



## Ministry Of Higher Education and Scientific Research

AL-Mustansaria University/College of Science /Department of Physics

( نموذج الخطة الدراسية للمساق )

### Course Plan



Course No.: **5082216-5082226**

Course Name: **Numerical Analysis2**

Time Division:

2hrs Theoretical and 2hrs Practical

Course Website:

Semester & Year:

Second Semester , 2016/2017

Course Description [ وصف المساق ]

( 3 credit hours, Prerequisite [ المتطلب السابق ] No. and Name)

Numerical analysis is a fundamental tool for most undergraduate students in science and engineering, and frequently constructs the core of their studies. The primary objective of the course is to develop the basic understanding of numerical algorithms and skills to implement algorithms to solve mathematical problems on computer.

Course Intended Outcomes [ المخرجات المتوقعة من المساق ]

At the end of the course, students are expected to learn:

- Find polynomial approximation of functions
- Use numerical methods to solve differential equations
- Use numerical techniques to integrate functions
- Use numerical techniques to differentiate functions

#### Course Outline

Week	Description
1	Introduction to Polynomial Approximation and Interpolation (3.1)
2	Lagrange Interpolating Polynomials (3.1)
3	Introduction to Differential Equation by Numerical Methods (5.1)
4-5	Taylor Method of order n (5.3)
6	Runge-Kutta Method (5.4)
7	Adams Method (5.6)
8	Introduction to Integration by Numerical Methods (4.3)
9	The Trapezoidal Rule
10	Simpson's Rule
11	Numerical Differentiation (4.1)
12	Forward-Difference Formula
13	Backward-Difference Formula
14	Three-Point Formulas
15	Five-Point Formulas
Final Exam	

Textbooks[ الكتاب المنهجي ]

1. Richard L. Burden, "Numerical Analysis", J. Douglas Faires, Ninth edition, 2011

Suggested references[ المراجع المساعدة للمنهج ]

1. John H. Mathews, "Numerical Methods: for Mathematics, Science and Engineering", 2<sup>nd</sup> Ed, Prentice-Hall International (UK) Limited, London, 1992.

2. R. W. Hamming, "Numerical Methods for Scientists and Engineers", Dover Publications; 2<sup>nd</sup> edition, 1987.

3. د. أبو بكر احمد السيد، "التحليل العددي"، منشورات دار القلم، الكويت، 1988.

4. أ.د. محمد منصور صبح، د. صالح بن منيع الحربي، "التحليل العددي و طرق حسابه العددية"، الطبعة الأولى، مكتبة الرشيد، ناشر، المملكة العربية السعودية، الرياض، 2006

#### Marking [توزيع الدرجات]

First Exam	10 marks	Second Exam	10 marks
Activity	4 marks	Final Exam	45 marks

#### Regulations [الضوابط والأنظمة]

1. There will be three term exams given during this semester. The best two out of three will be considered for the First & Second exam. This means there will NO markup exams. Missing one of the two left exams means a ZERO grade will be given for that exam.
2. Attendance is mandatory and University regulations will be enforced.
3. All Cheating incidents will be reported to the chair. The following activities are considered cheating:
  - a. Turning in assignment that includes parts of someone else work.
  - b. Turning in someone else assignment as your own.
  - c. Giving assignment to someone else to turn in as their own.
  - d. Copying answers in a test or quiz.
  - e. Taking a test or quiz for someone else.
  - f. Having someone else take a test or quiz for you.
  - g. Copying answers to the selected home works.

#### Assignments and/or Projects [الواجبات والمشاريع]

Assignment/Project	Description	Due Date	Marking
H.W. 1	Exercise Set 3.1	The selected questions must be submitted through a week as max. The questions were listed with their full details through MOODLES	4 Marks
H.W. 2	Exercise Set 5.3		
H.W. 3	Exercise Set 5.4		
H.W. 4	Exercise Set 5.6		
H.W. 5	Exercise Set 4.3		
H.W. 6	Exercise Set 4.1		
Quizzes	Highest Ten quizzes	During the semester	

#### Instructor(s) information [معلومات الأستاذ]

Section: 2 Lecture Room: B303 Time: Monday & Thursday: 9:30 AM  
12:30 PM

Instructor's Name: E-Mail: Office No.: 9

Office Hours: [8:30-9:30], [10:30-12:30], [1:30-2:30] Mon, Thu  
[11:30-12:30] Wed, Tue  
Other office hours are available by appointment.

Important: The content of this syllabus may not be changed during the current semester.

Lecturer Signature

Chair Signature