Software and Informatics Engineering Department

College of Engineering- Salahaddin University

Subject: Engineering Analysis

Course Book of 3rd Year – Fall course

Lecturer's name: MSc., Nyan Dawood Sallman

Academic Year: 2022/2023

Course Book

1. Course name	**Engineering Analysis**
2. Lecturer in charge	**Nyan D. Salman**
3. Department/ College	**Software & Info. Engineering- College of Engineering**
4. Contact	**e-mail: nyan.sallman@su.edu.krd**
5. Time (in hours) per week	**Theory: 4 hrs**
6. Office hours	**Sunday and Wednesday (2 hours each group)**
7. Course code	**SE_0111**
8. Teacher's academic profile	www.a/su.edu.krd/nyan_dawwod
9. Keywords	**Differential equation, Fourier Transform, FFT, oscillation, Randomness , Nature math simulation**

10. Course overview:

This course is a mandatory requirement for the BSc in Software Engineering. It provides an introduction to many of advance engineering analysis. the course aims to enhance student's mathematical simulation with a view to providing them with the skills, knowledge and experience that they need in some mathematical tools and analytical reasoning that may be related to, and useful in, their future professions. This course also studied to supply students with a greater appreciation of the relevance and importance of mathematics within the engineering professions with a view to enhancing motivation and increasing interest in the field of mathematics.

11. Course objective:

- The primary objectives of this subject are to expose engineering students to the most important analytical areas of applied mathematics that are useful in graduate level engineering problem solving.
- Analyze some nature mathematical equations and simulate it in order to give students skills to programming video game or making preparatory level for expert system.

12. Student's obligation

Students are obliged to attend within the time stated in the lecture schedule for lessons that are many examples of solution during the lecture for closer understanding of the subject and that's what does not exist in the form reproduced obtained lectures, also the students responsible to solving home works and assignments.

13. Forms of teaching

The subject will be covered theoretical part in the class (material parts of the processor) with programming also in the class); whiteboard and pen have been mostly used and frequently clear the subject step by step. Homework is normally given throughout the academic year.

14. Assessment scheme

The following grade system is used for the evaluation of the module exam:
The module exam is based on the summation of two categories of evaluations:
First: (40%) of the mark is based on the academic semester effort which includes
- Five normal exams during the academic semester = 35%.
- Assignments = (5%).

Second: (60%) of the mark is based on final examination that is comprehensive for the whole of the study materials reviewed during the academic semester.

Note:

There will be scheduling and randomly quizzes. Each quiz will be given at the beginning of the class period and covers materials covered in the previous lectures.

15. Student learning outcome:

- Basic competence in all the important areas of applied mathematics for graduate level engineering applications.
- An understanding of how contemporary applied mathematics is used in conjunction with physical principles to develop detailed models for describing the key physical processes governing engineering applications

16. Course Reading List and References:

- ✓ THE NATURE OF CODE, 2012 by Daniel Shiffman, ISBN-13: 978-0985930806.
- ✓ Advanced Engineering Mathematics", 2007, Peter V. O'Neil.
- ✓ "Advanced Engineering Mathematics", 5th Edition, C.Ray Wylie & Louis C. Barrett.

17. The Topics:	Lecturer's name
1. Introduction 2. First order – Ordinary differential equation ODE 3. Higher order – ODE 4. Partial differential equation 5. Randomness 6. Vector processing 7. Oscillation 8. Fourier analysis and Fourier series 9. Fourier Transform 10. Discrete Fourier transform and FFT 11. Velocity and Acceleration analysis for moving objects 12. Angular movements analysis 13. Flocking simulation	**Nyan D. Salman (4 hrs.)** **Each topic - one week**

14. Force and Newton's law analysis 15. Particle systems	
20. Extra notes:	
21. Peer review :	