كلية الهندسة - جامعة حلوان

Faculty of Engineering - Helwan University

لائحة الدراسات العليا بنظام الساعات المعتمدة

Postgraduate Bylaw (Credit Hour System)

2025

قسم الهندسة الميكانيكية

Department of Mechanical Engineering

قسم الهندسة الميكانيكية

Department of Mechanical Engineering

List of Progams offered by the Department

No.	Program Name
1	Production Engineering
2	Industrial Engineering
3	Mechatronics Engineering

Production Engineering Program — برنامج هندسة الإنتاج

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.1).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.1, and Level 600 – Table 3.1).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.1).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.1, and Level 600 – Table 3.1).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.1).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.1 and Level 700 – Table 5.1).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Production Engineering Program **برنامج هندسة الإنتاج**

Table (1.1): List of Compulsory Courses – Level 500

Production Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC571	Statistical Analysis	3	2	2	30	20	50	100	3
MEC521	Material Engineering and Testing	3	2	2	30	20	50	100	3
MEC511	Manufacturing Engineering	3	2	2	30	20	50	100	3
MEC572	Academic Writing	3	2	2	30	20	50	100	3

Production Engineering Program **برنامج هندسة الإنتاج**

Table (2.1): List of Elective Courses – Level 500

Production Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC522	Introduction to Nano Materials	3	2	2	30	20	50	100	3
MEC523	Introduction to Composite Materials	3	2	2	30	20	50	100	3
MEC524	Heat Treatment of Metals	3	2	2	30	20	50	100	3
MEC512	Computer Aided Manufacturing	3	2	2	30	20	50	100	3
MEC513	Numerical Control Machines	3	2	2	30	20	50	100	3
MEC525	Physical Metallurgy	3	2	2	30	20	50	100	3
MEC514	Selected Topics	3	2	2	30	20	50	100	3

Production Engineering Program **برنامج هندسة الإنتاج**

Table (3.1): List of Elective Courses – Level 600

Production Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC611	Nontraditional Machining	3	2	2	30	20	50	100	3
MEC612	Reverse Engineering	3	2	2	30	20	50	100	3
CSE617	Programming	3	2	2	30	20	50	100	3
MEC631	Computer Aided Design Systems	3	2	2	30	20	50	100	3
MEC651	Mechanical Fault Diagnosis	3	2	2	30	20	50	100	3
MEC621	Ceramic Materials	3	2	2	30	20	50	100	3
MEC613	Metal Forming Processes	3	2	2	30	20	50	100	3
MEC622	Fracture Mechanics	3	2	2	30	20	50	100	3
MEC623	Engineering Corrosion	3	2	2	30	20	50	100	3
MEC652	Measurements and Control Systems	3	2	2	30	20	50	100	3
MEC661	Industrial Robot	3	2	2	30	20	50	100	3
MEC614	Engineering Joining Processes	3	2	2	30	20	50	100	3
MEC615	Sheet Metal Forming	3	2	2	30	20	50	100	3
MEC616	Surface Coating Processes	3	2	2	30	20	50	100	3
MEC671	Research and Thesis Writing	3	2	2	30	20	50	100	3
MEC617	Automated Manufacturing Systems	3	2	2	30	20	50	100	3
MEC672	Design and Analysis of Experiments	3	2	2	30	20	50	100	3
MEC618	Cutting Tool Engineering	3	2	2	30	20	50	100	3
MEC673	Applied Project	3	-	**6**	**50**	**50**	-	100	-
MEC624	Selected Topics	3	2	2	30	20	50	100	3

Production Engineering Program **برنامج هندسة الإنتاج**

Table (4.1): List of Core Courses – Level 700

Production Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC711	Machining Difficult-to-Cut Materials	3	2	2	30	20	50	100	3
MEC712	Green manufacturing	3	2	2	30	20	50	100	3
MEC721	Modern Materials Technology	3	2	2	30	20	50	100	3

Production Engineering Program **برنامج هندسة الإنتاج**

Table (5.1): List of Elective Courses – Level 700

Production Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC713	Computer Integrated Manufacture	3	2	2	30	20	50	100	3
MEC741	Industry 4	3	2	2	30	20	50	100	3
MEC761	Advanced Robot: Science and Application	3	2	2	30	20	50	100	3
MEC722	Mechanics of Composite Materials	3	2	2	30	20	50	100	3
MEC723	Technology of Smart Materials	3	2	2	30	20	50	100	3
MEC714	Metal Casting Technology	3	2	2	30	20	50	100	3
MEC715	Additive Manufacturing	3	2	2	30	20	50	100	3
MEC724	Micro and Nano Technologies	3	2	2	30	20	50	100	3
MEC725	Nano Materials	3	2	2	30	20	50	100	3
MEC716	Special Topics in Welding	3	2	2	30	20	50	100	3
MEC726	Numerical Modeling in Engineering Materials Science	3	2	2	30	20	50	100	3
MEC717	Advanced Sheet-Metal Forming Technology	3	2	2	30	20	50	100	3
CSE789	Object-oriented Programming	3	2	2	30	20	50	100	3
MEC718	Selected Topics	3	2	2	30	20	50	100	3

Industrial Engineering Program **برنامج الهندسة الصناعية**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.2).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.2, and Level 600 – Table 3.2).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.2).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.2, and Level 600 – Table 3.2).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.2).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.2 and Level 700 – Table 5.2).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Table (1.2): List of Compulsory Courses – Level 500

Industrial Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC573	Project Management and Cost Analysis	3	2	2	50	-	50	100	3
MEC541	Quality Engineering	3	2	2	50	-	50	100	3
MEC542	Material Management and Supply Chain	3	2	2	50	-	50	100	3
MEC571	Statisticical Analysis	3	2	2	30	20	50	100	3

Table (2.2): List of Elective Courses – Level 500

Industrial Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC543	Facility Planning and Material Handling	3	2	2	30	20	50	100	3
MEC544	Operations And Industrial Management	3	2	2	30	20	50	100	3
MEC545	Analysis and Control of Production Systems	3	2	2	30	20	50	100	3
MEC574	Research Reports and Seminars	3	2	2	30	20	50	100	3
MEC575	Selected Topics	3	2	2	30	20	50	100	3

Table (3.2): List of Elective Courses – Level 600

Industrial Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC672	Design and Analysis of Experimental	3	2	2	30	20	50	100	3
MEC641	Time Series and Forecasting	3	2	2	30	20	50	100	3
MEC642	Scheduling Techniques	3	2	2	30	20	50	100	3
MEC643	Industrial Systems Simulation	3	2	2	30	20	50	100	3
MEC674	Research Project	3	2	2	30	20	50	100	3
MEC644	Machine Learning Techniques	3	2	2	30	20	50	100	3
MEC671	Research and Thesis Writing	3	2	2	30	20	50	100	3
MEC645	Methods and Applications of Data Mining	3	2	2	30	20	50	100	3
MEC646	Reliability and Maintenance Management	3	2	2	30	20	50	100	3
MEC647	Production System Modelling and Analysis	3	2	2	30	20	50	100	3
MEC673	Applied Project	3	-	6	50	50	-	100	3
MEC675	Selected Topics	3	2	2	30	20	50	100	3

Industrial Engineering Program **برنامج الهندسة الصناعية**

Table (4.2): List of Core Courses – Level 700

Industrial Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC741	Industrial Applications of Machine Learning	3	2	2	30	20	50	100	3
MEC742	Advanced Topics in Industrial Engineering	3	2	2	30	20	50	100	3
MEC743	Industrial Engineering seminar	3	2	2	30	20	50	100	3

Table (5.2): List of Elective Courses – Level 700

Industrial Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC744	Fuzzy Logic and Fuzzy Systems	3	2	2	30	20	50	100	3
MEC745	Optimization In Industrial Processes and Products	3	2	2	30	20	50	100	3
MEC746	Algorithms and Problem Solving	3	2	2	30	20	50	100	3
MEC747	Advanced Operations Research	3	2	2	30	20	50	100	3
MEC748	Selected Topics in Industrial Engineering	3	2	2	30	20	50	100	3

Mechatronics Engineering Program — برنامج هندسة الميكاترونيات

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.3).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.3, and Level 600 – Table 3.3).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.3).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.2, and Level 600 – Table 3.3).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.3).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.3 and Level 700 – Table 5.3).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Mechatronics Engineering Program **برنامج هندسة الميكاترونيات**

Table (1.3): List of Compulsory Courses – Level 500

Mechatronics Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
CSE574	Programing of Microcontrollers and Applications	3	2	2	30	20	50	100	3
CSE554	Digital Signal Processing	3	2	2	30	20	50	100	3
CSE588	Object-oriented programming in Paython	3	2	2	30	20	50	100	3
MEC571	Statisticical Analysis	3	2	2	30	20	50	100	3

Mechatronics Engineering Program **برنامج هندسة الميكاترونيات**

Table (2.3): List of Elective Courses – Level 500

Mechatronics Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC561	Sensors and Actuators	3	2	2	30	20	50	100	3
MEC515	Modern Manufacturing Technology	3	2	2	30	20	50	100	3
MEC562	Modern Measurements and Control Systems	3	2	2	30	20	50	100	3
MEC563	Selected Topics in Mechatronics Engineering	3	2	2	30	20	50	100	3

Table (3.3): List of Elective Courses – Level 600

Mechatronics Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
MEC661	Mechatronic System Design	3	2	2	30	20	50	100	3
CSE626	Machine Learning Techniques	3	2	2	30	20	50	100	3
MEC662	Fault Detection and Condition Monitoring	3	2	2	30	20	50	100	3
EPM646	Adaptive Control Systems	3	2	2	30	20	50	100	3
MEC663	Advanced Robot Systems	3	2	2	30	20	50	100	3
MEC671	Research and Thesis Writing	3	2	2	30	20	50	100	3
MEC664	Selected Topics in Mechatronics Engineering	3	2	2	30	20	50	100	3
MEC665	Applied Project	3	-	6	50	50	-	100	-

Table (4.3): List of Core Courses – Level 700

Mechatronics Engineering Program									
Course Code	**Course Name**	**Credit Hours**	**Contact Hours**		**Marks**				**Final Exam Duration**
			Lecture	**Practical**	**Course work**	**Practical & Oral**	**Final Exam**	**Total**	
MEC761	Advanced Mechatronic Systems	3	2	2	30	20	50	100	3
MEC762	Advanced Robot Dynamics and Control	3	2	2	30	20	50	100	3
EPM747	Advanced Control Techniques	3	2	2	30	20	50	100	3

Mechatronics Engineering Program **برنامج هندسة الميكاترونيات**

Table (5.3): List of Elective Courses – Level 700

Mechatronics Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
CSC728	Deep learning	3	2	2	30	20	50	100	3
MEC771	Seminars and Research Writing	3	2	2	30	20	50	100	3
CSC727	Artificial Intelligence	3	2	2	30	20	50	100	3
EPM748	Digital Control Systems	3	2	2	30	20	50	100	3
EPM749	Nonlinear Control Systems	3	2	2	30	20	50	100	3
BIO753	Biomechatronics	3	2	2	30	20	50	100	3
MEC763	Selected Topics in Mechatronics Engineering	3	2	2	30	20	50	100	3

قسم هندسة الالكترونيات والاتصالات

Department of Electronics and Communication Engineering

قسم هندسة الإلكترونيات والاتصالات

Department of Electronics and Communication Engineering

List of Progam Specializations offered by the Department

No.	Specializations
1	Electronics Engineering
2	Communication Engineering

Electronics and Communication Engineering Program | **برنامج هندسة الالكترونيات والاتصالات**

Electronics Engineering Specialization | **تخصص هندسة الالكترونيات**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.4).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.4, and Level 600 – Table 3.4).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.4).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.4, and Level 600 – Table 3.4).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy (Ph.D.) in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.4).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.4 and Level 700 – Table 5.4).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Electronics and Communication Engineering Program | **برنامج هندسة الالكترونيات والاتصالات**

Electronics Engineering Specialization | **تخصص هندسة الالكترونيات**

Table (1.4): List of Compulsory Courses – Level 500

Electronics and Communication Engineering Program (Electronics Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE591	Research Seminars and Scientific writing	1	-	2	50	50	-	100	-
ECE592	Applied Mathematics	2	2	1	50	-	50	100	3
ECE541	Intelligent Embedded Systems	3	2	2	50	-	50	100	3
ECE521	Advanced Electronics Engineering	3	2	2	50	-	50	100	3
ECE542	Embedded Systems Applications	3	2	2	50	-	50	100	3

Electronics and Communications Engineering Program | **برنامج هندسة الالكترونيات والاتصالات**

Electronics Engineering Specialization | **تخصص هندسة الالكترونيات**

Table (2.4): List of Elective Courses – Level 500

Electronics and Communication Engineering Program (Electronics Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE543	Intelligent Control	3	3	-	50	-	50	100	3
ECE544	Digital Signal Processing Applications	3	3	-	50	-	50	100	3
ECE531	Integrated Opto-electronics	3	3	-	50	-	50	100	3
ECE511	Semiconductor Process Technology	3	3	-	50	-	50	100	3
ECE522	Product Design and Development	3	3	-	50	-	50	100	3

Electronics and Communication Engineering Program | **برنامج هندسة الالكترونيات والاتصالات**

Electronics Engineering Specialization | **تخصص هندسة الالكترونيات**

Table (3.4): List of Elective Courses – Level 600

Electronics and Communication Engineering Program (Electronics Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE621	Digital Systems	3	3	-	50	-	50	100	3
ECE631	Optical Sensors	3	3	-	50	-	50	100	3
ECE611	Energy Harvesting	3	3	-	50	-	50	100	3
ECE622	Analog Integrated Circuits	3	3	-	50	-	50	100	3
BIO613	Bio-Systems and Applications	3	3	-	50	-	50	100	3
ECE623	Fault tolerant Systems	3	3	-	50	-	50	100	3
ECE624	Selected Topics in Electronics	3	3	-	50	-	50	100	3
ECE691	Applied Project	3	-	6	50	50	-	100	-

Electronics and Communication Engineering Program | **برنامج هندسة الالكترونيات والاتصالات**

Electronics Engineering Specialization | **تخصص هندسة الالكترونيات**

Table (4.4): List of Core Courses - Level 700

Electronics and Communication Engineering Program (Electronics Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE791	Research Seminars	2	-	4	50	50	-	100	-
ECE711	Applications of Nano-electronics	3	3	1	50	-	50	100	3
ECE712	Advanced Semiconductor Devices	4	4	1	50	-	50	100	3

Electronics and Communication Engineering Program | **برنامج هندسة الالكترونيات والاتصالات**

Electronics Engineering Specialization | **تخصص هندسة الالكترونيات**

Table (5.4): List of Elective Courses - Level 700

Electronics and Communication Engineering Program (Electronics Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE731	Advanced Integrated Opto-electronics	3	3	-	50	-	50	100	3
ECE732	Nano-photonics	3	3	-	50	-	50	100	3
ECE733	Optical MEMS	3	3	-	50	-	50	100	3
ECE713	Renewable Energy Electronics	3	3	-	50	-	50	100	3
ECE721	Advanced Analog Integrated Circuits	3	3	-	50	-	50	100	3
ECE722	Low-Noise Electronic System Design	3	3	-	50	-	50	100	3
ECE723	Electronic Design Automation	3	3	-	50	-	50	100	3
ECE724	Selected Topics in Electronics Engineering	3	3	-	50	-	50	100	3

Electronics and Communication Engineering Program | **برنامج هندسة الالكترونيات والاتصالات**

Communication Engineering Specialization | **تخصص هندسة الاتصالات**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.5).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.5, and Level 600 – Table 3.5).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.5).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.5, and Level 600 – Table 3.5).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.2).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.5 and Level 700 – Table 5.5).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Electronics and Communication Engineering Program — **برنامج هندسة الالكترونيات والاتصالات**

Communication Engineering Specialization — **تخصص هندسة الاتصالات**

Table (1.5): List of Required Courses - Level 500

Electronics and Communication Engineering Program (Communication Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE591	Research Seminars and Scientific writing	1	-	2	50	50	-	100	-
ECE593	Advanced Engineering Mathematics	2	2	1	50	-	50	100	3
ECE545	Artificial Intelligence for Telecommunications	3	3	1	50	-	50	100	3
ECE551	Modern Communication Systems	3	3	1	50	-	50	100	3
ECE561	Advanced microwave engineering	3	3	1	50	-	50	100	3

Electronics and Communication Engineering Program — **برنامج هندسة الالكترونيات والاتصالات**

Communication Engineering Specialization — **تخصص هندسة الاتصالات**

Table (2.5): List of Elective Courses - Level 500

Electronics and Communication Engineering Program (Communication Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE544	Digital Signal Processing applications	3	3	-	50	-	50	100	3
ECE571	Data Communication Networks	3	3	-	50	-	50	100	3
ECE581	Security in information networks	3	3	-	50	-	50	100	3
ECE532	Optical Engineering	3	3	-	50	-	50	100	3
ECE562	Numerical Techniques in Electromagnetics	3	3	-	50	-	50	100	3

Electronics and Communication Engineering Program — **برنامج هندسة الالكترونيات والاتصالات**

Communication Engineering Specialization — **تخصص هندسة الاتصالات**

Table (3.5): List of Elective Courses - Level 600

Electronics and Communication Engineering Program (Communication Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE661	Wireless communications system	3	3	-	50	-	50	100	3
ECE662	Advanced Mobile Communication Networks	3	3	-	50	-	50	100	3
ECE651	Channel Coding Systems	3	3	-	50	-	50	100	3
ECE681	CyberSecurity Risk Management	3	3	-	50	-	50	100	3
ECE632	Integrated Optics	3	3	-	50	-	50	100	3
ECE633	Advanced optical Communications Systems	3	3	-	50	-	50	100	3
ECE663	Antenna Array Theory	3	3	-	50	-	50	100	3
ECE664	Modern satellite communications systems	3	3	-	50	-	50	100	3
ECE652	Selected Topics in Communication	3	3	-	50	-	50	100	3
ECE691	Applied Project	3	-	3	50	50	-	100	-

Electronics and Communication Engineering Program — **برنامج هندسة الالكترونيات والاتصالات**

Communication Engineering Specialization — **تخصص هندسة الاتصالات**

Table (4.5): List of Core Courses - Level 700

Electronics and Communication Engineering Program (Communication Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE791	Research Seminars	2	-	4	50	50	-	100	-
ECE751	Statistical Communication	3	3	1	50	-	50	100	3
ECE752	Advanced Communication Systems	4	4	1	50	-	50	100	3

Electronics and Communication Engineering Program — **برنامج هندسة الالكترونيات والاتصالات**

Communication Engineering Specialization — **تخصص هندسة الاتصالات**

Table (5.5): List of Elective Courses - Level 700

Electronics and Communication Engineering Program (Communication Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE761	Wireless Ad Hoc and Sensor Networks	3	3	-	50	-	50	100	3
ECE762	Advanced Satellite Systems	3	3	-	50	-	50	100	3
ECE741	Internet of Things	3	3	-	50	-	50	100	3
ECE781	Advanced Data encryption and security	3	3	-	50	-	50	100	3
ECE734	Non-linear optics	3	3	-	50	-	50	100	3
ECE735	Wireless optical communication systems	3	3	-	50	-	50	100	3
ECE763	Metamaterials in electromagnetic	3	3	-	50	-	50	100	3
ECE764	Planar Microstrip Antennas	3	3	-	50	-	50	100	3
ECE792	Simulation and Modeling Methodology	3	3	-	50	-	50	100	3
ECE771	Selected Topics in Communication Networks	3	3	-	50	-	50	100	3

قسم هندسة القوى والألات الكهربية

Department of Electrical Power and Machines Engineering

قسم هندسة القوى والألات الكهربية

Department of Electrical Power and Machines Engineering

List of Progam Specializations offered by the Department

No.	Specializations
1	Electrical Power Engineering
2	Electrical Machines and Drive Systems Engineering
3	High Voltage Engineering
4	Automatic Control Engineering
5	Power Electronics Engineering
6	Electrical Protection Engineering

Electrical Power and Machines Engineering Program | **برنامج هندسة القوى والألات الكهربية**

All Specializations | **جميع التخصصات**

First: Diploma in Engineering Sciences

The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.6).

Table (1.6): List of Required Courses - Common to all specializations - Level 500

Electrical Power and Machines Engineering Program (All Specializations)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM511	Electrical Power Systems	3	2	2	30	20	50	100	3
EPM521	Electrical Machines & Machinery Systems	3	2	2	30	20	50	100	3
EPM551	Electrical Power Electronics	3	2	2	30	20	50	100	3
EPM541	Automatic Control Engineering	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program	**برنامج هندسة القوى والألات الكهربية**
Electrical Power Engineering Specialization	**تخصص هندسة القوى الكهربية**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.6).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.6, and Level 600 – Table 3.6).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.6).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.6, and Level 600 – Table 3.6).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.6).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.6 and Level 700 – Table 5.6).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Electrical Power Engineering Specialization — **تخصص هندسة القوى الكهربية**

Table (2.6): List of Elective Courses - Level 500

Electrical Power and Machines Engineering Program (Electrical Power Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM512	Electrical Power Engineering	3	2	2	30	20	50	100	3
EPM513	Computer Applications in Electrical Power Systems	3	2	2	30	20	50	100	3
EPM514	Distribution Networks and Electrical Distribution Systems	3	2	2	30	20	50	100	3
EPM515	Performance of Electrical Power Systems	3	2	2	30	20	50	100	3
EPM516	Electric Power Transmission Systems	3	2	2	30	20	50	100	3
EPM517	Load Management and Electric Energy Rationalization	3	2	2	30	20	50	100	3
EPM571	Renewable Energy Resources	3	2	2	30	20	50	100	3
EPM518	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Electrical Power Engineering Specialization — **تخصص هندسة القوى الكهربية**

Table (3.6): List of Elective Courses - Level 600

Electrical Power and Machines Engineering Program (Electrical Power Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM611	Electrical Power Systems Analysis	3	2	2	30	20	50	100	3
EPM681	Electrical Power Systems Control	3	2	2	30	20	50	100	3
EPM671	Solar Energy Systems	3	2	2	30	20	50	100	3
EPM672	Wind Energy Systems	3	2	2	30	20	50	100	3
EPM612	Reliability of Electrical Power Systems	3	2	2	30	20	50	100	3
EPM613	Smart Electrical Grids	3	2	2	30	20	50	100	3
EPM614	Research Seminars and Scientific Reports	3	-	6	50	50	-	100	-
EPM615	Applied Project	3	-	6	50	50	-	100	-
EPM616	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Electrical Power Engineering Specialization — **تخصص هندسة القوى الكهربية**

Table (4.6): List of Core Courses - Level 700

Electrical Power and Machines Engineering Program (Electrical Power Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM711	Distributed Generation Systems	3	2	2	30	20	50	100	3
EPM712	Advanced Electrical Power Systems	3	2	2	30	20	50	100	3
EPM713	Interconnected Electrical Networks	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Electrical Power Engineering Specialization — **تخصص هندسة القوى الكهربية**

Table (5.6): List of Elective Courses - Level 700

Electrical Power and Machines Engineering Program (Electrical Power Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM714	Direct Current Transmission Lines	3	2	2	30	20	50	100	3
EPM781	Applications of Advanced Control Methods in Electrical Power Systems	3	2	2	30	20	50	100	3
EPM782	Applications of Optimization Methods to Electric Power Systems	3	2	2	30	20	50	100	3
EPM716	Risk Analysis of Electrical Power Systems	3	2	2	30	20	50	100	3
EPM717	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program	**برنامج هندسة القوى والألات الكهربية**
Electrical Machines and Drive Systems Engineering Specialization	**تخصص هندسة الألات الكهربية ونظم التحريك**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.6).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.7, and Level 600 – Table 3.7).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.6).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.7, and Level 600 – Table 3.7).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.7).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.7 and Level 700 – Table 5.7).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Electrical Power and Machines Engineering Program	**برنامج هندسة القوى والألات الكهربية**
Electrical Machines and Drive Systems Engineering Specialization	**تخصص هندسة الألات الكهربية ونظم التحريك**

Table (2.7): List of Elective Courses - Level 500

Electrical Power and Machines Engineering Program (Electrical Machines and Drive Systems Engineering Specialization)									
Course Code	**Course Name**	**Credit Hours**	**Contact Hours**		**Marks**				**Final Exam Duration**
			Lecture	**Practical**	**Course work**	**Practical & Oral**	**Final Exam**	**Total**	
EPM522	Analysis of Electrical Machines	3	2	2	30	20	50	100	3
EPM523	Electric Drive systems	3	2	2	30	20	50	100	3
EPM524	Electric Vehicles	3	3	-	30	20	50	100	3
EPM552	Applications of power electronics in traction	3	2	2	30	20	50	100	3
EPM525	Selected Topics	3	3	-	30	20	50	100	3

Electrical Power and Machines Engineering Program	**برنامج هندسة القوى والألات الكهربية**
Electrical Machines and Drive Systems Engineering Specialization	**تخصص هندسة الألات الكهربية ونظم التحريك**

Table (3.7): List of Elective Courses - Level 600

Electrical Power and Machines Engineering Program (Electrical Machines and Drive Systems Engineering Specialization)									
Course Code	**Course Name**	**Credit Hours**	**Contact Hours**		**Marks**				**Final Exam Duration**
			Lecture	**Practical**	**Course work**	**Practical & Oral**	**Final Exam**	**Total**	
EPM621	Control of electrical machines	3	2	2	30	20	50	100	3
EPM622	Electrical Traction Applications	3	2	2	30	20	50	100	3
EPM623	Research Seminars and Scientific Reports	3	-	6	50	50	-	100	-
EPM624	Applied Project	3	-	6	50	50	-	100	-
EPM625	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program	**برنامج هندسة القوى والألات الكهربية**
Electrical Machines and Drive Systems Engineering Specialization	**تخصص هندسة الألات الكهربية ونظم التحريك**

Table (4.7): Core Courses - Level 700

Electrical Power and Machines Engineering Program (Electrical Machines and Drive Systems Engineering Specialization)									
Course Code	**Course Name**	**Credit Hours**	**Contact Hours**		**Marks**				**Final Exam Duration**
			Lecture	**Practical**	**Course work**	**Practical & Oral**	**Final Exam**	**Total**	
EPM721	Modelling of Electrical Machines using Computer	3	2	2	30	20	50	100	3
EPM722	Advanced Electric Drive Systems	3	2	2	30	20	50	100	3
EPM783	Advanced Control of Electrical Machines	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program	**برنامج هندسة القوى والألات الكهربية**
Electrical Machines and Drive Systems Engineering Specialization	**تخصص هندسة الألات الكهربية ونظم التحريك**

Table (5.7): List of Elective Courses - Level 700

Electrical Power and Machines Engineering Program (Electrical Machines and Drive Systems Engineering Specialization)									
Course Code	**Course Name**	**Credit Hours**	**Contact Hours**		**Marks**				**Final Exam Duration**
			Lecture	**Practical**	**Course work**	**Practical & Oral**	**Final Exam**	**Total**	
EPM723	Advanced Analysis of Magnetic Materials Used in Electrical Machines	3	2	2	30	20	50	100	3
EPM724	Design of Electrical Traction Systems	3	2	2	30	20	50	100	3
EPM725	Advanced Electrical Motor Applications	3	2	2	30	20	50	100	3
EPM726	Modern Trends in Electric Machines	3	2	2	30	20	50	100	3
EPM727	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program | **برنامج هندسة القوى والألات الكهربية**

High Voltage Engineering Specialization | **تخصص هندسة الجهد العالي**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.6).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.8, and Level 600 – Table 3.8).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.6).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.8, and Level 600 – Table 3.8).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.8).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.8 and Level 700 – Table 5.8).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

High Voltage Engineering Specialization — **تخصص هندسة الجهد العالي**

Table (2.8): List of Elective Courses - Level 500

Electrical Power and Machines Engineering Program (High Voltage Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM531	High Voltage Engineering	3	2	2	30	20	50	100	3
EPM532	Earthing Grids Engineering	3	3	-	30	20	50	100	3
EPM533	Electrical Materials	3	2	2	30	20	50	100	3
EPM534	Safety in Electrical Installations	3	3	-	30	20	50	100	3
EPM535	High Voltage Equipment	3	3	-	30	20	50	100	3
EPM536	Selected Topics	3	3	-	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

High Voltage Engineering Specialization — **تخصص هندسة الجهد العالي**

Table (3.8): List of Elective Courses - Level 600

Electrical Power and Machines Engineering Program (High Voltage Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM631	High Voltage Measurements	3	2	2	30	20	50	100	3
EPM632	Experiments and Standard Specifications in High Voltage Systems	3	2	2	30	20	50	100	3
EPM633	Research Seminars and Scientific Reports	3	-	6	50	50	-	100	-
EPM634	Design and Analysis of High Voltage Networks	3	2	2	30	20	50	100	3
EPM635	Applied Project	3	-	6	50	50	-	100	-
EPM636	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

High Voltage Engineering Specialization — **تخصص هندسة الجهد العالي**

Table (4.8): List of Core Courses - Level 700

Electrical Power and Machines Engineering Program (High Voltage Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM731	Gases Discharge	3	2	2	30	20	50	100	3
EPM732	High Voltage Insulators	3	2	2	30	20	50	100	3
EPM733	Lightning and Over Voltages	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

High Voltage Engineering Specialization — **تخصص هندسة الجهد العالي**

Table (5.8): List of Elective Courses - Level 700

Electrical Power and Machines Engineering Program (High Voltage Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM734	Advanced High Voltage Engineering	3	2	2	30	20	50	100	3
EPM735	Gas Insulated Systems	3	2	2	30	20	50	100	3
EPM736	Numerical Analysis of Electric Fields	3	2	2	30	20	50	100	3
EPM737	Applications in High Voltage Engineering	3	2	2	30	20	50	100	3
EPM738	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Automatic Control Engineering Specialization — **تخصص هندسة التحكم الآلي**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.6).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.9, and Level 600 – Table 3.9).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.6).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.9, and Level 600 – Table 3.9).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.9).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.9 and Level 700 – Table 5.9).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Automatic Control Engineering Specialization — **تخصص هندسة التحكم الآلي**

Table (2.9): List of Elective Courses - Level 500

Electrical Power and Machines Engineering Program (Automatic Control Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM542	Modern Control Systems	3	2	2	30	20	50	100	3
EPM543	Digital Control Systems	3	2	2	30	20	50	100	3
EPM544	Programmable Controllers	3	2	2	30	20	50	100	3
EPM545	Optimal Control	3	2	2	30	20	50	100	3
EPM546	Selected Topics	3	2	2	50	-	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Automatic Control Engineering Specialization — **تخصص هندسة التحكم الآلي**

Table (3.9): List of Elective Courses - Level 600

Electrical Power and Machines Engineering Program (Automatic Control Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM641	Nonlinear Control Systems	3	2	2	30	20	50	100	3
EPM642	Fuzzy Logic Control Systems	3	2	2	30	20	50	100	3
EPM643	Research Seminars and Scientific Reports	3	-	6	50	50	-	100	-
EPM644	Applied Project	3	-	6	50	50	-	100	-
EPM645	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Automatic Control Engineering Specialization — **تخصص هندسة التحكم الآلي**

Table (4.9): List of Core Courses - Level 700

Electrical Power and Machines Engineering Program (Automatic Control Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM741	Predictive Control Applications	3	2	2	30	20	50	100	3
EPM742	Design of Digital Control Systems	3	2	2	30	20	50	100	3
EPM743	Advanced Studies for Automatic Control Systems	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Automatic Control Engineering Specialization — **تخصص هندسة التحكم الآلي**

Table (5.9): List of Elective Courses - Level 700

Electrical Power and Machines Engineering Program (Automatic Control Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM744	Design of Computer Control Systems	3	2	2	30	20	50	100	3
EPM745	Selected Topics	3	2	2	30	20	50	100	3
EPM746	Adaptive Control	3	2	2	30	20	50	100	3
EPM784	Advanced Control Applications in Power Systems	3	2	2	30	20	50	100	3
EPM785	Control of Large-Scale Systems	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program	**برنامج هندسة القوى والألات الكهربية**
Power Electronics Engineering Specialization	**تخصص هندسة الكترونيات القوي الكهربية**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.6).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.10, and Level 600 – Table 3.10).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.6).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.10, and Level 600 – Table 3.10).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.10).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.10 and Level 700 – Table 5.10).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Power Electronics Engineering Specialization — **تخصص هندسة الكترونيات القوي الكهربية**

Table (2.10): List of Elective Courses - Level 500

Electrical Power and Machines Engineering Program (Power Electronics Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM553	Power Electronics Engineering	3	2	2	30	20	50	100	3
EPM554	Power Electronics Applications	3	2	2	30	20	50	100	3
EPM555	Microprocessor and its Applications	3	2	2	30	20	50	100	3
EPM556	Selected Topics	3	2	2	30	20	50	100	3
EPM557	Synchronous Motor Drives	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Power Electronics Engineering Specialization — **تخصص هندسة الكترونيات القوي الكهربية**

Table (3.10): List of Elective Courses - Level 600

Electrical Power and Machines Engineering Program (Power Electronics Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM651	Power Electronics Systems Modeling	3	2	2	30	20	50	100	3
EPM652	Advanced Applications in Power Electronics	3	2	2	30	20	50	100	3
EPM653	Research Seminars and Scientific Reports	3	-	6	50	50	-	100	-
EPM654	Applied Project	3	-	6	50	50	-	100	-
EPM655	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Power Electronics Engineering Specialization — **تخصص هندسة الكترونيات القوي الكهربية**

Table (4.10): List of Core Courses - Level 700

Electrical Power and Machines Engineering Program (Power Electronics Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM751	Applications of Power Electronics in Electrical Machines	3	2	2	30	20	50	100	3
EPM752	Power Electronics Applications in Electrical Power Transmission Systems	3	2	2	30	20	50	100	3
EPM753	Flexible Alternating Current Transmission Systems	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Power Electronics Engineering Specialization — **تخصص هندسة الكترونيات القوي الكهربية**

Table (5.10): List of Elective Courses - Level 700

Electrical Power and Machines Engineering Program (Power Electronics Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM754	Advanced Power Electronics	3	2	2	30	20	50	100	3
EPM755	Special Applications in Power Electronics	3	2	2	30	20	50	100	3
EPM756	Selected Topics	3	2	2	30	20	50	100	3
EPM757	Automotive Applications of Power Electronics	3	2	2	30	20	50	100	3
EPM758	Power Electronic Application of Fuzzy logic in Electric Drives	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program	**برنامج هندسة القوى والألات الكهربية**
Electrical Protection Engineering Specialization	**تخصص هندسة وقاية نظم القوي الكهربية**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.6).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.11, and Level 600 – Table 3.11).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.6).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.11, and Level 600 – Table 3.11).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.11).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.11 and Level 700 – Table 5.11).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Electrical Power and Machines Engineering Program	**برنامج هندسة القوى والألات الكهربية**
Electrical Protection Engineering Specialization	**تخصص هندسة وقاية نظم القوي الكهربية**

Table (2.11): List of Elective Courses - Level 500

Electrical Power and Machines Engineering Program (Electrical Protection Engineering Specialization)									
Course Code	**Course Name**	**Credit Hours**	**Contact Hours**		**Marks**				**Final Exam Duration**
			Lecture	**Practical**	**Course work**	**Practical & Oral**	**Final Exam**	**Total**	
EPM561	Diagnostics and Maintenance of Power Systems	3	2	2	30	20	50	100	3
EPM562	Switchgears	3	2	2	30	20	50	100	3
EPM563	Digital Protection	3	2	2	30	20	50	100	3
EPM564	Protection and Maintenance of Electrical Equipment	3	2	2	30	20	50	100	3
EPM565	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program — **برنامج هندسة القوى والألات الكهربية**

Electrical Protection Engineering Specialization — **تخصص هندسة وقاية نظم القوي الكهربية**

Table (3.11): List of Elective Courses - Level 600

Electrical Power and Machines Engineering Program (Electrical Protection Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM661	Advanced Protection Systems	3	2	2	30	20	50	100	3
EPM662	Operation and Prevention of Substations	3	2	2	30	20	50	100	3
EPM663	Research Seminars and Scientific Reports	3	-	6	50	50	-	100	-
EPM664	Applied Project	3	-	6	50	50	-	100	-
EPM665	Selected Topics	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program	**برنامج هندسة القوى والألات الكهربية**
Electrical Protection Engineering Specialization	**تخصص هندسة وقاية نظم القوي الكهربية**

Table (4.11): List of Core Courses - Level 700

Electrical Power and Machines Engineering Program (Electrical Protection Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM761	Protection Systems Coordination	3	2	2	30	20	50	100	3
EPM762	Digital Protection	3	2	2	30	20	50	100	3
EPM763	Advanced Protection Systems of Smart Grids	3	2	2	30	20	50	100	3

Electrical Power and Machines Engineering Program | **برنامج هندسة القوى والألات الكهربية**

Electrical Protection Engineering Specialization | **تخصص هندسة وقاية نظم القوي الكهربية**

Table (5.11): List of Elective Courses - Level 700

Electrical Power and Machines Engineering Program (Electrical Protection Engineering Specialization)									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM764	Intelligent Protection Systems	3	2	2	30	20	50	100	3
EPM765	Protection of interconnected Networks	3	2	2	30	20	50	100	3
EPM766	Selected Topics	3	2	2	30	20	50	100	3
EPM767	Protection of Electrical Networks	3	2	2	30	20	50	100	3
EPM768	Static and Hybrid Circuit Breakers	3	2	2	30	20	50	100	3

قسم الهندسة الحيوية الطبية

Department of Biomedical Engineering

Biomedical Engineering Program **برنامج الهندسة الحيوية الطبية**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.12).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.12, and Level 600 – Table 3.12).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.12).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.12, and Level 600 – Table 3.12).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.12).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.12 and Level 700 – Table 5.12).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Table (1.12): List of Required Courses - Level 500

Biomedical Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
BIO511	Numerical Analysis in Biomedical Engineering	3	2	2	50	-	50	100	3
BIO571	Fundamentals of Scientific Research	3	2	2	50	50	-	100	-
BIO512	Biostatistics	3	2	2	50	-	50	100	3
BIO513	Modeling in Biomedical Engineering	3	2	2	50	-	50	100	3

Table (2.12): List of Elective Courses - Level 500

Biomedical Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
BIO531	Microfluidic and lab on chip	3	2	2	50	-	50	100	3
BIO514	Selected Topics	3	2	2	50	-	50	100	3
BIO515	Medical imaging	3	2	2	50	-	50	100	3
BIO516	Healthcare Information Systems	3	2	2	50	-	50	100	3
BIO532	Fundamentals of Nano-Technology	3	2	2	50	-	50	100	3

Biomedical Engineering Program **برنامج الهندسة الحيوية الطبية**

Table (3.12): List of Elective Courses - Level 600

Biomedical Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
BIO621	Signal processing and Systems	3	2	2	50	-	50	100	3
BIO651	Therapeutic and Prosthetic Devices (1)	3	2	2	50	-	50	100	3
BIO622	Applications of computer vision in healthcare	3	2	2	50	-	50	100	3
BIO652	Biomaterials	3	2	2	50	-	50	100	3
BIO623	Human machine interface(1)	3	2	2	50	-	50	100	3
BIO661	Bioinformatics(1)	3	2	2	50	-	50	100	3
BIO611	Optical fibers in biomedical engineering	3	2	2	50	-	50	100	3
BIO641	Fundamentals of Clinical Engineering	3	2	2	50	-	50	100	3
BIO642	Medical decision making techniques (1)	3	2	2	50	-	50	100	3
BIO612	The Internet of Things in Medicine and Biology(1)	3	2	2	50	-	50	100	3
BIO671	Applied Project	3	-	6	50	50	-	100	-

Table (4.12): List of Core Courses - Level 700

Biomedical Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
BIO711	Applications of Modeling in Biomedical Engineering	3	2	2	50	-	50	100	3
BIO712	Advanced Biostatistics	3	2	2	50	-	50	100	3
BIO771	Research seminars and scientific reports	3	-	6	50	50	-	100	-

Biomedical Engineering Program **برنامج الهندسة الحيوية الطبية**

Table (5.12): List of Elective Courses - Level 700

برنامج الهندسة الحيوية الطبية Biomedical Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
BIO751	Therapeutic and Prosthetic Devices **(2)**	3	2	2	50	-	50	100	3
BIO721	Computational Imaging	3	2	2	50	-	50	100	3
BIO752	Advanced Biomaterials	3	2	2	50	-	50	100	3
BIO722	Human machine interface**(2)**	3	2	2	50	-	50	100	3
BIO761	Bioinformatics**(2)**	3	2	2	50	-	50	100	3
BIO741	Risk management in medical devices	3	2	2	50	-	50	100	3
BIO742	Medical decision making techniques **(2)**	3	2	2	50	-	50	100	3
BIO713	The Internet of Things in Medicine and Biology**(2)**	3	2	2	50	-	50	100	3
BIO731	Applications of Microfluidic and Lab on chip	3	2	2	50	-	50	100	3
BIO714	Selected Topics	3	2	2	50	-	50	100	3
BIO743	Electronic Health Records	3	2	2	50	-	50	100	3
BIO723	Advanced Artificial Neural Networks	3	2	2	50	-	50	100	3
BIO732	Nano-Technology Applications	3	2	2	50	-	50	100	3

قسم هندسة الحاسبات والنظم

Department of Computer and Systems Engineering

Computer and Systems Engineering Program **برنامج هندسة الحاسبات والنظم**

First: Diploma in Engineering Sciences
The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.13).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.13, and Level 600 – Table 3.13).

Second: Master of Science in Engineering
The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.13).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.13, and Level 600 – Table 3.13).
- **Phase Three**: 12 credit hours for the master's thesis.

Third: Doctor of Philosophy in Engineering Sciences
The student completes 54 credit hours in this program.

- **Phase One**: 9 credit hours of core courses (Level 700 – Table 4.13).
- **Phase Two**: 9 credit hours of advanced elective courses (3 elective courses from Level 600 – Table 3.13 and Level 700 – Table 5.13).
- **Thesis (Academic Research)**: 36 credit hours, distributed as follows:
  - **First Research Stage (12 credit hours)**: Data collection and preliminary study, concluded with a presentation before the comprehensive exam committee.
  - **Second Research Stage (12 credit hours)**: Results analysis and presentation, concluded with a progress presentation.
  - **Thesis Writing Stage (12 credit hours)**: Writing and completing the dissertation.

Computer and Systems Engineering Program **برنامج هندسة الحاسبات والنظم**

Table (1.13): List of Required Courses - Level 500

Computer and Systems Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
CSE511	High-Performance Computer Architecture	4	3	2	50	-	50	100	3
CSE531	Advanced Computer Networks	3	2	2	50	-	50	100	3
CSE581	Advanced Database Systems	3	2	2	50	-	50	100	3
CSE591	Research Seminar	2	2	-	50	50	-	100	-

Table (2.13): List of Elective Courses - Level 500

Computer and Systems Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
--------	Elective 1	3	2	2	50	-	50	100	3
--------	Elective 2	3	2	2	50	-	50	100	3

Elective 1	
Course Code	**Course Name**
CSE532	Advanced Computer and Network Security
CSE582	Advanced Operating Systems
CSE541	Advanced Cybersecurity
CSE583	Advanced compilers Design
CSE533	Selected Topics in Networks Engineering
CSE542	Selected Topics in Computer Security

Elective 2	
Course Code	**Course Name**
CSE521	Optimization Techniques
CSE522	Robotics
CSE571	Sensor Based Systems
CSE572	Advanced Embedded Systems
CSE512	Selected Topics in Computers Engineering

Computer and Systems Engineering Program **برنامج هندسة الحاسبات والنظم**

Table (3.13): List of Elective Courses - Level 600

Computer and Systems Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
---------	Elective 3	3	2	2	50	-	50	100	3
---------	Elective 4	3	2	2	50	-	50	100	3

Elective 3	
Course Code	**Course Name**
CSE661	Advanced Control System
CSE651	Advanced Digital Signal Processing
CSE684	Advanced Software Engineering
CSE643	Internet of Things (IoT) Security
CSE623	Advanced Deep Learning
CSE624	Advanced Artificial intelligence
CSE685	Selected Topics in Software Engineering

Elective 4	
Course Code	**Course Name**
CSE613	Advanced Parallel and Distributed Systems
CSE652	Advanced Digital Image Processing
CSE653	Advanced Computer Vision
CSE686	Big Data Analytics
CSE644	Advanced Malware Analysis and Reverse Engineering
CSE614	Selected Topics in Computer Technology
CSE692	Applied Project

Table (4.13): List of Core Courses - Level 700

Computer and Systems Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
CSE734	Network Computer Modelling	3	2	2	50	-	50	100	3
CSE787	Software Engineering in Mobile Computing	3	2	2	50	-	50	100	3
CSE773	Application Specific Signal Processors	3	2	2	50	-	50	100	3

Table (5.13): List of Elective Courses - Level 700

Computer and Systems Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
CSE715	Quantum Computing	3	2	2	50	-	50	100	3
CSE745	Security of Cloud Computing Systems	3	2	2	50	-	50	100	3
CSE762	Advanced Optimal Control	3	2	2	50	-	50	100	3
CSE725	Pattern Recognition	3	2	2	50	-	50	100	3
CSE735	Multimedia Networking	3	2	2	50	-	50	100	3
ECE782	Wireless Networks and Security	3	2	2	50	-	50	100	3

برامج الدراسات العليا البينية

Interdisciplinary Postgraduate Programs

Interdisciplinary Posgraduate Programs — برامج الدراسات العليا البينية

Smart Grid Engineering Program — برنامج هندسة الشبكات الكهربية الذكية

First: Diploma in Engineering Sciences

The student completes 24 credit hours over two phases.

- **Phase One: Basic Engineering Diploma**
  - The student takes 12 credit hours of compulsory courses (Level 500 – Table 1.14).
- **Phase Two: Advanced Engineering Diploma**
  - The student takes 12 credit hours of elective courses from Level 500–600, in coordination with the academic advisor (4 elective courses from Level 500 – Table 2.14, and Level 600 – Table 3.14).

Second: Master of Science in Engineering

The student completes 36 credit hours in this program.

- The student takes 24 credit hours of coursework:
  - **Phase One**: 12 credit hours of compulsory courses (Level 500 – Table 1.14).
  - **Phase Two**: 12 credit hours of elective courses (4 elective courses from Level 500 – Table 2.14, and Level 600 – Table 3.14).
- **Phase Three**: 12 credit hours for the master's thesis.

Interdisciplinary Posgraduate Programs **برامج الدراسات العليا البينية**

Smart Grid Engineering Program **برنامج هندسة الشبكات الكهربية الذكية**

Table (1.14): List of Required Courses - Level 500

Smart Grid Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM591	Introduction to Smart Grid	3	3	-	50	-	50	100	3
EPM592	Measurements and Signal Processing	3	3	-	50	-	50	100	3
ECE552	Digital Communication Systems	3	3	-	50	-	50	100	3
EPM593	Systems Modeling and Simulation	3	3	-	50	-	50	100	3

Interdisciplinary Posgraduate Programs **برامج الدراسات العليا البينية**

Smart Grid Engineering Program **برنامج هندسة الشبكات الكهربية الذكية**

Table (2.14): List of Elective Courses - Level 600

Smart Grid Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
EPM691	Renewable Energy and Storage Systems	3	3	-	50	-	50	100	3
EPM692	Smart Distribution Systems	3	3	1	50	-	50	100	3
EPM693	Control in Electrical Smart Grid	3	3	-	50	-	50	100	3
EPM694	Power Systems Protection in Smart Grid	3	3	-	50	-	50	100	3
EPM695	Distributed Generation and Microgrids	3	3	-	50	-	50	100	3
EPM696	Smart Grid Planning and Operation	3	3	-	50	-	50	100	3
EPM697	Advanced Power Electronics	3	3	-	50	-	50	100	3
EPM641	Nonlinear Control Systems	3	3	-	50	-	50	100	3
EPM646	Adaptive Control Systems	3	3	1	50	-	50	100	3
ECE641	Internet of Things (IoT) Networks	3	3	-	50	-	50	100	3
ECE653	Advanced Metering Infrastructure	3	3	-	50	-	50	100	3
ECE682	Information Network Security	3	3	1	50	-	50	100	3
ECE671	Data Communication Networks	3	3	1	50	-	50	100	3
ECE665	Wireless communications for smart Grid	3	3	-	50	-	50	100	3
CSE616	Cloud Computing and Big Data Analytics	3	3	1	50	-	50	100	3
ECE642	Artificial Intelligence and its Applications in Smart rid	3	3	1	50	-	50	100	3
EPM698	Selected Topics in Smart Grid	3	3	-	50	-	50	100	3
ECE654	Selected Topics in Smart Grid Communications	3	3	-	50	-	50	100	3
EPM699	Applied Project in Smart Grid	3	-	6	50	50	-	100	-

Smart Grid Engineering Program									
Course Code	Course Name	Credit Hours	Contact Hours		Marks				Final Exam Duration
			Lecture	Practical	Course work	Practical & Oral	Final Exam	Total	
ECE655	Applied Project in Smart Grid Communications	3	-	6	50	50	-	100	-