Bachelor of Science in Material Science and Engineering

2024-2025

Major Sheet

1. General Program Presentation

Graduating with a Bachelor of Science in Material Science and Engineering (MSE) necessitates the successful completion of a total of 132 credit hours (CH). These credit hours are distributed across different requirements, encompassing courses that are essential as well as those that can be chosen as elective courses. The table below shows how 132 credit hours are distributed across requirements:

Table 1: MSE credit hours distribution.

Requirements	Credit hours (CH)
General Education Requirements	36
College Requirements	43
Program Requirements	53 (Including 9 CH electives)
Total Credit Hours	132

2. General Education (36 Credits)

Students here are required to complete 36 credit hours distributed over five sections as follows:

2.1. Communication (9 Credits)

Table 2.1: Compulsory courses.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
ENL101	English for Academic Studies	3	3	IEP099 or Equivalent	DPS095*
ENL102	English Composition	3	3	ENL101 DPS095	
ENL201	Writing and Research	3	3	ENL102	

*Preparatory Program; Digital and Professional Skills (DPS095).

2.2. Innovation and Creativity (6 Credits)

Table 2.2.1: Compulsory course.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
GEN150	Professionalism and Ethics	3	3		

Table 2.2.2: Elective courses, students should select one course from the following list.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
GEN131	Creativity and Problem Solving	3	3		
BUS101	Entrepreneurship Essentials	3	3		
ENI110	Intro. to Innovation and Creativity	3	3		

ENI140	Design Thinking	3	3		
ENI150	Innovation in Business Models	3	3		
ENI160	Innovation and Globalization	3	3		

2.3. Global Citizen (6 Credits)

Table 2.3.1: Compulsory course.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
INF120	Computers and Information Systems	3	3	DPS095	

Table 2.3.2: Elective courses, students should select one course from the following list.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
GEN201	Globalization and Sustainability	3	3		
GEN202	Global Citizenship in the Digital Age	3	3		
BUS201	Global Economics and Trade	3	3		

2.4. Art and Humanities (9 Credits)

Table 2.4.1: Compulsory course.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
HST101	Islamic Culture and Values	3	3		

Table 2.4.2: Elective courses, group I, students should select one course from the following list.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
HST102	Kuwait History	3	3		
ARB101	Arabic Communication Skills	3	3		
ART101	Art Appreciation	3	3		
ART102	Intro. to Media and Communication	3	3		

Table 2.4.3: Elective courses, group II, students should select one course from the following list.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
PHL101	Introduction to Philosophy	3	3		
LAW101	Law and Society	3	3		
PSY101	Introduction to Psychology	3	3		
SOC101	Introduction to Sociology	3	3		

BUS300	Career Planning	3	3		

2.5. Math and Science (6 Credits)

Table 2.5: Compulsory courses.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
MAT101	Calculus I	3	3	IMP099* or Equivalent	
PHY101	Physics I	3	3		MAT101

*Preparatory Program; Precalculus (IMP099).

3. College Requirements (43 Credits)

Table 3.1: Compulsory courses for Math and Science (21 Credits).

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
PHY105	Physics Lab I	1	3		PHY101
MAT102	Calculus II	3	3	MAT101	
MAT201	Calculus III	3	3	MAT102	
PHY102	Physics II	3	3	PHY101 MAT101	
PHY107	Physics II Lab	1	3	PHY105	PHY102
CHM101	Chemistry I	3	3	IMP099 or Equivalent	
CHM105	Chemistry I Lab	1	3		CHM101
MAT202	Linear Algebra	3	3	MAT101	
MAT240	Differential Equations	3	3	MAT102	

Table 3.2: Compulsory courses for Engineering (22 Credits).

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
ENG205	Electrical and Electronic Circuits	3	3	PHY102 MAT102	
ENG206	Electrical and Electronic Circuits Lab	1	3	ENG205 PHY107	
ENG207	Programming	3	3	MAT202	
ENG208	Introduction to Energy and Sustainability	3	3	PHY102 CHM105	
ENG209	Statics and Strength of Materials	3	3	PHY102 CHM101	
ENG304	Engineering Probability & Statistics	3	3	MAT102	
ENG308	Numerical Methods	3	3	MAT202	

				MAT240	
ENG309	Engineering Project Management and Economics	3	3	ENG207 ENG208	

4. Program Requirements (53 Credits)

Table 4.1: Compulsory courses (44 Credits).

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
MSE211	Introduction to Materials Science and Engineering	3	3	ENG209	
MSE301	Thermodynamics of Materials	3	3	CHM101	
MSE302	Materials Characterization	3	3	MSE211	
MSE303	Structure & Bonding of Solids	3	3	MSE211	
MSE304	Physical Chemistry	3	3	MSE302	
MSE305	Electronic Properties of Materials	3	3	MSE211	
MSE306	Mechanical and Thermal Properties of Materials	3	3	MSE211	
MSE307	Nanomaterials	3	3	MSE303	
MSE308	Materials Characterization Laboratory 1	1	3		MSE302
MSE309	Materials Synthesis Laboratory	1	3	MSE303 MSE304	
MSE310	Electronic Device Fabrication Laboratory	1	3	ENG206	MSE305
MSE311	Material Property Measurement Laboratory	1	3	MSE305 MSE306	
MSE400	Diffusion and Kinetics in Materials	3	3	MSE301 MSE303	
MSE401	Phase Diagrams & Phase Transformations	3	3	MAT201 MSE306 MSE308	
MSE402	Materials for Renewable Energy & Storage Technologies	3	3	MSE305 MSE306 ENG208	
MSE403	Materials Characterization Laboratory 2	1	3	MSE302 MSE308	
MSE490	Capstone Design 1	3	3	Pass 96 CH	
MSE491	Capstone Design 2	3	3	MSE490	

Table 4.2: Elective courses, students should select three courses (9 Credits) from the following list.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
MSE382	Organic Chemistry	3	3	CHM101	
MSE484	Material Synthesis Techniques	3	3	MSE303	
MSE485	Material Modeling & Simulation	3	3	MSE302	
MSE486	Polymer Science and Engineering	3	3	MSE302	
MSE487	Composite Material Design and Engineering	3	3	MSE302	
MSE488	Materials Engineering for Harsh Environments	3	3	MSE302	
MSE480	Internship	3	3	Program Approval	
MSE495	Special Topics in Material Science Engineering	3	3	Program Approval	

- **Students may take up to 3 credits of program electives from another college at the 300 level or above to replace one of their program electives, provided they obtain the approval of both the program and the college.**