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

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Dean's Assistant for Scientific Affairs
Date :17/9/2023
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The College Quality Assurance and University Performance Manager
Date :17/9/2023
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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

- 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 computers work and how to deal with computer algorithms.

A2- Enabling students to obtain knowledge and understanding in working on and designing electronic circuit.

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

1st Year-2nd Semester	E 102	Mathematics 2	6
1st Year-2nd Semester	EE 102	Electrical Engineering Fundamentals 2	8
1st Year-2nd Semester	EE 103	Digital techniques	7
1st Year-2nd Semester	EE 105	C++ Programming	4
1st Year-2nd Semester	EE 104	Workshops skills	3
1st Year-2nd Semester	U 101	Human Rights and Democracy	2
2nd Year-1st Semester	E201	Advance Mathematics –I	3
2nd Year-1st Semester	EE 201	Electronics I	2
2nd Year-1st Semester	EE 203	Electric Circuits Analysis I	2
2nd Year-1st Semester	EE 205	Advanced Programming	1
2nd Year-1st Semester	EE 208	Electro-Magnetics I	2
2nd Year-1st Semester	EE 210	Digital Electronic I	2
2nd Year-1st Semester	EE 206	Machines (DC)	2
2nd Year-2nd Semester	E202	Advance Mathematics- II	3
2nd Year-2nd Semester	EE 202	Electronics II	3
2nd Year-2nd Semester	EE 204	Electric Circuits Analysis II	2
2nd Year-2nd Semester	EE 212	Measurement &Instruments	2
2nd Year-2nd Semester	EE 209	Electro-Magnetics II	2
2nd Year-2nd Semester	EE 211	Digital Electronic II	3
2nd Year-2nd Semester	EE 207	Power and AC Machines	4
2nd Year-2nd Semester	EE 213	University Culture Activity	-

3rd Year-1st Semester	EE 301	Digital Signal Processing I	2
3rd Year-1st Semester	EE 309	Advanced Electronics I	3
3rd Year-1st Semester	EE 303	Communication Systems I	3
3rd Year-1st Semester	EE 305	Microprocessor and Microcontroller: Hardware	3
3rd Year-1st Semester	EE 307	Engineering Analysis I	2
3rd Year-1st Semester	EE 311	Antenna	3
3rd Year-2nd Semester	EE 312	Engineering Administration	2
3rd Year-2nd Semester	EE 302	Digital Signal Processing II	3
3rd Year-2nd Semester	EE 310	Advanced Electronics II	3
3rd Year-2nd Semester	EE 304	Communication Systems II	3
3rd Year-2nd Semester	EE 306	Microprocessor-Based System: Programming	2
3rd Year-2nd Semester	EE 308	Engineering Analysis II	2
3rd Year-2nd Semester	EE 313	Optoelectronics	2
Fourth Year-1st Semester	EE 401	Microelectronic I	2
Fourth Year-1st Semester	EE 403	Power Electronics I	3
Fourth Year-1st Semester	EE405	Control System I	3
Fourth Year-1st Semester	EE407	Digital System Design	3
Fourth Year-1st Semester	EE 409	Information Theory	3
Fourth Year-1st Semester	EE411	Hardware Description Language (HDL) Programming	3
Fourth Year-2nd Semester	EE 413	Introduction to AI	2
Fourth Year-2nd Semester	E402	Eng. Graduation Project I	2

Fourth Year- 2nd Semester	EE402	Microelectronic II	2
Fourth Year- 2nd Semester	EE404	Power Electronics II	3
Fourth Year- 2nd Semester	EE406	Control System II	3
Fourth Year- 2nd Semester	EE408	Advanced Digital System Design	3
Fourth Year- 2nd Semester	EE410	Microwave	2
Fourth Year- 2nd Semester	E401	Engineering Profession Ethics	2
Fourth Year- 2nd Semester	EE412	Digital Image Processing	2
Fourth Year- 2nd 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**
3rd Year-1st Semester	**EE301**	**Digital Signal Processing I**	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	EE301/ Digital Signal Processing I
4. Modes of Attendance offered	Class Lectures
5. Semester/Year	1st Semester – 3rd Year
6. Number of hours tuition (total)	42 hours
7. Date of production/revision of this specification	17/09/2023
8. Aims of the Course	
The Digital Signal Processing (DSP) course covers modern techniques in digital signal processing, which are considered essential in various diverse applications that are involved in electronic engineering and communications applications, and processing various signals digitally, such as processing and interpreting body signals, in addition to the basic role of this course in providing the capabilities of processing medical images.	

9· Learning Outcomes, Teaching ,Learning and Assessment Method

A- Cognitive goals.

A1-During the academic year, the student learns how to analyze the most important types of basic signals that are involved in the design of complex systems.

A2- Learn how to identify the characteristics of analogue and digital signals and study and convert between them.

A3- The student learns how to design digital filters in basic ways that will open horizons towards learning advanced complex methods.

A4- Understanding and interpreting mathematical relationships in different fields at the time domain and frequency domain levels.

A5- Using the MATLAB program to implement the mathematical relationships that are being studied to understand how to program them using a computer.

A6- Study of Z-transform and Z-inverse and how to use them to simplify the analysis of digital signals.

B. The skills goals special to the course.

B1-Familiarity with the mathematical relationships that represent the Fourier transform

B2- Familiarity with the mathematical relationships that represent the Z-transform.

B3- Familiarity with various methods of analyzing digital signals.

B4- Summarizing the basic concepts of the characteristics of digital and analogue signals and how to analyze them.

B6- Familiarity with the basic methods for designing FIR and IIR filters manually and programmatically using the MATLAB program.

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 understand the operation of each function or code within the language.

C2- Urging the student to think about how to develop himself in the field of computers.
C4- Making the student able to deal with the calculator and how to use the programs.

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 digital signal processing.
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.

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	3	Explains the basic elements in digital system design	Introduction to DSP	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 2	3	Study of converting analogue signals to digital	The concept of frequency in continues time and discrete time signals	Lectures Notes PDF power point Video	Daily exams + monthly exams

Week 3	3	Studies the methods of generating and classifying digital signals.	Digital signals and systems	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 4	3	Study of digital discrete time systems, their characteristics	Discrete time Systems	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 5	3	The teaching shows representing digital systems using blocks	Block diagram representation of discrete time systems	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 6	3	Analysis and study of digital discrete time systems in the form of differential equations	Discrete time systems as difference equation	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 7	3	Study of linear mathematical comparison techniques for digital signals	Linear convolution and signal comparison	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 8	3	Study of linear mathematical comparison techniques for digital signals	Linear convolution	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 9	3	Study of circular mathematical comparison techniques for digital signals	Circular convolution of discrete time sequence	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 10	3	Signal analysis and digital systems by applying discrete Fourier transform methods	Discrete Fourier Transform DFT	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 11		Application of		Lectures Notes	Daily exams

	3	inverse discrete Fourier transform methods	Inverse of Discrete Fourier Transform DFT	PDF power point Video	+ monthly exams
Week 12	3	Studying some practical applications of the discrete Fourier transform method	Application of Discrete Fourier Transform	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 13	3	Study of the fast discrete Fourier transform and its contribution to increasing the speed of DFT implementation	Fast Fourier Transform FFT	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 14	3	Study of the fast discrete inverse Fourier transform	Inverse of Fast Fourier Transform IFFT	Lectures Notes PDF power point Video	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	1. Digital Signal Processing: principles, algorithms, and applications, third edition, by John G. Proakis and Dimitris G. Manolakis. 2. Digital Signal Processing, fundamentals and applications, 2008, by Li Tan.
2. Main references (sources)	• Lectures presented by the Lecturer • Books available in the college library
A- Recommended books and references (scientific journals, reports…).	All solid scientific journals that are related to the broad concept of engineering analyses.
B-Electronic references, Internet sites…	1. . Mathematics for Engineers and Applied Scientists, 2nd edition, by Stanley. 2. Introductory Digital Signal Processing, 2nd edition by P. A. Lynn.

12. The development of the curriculum plan
Adding vocabulary to the curriculum within the development of the course and at a rate not exceeding 10%. It is absolutely necessary to provide a laboratory for the subject because of its importance in deepening the understanding of the aforementioned vocabulary.