

## 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	Al- Mansour University College
2. University Department/Centre	Communication Department
3. Course title/code	Numerical Methods
4. Programme(s) to which it contributes	
5. Modes of Attendance offered	Weekly – Lectures
6. Semester/Year	2020 – 2021 (Second Semester)
7. Number of hours tuition (total)	60 Hours (Theory and Lab.)
8. Date of production/revision of this specification	28-6-2021
9. Aims of the Course	Introducing the different numerical analysis methods used in solving multiple problems in mathematics, and this matter has two directions, theoretical and practical, where students are able to write computer programs for the purpose of solving different mathematical problems using numerical methods.
10. Learning Outcomes, Teaching ,Learning and Assessment Methode	A- Knowledge and Understanding A1. Learn about numerical analysis in general.

A2- Learn a variety of numerical methods for solving different problems in mathematics.  
A3- Linking theoretical knowledge with the practical aspect.  
A4- Identifying the necessary software algorithms to transform the theoretical side into an application.

#### B. Subject-specific skills

B1 Training the student to deal with different sports situations.  
B2 - Training the student on programming and implementing relevant algorithms.

#### Teaching and Learning Methods

1- Theoretical lectures with solving various practical examples.  
2- Homework.  
3- Program applications in Lab.

#### Assessment methods

1- Assessment of class exercises  
2- Evaluation of extra-curricular exercises  
3- Semester exams

#### C. Thinking Skills

C1. Training students on the behavior of the scientific approach in investigation and research.  
C2 - Training students on scientific reasoning about dealing with different issues and situations.

#### Teaching and Learning Methods

Theoretical lectures with related seminars.

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

D1. Enable the student to know the subject of numerical analysis in its theoretical and practical branches and link the two branches with each other.

D2 - Enable the student to obey the foundations he has received in order to be able to apply them in different aspects of life.

### 11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1-2	4	Integration	Trapezoidal and Simpson Rules	Theoretical and lab. Lectures	Exam and assessment
3-4	4	Differentiation	Forward and central formula	Theoretical and lab. Lectures	Exam and assessment
5-6	4	Interpolation	Lagrange and Newton Interpolation	Theoretical and lab. Lectures	Exam and assessment
7-8	4	Linear equations	Direct Methods	Theoretical and lab. Lectures	Exam and assessment
9-10	4	Linear equations	Iterative Methods	Theoretical and lab. Lectures	Exam and assessment
11-12	4	Roots of equations	Bisection Method	Theoretical and lab. Lectures	Exam and assessment
13-14	4	Roots of equations	Newton-Raphson Method	Theoretical and lab. Lectures	Exam and assessment
15	2	Differential Equations	Euler Method	Theoretical and lab. Lectures	Exam and assessment

### 12. Infrastructure

Required reading:

- CORE TEXTS
- COURSE MATERIALS
- OTHER

Numerical methods. By: Robert W. Hornbeck.  
 Numerical methods for math. science, and eng. By:  
 John H. Mathews.