University of Derna

Master's Program – Faculty of Engineering

GRADUATE STUDIES FOR THE FACULTY OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING – THERMAL POWER ENGINEERING DIVISION

Vision of the Department

The Department of Mechanical Engineering aims to graduate qualified technical professionals in the fields of mechanics and industrial technology, enhancing the level of university education in engineering disciplines to align with regional and global standards. This will be achieved through the development of curricula, libraries, and laboratories, as well as the provision and training of teaching staff, alongside expanding specializations within the department to cover all aspects and branches of mechanical engineering.

Mission of the Department

To develop studies quantitatively and qualitatively in accordance with the university's core objectives by creating new pathways and channels in both undergraduate and graduate studies that align with modern technological developments. The specializations and research should harmonize with the scientific advancement of the country in line with continuous discoveries and the rapid progress of sciences and technologies in all aspects of contemporary human life and its activities.

Objectives of the Department

The objectives of the Department of Mechanical Engineering extend the goals of Derna University, which include:

1. To prepare engineering staff in various fields of mechanical engineering (general mechanics, air conditioning and refrigeration, renewable energy engineering, automotive engineering, and power plant engineering), which bear the responsibility of building the nation and participating in its comprehensive development in line with the country's needs.
2. To instill authentic Islamic, national, and humanitarian values in the new generation and prepare future alternative leaders in mechanical engineering specializations.
3. To cultivate a knowledgeable generation armed with science as a solid foundation for enacting fundamental changes, placing scientific knowledge and analytical thinking in the service of national goals and eliminating various negative aspects associated with it.
4. To elevate the level of graduate studies and diversify them while providing their various requirements in accordance with the needs of the country.
5. To enhance the status of Derna University as a creative center of culture that deepens authentic social values.
6. To deepen the balance between the advancement of theoretical sciences and their practical aspects.
7. To guide students and choose the best means to expand their activities and deepen their scientific and professional specializations within the framework of sustainable development and the needs of the country, fostering their spirit of innovation, creativity, renewal, and initiative.
8. To link graduate studies with the transitional needs of the sustainable development plan for the country, responding to them and providing appropriate scientific and practical solutions for the problems it faces or proposing suggestions and regulations for them.
9. To focus on introducing modern methods in the learning system that enhance students' capacity for creativity and innovation.
10. To actively contribute to deepening and solidifying the university's relationship with the community through the implementation of consultancy services, training, and the development of staff, as well as organizing specialized courses.

Program Overview

Study System:

The graduate studies at the Faculty of Engineering, Derna University, follow a semester system consisting of two academic semesters each year: the fall and spring semesters. A summer semester may be added if necessary, based on a decision by the Graduate Studies Council.

Language of Instruction:

English is the primary language of instruction in the department. However, the Scientific Council may allow courses or research to be conducted in Arabic based on a proposal from an instructor.

Duration of Study:

The duration of study in the department ranges from a minimum of 18 months to a maximum of 36 months to obtain a Master's degree (M.Sc.) by research.

Study Phases:

The program combines theoretical and practical studies. Students will study a set of general and specialized courses totaling 24 credit hours, in addition to completing and defending a Master's thesis equivalent to 12 credit hours.

Grading and Success Criteria

An alphabetical grading system is used to evaluate student performance. Students must maintain a semester or cumulative GPA of at least 3.0 (B) or equivalent to 75%. A student is considered successful in a course if they achieve at least 2.0 (C) or equivalent to 65%.

Percentage (%)	Equivalent Grade	Points	Grade	Course Status
Above 95%	Excellent	4.00	A+	Pass
95% - Below 90%	Excellent	3.90	A	Pass
90% - Below 85%	Excellent	3.70	A-	Pass
85% - Below 80%	Very Good	3.40	B+	Pass
80% - Below 75%	Very Good	3.00	B	Pass
75% - Below 70%	Good	2.70	B-	Pass
70% - Below 68%	Good	2.30	C+	Pass
68% - Below 65%	Good	2.00	C	Pass
65% - Below 60%	Weak	1.70	C-	Fail
60% - Below 55%	Weak	1.30	D+	Fail
55% - Below 50%	Weak	1.00	D	Fail
Below 50%	Weak	0	F	Fail

Admission Requirements for Graduate Studies

1. Passing the entrance examination specific to the Department of Mechanical Engineering – Thermal Power Engineering Division.
2. Completion of at least 24 credit hours in graduate-level courses in the specialized field, along with completing and defending a thesis equivalent to 12 credit hours.
3. Each student is required to submit a proposal for their Master's thesis to a specialized committee for review and approval. The thesis topic must be in one of the following areas:
    - Topics in mechanical engineering related to thermal power engineering.
    - Topics in renewable energy engineering focused on design and power generation.
    - Topics related to statistical evaluation, whether in power or other fields, are not accepted.

COURSE SPECIFICATIONS (THERMAL POWER ENGINEERING DIVISION)

Mandatory Courses

Category A - General Courses

These courses are mandatory for all students in the department and each carries 3 credit hours. The courses include:

Category A - General Courses

Course Code	Course Title		Credits
GME 600	Advanced Numerical Methods		3
GME 601	Research Methodology		3
GME 602	Instrumentation and Measurement Techniques	(Elective general courses) - each student is required to select one course	3
GME 603	Advanced Engineering Mathematics		3
GME 604	Advanced Engineering Statistics		3

Category B – Core Courses

These courses are mandatory for students in the Thermal Power Engineering Division, each carrying 3 credit hours. The courses include:

Category B – Core Courses

Course Code	Course Title	Credits
MEP 605	Advanced Thermodynamics	3
MEP 606	Convective Mass and Heat Transfer	3
MEP 607	Advanced Fluid Mechanics	3

Elective Courses

Category C - Elective Courses

Any student enrolled in the Thermal Power Engineering Division may choose 2 elective courses from the following list, each carrying 3 credit hours:

Category C - Elective Courses

Course Code	Course Title	Credits
MEP 608	Internal Combustion Engineering	3
MEP 609	Conduction Heat Transfer	3
MEP 610	Control Volume Methods	3
MEP 611	Radiation Heat Transfer	3
MEP 612	Advanced Gas Dynamics	3
MEP 613	Applied Finite Elements	3
MEP 614	Refrigeration and HVAC System Design	3
MEP 615	Renewable Energy Systems	3
MEP 616	Principles of Desalination	3
MEP 617	Advanced Gas Turbine Cycles	3
MEP 618	Advanced Air Conditioning	3
MEP 619	Principles of Hydraulic Machines and System Design	3
MEP 620	Solar Thermal Processes	3
MEP 621	Photovoltaic Solar Cells	3
MEP 622	Wind Energy	3
MEP 623	Passive Solar Heating and Cooling	3
MEP 624	Seawater Thermal Desalination	3
MEP 625	Heat Exchangers Analysis and Design	3
MEP 626	Corrosion and Materials Selection	3
MEP 627	Energy Management and Efficiency	3
MEP 628	Exergy Analysis of Thermal Systems	3
MEP 629	Advanced Automatic Control	3
MEP 630	Theory of Mechanical Vibrations	3
MEP 631	Special Topics	3

Category D - M.Sc. Thesis

MEP 632	M.Sc. Thesis	12