



Department of Mathematics

College of Science

University of Salahaddin

Subject: Topic in applied Mathematics

Course Book – (Year-4)

Lecturer's name: Hero Waisi Salih

Academic Year: 2022/2023

Semester: II

Course Book

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| 1. Course name | Topic in applied mathematics |
| 2. Lecturer in charge | Hero Waisi salih |
| 3. Department/ College | Mathematics/ Science |
| 4. Contact | e-mail :hero.salih@su.edu.krd Tel: () |
| 5. Time (in hours) per week | For Theory: 3 tutorial 1 |
| 6. Office hours | 2hours |
| 7. Course code | |
| 8. Teacher's academic profile | <p>Name: Dr. Hero Waisi Salih Work Address: Mathematics Department, College of Science, Salahaddin University-Erbil. Employment October 2017– up to now: Mathematics Department, College of Science, Salahaddin University-Erbil Qualifications & background B. Sc., Salahaddin University-Erbil, College of Science, Mathematics Department, Iraq. M. Sc., Koya University-Erbil, College of Science, Mathematics Department, Iraq. PhD, university technology Malaysia (UTM) , Faculty of Science Mathematical science department , Malaysia. General specialization: Mathematics. Specific specialization: Differential Equations.</p> |

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| 9. Keywords | Ordinary differential equations, series solution, Leibnitz formula, Laplace and Laplace inverse tables. |
| <p>10. Course overview: Partial differential equations occur in advanced studies in applied mathematics, physics and engineering.</p> <p>11. Course objective: The aim of this course is to learn the students the importance of Partial differential equations, the difference between these equations and ordinary differential equations .Also, this course demonstrates the area of using partial differential equations specially students in physical and engineering science,since,these equations arise in solving problems which is of great importance in applications.</p> | |
| <p>12. Student's obligation : Attending classes regularly, doing homework's, quizzes and exams, participate solving homework in the class.</p> | |
| <p>13. Forms of teaching Magic board and discussion and allow students to write some problems on the board.</p> | |
| <p>14. Assessment scheme The students are required to do 3 closed book exams during of the study year. The exam has 30 marks, the attendance, and classroom activities and quizzes 10 marks. There will be a final exam on 60 marks.</p> | |
| <p>15. Student learning outcome: The student learns new types of equations called Partial differential equations and special Partial differential equations, which occur in physical and engineering applications, for</p> | |
| <p>16. Course Reading List and References: [1] Applied mathematics ,N.P.Bali,unversty science press,Delhi,2008 [2] Mathematical methods in physics, D. Biswas new central book agency (p)Ltp, India, 2002 [3] Mathematical methods in physics, Arfken and Weber, A Harcourt Science</p> | |

and Technology company

[4] A Text book of differential equation, N. Kapoor pita bar publishing Company (p) LTP., WewDelhi.

| 17.The Topics: - | Lecturer name |
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| 1. Basic concepts 1.1 Classification of second order linear equations as hyperbolic, parabolic or elliptic 1.2 Reduction of second order linear equations to canonical forms | |
| 2. Fourier series 2.1 Fourier series 2.2 How to find Fourier coefficients 2.3 Property of Fourier series | |
| 3 Boundary value problem 3.1 Boundary value problem 3.2 Separation of variables for solving order PDE 3.3 Different Boundary condition | |
| 4 mathematical problems 4.1 Heat equation 4.2 Wave equation 4.3 Poisson equation | |
| 5 D'Alembert's Solution 5.1 Infinity string 5.2 Semi-infinite string (unbounded region) 5.3 The Potential (Laplace's) equation 5.4 Laplace equation in polar coordinates | |
| 18. Practical Topics (If there is any) | |

19. Examinations

Apart of exam questions from lecture notes and the home works. In add ions, some questions about the subject but not included in the lecture notes for high level students in mathematics

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