

**Ministry of Higher Education and Scientific Research  
Scientific Supervision and Scientific Evaluation Apparatus  
Directorate of Quality Assurance and Academic Accreditation  
Accreditation Department**



# **Academic Program and Course Description Guide**

**2024**

## **Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## **Concepts and terminology:**

**Academic Program Description:** The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.


**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

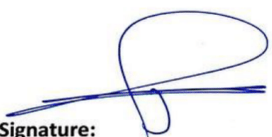
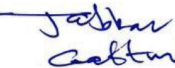
**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.


**Academic Program Description Form**

University Name: Diyala  
Faculty/Institute: College of Engineering  
Scientific Department: Department of Electrical Power and Machines Engineering  
Academic or Professional Program Name: Bachelor  
Final Certificate Name: Bachelor of science in Electrical Power and Machines Engineering  
Academic System: Course  
Description Preparation Date: 13/8/2024  
Completion Date: 13/8/2024

Signature:   
Head of Department Name:  
Asst. prof. Dr. Balasim M. Hussein  
Date: 13/8/2024

Signature:   
Scientific Associate Name:  
Asst. prof. Dr.   
Date: 13/8/2024



The file is checked by:  
Department of Quality Assurance and University Performance  
Director of the Quality Assurance and University Performance Department:  
Date:  
Signature: 

  
Approval of the Dean

Prof. Dr. Anees A. Khaden

## Course description form

<b>1. Course Name</b>	
Electromagnetics II	
<b>2. Course Code</b>	
EP209	
<b>3. Semester/Year</b>	
2n'd Semester/Second Year	
<b>4. The date this description was prepared</b>	
1/9/2023	
<b>5. Available forms of attendance</b>	
Face-to-Face theoretical lectures	
<b>6. Number of study hours (total) / number of units (total)</b>	
30/6	
<b>7. Name of the course administrator</b>	
Name: Ass .Lect. Yasir Ghazi Rashid Email: <a href="mailto:yasserghazee_enge@uodiyala.edu.iq">yasserghazee_enge@uodiyala.edu.iq</a>	
<b>8. Course objectives</b>	
<b>Objectives of the study subject</b>	<p>The objective of the subject of electromagnetic theory in the second course is to introduce the student to the concept of voltage and the potential difference on a charge or system of charges and the potential field, as well as the relationship between voltage and the electric field and ways to extract them mathematically, in addition to getting to know the concepts of the electric duo and electric flux and knowing their laws and ways to extract them. In this course, the student also learns about the types of materials such as conductors, insulators, and semiconductors, as well as the types of currents and their densities that pass through the three types of materials. The student also learns about the concept of electrical polarization. The student also learns about the concept of insulators and their direct relationship to the electrical capacity and energy stored in them, the operation of capacitors and methods of connecting them. Finally, the concept of magnetic flux and how it arises is learned, and the laws of Biot-Svart &amp; We then discuss the magnetic field, how to measure it on a strip of electric current, and magnetic flux density and its relationship to the magnetic field. The student also learns how to extract these concepts mathematically.</p>

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## 9. Teaching and learning strategies

<b>The Strategy</b>	<ul style="list-style-type: none"> <li>❖ Weekly lectures included providing students with the basics and topics related to the pre-skills education outcomes to solve practical problems through presentation, lecture, or conducting experiments.</li> <li>❖ Solve a group of practical and applied examples by faculty members.</li> <li>❖ Through discussion, students participate in solving some practical problems.</li> <li>❖ Practical laboratories in the department are monitored by faculty members in the department.</li> <li>❖ Asking the student to visit the library and the international information network (the Internet) to obtain additional knowledge of the academic subjects.</li> <li>❖ Presenting a seminar to the student in front of his fellow students to enhance his self-confidence.</li> </ul>
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## 10. Course structure

Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Interpolation and solving differential equations.
1&2	4	<b>Electric Fields in Material Space:</b> <i>Properties of Materials; Convection and Conduction Currents; Conductor properties and boundary conditions; The method of images; Semiconductors; The nature of dielectric materials; Boundary conditions for perfect dielectric materials.</i>	Learn about the properties of materials. Convection and conduction currents; Conductor properties and boundary conditions; The way of the magicians; Semiconductors. Nature of insulating materials.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
3&4&5	6	<b>Capacitance:</b> <i>Capacitance; Capacitance of some useful configuration; Capacitance of a two-wire line; Poisson's and Laplace's equations-Poisson's and Laplace equations; Uniqueness theorem; Solution of Laplace's equation in certain situation; Solution of Poisson's equation in certain situation; Product solution of Laplace's equation.</i>	Definition of capacity; Capacity of some useful configurations; Two-wire line capacity. Poisson and Laplace equations - Poisson and Laplace equations; Singularity theory; Solve Laplace's equation in a given situation.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports



6&7	4	<b>Magnetostatic Fields:</b> <i>The steady of magnetic field; Biot- savart law; the curl; Stocke's theorem</i>	Introduction to static magnetic fields: Magnetic field constant. Peyote-Savart Law; Curl Stoke's Theory	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
8&9&10	6	<b>Magnetostatic Fields:</b> <i>Ampere's circuit law; Application of ampere's law; Magnetic flux and magnetic flux density; The scalar and vector magnetic potential; Derivation of steady magnetic field laws.</i>	Understand and apply Ampere's circle law; Application of Ampere's law. Magnetic flux and magnetic flux density.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
11&12	4	<b>Magnetostatic Fields:</b> <i>Magnetic forces; Materials and inductance-force on a moving charge; Force on a differential current element; Force between differential current elements.</i>	Calculating magnetic forces. Materials and the induced force on a moving charge; The force on the differential current element. The force between the differential current elements.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
13&14	4	<b>Magnetostatic Fields:</b> <i>Force and torque on a closed circuit; The nature of magnetic materials; Magnetization and permeability; Magnetic boundary conditions, The magnetic circuit, Potential energy and forces on magnetic materials; Inductance and mutual inductance; Time varying fields.</i>	Understanding force and torque in a closed circuit; The nature of magnetic materials; Magnetism and permeability. Magnetic boundary conditions	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
15	2	<b>Maxwell's Equations:</b> <i>Maxwell's equations- faraday's law; displacement current; Maxwell's equations in point form; Maxwell's equations integral form; the retarded potentials.</i>	Learn about Max Well's equations	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports

## 11. Course Evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

<b>Quizzes</b>	10% (10)
<b>Assignments</b>	10% (10)
<b>Projects</b>	10% (10)
<b>Report</b>	10% (10)
<b>Annual quest</b>	40% (40)
<b>Final Exam</b>	60% (60)
<b>Total assessment</b>	100% (100 Marks)



## 12. Learning and teaching resources

Required textbooks (methodology, if any)	Matthew, N. O. "Sadiku Elements of Electromagnetics." (2018).
Main references (sources)	Electromagnetics By Joseph Edminister (Schaum's Outline Series) : Joseph Edminister, Vishnu Priye Mc Graw Hill Education
Recommended supporting books and references (scientific journals, reports...)	All scientific magazines and periodicals related to electromagnetic fields
Electronic references, Internet sites	<a href="https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering</a>