ME1021	1
Engineering Statics	ME1213	3
Engineering Dynamics	ME2223	3
Mechanics of Materials-I	ME2233	3
Fluid Mechanics-I	ME2513	3
Mechanics of Machines	ME2033	3
Precision Engineering & Metrology	ME3312	2
Manufacturing Processes	ME3613	3
Engineering Mechanics Lab	ME2221	1
Manufacturing Processes Lab	ME3611	1
Precision Engineering & Metrology Lab	ME3311	1

■ Natural Science Courses (20 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Calculus & Analytical Geometry	MTME1013	3
Applied Differential Equations	MTME1043	3
Complex Variables & Transforms	MTME2053	3
Linear Algebra & Numerical Analysis	MTME2063	3
Engineering Statistics	MTME3073	3
Applied Physics	PHME1012	2
Applied Physics lab	PHME1011	1
Applied Chemistry	CHME1012	2

■ Computing Courses (3 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Computer Systems & Programming	CSME1012	2
Computer Systems & Programming lab	CSME1011	1

■ Breadth Courses (25 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Thermodynamics-II	ME2123	3
Mechanics of Materials-II	ME3243	3
Fluid Mechanics-II	ME3523	3
Machine Design-I	ME3043	3
Machine Design-II	ME3052	2
Heat & Mass Transfer	ME3133	3
Introduction to Finite Element Methods	ME3062	2
Heat & Mass Transfer Lab	ME3131	1
Thermodynamics Lab	ME2121	1
Mechanics of Materials Lab	ME3241	1
Fluid Mechanics Lab	ME3521	1
Computer Aided Designing (CAD) Lab	ME3081	1
Introduction to Finite Element Methods Lab	ME3061	1

■ Depth Courses (14 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Internal Combustion Engines	ME4142	2
Refrigeration & Air Conditioning	ME4153	3
Mechanical Vibrations	ME4253	3
Power Plants	ME4173	3
Internal Combustion Engines Lab	ME4141	1
Refrigeration & Air Conditioning Lab	ME4151	1
Mechanisms and Mechanical Vibrations Lab	ME4261	1

■ Humanities Courses (16 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
English-I (Functional English)	HMME1013	3
English-II (Functional English)	HMME1023	3
English-III (Technical Report Writing)	HMME3033	3
Pakistan Studies	HMME1002	2
Islamic Studies/Ethics	HMME1012	2
Social Science	HMME3xx2	2

■ Management Science Courses (5 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Management Elective-I	HMME3xx2	2
Management Elective-II	HMME4xx2	2
Health, Safety & Environment	HMME3761	1

■ Inter Departmental Engineering Electives (IDEE) (9 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Electrical Engineering	EEME2742	2
Electrical Engineering Lab	EEME2741	1
Electronics Engineering	EEME2752	2
Electronics Engineering Lab	EEME2751	1
Control Engineering	EEME4012	2
Control Engineering Lab	EEME4011	1

■ Mechanical Engineering Electives (6 Cr. Hrs.)

Students are required to take 6 Cr. Hrs. as elective courses. These are depth courses. A list of technical elective courses is given below:

Course Title	Code	Cr. Hrs.
Renewable Energy Technology	ME4163	3
Gas Dynamics	ME4533	3
Aerodynamics	ME4543	3
Machining & Automation	ME4623	3

Introduction to Mechatronics	ME4423	3
Introduction to Robotics	ME4443	3
Computational Fluid Dynamics with lab	ME4553	3
CAD/CAM	ME4073	3

■ Management Elective Courses (04 Cr. Hrs)

Students are required to take 04 Cr. Hrs. as management elective courses. A list of management elective courses is given below:

Course Title	Code	Cr. Hrs.
Engineering Economics	HMME3xx2	2
Total Quality Management	HMME4xx2	2
Project Management	HMME4xx2	2
Productions and Operations Management	HMME4xx2	2

■ Design Project (6 Cr. Hrs.)

After the completion of 90 Cr. Hrs., the students are required to demonstrate their practical skills in the field of mechanical engineering by designing and implementing a design project worth 6 Cr. Hrs. The project shall be completed in two parts as given below:

Course Title	Code	Cr. Hrs.
Design Project (Part-I)	ME4913	3
Design Project (Part-II)	ME4923	3

■ Industrial Internship (ME4000)

Each student is required to complete an 8-week industrial internship training usually after 6 semesters or on the completion of 90 Cr. Hrs. The internship shall be graded as pass/fail.

■ Community Work (VIS4000)

Each student is required to complete 65 hours community work, usually after 4th semester which would be a prerequisite for the award of degree.

■ CGPA Requirement

A student is required to earn a minimum 2.00/4.00 CGPA on the completion of his/her degree requirements.

■ Program Duration

This is a four year degree program comprising of 8 semesters. There will be a Fall and a Spring semester in each year. The summer semester will be utilized for internship or deficiency courses. The maximum duration to complete BS Mechanical Engineering degree is 07 years.

SCHEME OF STUDIES

BS Mechanical Engineering Program

☐ Semester-I (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MTME1013	Calculus & Analytical Geometry	Natural Sciences	3
PHME1012	Applied Physics	Natural Sciences	2
PHME1011	Applied Physics Lab	Natural Sciences	1
HMME1013	English-I (Functional English)	Humanities	3
CHME1012	Applied Chemistry	Natural Sciences	2
CSME1012	Computer System & Programming	Computing	2
CSME1011	Computer System & Programming Lab	Computing	1
ME1801	Workshop Practice-I	Foundation	1
HMME1002	Pakistan Studies	Humanities	2

☐ Semester-II (18 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
EEME2742	Electrical Engineering	IDEE	2
EEME2741	Electrical Engineering Lab	IDEE	1
MTME1043	Applied Differential Equations	Natural Sciences	3
ME1113	Thermodynamics-I	Foundation	3
ME1011	Engineering Drawing & Graphics	Foundation	1
ME1021	Engineering Drawing & Graphics Lab	Foundation	1
ME1213	Engineering Statics	Foundation	3
ME1811	Workshop Practice-II	Foundation	1
ME1413	Engineering Materials	Foundation	3

☐ Semester-III (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
HMME1023	English-II (Communication Skills)	Humanities	3
EEME2752	Electronic Engineering	IDEE	2

EEME2751	Electronic Engineering Lab	IDEE	1
ME2233	Mechanics of Materials-I	Foundation	3
ME2123	Thermodynamics-II	Breadth	3
ME2121	Thermodynamics-II Lab	Breadth	1
ME2223	Engineering Dynamics	Foundation	3
ME2221	Engineering Mechanics Lab	Foundation	1

Semester-IV (18 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MTME2063	Linear Algebra & Numerical Analysis	Natural Sciences	3
HMME1012	Islamic Studies	Humanities	2
ME3243	Mechanics of Materials-II	Breadth	3
ME3241	Mechanics of Materials Lab	Breadth	1
ME2513	Fluid Mechanics-I	Foundation	3
ME2033	Mechanics of Machines	Foundation	3
ME3312	Precision Engineering & Metrology	Foundation	2
ME3311	Precision Engineering & Metrology Lab	Foundation	1

Semester-V (18 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MTME2053	Complex Variables & Transforms	Natural Sciences	3
HMME3XX2	Social Science	Humanities	2
ME3523	Fluid Mechanics-II	Breadth	3
ME3521	Fluid Mechanics-II Lab	Breadth	1
ME3613	Manufacturing Processes	Foundation	3
ME3611	Manufacturing Processes Lab	Foundation	1
ME3043	Machine Design -I	Breadth	3
HMME3xx2	Management Elective-I	Mgmt Elective	2

□ Semester-VI (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MTME3073	Engineering Statistics	Natural Sciences	3
HMME2003	English-III (Technical Report Writing)	Humanities	3
HMME3761	Health, Safety & Environment	Mgmt. Sciences	1
ME3133	Heat & Mass Transfer	Breadth	3
ME3131	Heat & Mass Transfer Lab	Breadth	1
ME3052	Machine Design -II	Breadth	2
ME3062	Introduction to Finite Element Methods	Breadth	2
ME3061	Introduction to Finite Element Methods Lab	Breadth	1
ME3081	Computer Aided Designing (CAD) Lab	Breadth	1

□ Semester-VII (16 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
EEME4012	Control Engineering	IDEE	2
EEME4011	Control Engineering Lab	IDEE	1
ME4142	IC Engine	Depth	2
ME4141	IC Engine Lab	Depth	1
ME4153	Refrigeration & Air Conditioning	Depth	3
ME4151	Refrigeration & Air Conditioning Lab	Depth	1
ME4xx3	Technical Elective-I	Depth	3
ME 4913	Design Project (Part-I)	Design Project	3

□ Semester-VIII (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
ME4253	Mechanical Vibrations	Depth	3
ME4251	Mechanisms and Mechanical Vibrations Lab	Depth	1
ME4173	Power Plants	Depth	3
ME4xx3	Technical Elective Course-II	Depth	3
HMME4xx2	Management Elective-II	Mgmt Elective	2
ME4923	Design Project (Part-II)	Design Project	3

MS Mechanical Engineering

■ Degree Requirements

A student admitted in this program will have to complete the degree requirements by following any one of the options given below:

■ Admission Requirements

- (i) A minimum of 16 years of education leading to BS/BE in Mechanical Engineering/Aerospace/Avionics or equivalent.
- (ii) Minimum 2.00/4.00 CGPA or 50% marks
- (iii) Admission Test/HEC Approved Test

(i) 24 Cr. Hrs. course work with 6 Cr. Hrs. Thesis

(ii) Course work only (10 Courses)

■ Specialization Requirements

A student can claim a specialization if he/she has completed 15 Cr. Hrs. including research work, if opted, from one of the specialization areas mentioned below. Otherwise, on the completion of 30 Cr. Hrs., he/she will be awarded the MS Degree without any specialization.

■ Mechanical Design

Course Title	Code	Cr. Hrs.
Theory of Elasticity	ME5013	3
Experimental Stress Analysis	ME5023	3
Continuum Mechanics	ME5033	3
Advanced Engineering Materials	ME5043	3
Advanced Mechanical Vibration	ME6003	3
Advanced Solid Mechanics	ME6013	3
Fracture Mechanics	ME6063	3
Advanced Mechanical Design	ME6073	3
Finite Elements Methods	ME5003	3

■ Thermal Science

Course Title	Code	Cr. Hrs.
Internal Combustion Engines	ME5113	3
Thermal Power Generation	ME5123	3
Gas Dynamics	ME5133	3
Energy Conversion	ME5143	3

Combustion	ME5153	3
Conduction Heat Transfer	ME5203	3
Convective Heat Transfer	ME5213	3
Thermal Design of Heat Exchangers	ME5223	3
Radiation Heat Transfer	ME5233	3
Computational Heat Transfer	ME5243	3
Advanced Fluid Mechanics	ME5503	3
Computational Fluid Dynamics	ME5513	3
Fluid Mixing & Separation	ME5523	3
Transport Phenomena	ME5533	3
Viscous Flow	ME5543	3
Advanced Engineering Thermodynamics	ME5103	3

■ Manufacturing

Course Title	Code	Cr. Hrs.
Computer Integrated Manufacturing	ME5613	3
Mechanism Design	ME5623	3
Automation & Control	ME5633	3
Digital Manufacture & Rapid Manufacture	ME5643	3
Manufacturing System Design & Analysis	ME5653	3
Production Planning & Control	ME5673	3
Operations Research	ME5683	3
Material Selection & Design	ME6603	3
Robotics & Manufacturing Automation	ME6633	3
Advanced CAD/CAM	ME5603	3
Product Design & Development	ME5663	3
Product Design & Development	ME5663	3

■ Elective Courses

Course Title	Code	Cr. Hrs.
Theory of Plates & Shells	ME6033	3
Design of Machine Tools	ME6043	3

Tribology	ME6053	3
Engineering Plasticity	ME6083	3
Mechanics of Composite Materials	ME6093	3
Solar Energy Utilization	ME6103	3
Energy Management	ME6113	3
Advanced Propulsion	ME6123	3
Renewable Energy Technologies	ME6133	3
Energy Systems	ME6143	3
Advanced Heat & Mass Transfer	ME6203	3
Boiling & Condensation Heat Transfer	ME6213	3
Industrial Air Conditioning & Refrigeration	ME6223	3
Design of Industrial Boilers & Furnaces	ME6233	3
Fuel Cell Technology	ME6243	3
Turbulent Flow	ME6503	3
Boundary Layer Theory	ME6513	3
Two Phase Flow	ME6523	3
Kinetic Theory of Gases	ME6533	3
Theory of Granular Flows	ME6543	3
Aerodynamics	ME6553	3
Modern Manufacturing Processes	ME6613	3
Gradient Optimization Techniques	ME6623	3
Nano Fabrication & Manufacturing	ME6643	3
Quality Engineering & Management	ME6653	3
Product Life Cycle Management	ME6663	3
Productivity Engineering	ME6673	3
Experimental Methods	ME5723	3
Scheduling & Sequencing	ME6683	3
Theory of Metal Cutting	ME6693	3
Research Methodologies for Engineers	ME5703	3
Optimization Methods for Engineers	ME5713	3
Experimental Methods	ME5723	3

■ Research Thesis

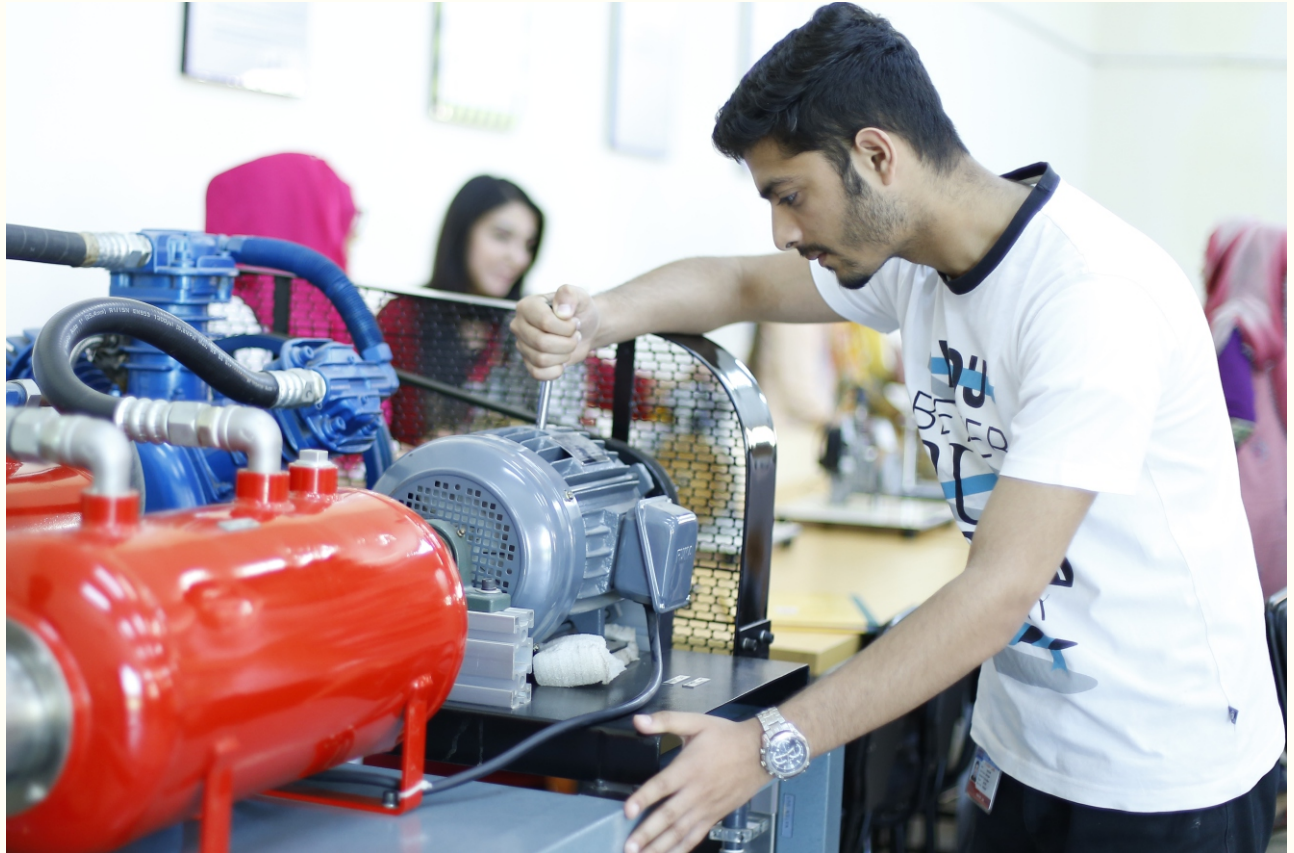
Course Title	Code	Cr. Hrs.
Research Thesis	ME6916	6

■ CGPA Requirement

A student is required to earn a minimum 3.00/4.00 CGPA on the completion of his/her degree requirements.

■ Program Duration

This is normally a two year program comprising of 4 semesters. There will be a Fall and a Spring semester in each year. The maximum duration to complete MS in Mechanical Engineering is 4 years.



MS Engineering Management

■ Degree Requirements

A student admitted in this program will have to complete the degree requirements by following any one of the options given below:

- (i) 24 Cr. Hrs. course work with 6 Cr. Hrs. Thesis
- (ii) Course work only (10 Courses)

■ Admission Requirements

- (i) A minimum of 16 years of education leading to BS Degree in Engineering/Applied Sciences or equivalent
- (ii) Minimum 2.00/4.00 CGPA or 50% marks
- (iii) Admission Test/HEC Approved Test

■ Core Courses

Students are required to qualify all the core courses listed below:

Course Title	Code	Cr. Hrs.
Engineering Management Techniques	EM6113	3
Operation Research	EM6323	3
Finance & Accounting for Engineering	EM6213	3
Research Methodologies for Engineers	EM6413	3

■ Elective Courses

Students are required to take 12 or 15 or 18 Cr. Hrs. from the list of elective courses given below:

Course Title	Code	Cr. Hrs.
Production Planning & Control	EM6333	3
Supply Chain Management	EM6343	3
Industrial Safety & Maintenance Management	EM6373	3
Manufacturing Strategy	EM6353	3
Product Design & Development	EM6363	3
Project Risk Assessment & Decision Analysis	EM6433	3
Project Management Information Systems	EM6443	3
Project Scheduling, Planning & Control	EM6463	3
Software Matrices	EM6513	3
Software Quality Management	EM6523	3
Software Requirements Engineering	EM6533	3

Software Risk & Configuration Management	EM6543	3
Innovation in Market Place	EM6713	3
Quality & Productivity Improvement	EM6133	3
Management of Project Based Organization	MPM6113	3
Project Process, Planning & Control	MPM6123	3
Project Monitoring & Evaluation	MPM6133	3
Engineering Project Management	EM6113	3
Entrepreneurial Basic Plan Preparation	EM6733	3
Competitive Strategies in Technology Management	EM6773	3
Environmental & Energy Management	EM6763	3
Technology Management	EM6703	3
Transfer of Technology	EM6753	3
Environment Impact Assessment	CE6723	3
Data Analysis & Quality Control	CE5403	3
Advanced Construction Management	CE5803	3
Advanced Project Management for Construction Projects	CE5823	3
Construction & Safety Management	CE5833	3
Construction Economics & Financial Management	CE6853	3
Sustainability in Construction Projects	CE6873	3
Manufacturing System Design & Analysis	ME5653	3
Optimization Methods for Engineers	ME5713	3

■ Research Thesis

Course Title	Code	Cr. Hrs.
Research Thesis	EM6916	6

■ CGPA Requirement

A student is required to earn a minimum 3.00/4.00 CGPA on the completion of his/her degree requirements.

■ Program Duration

This is normally a two years program comprising of 4 semesters. There will be a Fall and a Spring semester in each year. The maximum duration to complete MS in Engineering Management is 4 years.

Note: The following courses are cross listed with MS Project Management.

Engineering Management	Project Management
Finance & Accounting for Engineers	Financial Management
Project Scheduling, Planning & Control	Project Process, Planning & Control
Engineering Project Management	Advanced Project Management
Project Risk Assessment & Decision Analysis	Project Risk Management

Note: The following courses are cross listed with MS Civil Engineering.

Engineering Management	Civil Management
Project Scheduling, Planning & Control	Project Planning & Control
Project Risk Assessment & Decision Analysis	Project Risk Management
Engineering Project Management	Advanced Project Management for Construction Projects
Finance & Accounting for Engineers	Construction Economics & Financial Management



PhD Mechanical Engineering

The PhD program in Mechanical Engineering is designed to deliver students a broad background in mechanical engineering and related technologies. The program mission is to impart knowledge through a comprehensive and advanced curriculum followed with intense research training so that the graduating PhDs are fully prepared for industrial and technological challenges of future. The students are expected to tackle complex engineering and technological problems through a professional approach by utilizing advanced tools and techniques under the guidance of professional, dedicated and research focused faculty members.

Mechanical engineering department provides students the opportunity to conduct research in Mechanical Design; Thermo-fluids and Manufacturing system. The Department has a close liaison with the industry and R&D organizations to support and foster research activities.

■ Admission Requirements

- (i) MS degree in relevant discipline

- (ii) Minimum CGPA 3.0/4.0 (Semester System) or 60% marks (Annual System)

- (iii) Admission Test/HEC Approved Test

- (iv) Interview

■ Degree Requirements

A PhD candidate shall be awarded degree on successful completion of the following requirements:

- (i) 18 Cr. Hrs. Course Work with minimum CGPA 3.00/4.00

- (ii) Comprehensive Examination (written and oral)

- (iii) 30 Cr. Hrs. Research Work

- (iv) Synopsis Defense

- (v) Dissertation Foreign Reviews

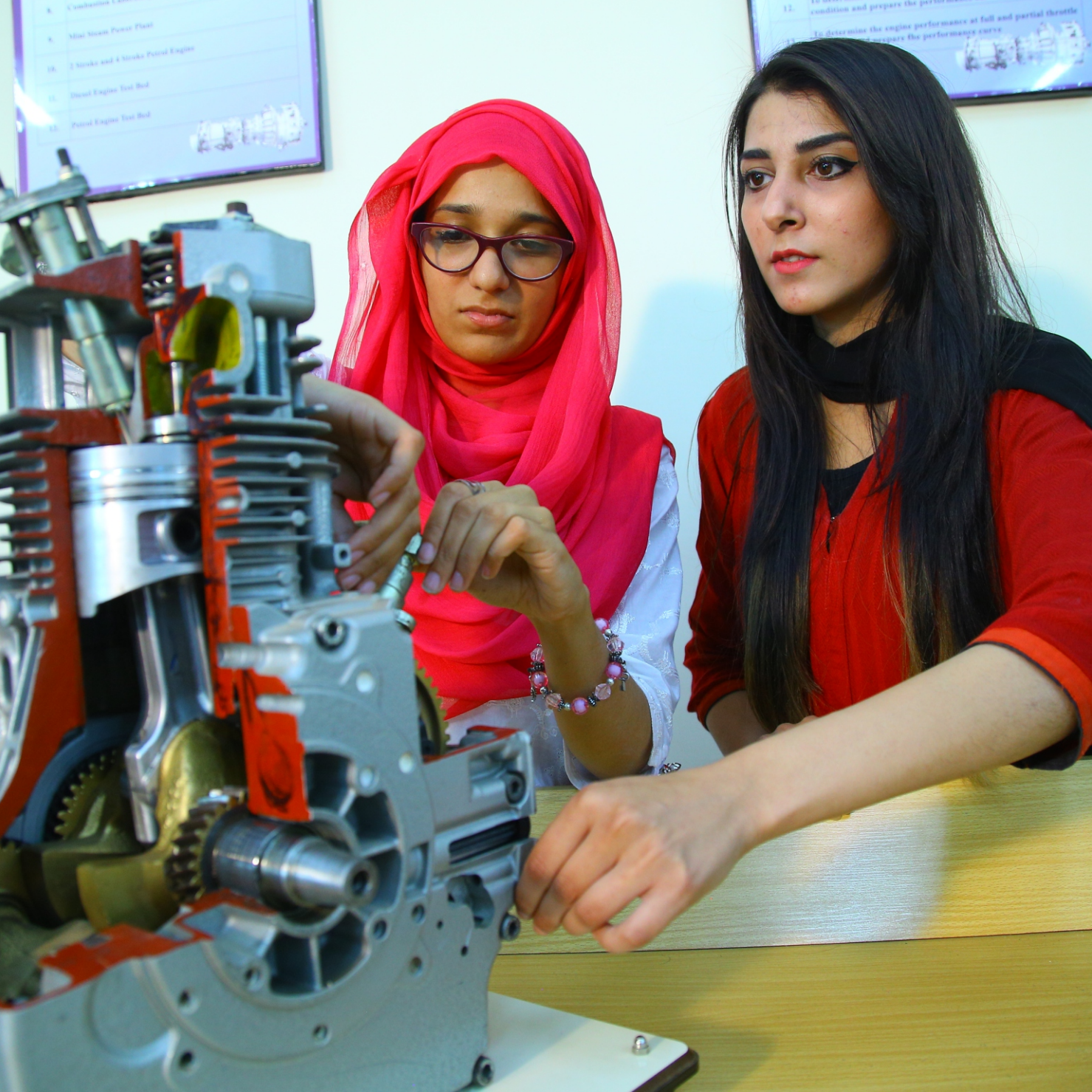
- (vi) Publication/Acceptance of at least one research paper in HEC approved journal.

- (vii) Dissertation Final Defense

Note: PhD scholars are required to comply with the following timeline:

Activity	Preferred Time	Maximum
Course Work	2 Semesters	3 Semesters
Comprehensive Exam	3 Semesters	5 Semesters
Synopsis Qualification	4 Semesters	6 Semesters
Thesis Submission	6 Semesters	10 Semesters





12. Combustion Chamber
13. Mini Steam Power Plant
14. 2 Stroke and 4 Stroke Petrol Engine
15. Diesel Engine Test Bed
16. Petrol Engine Test Bed

12. condition and prepare the performance at full and partial throttle
13. To determine the engine performance at full and partial throttle
14. To determine the engine performance at full and partial throttle
15. To determine the engine performance at full and partial throttle