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	Engineering and Numerical analysis
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 computer 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 engineering and numerical analysis and how to deal with electronics engineering.

A2- Enabling students to obtain knowledge and understanding in engineering and numerical analysis for systems in electronics engineering and working with another engineering departments.

A3- Teaching the student the methods the electronics and numerical engineering and the special methods in analysis with its applications on electrical circuits (Electronics and communications).

A4- Enabling students to obtain knowledge and understanding of analyzing the electrical circuits by mathematically and numerically analysis.

A5- Enabling students to obtain knowledge and understanding in generations for electrical and communications engineering, mathematically and numerically.

A6- Teaching the student the foundations of dealing with a non-electronic, creating and programming electronic circuits in different hardware languages.

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

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
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

Bachelor Degree Requires (155) credits

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**
1st Year-1st Semester	**E 103**	**Physics**	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	EE 302 / Engineering & Numerical Analysis
4. Modes of Attendance offered	Class Lectures
5. Semester/Year	1st Semester – 1st Year
6. Number of hours tuition (total)	45 hours
7. Date of production/revision of this specification	17/09/2023
9. Aims of the Course	
The curriculum aims to teach the numerical matrices and mathematical transfers such as (Fourier-Transform; Z-Transform ; Laplace Transform) , the most important thing is to teach the student how to use them in engineering applications, especially electrical and electronic, in addition to studying complex variables, power series , partial differential equations, and numerical analysis of all kinds with probability, and how to use each of them in electronic applications.	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Cognitive goals.

A1- During the semester of the academic year, the student learns how to analyze geometric circuits using (Fourier transform, Laplace Transform and Matrices), and simplify them.

A2- Understanding and studying complex variables, finding their derivatives, integrating them, and studying their theories.

A3- The students learns the topic of power series and how to analyze them.

A4- The student learns the topic of partial differential equations and how to find solutions for them and their methods.

A5 – Understanding and interpreting the principle of numerical analysis in its various ways, in addition to statistics and probability.

B. The skills goals special to the course.

B1 - Learn how to deal with mathematical relationships that represent FT,ZT,LT.

B2- Learn about the relationships related to numerical matrices and how to calculate them .

B3- Familiarity with mathematical derivatives and relationships related to the subject of complex variables.

B4- Familiarity with derivatives and mathematical relationships related to the topic of power series.

B5- Familiarity with the derivations and mathematical relationships related to the subject of partial differential equations.

B6- Familiarity with the mathematical laws related to the subject of numerical analysis, the most important of which is statistics.

B7- Familiarity with the basic concepts of probability as well as the mathematical relationships for continuous and discrete probability.

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 studying the electronics circuits by using Fourier transform.

C2- Urging the student to understand the applications ZT & LT in communications fields, signal processing , and electronics filters.

C2- Urging the student to think about applications complex variables in Control field and signal processing .
C4- Urging the student to think about applications PDE & Power series in electronics engineering.
C5- Urging the student to think the aim of studying the numerical analysis and statistics.
C6- Urging the student to think about applications of probability and its using in digital communications.

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 engineering analysis.
D2- Enabling students to know how use the methods in practical circuirs.
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.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	3	The student learns an introduction to the Eigen values and Eigen Vector	Matrices	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 2	3	The	Matrices	Lectures Notes	Daily exams

		student learns the Reduction matrix to diagonal form + Jordan canonical form + Hamilton theorem		PDF power point Video	+ monthly exams
Week 3	3	The teacher describes how to solve the differential equations by matrices	Matrices	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 4	3	The teacher explains the Fourier series and applications	Fourier Series	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 5	3	Fourier Integral applications	Fourier Series	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 6	3	Fourier Transform applications	Fourier Transform	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 7	3	FT in electrical circuits	Fourier Transform	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 8	3	The teaches explains the convolution	Fourier Transform	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 9	3	The teacher explains the principles of Z-transform	Z- Transform	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 10	3	The	Z- Transform	Lectures Notes	Daily exams

		applcations of Z-transform in continuous systems		PDF power point Video	+ monthly exams
Week 11	3	z-transform in electric circuits	Z- Transform	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 12	3	The solution the non-linear equation by newton Raphson	Numerical Analysis	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 13	3	Differntail and derivatives equations	Numerical Analysis	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 14	3	Solution of First derivatives	Numerical Analysis	Lectures Notes PDF power point Video	Daily exams + monthly exams
Week 15	3	Find the roots of nonlinear equations	Numerical Analysis	Lectures Notes PDF power point Video	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	1.Advanced Engineering Mathematics, 3rd edition, by C. R. Wylie 2.Advanced engineering mathematics 10 th edition
2. Main references (sources)	• Lectures presented by the Lecturer • Books available in the college library
A- Recommended books and references (scientific journals, reports…).	• All sciences journals that is related to Engineering and Numerical analysis.
B-Electronic references, Internet sites…	1. Mathematics for Engineers and Applied Scientists, 2nd edition, by Stanley. Introductory Digital Signal Processing, 2nd edition by P. A. Lynn.
