Department of physics

College of Science

University of Salaheddin

Subject: Mathematical Physics

Course Book: Second Year Physics

Lecturer's name: MSc. Muzhda. Abdulrahim

Academic Year: 2022/2023

Course Book

1. Course name	**Mathematical Physics**
2. Lecturer in charge	Muzhda Amjad Abdulraheem
3. Department/ College	**College of Science- Department of Mathematics**
4. Contact	**e-mail: Muzhda.abdulraheem@su.edu.krd** **Tel: (optional)**
5. Time (in hours) per week	**Theory: 2 discussion: 1** **Practical: 0**
6. Office hours	
7. Course code	
8. Teacher's academic profile	My name is Muzhda Amjad abdulraheem, I born in Erbil, Iraq in 1981.I graduated from mathematical Department / college of science in Salahaddin University-Erbil in 2003-2004, in Erbil,Iraq.I got Master of science in differential equation in 2010.I am working as a lecturer in mathematical department/college of science/Salahaddin University-Erbil.
9. Keywords	**Multiple integral ,tiple integral, Special function, Furious series .**

10. Course overview:

After completing the course, the student should acquire basic knowledge of some advanced topics in Mathematical Physics, such as the Multiple and triple integrals, Knowledge about some special functions such as Gamma function, Beta function and Error functions. The student should be able to learn more about Fourier analysis

This should not be less than 200 words

11. Course objective:

introduce the students to the basic theory of ordinary differential equations and give a competence in solving ordinary differential equations, classify differential equations by order, linearity, and homogeneity, solve first order linear differential equations, solve linear equations with constant coefficients, use separation of variables to solve differential equations, solve exact differential equations, use variation of parameters to solve differential equations, use the method of D operator coefficients to solve differential equations, determine whether a set of functions is linearly independent using the Wronksian,use power series to solve differential equations and use Laplace transforms and their inverses to solve differential equations

12. Student's obligation

- **a.** Students rein a commitment to come on time and remain in the classroom for the duration of scheduled classes and Labs.
- **b.** Nothingness speak students with each other during lecture.

c. All devices must be turned off.

d. When teacher ask question, Students will be to rise your hand before answer his question.

Students own an obligation to write tests and final examinations at the times scheduled by the teacher or the College.

13. Forms of teaching

Different ways of teaching will be used to reach the objectives. In general, a magic board is used for learning and discussing the objectives.

14. Assessment scheme

The academic year contain two obligatory exams with average 30% degree and 10% Quizzes. The other will be reserved for final exam .

15. Student learning outcome:

1. The student will learn to formulate ordinary differential equations (ODEs) and seek understanding of their solutions.
2. Students should understand the concept of a solution to an initial value problem.
3. The student will recognize basic types of differential equations which are solvable, and will understand the features of linear equations in particular.
4. Students will learn to use different approaches to investigate equations which are not easily solvable.

16. Course Reading List and References:

1. "differential equations", 2004 by Shepley L. Ross, 3rd Edition.
2. "A first course in differential equations with applications", by A.H.Siddiqi and P. Manchanda, Macmillan India Ltd., 2006.
3. "Applied differential equations" , by Murray R.Spiegel,2nd edition ,1958.
4. "differential equations", by Richard Bronson and Gabriel B.Costa, 2006 (Schaum's outline Series), The McGraw Companies.

17. The Topics:	Lecturer's name
1.Multiple and triple Integrals **2.** Special functions: Gamma , Beta and Error functions - definitions and simple properties **3. Fourier Transform:** 3.1 Fourier Integral Theorem (statement only), Fourier Transform of a function, Fourier Sine and Cosine Integral Theorem (statement only), Fourier Cosine & Sine Transforms. 3.2 Fourier, Fourier Cosine & Sine Transforms of elementary functions. Properties of Fourier Transform: Linearity, Shifting, Change of scale, Modulation. Examples. 3.3Fourier Transform of Derivatives. Examples. Convolution Theorem (statement only), Inverse of Fourier Transform, Examples. Notes: • The course program does not include the examination days, which need at least a couple of weeks during the year; thus the total number of weeks in a course year will be: (21 + 2). • This course is for second year students, who start the course at least 4 weeks later than the other grades.	(2-5)weeks (4) weeks (3)weeks
18. Practical Topics (If there is any)	
In this section The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the lecture	Lecturer's name ex: (3-4 hrs) ex: 7/10/2018

19. Examinations:

1. Compositional: In this type of exam the questions usually starts with Explain how, What are the reasons for…?, Why…?, How….?
With their typical answers
Examples should be provided

2. True or false type of exams:

In this type of exam a short sentence about a specific subject will be provided, and then students will comment on the trueness or falseness of this particular sentence. Examples should be provided

3. Multiple choices:
In this type of exam there will be a number of phrases next or below a statement, students will match the correct phrase. Examples should be provided.

20. Extra notes:

Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.

21. Peer review پێداچوونەوەی هاوەڵ

ئەم کۆرسبووکە دەبێت لەلایەن هاوەڵێکی ئەکادیمیەوە سەیر بکرێت و ناوەرۆکی بابەتەکانی کۆرسەکە پەسەند بکات و جەند ووشەیەک بنووسێت لەسەر شیاوی ناوەرۆکی کۆرسەکە و واژووی لەسەر بکات.
هاوەڵ ئەو کەسەیە کە زانیاری هەبێت لەسەر کۆرسەکە و دەبیت پلەی زانستی لە مامۆستا کەمتر نەبێت.