

*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

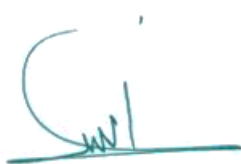
*University: Diyala
College: Engineering
Number Of Departments in The College:02
Date Of Form Completion:23/6/2023*

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

Signature



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

Signature

TEMPLATE FOR PROGRAM SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAM REVIEW

PROGRAM 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 | 23/06/2023 |
| 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 students the foundations of electrical and mathematical engineering related to electrical engineering.
 - A2- Enabling students to obtain knowledge and realization of the suitable way to work on modern electronic systems and how to analyze programs related to those systems.
 - A3- Enriching the student knowledge to understand the methods of generating electromagnetic waves and their propagation in various media along with the possibility of transporting them from one place to another as well as their impact on the performance of electronic devices.
 - A4- Enabling students to obtain knowledge and understanding of designing and implementing various electronic systems.
 - A5- Enabling students to obtain knowledge and understanding of diagnosing faults and maintaining various Electronic 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 the topics of the foundations of electrical engineering and electronic physics by specialists and make sure of using 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.
- B3- Topics of wave propagation are presented along with topics of electromagnetic energy transfer, and emphasis is placed on mathematical topics, electrical circuits, and antenna topics together.
- B4: The focus is on the topics of design and analysis of electronic systems and their development with Artificial intelligence AI.
- B5- Providing students with skills in choosing a factory location, planning it, and classifying administrative levels according to the size of the factory.

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 electronic systems related to the engineering framework.
- C3- Helping students to imagine the forms of electrical waves and their propagation in physical environments.
- 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.

| Program Structure | | | | |
|--|-----------------------|--|--------------|-----------|
| Level Year/ 1 st semester | Course or Module Code | Course or Module Title | Credit hours | |
| | | | Theoretical | practical |
| 1 st Year/ 1 st Sem. | E101 | Mathematics –I | 3 | - |
| 1 st Year/ 1 st Sem. | EE107 | Electronic Physics I | 2 | - |
| 1 st Year/ 1 st Sem. | E106 | Workshop Skills- I | - | 2 |
| 1 st Year/ 1 st Sem. | EE101 | Digital Technique I | 2 | 2 |
| 1 st Year/ 1 st Sem. | EE103 | Electrical Engineering Fundamentals I | 3 | 2 |
| 1 st Year/ 1 st Sem. | U101 | Human Rights | 1 | - |
| 1 st Year/ 1 st Sem. | U105 | Arabic Language | 1 | - |
| 1 st Year/ 1 st Sem. | E104 | Engineering Drawing I (Basic) | 1 | 2 |
| 1 st Year/ 1 st Sem. | U103 | Computer Science | 1 | 2 |
| 1 st Year/ 1 st Sem. | EE105 | Engineering Mechanics-I (Statics) | 2 | - |
| 1 st Year/ 2 nd Sem. | E102 | Mathematics- II | 3 | - |
| 1 st Year/ 2 nd Sem. | EE108 | Electronic Physics II | 2 | - |
| 1 st Year/ 2 nd Sem. | EE102 | Digital Technique II | 3 | 2 |
| 1 st Year/ 2 nd Sem. | EE104 | Electrical Engineering Fundamentals II | 4 | 2 |
| 1 st Year/ 2 nd Sem. | U102 | Human Rights | 1 | - |
| 1 st Year/ 2 nd Sem. | U104 | English Language | 2 | - |
| 1 st Year/ 2 nd Sem. | E105 | Engineering Drawing-II(AutoCAD) | 2 | 2 |
| 1 st Year/ 2 nd Sem. | E107 | Programming | 3 | 2 |
| 1 st Year/ 2 nd Sem. | EE106 | Engineering Mechanics-II (Dynamics) | 2 | - |
| 2 nd Year-1 st Sem. | E201 | Advance Mathematics –I | 3 | - |
| 2 nd Year-1 st Sem. | EE 201 | Electronics I | 2 | 2 |
| 2 nd Year-1 st Sem. | EE 203 | Electric Circuits Analysis I | 2 | - |
| 2 nd Year-1 st Sem. | EE 205 | Advanced Programming | 1 | 2 |
| 2 nd Year-1 st Sem. | EE 208 | Electro-Magnetics I | 2 | - |
| 2 nd Year-1 st Sem. | EE 210 | Digital Electronic I | 2 | 2 |
| 2 nd Year-1 st Sem. | EE 206 | Machines (DC) | 2 | 2 |
| 2 nd Year-2 nd Sem. | E202 | Advance Mathematics- II | 3 | - |
| 2 nd Year-2 nd Sem. | EE 202 | Electronics II | 2 | 2 |
| 2 nd Year-2 nd Sem. | EE 204 | Electric Circuits Analysis II | 2 | - |
| 2 nd Year-2 nd Sem. | EE 212 | Measurement & Instruments | 2 | - |
| 2 nd Year-2 nd Sem. | EE 209 | Electro-Magnetics II | 2 | - |
| 2 nd Year-2 nd Sem. | EE 211 | Digital Electronic II | 2 | 2 |
| 2 nd Year-2 nd Sem. | EE 207 | Power and AC Machines | 3 | 2 |
| 2 nd Year-2 nd Sem. | EE 213 | University Culture Activity | - | 1 |
| 3 rd Year-1 st Sem. | EE 301 | Digital Signal Processing I | 2 | - |
| 3 rd Year-1 st Sem. | EE 309 | Advanced Electronics I | 2 | 2 |

| | | | | |
|---|--------|---|---|---|
| 3 rd Year-1 st Sem. | EE 303 | Communication Systems I | 2 | 2 |
| 3 rd Year-1 st Sem. | EE 305 | Microprocessor and Microcontroller: Hardware | 2 | 2 |
| 3 rd Year-1 st Sem. | EE 307 | Engineering Analysis I | 2 | - |
| 3 rd Year-1 st Sem. | EE 311 | Antenna | 2 | 2 |
| 3 rd Year-1 st Sem. | EE 312 | Engineering Administration | 2 | - |
| 3 rd Year-2 nd Sem. | EE 302 | Digital Signal Processing II | 2 | - |
| 3 rd Year-2 nd Sem. | EE 310 | Advanced Electronics II | 2 | 2 |
| 3 rd Year-2 nd Sem. | EE 304 | Communication Systems II | 2 | 2 |
| 3 rd Year-2 nd Sem. | EE 306 | Microprocessor-Based System: Programming | 2 | 2 |
| 3 rd Year-2 nd Sem. | EE 308 | Engineering Analysis II | 2 | - |
| 3 rd Year-2 nd Sem. | EE 313 | Optoelectronics | 2 | - |
| 4 th Year-1 st Sem. | EE 401 | Microelectronic I | 2 | - |
| 4 th Year-1 st Sem. | EE 403 | Power Electronics I | 2 | 2 |
| 4 th Year-1 st Sem. | EE405 | Control System I | 2 | 2 |
| 4 th Year-1 st Sem. | EE407 | Digital System Design | 3 | - |
| 4 th Year-1 st Sem. | EE 409 | Information Theory | 3 | - |
| 4 th Year-1 st Sem. | EE411 | Hardware Description Language | 2 | 2 |
| 4 th Year-1 st Sem. | EE 413 | Introduction to AI | 2 | - |
| 4 th Year-1 st Sem. | E402 | Eng. Graduation Project I | - | 4 |
| 4 th Year-2 nd Sem. | EE402 | Microelectronic II | 2 | - |
| 4 th Year-2 nd Sem. | EE404 | Power Electronics II | 2 | 2 |
| 4 th Year-2 nd Sem. | EE406 | Control System II | 2 | 2 |
| 4 th Year-2 nd Sem. | EE408 | Advanced Digital System Design | 3 | - |
| 4 th Year-2 nd Sem. | EE410 | Microwave | 2 | - |
| 4 th Year-2 nd Sem. | E401 | Engineering Profession Ethics | 2 | - |
| 4 th Year-2 nd Sem. | EE412 | Digital Image Processing | 2 | - |
| 4 th Year-2 nd Sem. | E403 | Eng. Graduation Project II | - | 4 |

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 Program Learning Outcomes are being assessed

| | | | | Program 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 |
| 1 st Year-1 st Semester | E 103 | Physics | C | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAM 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 program specification.

| | |
|--|--|
| 1. Teaching Institution | University of Diyala |
| 2. University Department/Centre | College of Engineering |
| 3. Course title/code | EE 413 / Introduction to AI |
| 4. Modes of Attendance offered | Class Lectures |
| 5. Semester/Year | 1 st Semester – 1 st Year |
| 6. Number of hours tuition (total) | 30 hours |
| 7. Date of production/revision of this specification | 23/06/2023 |
| 8. Aims of the Course | <p>The topic of artificial intelligence aims to teach students the types of artificial intelligence, including neural networks and fuzzy systems, in addition to their method of operation. There are types of neural networks and methods for training them, including the perceptron and the way they represent types of logic gates as well as types of memory networks, including the Bidirectional Associated Memory & Hopfield method. The course also focuses on methods for training networks, whether as supervised or unsupervised. The student is taught multi-layer networks and how to train them to do what is required to building a specific function. Fuzzy systems are studied, which have many applications in multiple fields, and the method of designing and building the system. And also:</p> <ol style="list-style-type: none">(1) Achieving the university's goals within the field of electronic engineering;(2) Gives proper education in the basics of electronic engineering;(3) Develop the skills and confidence necessary to solve, based on engineering and scientific |

principles, problems in the electronic industries.

(4) Continuing to create highly capable graduates;

(5) Providing education compatible with the needs of the labor market linked to the Engineers Syndicate.

9. Learning Outcomes, Teaching ,Learning and Assessment Method:

A- Cognitive goals.

A1- During the school year, the student learns an idea about artificial intelligence.

A2-Learn and understand different types of artificial intelligence.

A2- Learn and understand how to use artificial intelligence to solve engineering problems.

A4- Learn and understand how to build the required programs.

B. The skills goals special to the course.

B1 - Familiarity with how all neural networks and fuzzy systems work.

B2- Familiarity with types of neural networks and fuzzy systems.

B3- Familiarity with how to use neural networks as the optimal solution to many problems.

B4- Familiarity with how to use fuzzy systems.

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 think about ways to write research.

C2- Urging the student to think about the importance of artificial intelligence.

C2- Urging the student to use modern programming.

C4- Urging the student to think about choosing important programs in building artificial intelligence systems..

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.

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 artificial intelligence.

D2- Enabling students to link theories to the practical reality of electrical circuits.

D3- Enabling students to pass professional tests organized by local or international bodies.

D4- Enabling students to continue self-development after graduation.

D5- Establishing special seminars for students for the purpose of self-development of their personalities.

| Course Structure | | | | | |
|------------------|-----|------|---------------------------------|--|-----------------------------------|
| Week | Hrs | IOLs | Unit/Module or Topic Title | Teaching Method | Assessment Method |
| 1 | 3 | | Introduction for AI | Lectures Notes PDF, power point, and Video | Daily exams + monthly exams |
| 2 | 3 | | Introduction for Neural Network | | |
| 3 | 3 | | Types of Neural Network | | |
| 4 | 3 | | Forward network | | |
| 5 | 3 | | Perceptron Neuron | | |
| 6 | 3 | | Associative Memory | | |
| 7 | 3 | | Perceptron Neuron | | |
| 8 | 3 | | Associative Memory | | |
| 9 | 3 | | Hopfield Neural Network | | |
| 10 | 3 | | BAM Neural Network | | |
| 11 | 3 | | Hamming Neural Network | | |
| 12 | 3 | | Hamming Neural Network | | |
| 13 | 3 | | Backpropagation learning | | |
| 14 | 3 | | Backpropagation learning | | |
| 15 | 3 | | Multilayer Neural Network | | |

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|---|---|
| 11. Infrastructure | |
| 1. Books Required reading: | <ul style="list-style-type: none"> • Jacek m. zurada, introduction to artificial neural systems, • T. J. Ross, fuzzy logic with engineering applications |
| 2. Main references (sources) | <ul style="list-style-type: none"> • Lectures presented by the Lecturer • Books available in the college library |
| A- Recommended books and references (scientific journals, reports...). | <ul style="list-style-type: none"> • Sedra and Smith, <i>Microelectronic Circuits</i>, Oxford University Press, <i>Sixth Edition</i>,2010. • Behzad Razavi, <i>Fundamentals of Microelectronics</i>, John Wiley & Sons, Preview Edition, 2006 • Jimmie J. Cathey, Ph.D, <i>Theory and Problems of Electronic Devices and Circuits</i>, 2nd Edition, 2002. |
| B-Electronic references, Internet sites... | Any other materials available on the web. |
| 12. The development of the curriculum plan | |
| Supporting theoretical lectures with ready-made practical examples and programs in order to bring them closer to the picture of the possibilities of artificial intelligence in developing problem solving and complex designs. | |