

## NUMERICAL ANALYSIS 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 Baghdad/ College of Science for Women
2. University Department/Centre	Computer Science
3. Course title/code	Numerical analysis/205 CNA
4. Programme(s) to which it contributes	
5. Modes of Attendance offered	Actual attendance in lectures
6. Semester/Year	second year/ first semester

7. Number of hours tuition (total)	30 oral hours and 120 practical hours
8. Date of production/revision of this specification	13-4-2016
9. Aims of the Course	
The course aims to put laws and the basic concepts and axioms in numerical analysis starting from the simplest ways of approximating solutions of different classifications and estimating function through various methods using Matlab programming language	

10. Learning Outcomes, Teaching ,Learning and Assessment Method
<p><b>R- Knowledge and Understanding</b></p> <p>A- cognitive goals</p> <p>A1- identify optimal ways to solve mathematical problems</p> <p>A2- learn how to distinguish the function of the differential equation and how to solve them</p> <p>A3- identify some ordinary differential equations and their solutions applications</p> <p>A4- identification of partial differential equations and their solutions</p> <p>A5- identify sequences and series , types and study the convergence and divergence in addition to her many other topics within the course</p>
<p><b>B. Subject-specific skills</b></p> <p>B1 - choose how best solution to the issue of sports after displaying different methods have the solution</p> <p>B 2 Knowledge of a way to simplify math problems based on the foundations of mathematics task</p>
<p><b>Teaching and Learning Methods</b></p> <ul style="list-style-type: none"> <li>• Education: provide lectures and printed sources from the modern and diverse and rich including examples</li> <li>• Education: Harnessing smart blackboard to the goal of teaching students and explain the steps the solution and extraction results</li> <li>• Education: resolving some questions, with intent to contain mistakes and make the students extracted error</li> <li>• Learning: asking questions and inquiries and making the student turn into a teaching</li> </ul>

explanation and solution on the blackboard at that point

- Learning: questions directly and gradually all students to learn the extent of interaction and the rest to be paid attention to
- Learning: Each specific group and explain its interaction between students with questions and answers and provide an environment that enables the student to lecture management or debate

### Assessment methods

- Quizzes (quiz) semi- weekly
- Reporting and in the form of aggregates by a report for each set and dropped over students
- Questions sudden and overlapping put up with to explain Article
- monthly and quarterly tests

### C. Thinking Skills

C1 - ask range solutions to the same problem and discussed separately and determine the appropriate method of solution to the problem at hand with a stand on the disadvantages of the rest of the roads

C2- put forward solutions contain inaccuracies and identifying these mistakes After discussion and processed

C 3 - asked questions that oral exceptional need exceptional answers as be of a specific weight in terms of calendar and grades which are strong hoof for the participation of students and compete and compete to solve

C4- choose the most appropriate way to solve mathematical problems after displaying different ways of solutions

### Teaching and Learning Methods

Discussions that arise in the course of the lecture , and an attempt to involve the largest possible number of students , and touched on the details of things and discussed objectively and targeted discussion.

## Assessment methods

- Oral evaluated by involving students in discussions
- Quizzes (quiz)
- exams monthly and quarterly

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

D1- distribution of specific topics for each group of students to prepare research reports on the World Wide Web , the sources or the library and drafted in accordance with the basis of the approved formulation research

D2 - giving leadership debate administration , however, the group discussion and enable them to drive and manage the dialogue

D3- alert on errors in students' oral answers and discussion to see her fault

D4- alert on errors in the answers the students and editorial marking them to clarify to the student.

## 11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Introduction to numerical solution and counting errors	Introduction to numerical solution and counting errors	According to pt 10	According to pt 10
2	2	Numerical solution of ordinary functions	Numerical solution of ordinary functions	According to pt 10	According to pt 10
3	2	Bisection numerical method and its program	Bisection numerical method and its program	According to pt 10	According to pt 10
4	2	False position numerical method and its program	False position numerical method and its program	According to pt 10	According to pt 10
5	2	Newton Raphson numerical method and its program	Newton Raphson numerical method and its program	According to pt 10	According to pt 10
6	2	Fixed point iterative numerical method and its program	Fixed point iterative numerical method and its program	According to pt 10	According to pt 10
7	2	Numerical Solution of system	Numerical Solution of	According	According to

		of equations such as: Gaussian elimination method Gauss Jordan method	system of equations such as: Gaussian elimination method Gauss Jordan method	to pt 10	pt 10
8	2	Numerical Solution of iterative methods: Gauss Seidel and Jacobi and triangular factorization	Numerical Solution of iterative methods: Gauss Seidel and Jacobi and triangular factorization	According to pt 10	According to pt 10
9	2	First exam	First exam	According to pt 10	According to pt 10
10	2	Forward Finite difference operators and its numerical solution	Forward Finite difference operators and its numerical solution	According to pt 10	According to pt 10
11	2	Central and backward Finite difference operators and its numerical solution	Central and backward Finite difference operators and its numerical solution	According to pt 10	According to pt 10
12	2	Lagrange numerical method and division method	Lagrange numerical method and division method	According to pt 10	According to pt 10

13	2	Trapezoidal method, 1/3 Simpson's rule, 3/8 Simpson's rule	Trapezoidal method, 1/3 Simpson's rule, 3/8 Simpson's rule	According to pt 10	According to pt 10
14	2	Solution of ordinary differential equations: Taylor, Runge-kutta, Euler, modified Euler	Solution of ordinary differential equations: Taylor, Runge-kutta, Euler, modified Euler	According to pt 10	According to pt 10
15	2	Final and second exam	Final and second exam	According to pt 10	According to pt 10

## 12. Infrastructure

<p>Required reading:</p> <ul style="list-style-type: none"> <li>· CORE TEXTS</li> <li>· COURSE MATERIALS</li> <li>· OTHER</li> </ul>	<p>A. D. Anderson, Introduction to numerical analysis, 2004</p> <p>Schoum, numerical analysis and its applications, 1999</p> <p>Burden, Numerical analysis using matlab, 2006</p> <p>Any book for numerical methods is suitable to study the subjects</p>
<p>Special requirements (include for example workshops, periodicals, IT software, websites)</p>	<p>Viewing periodically on the rich resources of websites and books related to the subject as well as attendance and participation in the patrols and workshops held</p>

Community-based facilities (include for example, guest Lectures , internship , field studies)	Any Numerical mathematical books which gives the basic concepts of numerical analysis as well as Matlab programming languages
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13. Admissions	
Pre-requisites	Intermittent structures , a good knowledge of the basics of math and other concepts of derivatives and methods of integration
Minimum number of students	Depending on the size of the classroom and on the division of the people, 30 students .
Maximum number of students	Depending on the size of the classroom and on the division of the people, 35 students .