

MS in Chemical Engineering

Program Overview:

Department of Chemical Engineering, Faculty of Engineering and Architecture is offering an MS program in Chemical Engineering since Spring 2016. Chemical Engineering is concerned with producing value-added stock from raw materials by applying suitable processing techniques, process analysis, optimization and economic evaluation as per requirement. Transformation of units from pilot scale to large scale production involves the design, erection, maintenance, workforce utilization, safety and process control etc. Main industrial employment includes Petrochemical industries, Petroleum refineries, Cement Factories, Food Processing and Technology units, Fertilizer Factories, Pharmaceutical industries, Biotechnology Sector, Environmental Health and Safety, and Quality control etc.

Main Areas of Research:

- Nanotechnology
- Energy storage materials & devices
- Polymer composites
- Wastewater treatment
- Extraction and green synthesis process
- Waste management
- Biomass and bioenergy
- Algal biomass and its residue application
- Biofuel production
- Pyrolysis and co-pyrolysis for fuel production
- Gasification
- Process modelling and optimization
- Heat transfer and thermodynamics
- Corrosion and corrosion mitigation
- Fiber characterization
- Biochemical
- Supercapacitor

For more information, please refer to the list of faculty members for their research field on the Department website.

Admission Requirement:

16 years of education or equivalent e.g. B.E/ BS - 4 years in Chemical Engineering/ Petroleum and Gas Engineering from HEC recognized University with at least 60 % marks (annual system) or CGPA 2.5 out of 4 (Semester System).

GAT general with at least 50% marks or GAT subject with at least 60% marks or HAT for the admission /scholarship in the specific program of study.

For more information on application deadlines, tests, and other admission requirements, please visit the admissions section of the Graduate Studies Office.

Program Requirement:

The minimum and maximum duration of the MS program is 1.5 to 4 years. Students must meet the following requirements for graduation:

- A minimum of 24 credit hours course work with a minimum CGPA of 2.5
- Successful defense of synopsis/ research proposal and its approval from the Advanced Studies and Research Board (AS&RB).
- A minimum of 6 credit hours research work/ thesis.
- Thesis defense and viva.

S#	Course Codes	Course Title	Credit Hours
FIRST SEMESTER			
1		Core-I	3 + 0
2		Core-II	3 + 0
3		Elective-I	3 + 0
SECOND SEMESTER			
1		Core-III	3 + 0
2		Elective-II	3 + 0
3		Elective-III	3 + 0
THIRD SEMESTER			
1		Core-IV	
2		Elective-IV	

FOURTH SEMESTER

1	Thesis	6 + 0
TOTAL		6
Total Courses		24
Total Credit Hours		30

Program Structure:**List of Courses for MS Chemical Engineering**

SR. NO	Core Courses	CREDIT HOURS
1	Advanced Chemical Engineering Thermodynamics	3-0
2	Research Methodology	3-0
3	Advanced Transport Phenomena	3-0
4	Advanced Engineering Mathematics	3-0
5	Advanced Process Dynamics and Control	3-0
6	Advanced Separation Processes	3-0
SR. NO	Elective Courses	CREDIT HOURS
1	Advanced Chemical Reactor Design	3-0
2	Advanced Fluid Mechanics	3-0
3	Advanced Heat Transfer	3-0
4	Numerical Methods in Chemical Engineering	3-0
5	Design of Heat Recovery Systems	3-0
6	Particle Dynamics	3-0
7	Experimental Design and Analysis	3-0

8	Project Management	3-0
9	Biochemical Engineering	3-0
10	Computational Fluid Dynamics	3-0
11	Computer Aided Process Design	3-0
12	Occupational Health and Safety in Process Industries	3-0
13	Process Design and Optimization	3-0
14	Transport Processes	3-0
15	Process Modelling and Control	3-0
16	Process Safety and Loss Prevention	3-0
17	Sustainable Energy Engineering	3-0
18	Environmental Engineering	3-0
19	Energy Management & Auditing	3-0
20	Power Plant Engineering	3-0
21	Coal Technology	3-0
22	Polymer Engineering	3-0
23	Explosives and Propellants	3-0
24	Rocket Propulsion Technology	3-0
25	Combustion of Energetic Materials	3-0
26	Advanced Composite Materials	3-0
27	Nano Technology	3-0
28	Materials Engineering	3-0
29	Mechanical & Thermal Behaviour of Materials	3-0
30	Advanced Surface Analysis	3-0

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