

*Republic of Iraq
Ministry of Higher Education & Scientific
Research Supervision and Scientific Evaluation
Directorate Quality Assurance and Academic
Accreditation International Accreditation Dept.*

Academic Program Specification Form for The Academic

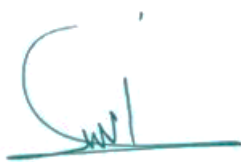
*University: Diyala
College: Engineering
Number Of Departments in The College: 02
Date Of Form Completion :17/9/2023*

Prof. Dr. Anees A. Khadom

The Dean

Date :17/9/2023

Signature



*Assist. prof. Dr. Jabbar Q.
Jabbar*

*Dean 's Assistant for
Scientific Affairs*

Date :17/9/2023

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Assist. prof. Dr. Salah N Farhan

***The College Quality Assurance
and University Performance
Manager***

Date :17/9/2023

Signature



Quality Assurance And University Performance

Manager Date : / /

Signature

TEMPLATE FOR PROGRAMME SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

This Program Specification provides a concise summary of the main features of the program and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the program.

1. Teaching Institution	University of Diyala
2. University Department/Centre	College of Engineering
3. Program Title	Electronic Engineering
4. Title of Final Award	BSc in Electronic Engineering
5. Modes of Attendance offered	Courses
6. Accreditation	N/A
7. Other external influences	None
8. Date of production/revision of this specification	17/09/2023
9. Aims of the Program	
<ul style="list-style-type: none">• Preparing the student scientifically to work in the field of Electronic engineering• Build and prepare the student psychologically to play his role as a reliable engineer in this field.• Building students capable of competing with other engineers for job opportunities and obtaining the required seats to complete postgraduate studies.• Ability to submit to external tests by local, regional or international bodies for the purpose of completing studies or appointment.• Urging the student to be creative and think about specialization projects and keep pace with developments in this field.• Providing students with scientific, practical and personal skills that enable them to solve practical problems and deal with them using scientific concepts.	

10. Learning Outcomes, Teaching, Learning and Assessment Methods

- A. Cognitive goals
- A1- Teaching the student the principles of how Electronic circuits and how to deal with computer algorithms.
 - A2- Enabling students to obtain knowledge and understanding in working on and designing electronic computers.
 - A3- Teaching the student the methods of forming computer parts and their interconnection.
 - A4- Enabling students to obtain knowledge and understanding of designing everything related to computer microprocessors.
 - A5- Enabling students to obtain knowledge and understanding of diagnosing faults and maintaining various computer devices.
 - A6- Teaching the student the foundations of solving programming problems, computer networks, and communications.

B. The skills goals special to the program.

- B1 - Explanation of computer principles topics by specialists in the subject, with an emphasis on the use of mathematics as a basis for understanding and learning.
- B2 - Providing them with skills to solve practical problems related to various computer systems and computer programs for addressing and solving technical problems in various fields of computerized work.

Teaching and Learning Methods

- Providing students with the basics and additional topics related to previous educational outcomes and skills to solve practical problems.
- Solving a group of practical examples by the academic staff.
- Students participate during the lecture in solving some practical problems.
- The department's scientific laboratories are monitored by the academic staff.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation marks for difficult competition questions among students.
- Assigning grades to homework assignments and reports assigned to them.
- Monthly exams for the curriculum in addition to the final exam.

C. Affective and value goals

- C1- Enabling students to think and analyze topics related to the engineering framework, such as various logical circuits.
- C2- Enabling students to think and analyze topics related to computer systems related to the engineering framework.
- C3- Enabling students to think and analyze topics related to solving practical problems.

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation marks for difficult competition questions among students.
- Assigning grades to homework assignments and reports assigned to them.
- Semester exams for the curriculum in addition to the final exam.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- Enabling students to write reports and notes on various branches of computer engineering.

D2- Enabling students to know how to use the Internet to obtain important information.

D3- Raising the student's self-confidence by linking theoretical material to practical reality.

D4- Developing students' skills in how to deal with computer hardware and software problems and how to deal with them.

Teaching and Learning Methods

- Through the Daily lectures by seminar and discussions
- discussion circles during lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics

Assessment Methods

- Evaluating the seminar and reports that submitted by students and providing them with the necessary feedback to improve their skills and self confidence

11. Program Structure

11. Program Structure				12. Awards and Credits
Level/Year	Course or Module Code	Course or Module Title	Credit rating	
1 st Year-1 st Semester	E 101	Mathematics 1	6	Bachelor Degree Requires (155) credits
1 st Year-1 st Semester	EE 101	Electrical Engineering Fundamentals 1	8	
1 st Year-1 st Semester	EE 107	Electronic Physics	6	
1 st Year-1 st Semester	EE 106	Engineering Drawing	4	
1 st Year-1 st Semester	U 103	Computer Skills	4	
1 st Year-1 st Semester	U 104	English Language	2	
1 st Year-2 nd Semester	E 102	Mathematics 2	6	

1 st Year-2 nd Semester	EE 102	Electrical Engineering Fundamentals 2	8
1 st Year-2 nd Semester	EE 103	Digital techniques	7
1 st Year-2 nd Semester	EE 105	C++ Programming	4
1 st Year-2 nd Semester	EE 104	Workshops skills	3
1 st Year-2 nd Semester	U 101	Human Rights and Democracy	2
2 nd Year-1 st Semester	E201	Advance Mathematics –I	3
2 nd Year-1 st Semester	EE 201	Electronics I	2
2 nd Year-1 st Semester	EE 203	Electric Circuits Analysis I	2
2 nd Year-1 st Semester	EE 205	Advanced Programming	1
2 nd Year-1 st Semester	EE 208	Electro-Magnetics I	2
2 nd Year-1 st Semester	EE 210	Digital Electronic I	2
2 nd Year-1 st Semester	EE 206	Machines (DC)	2
2 nd Year-2 nd Semester	E202	Advance Mathematics- II	3
2 nd Year-2 nd Semester	EE 202	Electronics II	3
2 nd Year-2 nd Semester	EE 204	Electric Circuits Analysis II	2
2 nd Year-2 nd Semester	EE 212	Measurement & Instruments	2
2 nd Year-2 nd Semester	EE 209	Electro-Magnetics II	2
2 nd Year-2 nd Semester	EE 211	Digital Electronic II	3
2 nd Year-2 nd Semester	EE 207	Power and AC Machines	4
2 nd Year-2 nd Semester	EE 213	University Culture Activity	-
3 rd Year-1 st Semester	EE 301	Digital Signal Processing I	2
3 rd Year-1 st Semester	EE 309	Advanced Electronics I	3

3 rd Year-1 st Semester	EE 303	Communication Systems I	3
3 rd Year-1 st Semester	EE 305	Microprocessor and Microcontroller: Hardware	3
3 rd Year-1 st Semester	EE 307	Engineering Analysis I	2
3 rd Year-1 st Semester	EE 311	Antenna	3
3 rd Year-2 nd Semester	EE 312	Engineering Administration	2
3 rd Year-2 nd Semester	EE 302	Digital Signal Processing II	3
3 rd Year-2 nd Semester	EE 310	Advanced Electronics II	3
3 rd Year-2 nd Semester	EE 304	Communication Systems II	3
3 rd Year-2 nd Semester	EE 306	Microprocessor-Based System: Programming	2
3 rd Year-2 nd Semester	EE 308	Engineering Analysis II	2
3 rd Year-2 nd Semester	EE 313	Optoelectronics	2
Fourth Year-1 st Semester	EE 401	Microelectronic I	2
Fourth Year-1 st Semester	EE 403	Power Electronics I	3
Fourth Year-1 st Semester	EE405	Control System I	3
Fourth Year-1 st Semester	EE407	Digital System Design	3
Fourth Year-1 st Semester	EE 409	Information Theory	3
Fourth Year-1 st Semester	EE411	Hardware Description Language (HDL) Programming	3
Fourth Year-2 nd Semester	EE 413	Introduction to AI	2
Fourth Year-2 nd Semester	E402	Eng. Graduation Project I	2
Fourth Year-2 nd Semester	EE402	Microelectronic II	2
Fourth Year-2 nd Semester	EE404	Power Electronics II	3
Fourth Year-2 nd Semester	EE406	Control System II	3

Fourth Year- 2 nd Semester	EE408	Advanced Digital System Design	3
Fourth Year- 2 nd Semester	EE410	Microwave	2
Fourth Year- 2 nd Semester	E401	Engineering Profession Ethics	2
Fourth Year- 2 nd Semester	EE412	Digital Image Processing	2
Fourth Year- 2 nd Semester	E403	Eng. Graduation Project II	2

13. Personal Development Planning

It is planned to develop the students' personalities by holding discussion circles with them and asking them for periodic reports and seminars throughout the four stages and on various topics to develop their personal development.

14. Admission criteria .

According to the rules and regulations of Ministry of Higher Education and Scientific Research.

15. Key sources of information about the program

- College website.
- The department's website and contact the department by email.

Curriculum Skills Map

please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

				Programme Learning Outcomes															
Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
2 st Year-2 st Semester	EE 207	Power and AC Machines	C	√		√		√		√		√		√	√				

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Diyala
2. University Department/Centre	College of Engineering
3. Course title/code	Power and AC Machines - EE 207
4. Modes of Attendance offered	Class Lectures
5. Semester/Year	2 st Semester – 2 st Year
6. Number of hours tuition (total)	30 hours
7. Date of production/revision of this specification	16/06/2023
8. Aims of the Course	
The Power and AC Machines curriculum aims to introduce the student to the skills of Power and AC Machines, the basics of Power and AC Machines, alternating current machines work, their types, and analysis of the mathematical model for each of them.	

9. Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Cognitive goals.

A1- During the school year, the student learns the basics of Power and AC Machines.

A2- Understanding the basics of alternating current machines.

A3- Learn how to think about how an alternating current machines works and its applications.

A4- The student learns about other types of alternating current machines and their applications in transmitting electrical power.

B. The skills goals special to the course.

B1 - Learn how to deal with alternating current machines and applications of alternating current machines .

B2- Learn about the types of alternating current machines.

B3- Familiarity with the basic concepts of the types of AC Motors, Transformers and special machines.

B4- Familiarity with how an ideal three-phase transformer and a practical transformer work.

Teaching and Learning Methods

- The lecturer prepares lectures on the subject in paper and electronic form and presents them to the students.
- The lecturer delivers lectures in detail.
- The lecturer requests periodic reports and homework assignments on the basic topics of the subject.

Assessment methods

- Daily discussion to determine the extent of students' understanding of the material and to evaluate the daily contributions.
- Daily exams with various short scientific questions to understand the extent of their understanding of the material.
- Giving part of the semester's grade to homework assignments.
- Daily exams (Quiz) and monthly exams for the curriculum and the final exam

C. Affective and value goals

C1- Urging the student to understand the purpose of studying the subject in general.

C2- Urging the student to think about how to develop himself in the field of AC Machines.

Teaching and Learning Methods

- The teacher delivers detailed theoretical lectures
- The teacher requests periodic reports on the basic topics of the subject

Assessment methods

- Daily exams with practical and scientific questions.
- Participation marks for difficult competition questions among students.
- Assigning grades to homework assignments and reports assigned to them.
- Semester exams for the curriculum in addition to the final exam.

D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)

D1- Enabling students to write reports on topics related to Power and AC Machine.

D2- Enabling students to know how to use the Internet to obtain important information.

D3- Raising the student's self-confidence by linking theoretical material to practical reality.

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	3	Definition of power and its types in single-phase and three-phase electrical circuits	Power Definition, Power In 1-Cct, Power in 3-Cct	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 2	3	Identify transmission lines for electrical energy	Power Plant Over Head Transmission Line	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 3	3	Study of conductive materials used in transmission lines and their mechanical design	Conductor Material, Material Design Sag Tension Relationship	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 4	3	Electrical transformers	Single Phase Transformer	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 5	3	The principle of operation	Principle of Working, Construction	Lectures Notes power point	

		of transformers and their installation			
Week 6		Mathematical equations for transformers		Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 7	3	Types of transformers and their equivalent circuit	Transformer Equations	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 8	3	Types of transformers and their equivalent circuit	Types and, Equivalent Circuits	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 9	3	Losses and efficiency in electrical transformers	Types And, Equivalent Circuits	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 10	3	Losses and efficiency in electrical transformers	Losses and Efficiency	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 11	3	Single-phase induction motors (types, working principle, properties, applications)	Losses and Efficiency	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 12	3	Stepper motors (types, working principle, properties, applications)	Single Phase Induction Motors, Types, Principle of Operation, Characteristics, Applications.	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 13	3	Motors that operate on direct and alternating current (types, working principle,	Stepper Motors, Types, Principle of Operation, Characteristics, Applications	Lectures Notes power point	Daily exams + practical experiments + monthly exams

		properties, applications)			
Week 14	3	Brushless motors (types, working principle, properties, applications)	Universal Motors, Types, Principle of Operation, Characteristics, Applications.	Lectures Notes power point	Daily exams + practical experiments + monthly exams
Week 15	3	Synchronous motors (types, working principle, properties, applications)	Brushless Motors, Types, Principle of Operation, Characteristics, Applications	Lectures Notes power point	Daily exams + practical experiments + monthly exams

11. Infrastructure	
1. Books Required reading:	1- Electrical Technology by B.L Theraja. 2- Principles of Electric Machines by V. K. Mehta and Rohit Mehta
2. Main references (sources)	<ul style="list-style-type: none"> College library to obtain additional sources for the curriculum. Check scientific websites to see recent developments in the subject.
A- Recommended books and references (scientific journals, reports...).	<ul style="list-style-type: none"> All solid scientific journals that are related to the broad concept of electronic physics.
B-Electronic references, Internet sites...	Any other materials available on the web.
12. The development of the curriculum plan	
The Development of the curriculum consists of various forms for the use of AC devices in industrial, domestic and commercial appliances.	