**Course description form**

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| 1. **Course Name** | | | | | | | | |
| Systems and Signals | | | | | | | | |
| 1. **Course Code** | | | | | | | | |
|  | | | | | | | | |
| 1. **Semester/Year** | | | | | | | | |
| 1st Semester/Third Year | | | | | | | | |
| 1. **The date this description was prepared** | | | | | | | | |
| 17 / 9 / 2023 | | | | | | | | |
| 1. **Available forms of attendance** | | | | | | | | |
| Face-to-Face theoretical lectures | | | | | | | | |
| 1. **Number of study hours (total) / number of units (total)** | | | | | | | | |
| 30/2 | | | | | | | | |
| 1. **Name of the course administrator** | | | | | | | | |
| Name: Asst. Prof. Omar Abbood Imran Email:[omarimran53@uodiyala.edu.iq](mailto:omarimran53@uodiyala.edu.iq) | | | | | | | | |
| 1. **Course objectives** | | | | | | | | |
| 1. Develop problem-solving skills and understand the principles of signaling systems.  2. Understand the basic concepts of analyzing and processing incoming signals after they pass through multistages of signal amplification.  3. Identify the types of amplifiers and their applications in electrical circuits. | | | | **Objectives of the study subject** | | | | |
| 1. Solution of non-linear equations and root findings. | | | | | | | | |
| * Weekly lectures included providing students with the basics and topics related to the pre-skills education outcomes to solve practical problems through presentation, lecture, or conducting experiments. * Solve a group of practical and applied examples by faculty members. * Through discussion, students participate in solving some practical problems. * Practical laboratories in the department are monitored by faculty members in the department. * Asking the student to visit the library and the international information network (the Internet) to obtain additional knowledge of the academic subjects. * Presenting a seminar to the student in front of his fellow students to enhance his self-confidence. | | | **The Strategy** | | | | | |
| 1. Numerical integration and differentiation. | | | | | | | | |
| Interpolation and solving differential equations. | **Learning method** | **Required learning outcomes** | | | | **Name of the unit or topic** | **Hours** | **Week** |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introduction to small sine signals | | | | **Small Signal** | 2 | 1 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Explanation of multistage systems | | | | **Multistage system and frequency consideration** | 2 | 2 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Completing the topic of multi-stage systems. | | | | **Feedback amplifier** | 2 | 3 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Signal amplifiers and their applications | | | | **OP-Amp and applications** | 2 | 4 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Oscillating signals | | | | **Oscillators** | 2 | 5 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Completing the topic of oscillating signals | | | | **Basic principles of sinusoidal oscillators, positive feedback and oscillation, the oscillation criterion (Barkhausen criterion).** | 2 | 6 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Explanation of RC oscillators, Wien-bridge | | | | **RC oscillator: RC phase shift oscillator and Wien-bridge oscillator.** | 2 | 7 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Explanation of LC oscillators | | | | **LC and crystal oscillator.** | 2 | 8 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introduction to large sine signals | | | | **Large Signal Amplifier** | 2 | 9 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Sequential circuit design | | | | **Sequential Circuit Design** | 2 | 10 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introduction to programmable logic devices | | | | **Introduction to Programmable Logic Devices** | 2 | 11 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Explanation of application interfaces | | | | **Applications Interfacing:** | 2 | 12 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Explanation of arithmetic processors | | | | **Arithmetic Processes** | 2 | 13 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Explanation of the electronic memory circuit | | | | **Electronic memory circuit** | 2 | 14 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Semester Exam. | | | | Exam. | 2 | 15 |
| 1. **Course Evaluation** | | | | | | | | |
| Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. | | | | | | | | |
| 1. **Learning and teaching resources** | | | | | | | | |
| * **Electronic circuits** | | | | | Required textbooks (methodology, if any) | | | |
| * **Modern digital & analog communication systems by lathi** * **Principles of communications by Zlemer** | | | | | Main references (sources) | | | |
| * **Electronic Devices and Circuit Theory 7th Edition by Boylestad** | | | | | Recommended supporting books and references (scientific journals, reports....) | | | |
|  | | | | | Electronic references, Internet sites | | | |