



Bachelor of Science in Energy Systems Engineering

2023-2024

جامعة
عبدالله السالم
Abdullah Al Salem
University

1) General Program Presentation

Graduating with a Bachelor of Science in Energy Systems Engineering 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: ESE credit hours distribution.

General Education Requirements	36 Credits
College Requirements	43 Credits
Program Requirements	53 Credits (9 Electives)
Total Credits Hours	132 Credits

2) General Education (36 Credits)

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

Communication (9 Credits)

Table 2: General education communication courses.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
ENL101	English for Academic Studies	(3 credits)	3		ICT 095*
ENL102	English Composition	(3 credits)	3	ENL101 ICT 095	
ENL201	Writing and Research	(3 credits)	3	ENL102	

*Preparatory Program: ICT 095 Information Technology Basics.

Innovation and Creativity (6 Credits)

Table 3: Innovation and Creativity Ethics compulsory course.

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

Table 4: General education innovation and creativity 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 credits)	3		
BUS101	Entrepreneurship Essentials	(3 credits)	3		
ENI110	Intro. to Innovation and Creativity	(3 credits)	3		
ENI140	Design Thinking	(3 credits)	3		
ENI150	Innovation in Business Models	(3 credits)	3		
ENI160	Innovation and Globalization	(3 credits)	3		

Global Citizen (6 Credits)

Table 5: General education global citizen compulsory course.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
INF120	Computers and Information Systems	(3 credits)	3	ICT095	

Table 6: General education global citizen 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 credits)	3		
GEN202	Global Citizenship in the Digital Age	(3 credits)	3		
BUS201	Global Economics and Trade	(3 credits)	3		

Art and Humanities (9 Credits)

Table 7: General education art and humanities compulsory course.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
HST 101	Islamic Culture and Values	(3 credits)	3		

Table 8: General education art and humanities elective course 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 credits)	3		
ARB101	Arabic Communication skills	(3 credits)	3		
ART101	Art Appreciation	(3 credits)	3		
ART102	Intro. to Media and Communication	(3 credits)	3		

Table 9: General education art and humanities elective course 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 credits)	3		
LAW101	Law and Society	(3 credits)	3		
PSY 101	Introduction to Psychology	(3 credits)	3		
SOC 101	Introduction to Sociology	(3 credits)	3		

Math and Science (6 Credits)

Table 10: General education math and science courses (6 credits).

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

*Preparatory Program: IMP099 Precalculus.

3) College Requirements (43 Credits)

• Math and Science (21 Credits)

Table 11: Math and Science courses.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
PHY105	Physics I Lab	(1 credit)	3		PHY101
MAT102	Calculus II	(3 credits)	3	MAT101	
MAT201	Calculus III	(3 credits)	3	MAT102	
PHY102	Physics II	(3 credits)	3	PHY101 MAT101	
PHY107	Physics II Lab	(1 credit)	3	PHY105	PHYS102
CHM101	Chemistry I	(3 credits)	3		
CHM105	Chemistry I Lab	(1 credit)	3		CHM101
MAT202	Linear Algebra	(3 credits)	3	MAT101	
MAT240	Differential Equations	(3 credits)	3	MAT102	

• Engineering requirements (22 Credits)

Table 12: Engineering courses.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
ENG205	Electrical and Electronic Circuits	(3 credits)	3	PHY102 MAT102	
ENG206	Electrical and Electronic Circuits Lab	(1 credit)	3	ENG205 PHY107	
ENG207	Programming	(3 credits)	3	MAT202	
ENG208	Introduction to Energy and Sustainability	(3 credits)	3	PHY102 CHM101 CHM105	
ENG209	Statics and Strength of Materials	(3 credits)	3	PHY102	
ENG304	Engineering Probability & Statistics	(3 credits)	3	MAT102	
ENG308	Numerical Methods	(3 credits)	3	MAT201 MAT240	

ENG309	Engineering Project Management and Economics	(3 credits)	3	ENG304
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4) Program Requirements (53 Credits):

- **Program Requirements (44 Credits)**

Table 13: Program courses.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
ESE211	Industrial Electronics	(3 credits)	3	ENG205	
ESE301	Thermodynamics	(3 credits)	3	MAT240 PHY102	
ESE302	Thermo-fluid systems	(3 credits)	3	ESE301 ENG308	
ESE305	Thermal Systems Lab	(1 credits)	3	ESE302	
RME304	Instrumentation, Sensors, and Actuators	(3 credits)	3	ESE211	
RME352	Digital Systems Design & Microcontrollers	(3 credits)	3	ESE211	
RME353	Digital Systems Design & Microcontrollers Lab	(1 credit)	3		RME352
ESE312	Electrical Machines and Drives	(3 credits)	3	ESE211	
ESE313	Electrical Machines and Drives Lab	(1 credit)	3	ESE312	
ESE314	Power Systems Analysis	(3 credits)	3	ENG308 ESE312	
ESE315	Power Systems Lab	(1 credit)	3	ESE314	
ESE321	Renewable Energy Conversion Systems	(3 credits)	3	ENG208 ESE301 ESE312	
RME360	Control Systems Analysis & Design	(3 credits)	3	MAT201 MAT240 RME352	
ESE401	Power Plants	(3 credits)	3	ESE302	
ESE402	Energy Efficient Buildings	(3 credits)	3	ESE302	
ESE425	Renewable Energy Conversion Systems Lab	(1 credit)	3	ESE321 ESE401	
ESE490	Capstone Design 1	(3 credits)	3	Program Approval	
ESE491	Capstone Design 2	(3 credits)	3	ESE490	

- **Program Electives (9 Credits)**

Table 14: Program elective courses (Three courses from the following list).

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
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ESE440	Solar Thermal Systems	(3 credits)	3	ESE302 ESE321
ESE441	Energy Storage Systems	(3 credits)	3	ESE302 ESE314
ESE442	Refrigeration	(3 credits)	3	ESE302 ESE321
ESE443	Petroleum Engineering	(3 credits)	3	ESE302 ESE321
ESE450	Power Electronics Conversion Systems	(3 credits)	3	ESE312
ESE451	Power Systems Protection	(3 credits)	3	ESE314
ESE452	Power Systems Generation, Transmission and Distribution	(3 credits)	3	ESE314
ESE453	Smart Grids	(3 credits)	3	ESE314 ESE321
ESE461	Techno-economic Modeling of Energy Systems	(3 credits)	3	ESE314 ESE321 ESE401
ESE462	Fuel Cell & Hydrogen Production Technology	(3 credits)	3	ESE321
ESE480	Internship	(3 credits)	3	Program Approval
ESE495	Special Topics in Energy Systems Engineering	(3 credits)	3	Program Approval

- Students can take up to three credits of technical electives from another department or institution.