Department of Civil Engineering

College of Engineering

University of Salahaddin-Hawler

Subject: Engineering Analysis
Course Book -2nd year civil Eng. students

Lecturer's name: Dr. Ali Ramadhan Yousif

Academic Year: 2021/2022

Course Book

1. Course name	**Engineering Analysis/ Fall semester**
2. Lecturer in charge	**Dr. Ali Ramadhan Yousif**
3. Department/ College	**Civil / Engineering**
4. Contact	**e-mail: ali.yousif@su.edu.krd** **dr.ali.r.goran@gmail.com** **Tel: (optional) 07504661557** **And 07814661557**
5. Time (in hours) per week	**Theory: 3** **Tutorial: 1** **Credits: 5**
6. Office hours	**According to my arranged time table**
7. Course code	**0111**
8. Teacher's academic profile	1- Ph. D. in Structural Engineering – University of Salahaddin – Arbil, Iraq , 2006 2- M. Sc. In Structural Engineering – University of Mosul – Mosul, Iraq, 1986 3- B. Sc. In Civil Engineering – University of Mosul – Mosul, Iraq, 1983 Now: Professor of Structural Engineering
9. Keywords	Mathematics, higher mathematics, numerical, determinant, matrices, Fourier series, Laplace transform, differential equations.

10. Course overview:

As people said: “Mathematics is the Language of Science”, it is very important material specially for engineers and physics. Knowing knowledge of advance mathematics help engineers to find solutions of complex mathematical models that cannot be solved explicitly, where approximate solutions are quite adequate for practical purposes.

11. Course objectives:

Making the students familiar with the methods that are necessary to solve their physical models exactly or approximately numerically. Also to expand their thoughts regarding understanding and solving engineering problems.

12. Student's obligation

1. **Attendance:** Students are required to attended lectures. Regular attendance is necessary to maintain pace with the lectures.

2. Maximum absence allowed per semester are 8 hrs. (=13 %). After that, taken 1 mark cancelled for each hour’s absence from final mark.

3. **Home Works:** Homework will be assigned according to instructor.

4. Short Quizzes may be given periodically: Bring your calculator to every class. The quizzes are done during the 15 to 20 minutes of the lecture period or at time fixed by instructor.

13. Forms of teaching

Different tools and techniques will be used to attain goals and objectives. The following forms are used:

a. Power point for main parts (head titles, definitions, objectives, cases, design tables, charts and mathematical equations, also examples, ….) for each subject.

b. White board will be used for presenting and solving different examples (mostly used).

c. Students will be called to submit assignments defined in advance.

d. Students have to participate in classroom discussions. The attendance (as much as possible) will take in consideration for students.

14. Assessment scheme

There will be one exam given in semester. There will also be a final exam given during final weeks of 1st semester at the time scheduled by the university. Details regarding exam content, etc. will be given in class as the exam dates draw near.

The final grade will be assigned as follows:

Exam	Date	Time	Weight
Quizzes	At any time during the lecture	Assigned by instructor	6 marks
Assignments	Fixed date	Assigned by instructor	6 marks
Exam 1	A week from day assigned	Assigned by instructor	28 marks
Final Exam	At the last weeks of fall semester scheduled by the University	9:00 – 11:00 am	60 marks

15. Student learning outcome:

The students had taken some of more advance and applicable mathematics that help them during their life. The outcomes will be through different applications of the subject, especially for the higher engineering mathematics.

16. Course Reading List and References:

1. Erwin Kreyszic, “Advanced Engineering Mathematics”, 9th edition, John Wiley & Sons, 2006.
2. Glyn James, “Advanced Modern Engineering Mathematics”, 4th Edition, Prentice Hall Edition, 2011.

3. PETER V. O'NEIL, "Advanced Engineering Mathematics", 7th Edition, Cengage Learning, 2012.
4. Lecture Notes.

17. The Topics:

Week	Topics
1	Introduction to Fourier series of periodic functions
2	Solving examples in Fourier series
3	Fourier series of any range and half-range series
4	Applications of Fourier series
5	Applications of Fourier series cont`d.
6	Applications of Fourier series cont`d.
7	Laplace transform
8	Solution of differential equations by Laplace transform
9	Solution of differential equations by Laplace transform cont`d.
10	Differential equations
11	Applications of first order differential equations
12	Applications of first order differential equations cont`d.
13	Applications of second order differential equations
14	Applications of second order differential equations cont`d
15	General review and comments.
Notes	The course will include assignments and quizzes.

Lecturer's name

Ali Ramadhan Yousif

18. Extra notes:

19. Peer review پێداچوونەوەی هاوەڵ

This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.

(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).

ئەم کۆرسبووکە دە بێت لە لایەن هاوەڵێکی ئەکادیمیە وە سە یر بکرێت و ناوە ڕۆکی بابە تە کانی کۆرسە کە پە سە ند بکات و جە ند ووشە یە ک بنووسێت لە سە ر شیاوی ناوە ڕۆکی کۆرسە کە و واڕووی لە سە ر بکات.

هاوەڵ ئە و کە سە یە کە زانیاری هە بێت لە سە ر کۆرسە کە و دە بیت پلە ی زانستی لە مامۆستا کە متر نە بێت