# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION  PERFORMANCE REVIEW: PROGRAM REVIEW

## COURSE SPECIFICATION

**It is the purpose of this lesson to provide important advanced mathematical concepts and methods needed by engineers and scientists as well as mathematicians who are interested in the applications of their field. each chapter begins with a clear statement of pertinent definitions principles and theorems ,the repetition of basic principles so vital to effective learning**

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| 1. Teaching Institution | **Baghdad University / Al Khwarizmi College of engineering** |
| 2. University Department/Centr | **Mechatronics Eng. Dept.** |
| 3. Course title/code | **Numerical Analysis /** |
| 4. Program(s) to which it contributes | **University Requirement** |
| 5. Modes of Attendance offered | **Full time** |
| 6. Semester/Year | **courses** |
| 7. Number of hours tuition (total) | **3 hours (2 theoretical/1 Prac.)** |
| 8. Date of production/revision of this specification | 2022 |
| 9. Aims of the Course | |
| | |
| To explain the concept of engineering and numerical analysis, and how to evaluate it in their | |

studies, to see the principle of engineering analysis And the use of geometric and numerical analysis in engineering applications such as the analysis of electrical circuits, give the student experience in dealing with all kinds of matrices and conducting various operations on them

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10· Learning Outcomes, Teaching , Learning and Assessment Methods

A- Knowledge and Understanding

A1. Gain the ability and skill to distinguish words and phrases and sports handling

A2. Acquire the skill to distinguish between relations and functions, and the link between them.

A3. Dealing with matrices

A4. Using the principles of counting

B. Subject-specific skills

B1. Summer -altdreb

B2. Research graduated

Teaching and Learning Methods

1Scientific lectures, which have been prepared by the professor where he
2discusses the basics and the most important concepts approved
3Daily and weekly tests sudden persistent.
4Exercises and activities in the classroom.
5Guiding students to some of the websites to take advantage of them

Assessment methods

1homework.
٢alamthanat fast and monthly
٣almcharkh in the classroom.
٤tkadim activities.

## C. Thinking Skills

C1.- develop the student's ability to work on the performance of the duties and delivered on schedule

C2. problem is a statistical analysis of a sports and find solutions to them on the basis of the expected results

C3. develop the student's ability to dialogue and discussion.

## Teaching and Learning Methods

1-Lecture manage their application is linked by daily life to attract students to the subject matter without a move away from the heart of the matter to be flexible material subject to the understanding and analysis.

٢-Assigning students to some activities and collective duties. Notes students discuss and try to reach the asymptotic practical understanding of reality.

3- Allocating a percentage of the division of duties and daily tests

## Assessment methods

1-Active participation in the classroom the student's commitment to guide and carry the responsibility.

2-To meet the deadline to submit assignments and research.

3-Reflect the quarterly and final commitment to the attainment of knowledge and skills tests

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

    D1. development of the student's ability to deal with the technical means

    D2. the development of the student's ability to deal with the Internet

    D3. the development of the student's ability to handle multimedia

    D4. develop the student's ability to dialogue and discussion.

| 11. Course Structure | | | | | |
|---|---|---|---|---|---|
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching Method | Assessment Method |
| | | | Fourier series<br>Series expansion and Euler coefficients | ٦ | 1,2 |
| | | | Even and odd functions<br>Half range expansion<br>Complex exponential form of Fourier series | ٦ | 3,4 |
| | | | Laplace transform :existence, definition of piecewise regular functions and functions of exponential order | 3 | ٥ |
| | | | Properties of Laplace transform<br>Inverse Laplace transform | 3 | 6 |
| | | | Solutions of ordinary differential equations<br>Solution of simultaneous differential equations | 3 | 7 |
| | | | Matrices :definitions &theorems ad joints &inverses | 3 | 8 |
| | | | Rank &equivalence system of linear equations, characteristic<br>Eigen values &Eigen vectors | 6 | 9.10 |
| | | | complex variable<br>Algebraic preliminaries and geometric representation of complex variable,Functions of complex variable properties of analytic functions, the logarithmic function | ٦ | 11.12 |
| | | | Integration in the complex plane , the residue theorem | ٩ | 13.14.15. |

| 12. Infrastructure | |
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| Required reading:<br>· CORE TEXTS<br>· COURSE MATERIALS<br>· OTHER | **1. Advanced Engineering Mathematics by C. R. Wylie**<br>**2. Advanced Engineering Mathematics by Peter V. O'Neil** |

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| | **3. Advanced Engineering Mathematics by Erwin Kreysizg**<br>**4. Introduction to communication systems by Ferrell G. Stremler** |
| Special requirements (include for example workshops, periodicals, IT software, websites) | |
| Community-based facilities (include for example, guest Lectures , internship , field studies) | |

| 13. Admissions | |
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| Pre-requisites | |
| Minimum number of students | ٢٠ |
| Maximum number of students | ٣٠ |