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**Department of Geomatics**

**College of Engineering**

**Salahaddin University – Hawler**

**Subject: Engineering Analysis**

**Course Book –Year 3**

**Lecturer's name: Dr. Kamaran Kakel Gardy**

**Academic Year: 2020 -2021**

**Course Book**

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| **1. Course name** | **Engineering Analysis I** |
| **2. Lecturer in charge** | **Dr. Kamaran Kakel Gardy** |
| **3. Department/ College** | **Geomatics/Engineering**  |
| **4. Contact** | **e-mail:** kamaran.hamad@su.edu.krd**Tel:** |
| **5. Time ( hr. / week )** | **two** |
| **6. Office hours** | **four** |
| **7. Course overview:** Throughout the course of history, engineering and mathematics have developed in parallel. All branches of engineering depend on mathematics for their description and there has been a steady flow of ideas and problems from engineering that has stimulated and sometimes initiated branches of mathematics. Thus, it is vital that engineering students receive a thorough grounding in mathematics, with the treatment related to their interest and problems. |
| **8. Course Objective:**The main idea behind this subject is the development of the student’s ability to use mathematics with understanding to solve engineering problems. They have the ability to solve first, second and higher-order differential equations with common methods in this field. |
| **9. Student's Obligation*** Regular attendance is required according to the university rules.
* The use of mobile phone during the class is prohibited.
* Only the students who are officially enrolled can attend the class, guests and children are not admitted.
* Daily participation and conducting assignments are required.
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| **10. Forms of Teaching**Usually, the whiteboard will be used for explaining the lectures. The lectures include details and explanation of theories, equations, and method of solution for deferent types of mathematics problems. Also, the lectures include many examples of solved problems for each subject. In classroom and during the presentation there will be focus on sharing the students in the course of explanation by raising a direct question to single student or a group of students.  |
| **11. Assessment Scheme**The first periodical examination carried out at the end of January, the second periodical examination carried out in April, and the final examination-first trial carried out at the beginning of July, while the second trial carried out in September. The students are required to exercise the classroom activities, quizzes at the end each subject, and homework. The distribution of marks will be as follows: Mid- Exam 30%  Quizzes& Classroom Activities 10%  Final Exam 60% Total 100% |
| **12. Course Reading List:** |
| **30 weeks** |
| **1st Week** | General introduction, objectives, References, Course program, and Definitions |
| **2nd Week** | Differential equations, solution types of DFEs, First-order ordinary differential equations. |
| **3rd Week**  | Initial value problem, Homogeneous ordinary differential equations of the first order. Exact ordinary differential equations of first order. |
| **4th Week** | Homogeneous ordinary differential equations of the first order. Exact ordinary differential equations of first order. |
| **5th Week** | Reduction to the exact form, Integration factors. |
| **6th Week** | Linear ordinary differential equations of the first order |
| **7th Week** | Reduction to linear Form (Bernoulli equation). |
| **8thWeek** | Reduction to linear Form (Bernoulli equation). |
| **9th Week** | Second order homogeneous linear ordinary differential equations, Reduction of order. |
| **10th Week** | Second order homogeneous linear ordinary differential equations, Reduction of order. |
| **11th Week** | Homogeneous linear ordinary differential equations with constant coefficients. |