جامعة البيان

# Academic Program Description

## Al-Bayan University

# Technical College of Engineering

2024-2025

Department of Medical Instruments Technical Engineering

2024/9/30

| | |
|---|---|
| **University** | Al-Bayan University |
| **Faculty/Institute** | Technical College of Engineering |
| **Scientific Department** | Department of Medical Instruments Technical Engineering |
| **Academic/Professional Program Name** | Bachelor of Science in Biomedical Engineering Technology |
| **Final Certificate Name** | Bachelor in Medical Instruments Technical Engineering |
| **Academic System** | First and second stages (Bologna path) third and fourth stages (year) |
| **Description Preparation Date** | 01-09-2024 |
| **File Completion Date** | 16-09-2024 |

**Head of Department**

**Signe**

**Name** Dr.Aqeel Nafaa Abdal-lateef

**Date** 16-9-2024

**Scientific Associate**

**Signe**

**Name** Dr. Nouf Thabit Mahmood

**Date** 16-9-2024

This File has been checked by Quality Assurance and University Performance

Director of Quality Assurance and University Performance Department

**Head of Quality Assurance Section**

**Signe**

**Name** Dr. Maryam Qutaiba abdalrazak

**Date** 16-9-2024

**Dean Approval**

## 1. Program Vision

The vision of the Medical Instruments Technical Engineering Department is to qualify the student to be an applied engineer familiar with modern technologies in the field of medical equipment engineering. In addition to that, providing an academic environment and community services that keep pace with the rapid development in the field of medical devices, and providing the latest study programs to keep pace with the scientific departments corresponding to the Department of Medical Equipment Technology Engineering in reputable Arab and international universities.

## 2. Program Mission

The mission of the Medical Instruments Technical Engineering Department is to provide an educational, technical and research environment for students through modern educational programs and curricula that demonstrate the importance of this specialization. Providing scientific and practical approaches and advanced applied research to simulate the needs of the labor market, openness to health institutions, and contribute to improving the health situation at the international and regional levels.

## 3. Program Objectives

- Graduating of an engineering staff with scientific and practical skills in diagnosing and repairing malfunctions resulting in medical devices.
- Preparing qualified engineers who have the ability to keep pace with the rapid development in the field of medical devices and provide them with the necessary skills to develop and modernize medical devices.
- Installing and operating various electronic and electromechanical medical devices, both diagnostic and therapeutic.
- Contributing and supervising the maintenance, maintenance and calibration of various medical devices.
- Designing, developing and trying to find alternatives for some parts related to medical devices.
- Carrying out scheduling and programming of periodic maintenance work.

## 4. The Program Accreditation

N/A

## 5. Other External Influences

N/A

## 6. Program Structure

| Course Structure | Number of Courses | Credit Units | (%) | Reviews |
|---|---|---|---|---|
| Institutional Requirements | | | | |
| College Requirements | | | | |
| Department Requirements | | | | |
| Summer Training | | | | |
| Other | | | | |

## 7. Program Description

| Year / Level | Course Code | Course Name | Credit Hours | |
|---|---|---|---|---|
| | | | Theoretical | Practical |
| 1st | | Bologna path | | |

| | | | | |
|---|---|---|---|---|
| **2nd** | Bologna path | | | |
| **3rd** | 0701301 | Medical Electronic Systems | 2 | 2 |
| | 0701303 | Medical Communication Systems | 2 | 2 |
| | 0701309 | Medical instruments 2 | 2 | 3 |
| | 0701305 | Power Electronics | 2 | 2 |
| | 0701304 | Electrical Technology | 2 | 2 |
| | 0701302 | Digital Signal Processing | 2 | 2 |
| | 0701306 | Computer Applications 3 | 1 | 2 |
| | 0701307 | Microprocessor & microcomputer | 2 | 2 |
| | 0701308 | English 3 | 1 | 0 |
| **4th** | | Medical instrumentation (III) | 2 | 3 |
| | | Control system | 2 | 2 |
| | | Engineering of radiation instruments | 2 | 2 |
| | | Medical laser systems | 1 | 2 |
| | | Advanced logic design | 2 | 2 |
| | | Management | 2 | |

| | | | |
|---|---|---|---|
| | Computer application | 1 | 2 |
| | English language | 1 | |
| | Project | | 6 |

## 8. Expected learning outcomes of the program

### ➔ Knowledge

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|---|---|
| **Outcome Learning 1** | The student should be capable of proposing plans and work programs, especially in the maintenance of medical devices. |
| **Outcome Learning 2** | They should be able to handle various types of medical devices, including their installation, operation, applications, and software. |
| **Outcome Learning 3** | The student should also be able to analyze and evaluate the performance of medical devices, identify maintenance and improvement needs, enhancing their understanding of maintenance and development processes in the medical field. |
| **Outcome Learning 4** | they should be able to analyze the needs of the job market and the aspirations of medical device companies, applying the acquired knowledge and skills effectively to meet those needs. |

### ➔ Skills

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|---|---|
| **Outcome Learning 1** | The student should be able to carry out maintenance and repair operations for various medical devices, enhancing their technical and practical skills in the field. |
| **Outcome Learning 2** | They should be capable of handling modern technology and tools used in the maintenance and development of medical devices, thus enhancing their capabilities in modern technology and innovation. |
| **Outcome Learning 3** | The student should have the ability to analyze data and prepare detailed technical reports on the performance of medical devices and suggest necessary improvements, developing their skills in communication and analysis. |
| **Outcome Learning 4** | They should be able to deal with problems and make technical and engineering decisions in the medical work context, fostering their abilities in problem-solving and making independent and responsible decisions. |

### ➔ Values

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|---|---|
| **Outcome Learning 1** | The student should be capable of developing innovative solutions to enhance patient care and deliver exceptional medical services. |
| **Outcome Learning 2** | They should be able to establish partnerships with healthcare institutions to exchange knowledge and practical experiences. |
| **Outcome Learning 3** | The student should be able to promote health awareness and educate the community about the importance of health and safety. |
| **Outcome Learning 4** | They should be able to contribute to the development of policies and regulations related to medical devices to ensure their quality and safety. |

## 9. Teaching and Learning Strategies

| | | |
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| Lectures and theoretical lessons. | Workshops and training courses. | Applied projects and case studies. |
| training on quality tools and techniques. | Online educational resources. | |

## 10. Evaluation Methods

Diagnostic Assessment

Formative Assessment

Summative Assessment

## 11. Faculty Members

| Titles | Specialization | | Numbers | |
|---|---|---|---|---|
| | General | Special | Staff | Lec |
| **Prof** | Electrical and Electronic Engineering | Electrical and Electronic Engineering | *1* | |
| ***Ass. Prof*** | Computer Science | Computer Science | 2 | |
| | Environmental Engineering | Environmental Engineering | | |
| **Lecturers** | Applied Physics | Applied Physics | 13 | |
| | Electrical Engineering | Electrical Engineering | | |
| | Biomedical Engineering | Biomedical Engineering | | |
| | Computer Science | Computer Science | | |
| | Information and Communication Engineering | s Communication Engineering | | |
| | Civil Engineering | Civil Engineering | | |
| **Ass. Lecturers** | Biomedical Engineering | Biomedical Engineering | 6 | 1 |
| | Telecommunications Engineering | Telecommunications Engineering | | |
| | Electrical Engineering | Electrical Engineering | | |
| | Computer Engineering | Computer Engineering | | |
| | Information Engineering | Network engineering | | |

## Program Skills

| Year/Level | Course Code | Course Title | Primary or Optional | Learning Outcomes Required from the Program | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Knowledge | | | | Skills | | | | Values | | | |
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 |
| 3rd | 0701301 | Medical Electronic Systems | | / | / | / | / | / | / | / | | / | | | / |
| | 0701303 | Medical Communication Systems | | / | / | / | / | / | / | / | | / | | | / |
| | 0701309 | Medical instruments 2 | | / | / | / | / | / | / | / | | / | | | / |
| | 0701305 | Power Electronics | | / | / | / | / | / | / | / | | / | / | | / |
| | 0701304 | Electrical Technology | | / | / | / | / | / | / | / | | / | | | / |
| | 0701302 | Digital Signal Processing | | / | / | / | / | / | / | / | | / | / | | / |
| | 0701306 | Computer Applications 3 | | / | / | / | / | / | / | / | | / | | | / |
| | 0701307 | Microprocessor & microcomputer | | / | / | / | / | / | / | / | | / | | | / |
| | 0701308 | English 3 | | / | / | / | | / | / | / | | / | / | | / |
| 4th | | Medical instrumentation (III) | | / | / | / | / | | / | / | | / | | | / |
| | | Control system | | / | / | / | / | / | / | / | | / | | | / |
| | | Medical laser system | | / | / | / | | / | / | / | | / | | | / |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Computer application /4 | / | / | / | / | / | / | / | | / | / | | / |
| | Advance logic design | / | / | / | | / | / | / | | / | | | / |
| | Engineering of radiation instruments | / | / | / | / | / | / | / | | / | / | | / |
| | Occupational safety | / | / | / | / | | / | / | | / | | | / |
| | Management | / | / | / | / | / | / | / | | / | | | / |
| | English language/4 | / | / | / | | / | / | / | | / | / | | / |

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# Course Description ( 1 )

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|---|---|
| **1. Course Title** | Medical Electronic Systems |
| **2. Course Code** | 0701301 |
| **3. Semester/Year** | 2024-2025 |
| **4. Description Preparation Date** | 2024-9-16 |
| **5. Available Attendance Form** | Weekly attendance |
| **6. No. of Hours (Total)** | 180 |
| **7. No. of Credits (Total)** | 6 |
| **8. Course Administrator Name** | Prof. Dr. Ziad Tarik Al-Dahan |
| **9. E-mail** | |

**10. Course Objectives**

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|---|---|---|
| **Knowledge** | **A1** | Explanation of the concept of medical electronic systems. |
| | **A2** | Understand and recognize the basic components of electronic systems |
| | **A3** | Describe the types of filter circuits and methods of analysis, as well as analysis and des of straightening, pruning and jumping circuits by reference |
| | **A4** | Identify the different areas of application as well as describe the different circuits methods of designing and simplifying them |
| **Skills** | **B1** | Learn the basics of numerical and directional quantities and electronic elements |
| | **B2** | Learn the types of signals and distinguish between them and the methods of calculat related to them from the rate and effective value. |
| | **B3** | How to calculate the frequency response of circuits and various filtration methods |
| | **B4** | Knowing the elements of the signal and the process amplifier and its various applicatio |
| **Values** | **C1** | Attracting students and gaining their love for the material and respecting the lesson |
| | **C2** | Achieving pleasure with the benefit of the study material and thus stimulating follow-u the student |
| | **C3** | Generating new ideas when understanding the subject from the theoretical and pract side and asking smart questions in order to achieve full and optimal benefit |
| | **C4** | Achieving the concept of support and teamwork as a team |

**11. Teaching and Learning Strategies**

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|---|---|---|---|
| **1.** | Demonstrate a thorough understanding of electronic systems and relevance in the medical field. | **4.** | Critical analysis and interpretation of data obtained from electronic |

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| | | | measurements in medical electronic systems |
| **2.** | Apply theoretical knowledge to solve problems and troubleshoot electronic circuits used in medical devices. | **5.** | Effective and professional communication about medical electronic systems, both orally and in writing |
| **3.** | Evaluate the suitability of different electronic circuits for specific medicine applications | **6.** | Develop students' knowledge and skills in designing, analyzing, and troubleshooting electronic circuits used in medical devices |

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| 12. The Structure of the Course | | | | | |
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| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1 | 2 theory + 2 practical | Study & understand the regulated power supply cir design | Regulated power supply | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 2 | 2 theory + 2 practical | Study & understand the Monolithic regulators IC type | Monolithic regulators | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 3 | 2 theory + 2 practical | Study & understand the Switching regulators circuits | Switching regulators | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 4 | 2 theory + 2 practical | Study & understand the Additional switching regulator topologies | Additional switching regulator Topologies | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 5 | 2 theory + 2 practical | Study & understand the Additional switching regulator topologies | Additional switching regulator Topologies | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 6 | 2 theory + 2 practical | Study & understand the Active filter circuit design | Active filters | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 7 | 2 theory + 2 practical | Study & understand the Butter worth filter in practice | Butter worth filter , practical Realization | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 8 | 2 theory + 2 practical | Study & understand the Butter worth filter in practice | Butter worth filter , practical Realization | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 9 | 2 theory + 2 practical | Study & understand the Band pass and , band – reject filter | Band pass filter , band – reject filter | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 10 | 2 theory + 2 practical | Study & understand the Band pass and , band – reject filter | Band pass filter , band – reject filter | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 11 | 2 theory + 2 practical | Study & understand the active resonant and band pass filter | Active resonant and band pass Filter | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 12 | 2 theory + 2 practical | Study & understand the Active resonant and band | Active resonant and band pass filter | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |

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| | | pass filter | | | |
| 13 | 2 theory + 2 practical | Study & understand the Active RC band pass filter circuit | Active RC band pass filter | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 14 | 2 theory + 2 practical | Study & understand the Digital to analogue converters (DAC) | Digital to analogue converters (DAC) | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 15 | 2 theory + 2 practical | Study & understand the A lodder – type DAC , multiplying DAC | A lodder – type DAC , multiplying DAC | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 16 | 2 theory + 2 practical | Study & understand the Analogue to digital converters (ADC) | Analogue to digital converters (ADC) | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 17 | 2 theory + 2 practical | Study & understand the The counting ADC , successive approximation ADC | The counting ADC , successive approximation ADC | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 18 | 2 theory + 2 practical | Study & understand the The counting ADC , successive approximation ADC | The counting ADC , successive approximation ADC | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 19 | 2 theory + 2 practical | Study & understand the The parallel – comparator ADC , dual – slope or radiometric ADC | The parallel – comparator ADC , dual – slope or radiometric ADC | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 20 | 2 theory + 2 practical | The parallel – comparator ADC , dual – slope or radiometric ADC | The parallel – comparator ADC , dual – slope or radiometric ADC | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 21 | 2 theory + 2 practical | Study & understand the Medical data acquisition system | Medical data acquisition system | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 22 | 2 theory + 2 practical | Study & understand the Medical data acquisition system | Medical data acquisition system | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 23 | 2 theory + | Study & understand the | Medical data acquisition system | Theory + Lab | Daily and monthly exams, |

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|---|---|---|---|---|---|
| | 2 practical | Medical data acquisition System | | | Lab reports, and discussions |
| 24 | 2 theory + 2 practical | Study & understand the Microcomputer based system | Microcomputer based system | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 25 | 2 theory + 2 practical | Study & understand the Monitoring | Monitoring | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 26 | 2 theory + 2 practical | Study & understand the Control | Control | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 27 | 2 theory + 2 practical | Study & understand the Control | Control | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 28 | 2 theory + 2 practical | Study Other medical Electronic systems | Other medical electronic systems | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 29 | 2 theory + 2 practical | Study Other medical Electronic systems | Other medical electronic systems | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |
| 30 | 2 theory + 2 practical | Study Other medical Electronic systems | Other medical electronic systems | Theory + Lab | Daily and monthly exams, Lab reports, and discussions |

| 13. Course Evaluation | |
|---|---|
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports .... etc | |
| **14. Learning & Teaching Resources** | |
| Required textbooks (curricular if any) | Electronic Devices and Circuits Theory (Eleventh Edition) by Robert L. Boylestad and Louis Nashelsky |
| Main References (sources) | |
| Recommended Books & References (Scientific Journals, Reports …) | |
| Websites or Electronic References | |

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# Course Description ( 2 )

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|---|---|
| **1. Course Title** | **Medical Communication System** |
| **2. Course Code** | **0701303** |
| **3. Semester/Year** | **2024-2025** |
| **4. Description Preparation Date** | **16-9-2024** |
| **5. Available Attendance Form** | **All students attending** |
| **6. No. of Hours (Total)** | **120** |
| **7. No. of Credits (Total)** | **6** |
| **8. Course Administrator Name** | **Dr. Ahmed Emad** |
| **9. E-mail** | |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | Integration of Technical Knowledge: Teach students to integrate their understanding of medical instrumentation with effective communication skills to convey technical information clearly to healthcare professionals and patients. |
| | **A2** | Documentation Proficiency: Develop students' ability to produce accurate and comprehensive documentation related to medical devices and equipment, adhering to industry standards and regulatory requirements. |
| | **A3** | Interdisciplinary Collaboration: Foster collaboration between medical instrumentation engineers and healthcare professionals by equipping students with the communication skills necessary to engage in productive interdisciplinary dialogue and teamwork. |
| | **A4** | User Training and Support: Prepare students to effectively communicate user manuals, training materials, and technical support information to healthcare professionals, ensuring the safe and effective use of medical devices and equipment. |
| **Skills** | **B1** | Technical Communication: Ability to convey complex technical information related to medical devices and equipment clearly and effectively to healthcare professionals and patients. |

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|---|---|---|
| | **B2** | Documentation Skills: Proficiency in producing accurate and comprehensive technical documentation, including user manuals, maintenance guides, and troubleshooting instructions. |
| | **B3** | Interdisciplinary Collaboration: Capacity to collaborate effectively with healthcare professionals from different disciplines, facilitating communication and teamwork in the development, implementation, and maintenance of medical instrumentation systems. |
| | **B4** | Training and Support: Capability to provide training and technical support to healthcare professionals on the proper use, maintenance, and troubleshooting of medical devices and equipment, ensuring optimal performance and safety. |
| **Values** | **C1** | Accuracy: Emphasizing the importance of conveying information precisely and without ambiguity to ensure the safe and effective use of medical devices and equipment. |
| | **C2** | Collaboration: Promoting interdisciplinary collaboration between medical instrumentation engineers and healthcare professionals to enhance patient care and technological advancements in the field. |
| | **C3** | Ethics: Instilling a commitment to ethical communication practices, including respect for patient confidentiality and adherence to professional standards and regulations. |
| | **C4** | Empowerment: Empowering students with the skills and knowledge to effectively communicate technical information, thereby enabling them to contribute meaningfully to healthcare delivery and innovation. |

## 11. Teaching and Learning Strategies

| | | | |
|---|---|---|---|
| **1.** | **Interactive Workshops** | **4.** | **Field Visits** |
| **2.** | **Guest Lectures** | **5.** | **Simulations** |
| **3.** | **Technological Tools Integration** | **6.** | **Feedback and Reflection** |

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| 12. The Structure of the Course | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1 | 4 | Reviewing fundamental concepts such as Coulomb's law, electric field, electric potential, and Gauss's law to ensure a solid understanding of electrostatic principles and their applications. | General review in electrostatic | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |
| 2 | 4 | Understanding how to apply Gauss's law to calculate the electric flux through closed surfaces surrounding various charge distributions, aiding in the determination of the net electric field produced by these distributions. | Gauss's law | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |
| 3 | 4 | Understanding the concept of magnetic flux and its relationship with magnetic field strength, aiding in the analysis of magnetic fields produced by steady current distributions and permanent magnets. | Steady magnetic field | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |

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| 4 and 5 | 4 | Understanding Faraday's law of electromagnetic induction and Lenz's law, which describe how changes in magnetic flux induce electromotive force (emf) and currents in conductors, facilitating the analysis of electromagnetic phenomena such as electromagnetic induction and transformers. | Time – varying magnetic field | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |
| 6 | 4 | Understanding the concept of wave propagation in uniform plane waves, including parameters such as wavelength, frequency, amplitude, and phase velocity, facilitating the analysis of electromagnetic wave behavior in various mediums and applications. | Uniform plane waves | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |
| 7 and 8 | 4 | Understanding the concept and mathematical principles behind the Fourier transform, including its application in decomposing complex signals or functions into simpler sinusoidal components, aiding in the analysis and synthesis of | Fourier transform | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |

| | | | | | |
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| | | signals in various engineering and scientific fields. | | | |
| 9 and 10 | 4 | Understanding the concept of system properties such as linearity, time-invariance, causality, and stability, and their effects on signal processing, aiding in the analysis and design of systems for various engineering applications. | Signals & system | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |
| 11 and 12 | 4 | Differentiating between periodic and non-periodic signals, understanding their characteristics, such as frequency content, amplitude variations, and time-domain behavior, aiding in the analysis and processing of signals in various engineering applications. | Periodic, non-periodic signals | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |
| 13 and 1 | 4 | Understanding the principles of modulation, including how amplitude and frequency variations in carrier waves encode information in AM and FM systems, facilitating the | AM & FM systems | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |

| | | | | | |
|---|---|---|---|---|---|
| | | analysis and design of communication systems for transmitting audio, data, and other signals. | | | |
| 15, 16, and 17 | 2 | Understanding the principles and applications of various modulation techniques in digital communication systems, including how sampling, pulse modulation, and pulse code modulation methods are used to encode analog signals into digital formats for transmission, storage, and processing. | Sampling, PAM, PWM, PPM, PCM | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |
| 18, 19, and 20 | 4 | Understanding the principles and characteristics of ASK, FSK, and PSK modulation schemes, including how they encode digital data onto carrier signals through variations in amplitude, frequency, or phase, facilitating the analysis and design of digital communication systems for transmitting and receiving digital information. | Digital modulation (ASK, FSK, PSK) | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |

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|---|---|---|---|---|---|
| 21 and 22 | 4 | Understanding the types and characteristics of noise in analog and digital systems, including thermal noise, shot noise, and quantization noise, as well as their impact on signal quality and methods for noise reduction and mitigation in communication systems. | Noise in analogue & digital systems | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |
| 23 and 24 | 4 | Understanding the fundamental properties and modes of propagation in rectangular waveguides, including the concept of cutoff frequency, waveguide dispersion, and characteristic impedance, aiding in the analysis and design of waveguide-based communication systems and components. | Rectangular wave – guides | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |
| 25 and 26 | 4 | Understanding the principles and applications of microwave passive devices such as couplers, splitters, filters, and attenuators, including their design considerations, | Microwave passive devices | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |

| | | | | | |
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| | | performance characteristics, and roles in microwave circuitry, aiding in the analysis, design, and optimization of microwave communication systems and components. | | | |
| 27 and 28 | 4 | Understanding the operation principles and characteristics of microwave generators such as klystrons, magnetrons, and traveling-wave tubes (TWTs), including their frequency range, power output, efficiency, and applications in radar systems, microwave ovens, and communication transmitters. | Microwave generators | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |
| 29 and 30 | 4 | Understanding the principles of antenna design, radiation patterns, impedance matching, and polarization, aiding in the analysis, design, and optimization of antennas for various applications in communication systems, | Antennas | Interactive Lectures, Small Group Discussions, Video Analysis, Practical | Daily test and student participation |

| | | | | | |
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| | | radar systems, and wireless technologies. | | | |

| 13. Course Evaluation | |
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| Distributing grades out of 100 based on tasks assigned to the student, such as daily preparation, daily exams, oral and monthly exams, written exams, reports, etc. | |
| **14. Learning & Teaching Resources** | |
| Required textbooks (curricular if any) | Stremler, F. G. (1982, January 1). Introduction to Communication Systems. Addison Wesley Publishing Company. |
| Main References (sources) | Stremler, F. G. (1982, January 1). Introduction to Communication Systems. Addison Wesley Publishing Company. |
| Recommended Books & References (Scientific Journals, Reports …) | Ray, E. B., & Donohew, L. (2013, November 5). Communication and Health. Routledge. |
| Websites or Electronic References | https://www.coursera.org/learn/human-body-communication-systems |

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# Course Description ( 3 )

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|---|---|
| **1. Course Title** | Medical Instrumentation (II) |
| **2. Course Code** | 0701309 |
| **3. Semester/Year** | 2024-2025 |
| **4. Description Preparation Date** | 16-9-2024 |
| **5. Available Attendance Form** | Attendance (weekly) |
| **6. No. of Hours (Total)** | 30 hours (theoretical) + 30 hours (practical) |
| **7. No. of Credits (Total)** | 7 |
| **8. Course Administrator Name** | Assist. Lect. Awab ali |
| **9. E-mail** | |

**10. Course Objectives**

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|---|---|---|
| **Knowledge** | **A1** | Developing the scientific ability of students in the maintenance and development of medical devices |
| | **A2** | Develop students' skills in the field of medical devices |
| | **A3** | Practical training for students on all electronic circuits in medical devices |
| | **A4** | |
| **Skills** | **B1** | Training in the operation and maintenance of medical devices |
| | **B2** | Installation and operation of medical devices (supervision and implementation) |
| | **B3** | Providing advice in the field of medical devices |
| | **B4** | Repair of medical equipment |
| **Values** | **C1** | Providing students with modern knowledge in the fields of devices and power electronic circuits for medical devices. |
| | **C2** | Developing students' skills and ability to carry out laboratory experiments for power electronic devices and circuits. |
| | **C3** | Teach the student the basic concepts, origin, development, importance and principles of power electronic devices and circuits. |
| | **C4** | The student learned the transformation taking place in medical devices in the field of power devices and circuits |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| 1. | Present, electronic and video lectures | 4. | workshops |

| | | | |
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| 2. | scientific laboratories (medical devices) | 5. | use of the smart board to explain the vocabulary of the curriculum |
| 3. | use of data show | 6. | |

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| 12. The Structure of the Course | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1 | 3 | Lecture + Lab | Cardiac function recorders and monitors. | The student understands the lesson | Direct questions |
| 2 | 3 | Lecture + Lab | Cardiac function recorders and monitors. | The student understands the lesson | Direct questions |
| 3 | 3 | Lecture + Lab | Cardiac function recorders and monitors. | The student understands the lesson | Direct questions |
| 4 | 3 | Lecture + Lab | Surgical scope | The student understands the lesson | Direct questions |
| 5 | 3 | Lecture + Lab | Surgical scope | The student understands the lesson | Direct questions |
| 6 | 3 | Lecture + Lab | Audiological system | The student understands the lesson | Direct questions |
| 7 | 3 | Lecture + Lab | Ophthalmic system | The student understands the lesson | Direct questions |
| 8 | 3 | Lecture + Lab | Ophthalmic system | The student understands the lesson | Direct questions |
| 9 | 3 | Lecture + Lab | Pulmonary function system | The student understands the lesson | Direct questions |
| 10 | 3 | Lecture + Lab | Pulmonary function system | The student understands the lesson | Direct questions |

| | | | | | |
|---|---|---|---|---|---|
| 11 | 3 | Lecture + Lab | Ultrasound, Radiation, X-ray | The student understands the lesson | Direct questions |
| 12 | 3 | Lecture + Lab | Ultrasound, Radiation, X-ray | The student understands the lesson | Direct questions |
| 13 | 3 | Lecture + Lab | Computed Tomography | The student understands the lesson | Direct questions |
| 14 | 3 | Lecture + Lab | Magnetic Resonance Imaging | The student understands the lesson | Direct questions |
| 15 | 3 | Lecture + Lab | Magnetic Resonance Imaging | The student understands the lesson | Direct questions |
| 16 | 3 | Lecture + Lab | Pathological units. | The student understands the lesson | Direct questions |
| 17 | 3 | Lecture + Lab | Pathological units. | The student understand the lesson | Direct questions |
| 18 | 3 | Lecture + Lab | Coronary care units | The student understands the lesson | Direct questions |
| 19 | 3 | Lecture + Lab | Coronary care units | The student understands the lesson | Direct questions |
| 20 | 3 | Lecture + Lab | Cardiac function recorders and monitors | The student understands the lesson | Direct questions |
| 21 | 3 | Lecture + Lab | Cardiac function recorders and monitors | The student understands the lesson | Direct questions |
| 22 | 3 | Lecture + Lab | Surgical scope | The student understands the lesson | Direct questions |
| 23 | 3 | Lecture + Lab | Surgical scope | The student understands the lesson | Direct questions |

| | | | | | |
|---|---|---|---|---|---|
| 24 | 3 | Lecture + Lab | Audiological system | The student understands the lesson | Direct questions |
| 25 | 3 | Lecture + Lab | Audiological system | The student understands the lesson | Direct questions |
| 26 | 3 | Lecture + Lab | Ophthalmic system | The student understands the lesson | Direct questions |
| 27 | 3 | Lecture + Lab | Ophthalmic system | The student understands the lesson | Direct questions |
| 28 | 3 | Lecture + Lab | Therapeutic Diathermy | The student understands the lesson | Direct questions |
| 29 | 3 | Lecture + Lab | Therapeutic Diathermy | The student understands the lesson | Direct questions |
| 30 | 3 | Lecture + Lab | Therapeutic Diathermy | The student understands the lesson | Direct questions |

| 13. Course Evaluation | |
|---|---|
| Daily assessment - quarterly assessment - practical assessment - final assessment -<br>presentation - daily attendance - weekly reports | |
| **14. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | The_Biomedical_Engineering_Handbook<br>Medical Devices and Systems<br>Joseph D. Bronzeno |
| Main References<br>(sources) | |
| Recommended Books & References<br>(Scientific Journals, Reports …) | |
| Websites or Electronic References | |

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# Course Description ( 4 )

| | |
|---|---|
| **1. Course Title** | Power Electronics |
| **2. Course Code** | 0701305 |
| **3. Semester/Year** | 2024/2025 |
| **4. Description Preparation Date** | 28-9-2024 |
| **5. Available Attendance Form** | Lecture attendance |
| **6. No. of Hours (Total)** | 60 Hours theoretical<br>60 Hours practical |
| **7. No. of Credits (Total)** | 6 |
| **8. Course Administrator Name** | Dr. Khalid Salih Mohammad |
| **9. E-mail** | Khalid_alhadithi2006@yahoo.com |

## 10. Course Objectives

| | | |
|---|---|---|
| Knowledge | A1 | Developing the competencies of graduates to meet the needs of various sectors in the field of using medical devices. |
| | A2 | Raising students' awareness to respond to the changes in the medical devices labor market. |
| | A3 | Providing students with modern knowledge in the fields of devices and power electronic circuits for medical devices. |
| | A4 | Developing students' skills and ability to carry out laboratory experiments for power electronic devices and circuits. |
| Skills | B1 | Teach the student the basic concepts, origin, development, importance and principles of Power electronic devices and circuits. |
| | B2 | The student learned the transformation taking place in medical devices in the field of Power devices and circuits |
| | B3 | Developing the competencies of graduates to meet the needs of various sectors in the field of using medical devices. |
| | B4 | Raising students' awareness to respond to the changes in the medical devices labor market. |
| Values | C1 | Providing students with modern knowledge in the fields of devices and power electronic circuits for medical devices. |
| | C2 | Developing students' skills and ability to carry out laboratory experiments for power electronic devices and circuits. |
| | C3 | Teach the student the basic concepts, origin, development, importance and principles of power electronic devices and circuits. |
| | C4 | The student learned the transformation taking place in medical devices in the field of power devices and circuits |

## 11. Teaching and Learning Strategies

| | | | |
|---|---|---|---|
| 1. | Interaction by asking engineering questions in everything related to power electronic devices and circuits. | 4. | Teaching students how to think, analyze and deduct in a correct scientific manner |
| 2. | Use teaching and learning methods with extensive explanation on the board. | 5. | Discuss topics and follow brainstorming to put forward opinions and ideas. |

| | | | |
|---|---|---|---|
| **3.** | Use modern methods available from the data viewer and smart board. | **6.** | Teaching and encouraging students to ask technical questions and come up with everything new to serve the scientific aspects and provide them with |

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| 12. The Structure of the Course | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1 | 2/Th.<br>2/lab. | Understanding<br>Introduction to power electronics. 1st | Introduction to power electronics. 1st | Lecture and Lab | Daily exams + semester exams +end-of-year exams + laboratory reports +brainstorming discussions |
| 2-3 | 8 | Understanding<br>Switching devices, power & control device. 2nd , 3rd | 2. Switching devices, power & control device. 2nd , 3rd | Lecture and Lab | Daily exams + semester exams +end-of-year exams + laboratory reports +brainstorming discussions |
| 4-5 | 8 | Understanding<br>Types and characteristic, rating (diode, transistor …). 4th , 5th | 3 .Types and characteristic, rating (diode, transistor …). 4th , 5th | Lecture and Lab | Daily exams + semester exams +end-of-year exams + laboratory reports +brainstorming discussions |
| 6<br>-7<br>-8 | 12 | Understanding<br>Methods of turning – on & turning – off. 6th , 7th , 8th | 4. Methods of turning – on & turning – off. 6th , 7th , 8th | Lecture and Lab | Daily exams + semester exams +end-of-year exams + laboratory reports +brainstorming |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | discussions |
| 9<br>-10 | 10 | Understanding<br>Protection of power devices.<br>9th , 10th | 5. Protection of power devices.<br>9th , 10th | Lecture and Lab | Daily exams +<br>semester exams<br>+end-of-year exams<br>+ laboratory reports<br>+brainstorming<br>discussions |
| 11<br>-12 | 10 | Understanding<br>Triggering & base drive<br>circuits. 11th , 12th | 6. Triggering & base drive<br>circuits. 11th , 12th | Lecture and Lab | Daily exams +<br>semester exams<br>+end-of-year exams<br>+ laboratory reports<br>+brainstorming<br>discussions |
| 13<br>-14<br>-15 | 12 | Understanding<br>Controlled rectifiers, 1 –<br>phase & 3 – phase circuits.<br>13th , 14th , 15th | 7. Controlled rectifiers, 1 –<br>phase & 3 – phase circuits.<br>13th , 14th , 15th | Lecture and Lab | Daily exams +<br>semester exams<br>+end-of-year exams<br>+ laboratory reports<br>+brainstorming<br>discussions |
| 16<br>-17<br>-18 | 12 | Understanding<br>Half – wave & full – wave<br>circuits. 16th , 17th , 18th | 8 .Half – wave & full – wave<br>circuits. 16th , 17th , 18th | Lecture and Lab | Daily exams +<br>semester exams<br>+end-of-year exams<br>+ laboratory reports<br>+brainstorming<br>discussions |
| 19-<br>21 | 12 | Understanding<br>D.C choppers; step – up &<br>step – down choppers. 19th , | 9. D.C choppers; step – up &<br>step – down choppers. 19th ,<br>20th , 21st | Lecture and Lab | Daily exams +<br>semester exams<br>+end-of-year exams |

| | | | | | |
|---|---|---|---|---|---|
| | | 20th , 21st | | | + laboratory reports +brainstorming discussions |
| 22-23 | 8 | Understanding A.C phase controllers. 22nd , 23rd | 10. A.C phase controllers. 22nd , 23rd | Lecture and Lab | Daily exams + semester exams +end-of-year exams + laboratory reports +brainstorming discussions |
| 24 - 26 | 12 | Understanding Invertors, 1 – phase & 3 – phase bridges. 24th , 25th , 26th | 11. Invertors, 1 – phase & 3 – phase bridges. 24th , 25th , 26th | Lecture and Lab | Daily exams + semester exams +end-of-year exams + laboratory reports +brainstorming discussions |
| 27-28 | 8 | Understanding Some applications: a – uninterruptible power supply(UPS). 27th , 28th | 12. Some applications: a – uninterruptible power supply(UPS). 27th , 28th | Lecture and Lab | Daily exams + semester exams +end-of-year exams + laboratory reports +brainstorming discussions |
| 29-30 | 8 | Understanding b – switching mode power sup (SMP). 29th , 30th | 13. b – switching mode pov supply (SMP). 29th , 30th | Lecture and Lab | Daily exams + semester exams +end-of-year exams + laboratory reports +brainstorming discussions |

| 13. Course Evaluation | |
|---|---|
| 1- Attendance and participation in daily preparation (10)<br>2- Laboratory Practical Exams (30)<br>4- Semi-semester and quarterly exams in addition to the end-of-year exams (60) | |
| **14. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | (1) Power Electronics, Cyril W. Lander, McGraw-Hill<br>(2) Power Electronic: Circuits, Devices and Applications", Muhammad H. Rashid, Prentice Hall. |
| Main References<br>(sources) | J.S. Chitode, "Power Electronic-III," Technical publication Pune, 2nd ed. |
| Recommended Books & References<br>(Scientific Journals, Reports …) | B. Grzesik and M. Stepien, "Power electronics in biomedical applications - An overview," 2012 15th International Power Electronics and Motion Control Conference (EPE/PEMC), Novi Sad, Serbia, 2012, pp. LS5a.1-1-LS5a.1-4. |
| Websites or Electronic References | Online tutorials and internet lectures |

جامعة البيان

# Course Description ( 5 )

| | |
|---|---|
| **1. Course Title** | **Electrical Technology** |
| **2. Course Code** | 0701304 |
| **3. Semester/Year** | **2024-2025** |
| **4. Description Preparation Date** | **1/9/2024** |
| **5. Available Attendance Form** | **presence** |
| **6. No. of Hours (Total)** | **4** |
| **7. No. of Credits (Total)** | **6** |
| **8. Course Administrator Name** | **Saif Mohamed Baraa** |
| **9. E-mail** | **Saif.mb@albayan.edu.iq** |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | Study the basics of electricity |
| | **A2** | Study of electric motors |
| | **A3** | Study of electrical transformers |
| | **A4** | Study of maintenance of motors and transformers and detection of faults |
| **Skills** | **B1** | Design and Maintenance of Electrical Circuits: Students learn how to desi analyze, and maintain electrical circuits including…<br>This includes digital and analog circuits |
| | **B2** | Analysis of electrical circuits and machines: Students learn how to u mathematical models and electrical computing<br>To analyze, design and improve electrical circuits and electrical machines |
| | **B3** | 1. Design and operation of electrical machines: Students acquire the sk necessary to design and operate a variety of electrical machines such as moto generators, and transformers. |
| | **B4** | Engineering thinking and problem solving: Students are trained to use engineering approach to solve complex problems in the field of electric machines, and transformers. |

| | | |
|---|---|---|
| Values | C1 | Efficiency: Electricity technology aims to improve the efficiency of machines a transformers, whether through developing new designs or using advanc manufacturing techniques, with the aim of increasing the electrical conversion r and reducing losses.<br>In energy. |
| | C2 | Reliability: Electrical technology seeks to improve the reliability of machines a transformers, which means designing them In a way that ensures the continuity work with high efficiency for long periods without malfunction or interruption operation |
| | C3 | Competitiveness: Electricity technology aims to develop machines and transform that are competitive in terms of performance and cost, to meet market needs a compete with other available products. |
| | C4 | Innovation: Technology in the field of machines and transformers is a platform continuous innovation and development, as researchers and engineers seek develop new technologies and innovative solutions to improve the performance these devices. |

## 11. Teaching and Learning Strategies

| | | | |
|---|---|---|---|
| 1. | **Use of interactive media: Interactive media such as interactive videos and interactive web applications can be used to explain basic concepts and engineering processes in the field of electrical machines.** | 4. | **Interactive assessment techniques: Interactive assessment techniques such as quizzes and interactive assessment tools can be used to assess students' progress and effectively guide them towards improving their performance and understanding.** |
| 2. | **Virtual Reality and Augmented Reality Applications: Virtual Reality and Augmented Reality applications** | 5. | **Electrical circuit simulation and modeling: Simulation software such as PSpice or** |

| | | | |
|---|---|---|---|
| | can be used to directly demonstrate the internal structures of electrical machines and equipment, helping students better understand systems and processes. | | MATLAB/Simulink can be used to create virtual models of electrical circuits and machines. These tools enable students to experiment and analyze circuits and machines without the need for actual materials. |
| 3. | Search for faults and provide appropriate solutions | 6. | |

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| 12. The Structure of the Course | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1 ,2 | 4 | Daily exams + discussions | Transformers : single phase transformer and construction | Presence | Daily exams + discussio |
| 3 | 4 | Daily exams + discussions | Theory of operation , no load and sh circuit test | Presence | Daily exams + discussio |
| 3,4 | 4 | Daily exams + discussions | Equivalent circuit auto-transformers, instrument transformers . | Presence | Daily exams + discussio |
| 5,6 | 4 | Daily exams + discussions | Three phase transformers constructions methods connection | Presence | Daily exams + discussio |
| 8,9 | 4 | Daily exams + discussions | Electromechanical ener conversion principles , rel operation . | Presence | Daily exams + discussio |
| 10,11 ,12 | 4 | حظوري | D.C machines : e.m.f a torque equation , equivale circuit , methods of excitatio generator characteristics . | Presence | Daily exams + discussio |
| 13,14 ,15 | 4 | Daily exams + discussions | Motor characteristics , testin calculation of losses a efficiency . | Presence | Daily exams + discussio |

| | | | | | |
|---|---|---|---|---|---|
| 16,17 ,18 | 4 | Daily exams + discussions | Induction machines equivalent circuit , ba equation , simple analy testing . | Presence | Daily exams + discussio |
| 19,20 ,21 | 4 | Daily exams + discussions | Single phase induction motor , methods of starting , siplitphase , capacitor shor capacitor run and shaded p motors . | Presence | Daily exams + discussio |
| 22,23 | 4 | Daily exams + discussions | Synchronous machines generators and motors equivalent circuit , ba equation . | Presence | Daily exams + discussio |
| 24,25 | 4 | Daily exams + discussions | linear motor , stepper moto dray cup type motor , ser motor , etc …….. | Presence | Daily exams + discussio |
| 26,27 | 4 | Daily exams + discussions | Control switches : pilot switches , push bottoms , limits | Presence | Daily exams + discussio |
| 28 | 4 | Daily exams + discussions | Switches , flost switches contactors , pressure switche | Presence | Daily exams + discussio |
| 29,30 | 4 | Daily exams + discussions | High voltage circuits . | Presence | Daily exams + discussio |

| 13. Course Evaluation | |
|---|---|
| Distribution of grades out of 100 according to tasks assigned to the student, such as daily preparation, daily exams, oral exams, monthly exams, written assignments, reports, etc. | |
| **14. Learning & Teaching Resources** | |
| Required textbooks (curricular if any) | **Not exist** |
| Main References (sources) | Theraga of electrical technology fourth generati |
| Recommended Books & References (Scientific Journals, Reports …) | IEEE, google scholar ,Pdf driver |
| Websites or Electronic References | https://byjus.com/physics/dc-generator http://bpie.org.in/online-study/humanities-and-science/EM-2%20Notes-2600.pdf |

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# Course Description ( 6 )

| | |
|---|---|
| **1. Course Title** | Digital Signal Processing |
| **2. Course Code** | 0701302 |
| **3. Semester/Year** | 2024-2025 |
| **4. Description Preparation Date** | 28/9/2024 |
| **5. Available Attendance Form** | Class attendances |
| **6. No. of Hours (Total)** | 120 |
| **7. No. of Credits (Total)** | 6 |
| **8. Course Administrator Name** | Dr. Taha Mahmoud Abbas |
| **9. E-mail** | taha.m.abbas.alnaimi@gmail.com |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | Understanding and classifying digital signal processing systems. |
| | **A2** | Understand how to convert an analogue signal to digital. |
| | **A3** | Understanding pulse and frequency analysis of intermittent signals. |
| | **A4** | Design digital filters and study their response. |
| **Skills** | **B1** | The student must be able to apply engineering-mathematical analyses. |
| | **B2** | The ability to identify, formulate and solve engineering problems. |
| | **B3** | Mastery of the mathematical, basic, and engineering sciences necessary to conduct the analysis and design of electrical engineering systems. |
| | **B4** | The ability to use systems simulation programs such as MATLAB. |
| **Values** | **C1** | Realizing the requirements of the engineering profession and ethical responsibility. |
| | **C2** | Understanding the impact of engineering solutions on economic and environmental activities and the societal context. |
| | **C3** | Recognizing the need for lifelong learning and the ability to engage in it. |
| | **C4** | |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| **1.** | Theoretical lectures | **4.** | Scientific laboratories |
| **2.** | Scientific exhibitions | **5.** | Workshops |
| **3.** | Seminars | **6.** | Case studies |

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| 12. The Structure of the Course | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1 | 2th+2Lab | The students understand the lesson | Introduction to digital signal processing | Theoretical lectures | Quizzes and Discussion |
| 2 | 2th+2Lab | The students understand the lesson | Basic elements of DSP, DSP vs. ASP, application of DSP, | Theoretical lectures | Quizzes and Discussion |
| 3 | 2th+2Lab | The students understand the lesson | Continues time signals vs. discrete time signals | Theoretical lectures | Quizzes and Discussion |
| 4 | 2th+2Lab | The students understand the lesson | Discrete time signals and sequences | Theoretical lectures | Quizzes and Discussion |
| 5 | 2th+2Lab | The students understand the lesson | Discrete time signals and sequences | Theoretical lectures | Quizzes and Discussion |
| 6 | 2th+2Lab | The students understand the lesson | Discrete time signals and sequences | Theoretical lectures | Quizzes and Discussion |
| 7 | 2th+2Lab | The students understand the lesson | Standard of discrete time signals (sequences) | Theoretical lectures | Quizzes and Discussion |
| 8 | 2th+2Lab | The students understand the lesson | Unit sample sequence, Unit step sequence, | Theoretical lectures | Quizzes and Discussion |
| 9 | 2th+2Lab | The students understand the lesson | Unit ramp sequence Exponential sequence. | Theoretical lectures | Quizzes and Discussion |
| 10 | 2th+2Lab | The students understand the lesson | (classification of discrete time signals) system properties | Theoretical lectures | Quizzes and Discussion |

| | | | | | |
|---|---|---|---|---|---|
| 11 | 2th+2Lab | The students understand the lesson | Static and dynamic system, shift invariant and shift variant system, | Theoretical lectures | Quizzes and Discussion |
| 12 | 2th+2Lab | The students understand the lesson | Causal and non-causal system, linear and nonlinear system, stable and unstable | Theoretical lectures | Quizzes and Discussion |
| 13 | 2th+2Lab | The students understand the lesson | Convolution: Direct form method, | Theoretical lectures | Quizzes and Discussion |
| 14 | 2th+2Lab | The students understand the lesson | graphical method, slide rule method | Theoretical lectures | Quizzes and Discussion |
| 15 | 2th+2Lab | The students understand the lesson | Correlation of discrete time sequence cross correlation and auto correlation | Theoretical lectures | Quizzes and Discussion |
| 16 | 2th+2Lab | The students understand the lesson | Correlation of discrete time sequence cross correlation and auto correlation | Theoretical lectures | Quizzes and Discussion |
| 17 | 2th+2Lab | The students understand the lesson | Frequency domain representation | Theoretical lectures | Quizzes and Discussion |
| 18 | 2th+2Lab | The students understand the lesson | Find Frequency response | Theoretical lectures | Quizzes and Discussion |
| 19 | 2th+2Lab | The students understand the lesson | Discrete Fourier transform (DFT) | Theoretical lectures | Quizzes and Discussion |
| 20 | 2th+2Lab | The students understand the lesson | Linear convolution using DFT | Theoretical lectures | Quizzes and Discussion |
| 21 | 2th+2Lab | The students understand the lesson | Invers Discrete Fourier transform IDFT | Theoretical lectures | Quizzes and Discussion |
| 22 | 2th+2Lab | The students understand the lesson | Fast Fourier transform( FFT) | Theoretical lectures | Quizzes and Discussion |
| 23 | 2th+2Lab | The students understand the lesson | Butterfly computation | Theoretical lectures | Quizzes and Discussion |
| 24 | 2th+2Lab | The students understand the lesson | Invers Fast Fourier transform (IFFT) | Theoretical lectures | Quizzes and Discussion |

| | | | | | |
|---|---|---|---|---|---|
| 25 | 2th+2Lab | The students understand the lesson | Introduction to Z transform Definition of Z transform and Roc | Theoretical lectures | Quizzes and Discussion |
| 26 | 2th+2Lab | The students understand the lesson | Properties of Z transform, Inverse z transform, application of Z transform (pole & zero plot, | Theoretical lectures | Quizzes and Discussion |
| 27 | 2th+2Lab | The students understand the lesson | Speech processing | Theoretical lectures | Quizzes and Discussion |
| 28 | 2th+2Lab | The students understand the lesson | Realization of digital filter: Basic FIR filter structure, direct form of F1R structure, | Theoretical lectures | Quizzes and Discussion |
| 29 | 2th+2Lab | The students understand the lesson | Cascaded form of FIR structure, Basic IIR fi er structure, direct form of structure, | Theoretical lectures | Quizzes and Discussion |
| 30 | 2th+2Lab | The students understand the lesson | Cascaded form of IIR structure. Parallel form of IR structure + Image processing | Theoretical lectures | Quizzes and Discussion |

## 13. 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.

## 14. Learning & Teaching Resources

| | |
|---|---|
| Required textbooks (curricular if any) | * Hwei P. Hsu, "Schaum's Outlines of Theory and Problems of Signals and System McGraw- Hill Companies.<br>*Monson H. Hayes," Schaum's Outline of Theory and Problems of Digital Signal Processing", McGraw- Hill Companies. |
| Main References (sources) | *John G. Proakis, Dimitris G. Manolakis," Digital Signal Processing", 3rd Edition.<br>*Pall A. lynn," Digital signal processing wit computer applications", 2nd edition.<br>*John W. Leis,"Digital Signal Processing Using Matlab for Students And Researchers".<br>*Vinay K. Ingle,John G. Proakis," Digital Signal Processing Using MATLAB". |
| Recommended Books & References (Scientific Journals, Reports …) | ScienceDirect, Wiley |
| Websites or Electronic References | ***"Signals and systems Introduction"***,<br>Tutorials Point website,<br>http://www.tutorialspoint.com/dip/signals_and_system_introduction.htm |

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# Course Description ( 7 )

| | |
|---|---|
| **1. Course Title** | Computer Applications 3 |
| **2. Course Code** | 0701306 |
| **3. Semester/Year** | 2024-2025 |
| **4. Description Preparation Date** | 16-9-2024 |
| **5. Available Attendance Form** | Theoretical and Practical Lectures |
| **6. No. of Hours (Total)** | 90 |
| **7. No. of Credits (Total)** | 4 |
| **8. Course Administrator Name** | Asst.lec . sari khadir |
| **9. E-mail** | |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | Understand the concepts and fundamentals of the MATLAB programming language. |
| | **A2** | Learn how to utilize MATLAB in various fields such as digital signal processing, numerical computation, and data analysis. |
| | **A3** | Familiarize yourself with the main tools and functions in the MATLAB working environment. |
| **Skills** | **B1** | Perform basic operations in MATLAB programming such as arithmetic, logical, and matrix operations. |
| | **B2** | Develop the ability to write simple programs using MATLAB to solve specific problems. |
| | **B3** | Utilize MATLAB for data analysis and visualization. |
| **Values** | **C1** | Enhance mental flexibility and creative problem-solving skills using computational applications with MATLAB. |
| | **C2** | Promote teamwork and knowledge exchange in utilizing MATLAB for solving engineering and scientific problems. |
| | **C3** | Strengthen discipline and perseverance through programming with MATLAB to solve a variety of problems and challenges. |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| **1.** | Interactivity: Encouraging active engagement and participation of | **5.** | Collaboration: Promoting teamwork |

| | | | |
|---|---|---|---|
| | students in learning processes. | | and exchange of knowledge and expertise among students. |
| 2. | Assessment: Employing comprehensive and varied assessment methods to measure the achievement of educational objectives. | 5. | Flexibility: Adapting educational processes to the diverse needs and learning styles of students. |
| 3. | Innovation: Using innovative methods and techniques to stimulate learning and achieve objectives. | 6. | Applicability: Linking knowledge to practical application in real- life contexts. |
| 4. | Continuity: Enhancing continuous learning and skill development throughout life. | 7. | Multimedia: Utilizing a diverse range of media and educational resources |

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## 12. The Structure of the Course

| Week | Hours | RLOs | Topic/Subject Name | Learning Method | Evaluation Method |
|---|---|---|---|---|---|
| 1-3 | 3 | Introduction, MATLAB Environment, MATLAB Windows (Command Window, Workspace Window, Command History window, Help Window, Editor Window). | INTRODUCTION | Theoretical + Practical | Classroom Participation |
| 4-5 | 3 | A First Program, Expressions, Constants, Entering Matrices, Useful Matrix Generators, Subscripting ,End as a subscript, Colon Operator, Transpose Deleting Rows or Columns. | A First Program | Theoretical + Practical | Daily Exam |
| 6 | 3 | Variables and assignment statement, logical operator. | Variables | Theoretical + Practical | Practical Application |
| 7-9 | 3 | Arrays, Built in functions, Basic Matrix Functions (sum, max, min, mean, magic, diag, length, size, median, prod, sort). | Arrays | Theoretical + Practical | Report + Daily Exam |
| 10-11 | 3 | Basic Plotting | Basic Plotting | Theoretical + Practical | Daily Exam |
| 12-15 | 3 | Control statements | Control statements | Theoretical + Practical | Student Participation |
| 16-18 | 3 | Repetition statements | Repetition statements | Theoretical + Practical | Student Participation |

| | | | | | |
|---|---|---|---|---|---|
| 19-20 | 3 | Procedures and Functions (a custom-made Matlab function, define the name of the function, the input and the output variables, Calling Functions) | Procedures | Theoretical + Practical | Student Participation |
| 21-27 | 3 | GUI | GUI | Theoretical + Practical | Student Participation + Homework |
| 28-30 | 3 | Review and exam | | | |

| 13. Course Evaluation | |
|---|---|
| Mid exam 20%<br>Lab exam 20%<br>Quizzes 5%<br>Attendance 5%<br>Final 40%<br>Final lab exam 10% | |
| **14. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | MATLAB Programming for Engineers |
| Main References<br>(sources) | |
| Recommended Books & References<br>(Scientific Journals, Reports …) | |
| Websites or Electronic References | WWW.MATHWORKS.COM |

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# Course Description ( 8 )

| | |
|---|---|
| **1. Course Title** | **Microprocessors and Microcontrollers** |
| **2. Course Code** | |
| **3. Semester/Year** | **2024-2025** |
| **4. Description Preparation Date** | **16-9-2024** |
| **5. Available Attendance Form** | **Full Time Course** |
| **6. No. of Hours (Total)** | **120** |
| **7. No. of Credits (Total)** | **3** |
| **8. Course Administrator Name** | Dr. Sinan Q. Salih |
| **9. E-mail** | Sinan.salih@albayan.edu.iq |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | Introducing students to key computer components, including processors and memories. |
| | **A2** | Educating students about the history of processors and semiconductor materials used in their production. |
| | **A3** | Teaching students the theoretical and practical operation of microprocessors. |
| | **A4** | Informing students about important developments in the field of microprocessors. |
| **Skills** | **B1** | Ability to differentiate microprocessors based on speed and performance. |
| | **B2** | Identifying the basic specifications for configuring computers for personal and scientific use. |
| | **B3** | Building simple programming concepts using Assembly language. |
| | **B4** | Ability to measure device speed based on the type of processor used. |
| **Values** | **C1** | Promoting teamwork for solving complex problems through collaborative projects. |
| | **C2** | Revamping student mindset for job market with creative thinking methods. |
| | **C3** | Introducing students to the fundamental principles of various programming languages. |
| | **C4** | |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| **1.** | Theoretical Lectures | **4.** | Oral Questions and Discussions |
| **2.** | Practical Lectures | **5.** | Daily Exams |
| **3.** | Projects | **6.** | Seminars and Presentations |

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## 12. The Structure of the Course

| Week | Hours | RLOs | Topic/Subject Name | Learning Method | Evaluation Method |
|---|---|---|---|---|---|
| 1-3 | 2 T<br>2 P | Understanding microprocessors and their significance. | Introduction to microprocessor and microcomputer | Theoretical and Practical Lectures | Oral Exams + Reports |
| 4-6 | 2 T<br>2 P | Basic memory units: ROM and RAM. | Semiconductor memories . | Theoretical and Practical Lectures | Oral Exams + HWs |
| 7 | 2 T<br>2 P | Secondary memory. | Auxiliary memories | Theoretical and Practical Lectures | Oral Exams + HWs |
| 8-9 | 2 T<br>2 P | 8085 processor architecture. | Microprocessor architecture | Theoretical and Practical Lectures | Oral Exams + HWs |
| 10-13 | 2 T<br>2 P | Time intervals and calculations. | Bus signal timing & I/O timing | Theoretical and Practical Lectures | Oral Exams + HWs |
| 14 | 2 T<br>2 P | Methods of interacting with microprocessors. | Microprocessor interfacing | Theoretical and Practical Lectures | Oral Exams + HWs |
| 15-17 | 2 T<br>2 P | Instruction sets and addressing methods. | Instruction sets & addressing mod | Theoretical and Practical Lectures | Oral Exams + HWs |
| 18-20 | 2 T<br>2 P | Digital input and output devices. | Digital I/O | Theoretical and Practical Lectures | Oral Exams + HWs |
| 21-24 | 2 T<br>2 P | Analog input and output devices. | Analogue I/O | Theoretical and Practical Lectures | Oral Exams + HWs |
| 25-27 | 2 T<br>2 P | Basic channels (serial and parallel). | Standard buses (serial & parallel buses). | Theoretical and Practical Lectures | Oral Exams + HWs |
| 28-30 | 2 T<br>2 P | Exploring practical applications of microprocessors. | Some practical microprocessor | Theoretical and Practical Lectures | Oral Exams + HWs |

- T : Theoretical P : Practical

| 13. Course Evaluation | |
|---|---|
| Annual grade is 50 points, final exam 50 points .<br>Annual grade comprises semester exams: (10 points theoretical exam, 10 points practical exam, 5 points for attendance and daily performance). | |
| **14. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | 1. An Introduction to Microprocessor 8085<br>2. Introduction to the Microprocessors with Intel 8085 |
| Main References<br>(sources) | |
| Recommended Books & References<br>(Scientific Journals, Reports …) | |
| Websites or Electronic References | https://www.sim8085.com<br>https://web8085.appspot.com |

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# Course Description ( 9 )

| | |
|---|---|
| **1. Course Title** | English language |
| **2. Course Code** | 0701409 |
| **3. Semester/Year** | 2024-2025 |
| **4. Description Preparation Date** | 16-9-2024 |
| **5. Available Attendance Form** | Attendance (weekly) |
| **6. No. of Hours (Total)** | 30 hours (theoretical) |
| **7. No. of Credits (Total)** | 2 |
| **8. Course Administrator Name** | Assist. Lect. Hiba jasim mohammed |
| **9. E-mail** | |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | The student Understands the basic structures of English sentences |
| | **A2** | Learns the basic vocabulary for any school stage |
| | **A3** | Listens and understands simple words and sentences in English |
| | **A4** | Learning Outcomes, Teaching ,Learning and Assessment Methods |
| **Skills** | **B1** | Understands the meanings of synonyms in English |
| | **B2** | Reads and understands words and phrases written in English |
| | **B3** | Writes sentences and phrases in English |
| | **B4** | talks to his colleague in English |
| **Values** | **C1** | Expresses ideas clearly and confidently in speech (verbal communication) |
| | **C2** | Work confidently with group ( Team work) |
| | **C3** | Uses the steps of the method of collecting information in a systematic and scientific manner, especially within his competence |
| | **C4** | |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| 1. | Present, electronic and video lectures | 4. | seminars |

| | | | |
|---|---|---|---|
| 2. | scientific laboratories (medical devices) | 5. | use of the smart board to explain the vocabulary of the curriculum |
| 3. | use of data show | 6. | |

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| 12. The Structure of the Course | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1 | 2 | Lecture | Tenses<br>Questions<br>Questions words | The student understands the lesson | Direct questions |
| 2 | 2 | Lecture | Present tenses<br>Present simple | The student understands the lesson | Direct questions |
| 3 | 2 | Lecture | Present continuous | The student understands the lesson | Direct questions |
| 4 | 2 | Lecture | Have /have got | The student understands the lesson | Direct questions |
| 5 | 2 | Lecture | Past tenses<br>Past simple | The student understands the lesson | Direct questions |
| 6 | 2 | Lecture | Past continuous | The student understands the lesson | Direct questions |
| 7 | 2 | Lecture | Quantity<br>Much and many<br>Some and any | The student understands the lesson | Direct questions |
| 8 | 2 | Lecture | Something, anyone, nobody, everywhere<br>A few, a little, a lot of | The student understands the lesson | Direct questions |
| 9 | 2 | Lecture | Articles | The student understands the lesson | Direct questions |
| 10 | 2 | Lecture | Future intentions<br>Going to and will | The student understands the lesson | Direct questions |

| | | | | | |
|---|---|---|---|---|---|
| 11 | 2 | Lecture | comparative and superlative | The student understands the lesson | Direct questions |
| 12 | 2 | Lecture | comparative and superlative | The student understands the lesson | Direct questions |
| 13 | 2 | Lecture | For and since | The student understands the lesson | Direct questions |
| 14 | 2 | Lecture | Tense revision | The student understands the lesson | Direct questions |
| 15 | 2 | Lecture | Have(got) to<br>Should, must | The student understands the lesson | Direct questions |
| 16 | 2 | Lecture | conditional clauses | The student understands the lesson | Direct questions |
| 17 | 2 | Lecture | What, etc. Infinitive<br>Something, etc. Infinitive | The student understand the lesson | Direct questions |
| 18 | 2 | Lecture | indirect questions | The student understands the lesson | Direct questions |
| 19 | 2 | Lecture | Second conditional might | The student understands the lesson | Direct questions |
| 20 | 2 | Lecture | Present Perfect simple | The student understands the lesson | Direct questions |
| 21 | 2 | Lecture | Present Perfect continuous | The student understands the lesson | Direct questions |
| 22 | 2 | Lecture | Present perfect and past perfect | The student understands the lesson | Direct questions |
| 23 | 2 | Lecture | Reported statements | The student understands the lesson | Direct questions |
| 24 | 2 | Lecture | revision | The student understands the lesson | Direct questions |

| | | | | | |
|---|---|---|---|---|---|
| 25 | 2 | Lecture | Components and assemblies | The student understands the lesson | Direct questions |
| 26 | 2 | Lecture | Engineering Design | The student understands the lesson | Direct questions |
| 27 | 2 | Lecture | Describing types of techni problems | The student understands the lesson | Direct questions |
| 28 | 2 | Lecture | Technical development | The student understands the lesson | Direct questions |
| 29 | 2 | Lecture | revision | The student understands the lesson | Direct questions |
| 30 | 2 | Lecture | Final exam | The student understands the lesson | Direct questions |

| 13. Course Evaluation | |
|---|---|
| Daily assessment - quarterly assessment - practical assessment - final assessment -<br>presentation - daily attendance - weekly reports | |
| **14. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | Cambridge English for Engineering<br><br>English Vocabulary In Use |
| Main References<br>(sources) | |
| Recommended Books & References<br>(Scientific Journals, Reports …) | |
| Websites or Electronic References | |

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# Course Description (1)

| | |
|---|---|
| **1. Course Title** | **Medical Instrumentation (III)** |
| **2. Course Code** | |
| **3. Semester/Year** | **2024-2025** |
| **4. Description Preparation Date** | **1-9-2024** |
| **5. Available Attendance Form** | **Classroom weekly attendance** |
| **6. No. of Hours (Total)** | **150** |
| **7. No. of Credits (Total)** | **7** |
| **8. Course Administrator Name** | **Dr. Safa Laith Kailan** |
| **9. E-mail** | Safa.l@albayan.edu.iq |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | Studying the medical device as a concept of a device |
| | **A2** | Studying the entire design of the medical device |
| | **A3** | Knowledge of all entire circuits of the medical devices and their operation |
| | **A4** | Using and dealing with all medical devices |
| **Skills** | **B1** | Ability of dealing with various medical devices |
| | **B2** | Operation and maintenance of the medical devices |
| | **B3** | Ability of designing electronic circuits |
| | **B4** | Ability of using the medical device |
| **Values** | **C1** | Attracting students and gaining their love for the material and respecting the lesson |
| | **C2** | Achieving pleasure with the benefit of the study material and thus stimulating follow-up in the student |
| | **C3** | Generating new ideas when understanding the subject from the theoretical and practical side and asking smart questions in order to achieve full and optimal benefit |
| | **C4** | Achieving the concept of support and teamwork as a team |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| **1.** | Demonstrate a thorough understanding of electronic systems and relevance in the medical field. | **4.** | Critical analysis and interpretation of data obtained from electronic measurements in medical electronic systems |

| | | | |
|---|---|---|---|
| **2.** | Apply theoretical knowledge to solve problems and troubleshoot electronic circuits used in medical devices. | **5.** | Effective and professional communication about medical electronic systems, both orally and in writing |
| **3.** | Evaluate the suitability of different electronic circuits for specific medicine applications | **6.** | Develop students' knowledge and skills in designing, analyzing, and troubleshooting electronic circuits used in medical devices |

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| 12. The Structure of the Course | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1st , 2nd | 4 | Study and learn surgical systems in general and in specific | General systems & specialized tools in general surgery | Theoretical & Practical | Quiz & Exams |
| 3rd , 4th , 5th | 6 | Learn about specialized systems and their tools | Specialized systems and inst. | Theoretical & Practical | Quiz & Exams |
| 6th , 7th | 4 | Knowledge of microsurgery tools for eyes | Ophthalmic microsurgical Inst. | Theoretical & Practical | Quiz & Exams |
| 8th , 9th | 4 | Study and knowledge of the open heart system, blood vessels and heart | Open heart & cardiovascular | Theoretical & Practical | Quiz & Exams |
| 10th | 2 | Study the heart and lung system and identify its components | Heart-lung machine | Theoretical & Practical | Quiz & Exams |
| 11th , 12th | 4 | Study and knowledge of the kidney system and its electronic structure | Kidney machine | Theoretical & Practical | Quiz & Exams |
| 13th , 14th | 4 | Study and knowledge of surgical thermal permeability and its working principle | Surgical diathermy | Theoretical & Practical | Quiz & Exams |

| | | | | | |
|---|---|---|---|---|---|
| 15th , 16th , 17th | 6 | Knowledge of the artificial organs of both internal and external types | Artificial organs – internal & external | Theoretical & Practical | Quiz & Exams |
| 18th , 19th , 20th | 6 | Study the work of dental system and composition | Dental system | Theoretical & Practical | Quiz & Exams |
| 21st , 22nd | 4 | Study and knowledge of gynecological tools and systems | Gynecology Inst. | Theoretical & Practical | Quiz & Exams |
| 23th , 24th | 4 | Recognition of the ultrasonic assistive device | Ultrasonic assisting device | Theoretical & Practical | Quiz & Exams |
| 25th , 26th | 4 | Study of logical auditory surgical units and knowledge of their components | Audio logical surgical units | Theoretical & Practical | Quiz & Exams |
| 27th , 28th | 4 | Study and know what the anesthesia device is and its construction | Anesthetic units | Theoretical & Practical | Quiz & Exams |
| 29th , 30th | 4 | Learn about the intens care unit and components | Intensive care units | Theoretical & Practical | Quiz & Exams |

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## 13. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports .... etc

## 14. Learning & Teaching Resources

| | |
|---|---|
| Required textbooks (curricular if any) | • S. Ananthi, 2005 , " A textbook of medical Instruments" |
| Main References (sources) | • John R. Cameron, James G. Skofronicks, "Medical Physics," John Wiley and Sons Inc., New York, 1978.<br>• Navin.C. Nanda, "Doppler Echocardiography", Lea & Febiger, USA, 2nd Edition, 1993.<br>• Peter Strong, "Biophysical Measurements", Tektronix Manual, Beaverton, Oregon, 1970. |
| Recommended Books & References (Scientific Journals, Reports …) | • Willis. J. Tompkins, John G. Webster, "Design of Microcomputer Based Medical Instru mentation", Prentice Hall International Inc, London, 1981<br>• R.S. Khandapur, "Hand Book of Biomedical Instrumentation," Tata McGraw Hill Pub lishers, New Delhi,1990. |
| Websites or Electronic References | Medical Text Books for sale \| eBay |

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# Course Description (2)

| | |
|---|---|
| **1. Course Title** | **Control system.** |
| **2. Course Code** | |
| **3. Semester/Year** | **2025-2024** |
| **4. Description Preparation Date** | **15/9/2024** |
| **5. Available Attendance Form** | **Weekly** |
| **6. No. of Hours (Total)** | **120 h** |
| **7. No. of Credits (Total)** | **6 units** |
| **8. Course Administrator Name** | **Dr. Nouf T. Mahmood** |
| **9. E-mail** | **Noof.t@albayan.edu.iq** |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | The student knows the definition of Control system |
| | **A2** | How to engage colleagues and stakeholders in managing information knowledge and control systems. |
| | **A3** | Design and simulation of control system by Matlab |
| | **A4** | To provide adequate knowledge in the time response of systems and steady state err |
| **Skills** | **B1** | The student can recognize the control system of accord basic knowledge in obtaining the open loop. |
| | **B2** | The student can identify the Design and implementation of control system |
| | **B3** | The student performs a technique of built Modelling and Simulation of Dynamic Systems. |
| | **B4** | Learning closed–loop frequency responses of systems |
| **Values** | **C1** | Enhancing safety and security |
| | **C2** | Commitment to sustainable development. |
| | **C3** | |
| | **C4** | |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| **1.** | **Theoretical lectures in classrooms** | **4.** | |

| | | | |
|---|---|---|---|
| 2. | Practical lectures on transducers and electronic circuit in Lab | 5. | |
| 3. | Seminars and workshops | 6. | |

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## 12. The Structure of the Course

| Week | Hours | RLOs | Topic/Subject Name | Learning Method | Evaluation Method |
|---|---|---|---|---|---|
| 1 | 2 Pr.+ 2 Th. | Study Introduction to linear control engineering. | Introduction to linear control engineering. | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |
| 2,3 | 2 Pr.+ 2 Th. | Study Mathematical backgroun lap lace transform, complex variable, matrices. | Mathematical background; lap la transform, complex variable, matrices. | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |
| 4,5,6 | 2 Pr.+ 2 Th. | Study Transfer function, bloc diagram representation and reduction, signal flow diagram | Transfer function, block diagrar representation and reduction, sig flow diagram. | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |
| 7,8,9 | 2 Pr.+ 2 Th | Study Time domain analysis, steady – state transient analysi | Time domain analysis, steady – st transient analysis. | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |
| 10,11 | 2 Pr.+ 2 Th. | Study Stability analysis; Routh Nyquist. | Stability analysis; Routh, Nyquis | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |
| 12,13 | 2 Pr.+ 2 Th. | Study Root locus technique | Root locus technique | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |
| 14,15,1 | 2 Pr.+ 2 Th. | Study Frequency domain analys Eainmargin, phase margin and bode plot. | Frequency domain analysis, Eainmargin, phase margin and bo plot. | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |
| 17,18 | 2 Pr.+ 2 Th. | Study Frequency domain synthesis, phase lead. | Frequency domain synthesis, pha lead. | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |
| 19,20 | 2 Pr.+ 2 Th. | Study Compensation, phase – la compensation lag – lead compensation. | Compensation, phase – lag compensation lag – lead compensation. | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |
| 21, 22,23,24 | 2 Pr.+ 2 Th. | Study PID controllers design. | PID controllers design. | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |
| 26, 27 | 2 Pr.+ 2 Th. | Study State space representatio and analysis | State space representation and analysis | Lecture/ Laboratory | Quiz, Mid Exam, Seminar, Laboratory |

| | | | | | |
|---|---|---|---|---|---|
| 28, 29 | 2 Pr.+ T | Study State diagram; analogue computer. | State diagram; analogue comput | Lecture/ Laborator | Quiz, Mid Exam, Seminar, Laboratory |
| 30 | 2 Pr.+ T | Study Block diagram representation. | State diagram; analogue comput | Lecture/ Laborator | Quiz, Mid Exam, Seminar, Laboratory |

| 13. Course Evaluation | |
|---|---|
| Distributing grades out of 100 according to the tasks assigned to the student, such as daily preparation, daily exams, oral exams, monthly exams, seminars, reports, etc. | |
| **14. Learning & Teaching Resources** | |
| Required textbooks (curricular if any) | **Katsuhiko Ogata, Modern Control Engineering, 5th Edition** |
| Main References (sources) | **Katsuhiko Ogata, Modern Control Engineering, 5th Edition** |
| Recommended Books & References (Scientific Journals, Reports …) | **Franklin G.F., Powell J.D,.Emami-Naeini A,. Feedback Control of Dynamic Systems, Pearson, Upper Saddle River, New Jersey, 5th edition, 2006.** |
| Websites or Electronic References | **IEEE** |

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# Course Description ( 3 )

| | |
|---|---|
| **1. Course Title** | **Engineering of Radiation Instruments.** |
| **2. Course Code** | |
| **3. Semester/Year** | **2024-2025** |
| **4. Description Preparation Date** | **28/9/2024** |
| **5. Available Attendance Form** | **Daily attendance** |
| **6. No. of Hours (Total)** | **60 theoretical hours, 2hours per week**<br>**60 practical hours, 2hours per week** |
| **7. No. of Credits (Total)** | **6** |
| **8. Course Administrator Name** | **Dr. Asaad Abdulhussain Mozan** |
| **9. E-mail** | **Asaad.a@albayan.edu.iq** |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | A study of the structure of the atom, atomic and nuclear radiation, their effects on human body, and their applications in medical devices. |
| | **A2** | Competence in troubleshooting and resolving issues with medical radiological equipment. |
| | **A3** | The ability to research and prepare the perfect setting for every device. |
| | **A4** | Recognizing how radiation interacts with matter. |
| **Skills** | **B1** | **The ability to measure radiation doses and dose measurement devices.** |
| | **B2** | **Preparing research and studies to improve and develop the work of medical radiation devices.** |
| | **B3** | **Installation and operation of medical radiation devices.** |
| | **B4** | **Equipping technical staff with the skills to operate and service medical laser systems.** |
| **Values** | **C1** | **Scientific integrity** |
| | **C2** | **Sincerity and loyalty.** |
| | **C3** | **Truthfulness** |
| | **C4** | **Respect for professional ethics.** |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| **1.** | **Lectures** | **4.** | **Theoretical exams (daily,termly, and final)** |
| **2.** | **Science laboratories** | **5.** | **Practical exams** |

| | | | |
|---|---|---|---|
| **3.** | **Visual aids and scientific models** | **6.** | **Assignments** |

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## 12. The Structure of the Course

| Week | Hours | RLOs | Topic/Subject Name | Learning Method | Evaluation Method |
|---|---|---|---|---|---|
| 1st , 2nd | 4 | Atomic structure and atomic radiation | Atomic structure and atomic radiation | Theory lectures | Exam and homework |
| 3rd , 4th | 4 | The nuclear and nuclear radiation | The nuclear and nuclear radiation | Theory lectures | Exam and homework |
| 5th , 6th | 4 | Interaction of radiation with matter. | Interaction of radiation with matter. | Theory lectures | Exam and homework |
| 7th , 8th , 9th | 4 | Radiation detection & engineering radiation detectors. | Radiation detection & engineering radiation detectors. | Theory lectures | Exam and homework |
| 10th , 11th , 12th | 4 | Engineering of radiation dosimetry and dosimeters. | Engineering of radiation dosimetry and dosimeters. | Theory lectures | Exam and homework |
| 13th , 14th | 4 | Radiation protection. | Radiation protection. | Theory lectures | Exam and homework |
| 15th , 16th | 4 | Engineering of body scanners. | Engineering of body scanners. | Theory lectures | Exam and homework |
| 17th , 18th | 4 | Production of X – rays. | Production of X – rays. | Theory lectures | Exam and homework |
| 19th , 20th | 4 | Clinical radiation generators. | Clinical radiation generators. | Theory lectures | Exam and homework |
| 21st , 22nd | 4 | Dose distribution and scatter analysis. | Dose distribution and scatter analysis. | Theory lectures | Exam and homework |
| 23rd , 24th | 4 | A system of dosimetric calculations. | A system of dosimetric calculations. | Theory lectures | Exam and homework |
| 25th , 26th | 4 | Treatment planning. | Treatment planning. | Theory lectures | Exam and homework |
| 27th , 28th | 4 | Engineering of electron beam therapy. | Engineering of electron beam therapy. | Theory lectures | Exam and homework |
| 29th , 30th | 4 | Brachy therapy. | Brachy therapy. | Theory lectures | Exam and homework |

| 13. Course Evaluation | |
|---|---|
| Weighting of the 100-point grade according to student assignments, which include daily preparation, daily and oral exams, monthly and written exams, reports, and other tasks | |
| **14. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | **1- Physics for Scientists and Engineers with Modern physics, Eighth Edition.**<br>By: Raymond A.Serway and John W.Jewett,Jr.<br>**2- The physics and Radiation Therapy.**<br>By: Faiz khans. |

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# Course Description ( 4 )

| | |
|---|---|
| **1. Course Title** | **Medical Laser System** |
| **2. Course Code** | |
| **3. Semester/Year** | **2024-2025** |
| **4. Description Preparation Date** | **16-9-2024** |
| **5. Available Attendance Form** | **Mandatory daily presence** |
| **6. No. of Hours (Total)** | **60 theoretical hours, 2hours per week**<br>**60 practical hours, 2hours per week** |
| **7. No. of Credits (Total)** | **6** |
| **8. Course Administrator Name** | Marwa Mustafa Ismaeel |
| **9. E-mail** | Marwa.mustafa1985@gmail.com |

**10. Course Objectives**

| | | |
|---|---|---|
| Knowledge | A1 | An investigation into the production of various lasers and their utilization in medical equipment. |
| | A2 | Competence in disassembling and analyzing laser components, determining the function of each part. |
| | A3 | Competence in troubleshooting and resolving issues with medical laser equipment. |
| | A4 | Competence in setting up and analyzing the ideal operating conditions for various devices. |
| Skills | B1 | Equipping technical staff with the skills to operate and service medical laser systems. |
| | B2 | Preparing research and studies to improve and develop the performance of medical laser devices. |
| | B3 | Serving on committees focused on medical laser technology. |
| | B4 | Installing and operating medical laser devices. |
| Values | C1 | Accuracy, dedication, and adherence to standards and specifications for medical laser devices. |
| | C2 | Collaborating with physicians and other medical staff. |
| | C3 | The responsibility for maintaining patient safety by accurately operating medi devices. |
| | C4 | A medical laser engineer is dedicated to maintaining high professional standa and pursuing ongoing professional development. |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| 1. | Lectures | 4. | Theoretical exams (daily,termly, and final) |
| 2. | Science laboratories | 5. | Practical exams |
| 3. | Visual aids and scientific models | 6. | Assignments |

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## 12. The Structure of the Course

| Week | Hours | RLOs | Topic/Subject Name | Learning Method | Evaluation Method |
|---|---|---|---|---|---|
| **1** | **4** | Laser generation. | Laser generation. | Theory lectures | Exam and homework |
| **2** | **4** | Laser generation. | Laser generation. | Theory lectures | Exam and homework |
| **3** | **4** | Types of laser. | Types of laser. | Theory lectures | Exam and homework |
| **4** | **4** | Types of laser. | Types of laser. | Theory lectures | Exam and homework |
| **5** | **4** | Light and light propagation in glass fiber. | Light and light propagation in glass fiber. | Theory lectures | Exam and homework |
| **6** | **4** | Light and light propagation in glass fiber. | Light and light propagation in glass fiber. | Theory lectures | Exam and homework |
| **7** | **4** | Light and light propagation in glass fiber. | Light and light propagation in glass fiber. | Theory lectures | Exam and homework |
| **8** | **4** | Optical fiber wave guide, band width distance product | Optical fiber wave guide, band width distar product | Theory lectures | Exam and homework |
| **9** | **4** | dispersion and pulse spreeding | dispersion and pulse spreeding | Theory lectures | Exam and homework |
| **10** | **4** | maximum allowable data rate, fiber power losses. | maximum allowable data rate, fiber power losses. | Theory lectures | Exam and homework |
| **11** | **4** | Transmitter devise and circuits (communication LEDs) | Transmitter devise and circuits (communication LEDs) | Theory lectures | Exam and homework |
| **12** | **4** | Transmitter devise and circuits (communication LEDs) | Transmitter devise and circuits (communication LEDs) | Theory lectures | Exam and homework |
| **13** | **4** | Injection lasers | Injection lasers | Theory lectures | Exam and homework |
| **14** | **4** | modulators | modulators | Theory lectures | Exam and homework |
| **15** | **4** | Receiver devices and circuits photo diode light detector. | Receiver devices and circuits photo diode light detector. | Theory lectures | Exam and homework |
| **16** | **4** | Receiver devices and circuits photo diode light detector. | Receiver devices and circuits photo diode light detector. | Theory lectures | Exam and homework |

| | | | | | |
|---|---|---|---|---|---|
| **17** | **4** | PIN photo diodes, photo multiplier. | PIN photo diodes, photo multiplier. | Theory lectures | Exam and homework |
| **18** | **4** | Avalanche photo diode (APD), | Avalanche photo diode (APD), | Theory lectures | Exam and homework |
| **19** | **4** | Avalanche photo diode (APD), | Avalanche photo diode (APD), | Theory lectures | Exam and homework |
| **20** | **4** | Transmission technology | Transmission technology | Theory lectures | Exam and homework |
| **21** | **4** | fiber technology | fiber technology | Theory lectures | Exam and homework |
| **22** | **4** | Splices | Splices | Theory lectures | Exam and homework |
| **23** | **4** | couplers | couplers | Theory lectures | Exam and homework |
| **24** | **4** | Laser applications in surgical oncolog | Laser applications in surgical oncology | Theory lectures | Exam and homework |
| **25** | **4** | Ophthalmic laser applications | Ophthalmic laser applications | Theory lectures | Exam and homework |
| **26** | **4** | Laser skin treatments | Laser skin treatments | Theory lectures | Exam and homework |
| **27** | **4** | Dental laser applications | Dental laser applications | Theory lectures | Exam and homework |
| **28** | **4** | Laser hazards | Laser hazards | Theory lectures | Exam and homework |
| **29** | **4** | the standard level for a safe working environment, lab – safety. | the standard level for a safe working environment, lab – safety | Theory lectures | Exam and homework |
| **30** | **4** | the standard level for a safe working environment, lab – safety. | the standard level for a safe working environment, lab – safety. | Theory lectures | Exam and homework |

| 13. Course Evaluation | |
|---|---|
| Weighting of the 100-point grade according to student assignments, which include daily preparation, daily and oral exams, monthly and written exams, reports, and other tasks | |
| **14. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | |
| Main References<br>(sources) | An introduction to the laser theory an application<br>By M.N. Avadhanulu and P.S. Hemne |
| Recommended Books & References<br>(Scientific Journals, Reports …) | Advanced Optics and Lasers by Roman Schmied |
| Websites or Electronic References | |

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# Course Description (5)

| | |
|---|---|
| **1. Course Title** | Advanced logic design ALD |
| **2. Course Code** | |
| **3. Semester/Year** | First semester /2024-2025 |
| **4. Description Preparation Date** | 2024-9-16 |
| **5. Available Attendance Form** | Lecture attendance |
| **6. No. of Hours (Total)** | 120 |
| **7. No. of Credits (Total)** | 6 |
| **8. Course Administrator Name** | Ali Mustafa |
| **9. E-mail** | Ali.m@albayan.edu.iq |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | Artificial intelligence . |
| | **A2** | Simulation and modeling . |
| | **A3** | Image processing and communications . |
| | **A4** | Digital control system . |
| **Skills** | **B1** | Digital Circuit Design |
| | **B2** | Boolean Algebra & Minimization Techniques |
| | **B3** | Finite State Machines (FSMs) |
| | **B4** | Programmable Logic Devices (PLDs) |
| **Values** | **C1** | Precision and Accuracy |
| | **C2** | Innovation and Creativity |
| | **C3** | Logical Reasoning |
| | **C4** | Critical Thinking |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| **1.** | Hands-On Lab Work and Experiments | **4.** | Flipped Classroom Approach |

| | | | |
|---|---|---|---|
| 2. | Problem-Based Learning (PBL) | 5. | Peer Learning and Group Wo |
| 3. | Interactive Lectures with Live Demonstrations | 6. | Use of Simulations and Virtual Labs |

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| 12. The Structure of the Course | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1 | 2 | Artificial intelligence . | Artificial intelligence . | Lecture | Exam |
| 2 | 2 | Simulation and modeling . | Simulation and modeling . | Lecture | Exam |
| 3 | 2 | Control system | Control system | Lecture | Exam |
| 4 | 2 | Image processing a communications . | Image processing a communications . | Lecture | Exam |
| 5 | 2 | Real – time system . | Real – time system . | Lecture | Exam |
| 6 | 2 | Microelectronics technology . | Microelectronics technology . | Lecture | Exam |
| 7 | 2 | VLSI system . | VLSI system . | Lecture | Exam |
| 8 | 2 | Advanced compu architecture . | Advanced computer architecti . | Lecture | Exam |
| 9 | 2 | Robotics and automation | Robotics and automation | Lecture | Exam |
| 10 | 2 | Topics in digital system . | Topics in digital system . | Lecture | Exam |
| 11 | 2 | Digital control system | Digital control system | Lecture | Exam |
| 12 | 2 | Signal processing | Signal processing | Lecture | Exam |
| 13 | 2 | Reliability engineering . | Reliability engineering . | Lecture | Exam |
| 14 | 2 | Fault diagnosis . | Fault diagnosis . | Lecture | Exam |

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|---|---|---|---|---|---|
| 15 | 2 | Microcomputer system desig | Microcomputer system design | Lecture | Exam |

| 13. Course Evaluation | |
|---|---|
| | |
| **14. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | Introduction to Advanced Logic Design<br>Key Concepts in ALD<br>Boolean Algebra and Logic Gates<br>Combinational Logic Design<br>Sequential Logic Circuits |
| Main References<br>(sources) | • Digital Design" by M. Morris Mano and Michael D. Ciletti<br>• "Fundamentals of Logic Design" by Charles H. Roth Jr. and Larry L. Kinney<br>• "CMOS VLSI Design: A Circuits and Systems Perspective" by Neil Weste and David Harris |
| Recommended Books & References<br>(Scientific Journals, Reports …) | • IEEE Transactions on Computers<br>• IEEE Transactions on Very Large Scale Integration (VLSI) Systems<br>• International Conference on Computer-Aided Design (ICCAD) Proceedings |
| Websites or Electronic References | • Google scholar, libgen.is,pdf drive<br>• Xilinx and Intel FPGA Documentation |

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# Course Description (6 )

| | |
|---|---|
| **1. Course Title** | **Management** |
| **2. Course Code** | **--** |
| **3. Semester/Year** | **2024-2025** |
| **4. Description Preparation Date** | **25/9/2024** |
| **5. Available Attendance Form** | **lecture** |
| **6. No. of Hours (Total)** | **60 study hours, two hours per week** |
| **7. No. of Credits (Total)** | **4** |
| **8. Course Administrator Name** | Dr. Zaid Ahmed Mohammed |
| **9. E-mail** | zaid.a@albayan.edu.iq |

**10. Course Objectives**

| | | |
|---|---|---|
| **Knowledge** | **A1** | Providing students with concepts related to the administrative activities carried out by organization and their applications. |
| | **A2** | Introducing the student to the principles and elements of project management strateg in terms of planning, scheduling and controlling activities. |
| | **A3** | Emphasis on quantitative methods to consider all administrative activities and functions the project. |
| | **A4** | The new relationship of Japanese management compared to American managem (Western in general). |
| **Skills** | **B1** | Effective communication and organization skills. |
| | **B2** | Risk management, problem solving and the ability to properly distribute tasks and role |
| | **B3** | Manage time efficiently. |
| | **B4** | Leadership and negotiation skills. |
| **Values** | **C1** | The value allocated to the life of the project (planned value). |
| | **C2** | The value of the integrated work related to planning (earned value). |
| | **C3** | The true value of the work done (expenditure). |
| | **C4** | |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| 1. | Lectures | 4. | Detailed presentations |
| 2. | Homework | 5. | Research projects |
| 3. | Exams | 6. | Report preparation |

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| 12. The Structure of the Course | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1st | 2 | Understand the basic concepts of project management. | Introduction to project management objective and trade offs. Cost – schedule – performance. | Lecture | Tests, daily attendan exams, reports |
| 2nd | 2 | Understand the basic stages and develop skills in project management | Planning and control in projects :<br>Planning<br>Scheduling<br>Controlling | = | = |
| 3rd | 2 | Knowing the basic concepts of scheduling, its types and methods, and building basic project management skills. | Scheduling methods. | = | = |
| 4th | 2 | Knowing the concept of the Gantt chart and enhance the learners ability to manage projects effectively and coordinate tasks in a visual and organized manner. | Gantt chart. | = | = |
| 5th | 2 | Knowing the basic concepts of networking methods and how to use them in project management. | Networks methods. | = | = |
| 6th | 2 | Knowing the concept of fixed time networks and how to use it effectively in managing | Constant – time network. | = | = |

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|---|---|---|---|---|---|
| | | complex projects that require precise time control. | | | |
| 7th , 8th | 4 | Knowing the concept of the PERT network and identify its components and enhance the learners ability to use it in project planning | Pert network. | = | = |
| 9th , 10th | 4 | Enhance skills in project planning and critical activity analysis | Critical path method. | = | = |
| 11th | 2 | Understand and apply the precedence planning method effectively in project management. | Precedence diagramming method. | = | = |
| 12th,13th | 4 | Making informed decisions about choosing the project location, which contributes to improving the project's feasibility | Project phases: choice of project location. | = | = |
| 14th | 2 | Understand process design concepts and develop development skills. | Process design. | = | = |
| 15th | 2 | Understand project needs, improve performance, reduce risks and increase returns. | Choice of technology. | = | = |
| 16th,17th | 4 | Understanding financial fundamentals, assessing needs and feasibility, analyzing the cost of replacement versus maintenance and analyzing customer needs helps in making informed decisions | Financial analysis.<br>Purchase of new machine.<br>Machine replacement.<br>Layout of facilities. | = | = |

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|---|---|---|---|---|---|
| | | that contribute to improving performance. | | | |
| 18th | 2 | Human Resources Planning, understanding the role of the project manager or the person responsible for managing the workforce, to ensure the organization and coordination of the work team to enhance productivity | Managing the work force in project who manages the work force. Principles in decision of work – force management. | = | = |
| 19th | 2 | Understanding Japanese organizational culture in the workplace, respect and career progression, communication in the workplace, training and workforce development | Japans work – force management. | = | = |
| 20th | 2 | Improve skills and knowledge, understand modern performance appraisal methods, design and implement effective and use technology to evaluate new performance. | New approach to evaluation performance. | = | = |
| 21st | 2 | Understanding material types and classification, inventory management, selecting suppliers, quality and safety standards in handling materials, sustainability in materials management and monitoring techniques | Materials handling. | = | = |

| | | | | | |
|---|---|---|---|---|---|
| 22nd | 2 | Understand the basics of the system Identify system elements and data, planning and coordination, determining material needs | Concepts of MRP system.<br>Elements of MRP system. | = | = |
| 23rd | 2 | Understand the basics of Material Requirements System and Point of Order System, the difference between the two approaches and determining when to use each system based on the nature of the operations and production volume.<br><br>Understand the basics of Material Requirements System and Time-Specific System, choose the most appropriate system based on the nature of the work, production volume and stability of demand | MRP versus order – point system.<br>MRP versus just in time system. | = | = |
| 24th,25th | 4 | Understand how to coordinate and divide activities, identify the relationship between activities, plan activities well, organize resources and use software | Activities in project:<br>Coordination of project activities.<br>Activities breakdown. | = | = |
| 26th | 2 | Understand the importance of measuring project progress, understand the tools and techniques needed to measure and evaluate project progress, using digital tools, quantitative | Measuring project process tools.<br>Purpose of work measurement. | = | = |

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|---|---|---|---|---|---|
| | | and qualitative analysis and reporting | | | |
| 27th | 2 | Understanding of methodologies, improving process efficiency, ability to collect and analyze data and develop and implement sustainable solutions | Methods study. | = | = |
| 28th | 2 | Understanding performance measurement, types of measurements, ability to analyze and apply continuous improvement practices | Types of work measurements. | = | = |
| 29th | 2 | Comprehensive understanding of the concept of time study, improving the efficiency of operations and reducing waste. | Time study. | = | = |
| 30th | 2 | Developing time management skills, the ability to plan, organize and apply effective strategies to make the most of the available time. | Time management. | = | = |

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| 13. Course Evaluation | |
|---|---|
| The grade is distributed out of 100 according to the tasks assigned to the student, such as daily preparation, and daily, oral, monthly and written exams, reports, etc. | |
| **14. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | |
| Main References<br>(sources) | "Project Management: A Systems Approach to Planning, Scheduling, and Control" ل Harold Kerzner<br><br>"Agile Project Management: Creating Innovative Products" ل Jim Highsmith<br><br>"Project Management: The Managerial Process" ل Eric W. Larson, Clifford F. Gray<br><br>"Construction Project Management: A Practical Guide to Field Construction Management" ل S. Keoki Sears, Richard H. Clough, Glenn A. Sears<br><br>"PMP Project Management Professional Study Guide" Phillips, Joseph (2004). McGraw-Hill/Osborne. p. 354. |
| Recommended Books & References<br>(Scientific Journals, Reports …) | Arab Projects Magazine: Publishes challenging research and articles on project management. |
| Websites or Electronic References | SABIS Academy Platform: Contains articles and studies related to project management<br>Aamal Website: Provides a group of articles related to project management and business development<br>Project Website: Contains articles and lessons on project management |

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# Course Description ( 7)

| | |
|---|---|
| **1. Course Title** | **Computer Applications 4** |
| **2. Course Code** | |
| **3. Semester/Year** | **Annually 2024-2025** |
| **4. Description Preparation Date** | **16/9/2024** |
| **5. Available Attendance Form** | **Attendance** |
| **6. No. of Hours (Total)** | **Theoretical Lessons 30 Hours**<br>**Practical Lessons 60 Hours** |
| **7. No. of Credits (Total)** | **3** |
| **8. Course Administrator Name** | Dr. Sinan Q. Salih |
| **9. E-mail** | Sinan.salih@albayan.edu.iq |

**10. Course Objectives**

| | | |
|---|---|---|
| Knowledge | A1 | The student should be able to prepare and formulate presentations. |
| | A2 | The student should be able to summarize reports and convert them into brief presentations. |
| | A3 | The student should have the required personality to present their report in the least amount of t with the best amount of information. |
| | A4 | |
| Skills | B1 | The student should be able to prepare a small number of slides with minimal content to pres important information. |
| | B2 | The student should be able to use PowerPoint professionally. |
| | B3 | The student should be able to prepare a presentation for their graduation project. |
| | B4 | The student should possess sufficient skills for delivering presentations. |
| Values | C1 | The student should be able to convey a complete and clear idea in a short time. |
| | C2 | The student should be able to use body language appropriately to engage with the audience. |
| | C3 | |
| | C4 | |

**11. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| 1. | Theoritical Lessons | 4. | Brain Storming |
| 2. | Practical Experiments | 5. | Seminars |
| 3. | Discussions | 6. | Additional Projects |

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## 12. The Structure of the Course

| Week | Hours | RLOs | Topic/Subject Name | Learning Method | Evaluation Method |
|---|---|---|---|---|---|
| 1 | 1 T<br>2 P | Familiarize with the PP work environment benefits, and the concept of applied presentations. | Introduction to PowerPoints | Theory + Practical | Daily and Monthly Exa<br>Homeworks<br>Reports<br>Seminars |
| 4-2 | 1 T | Build a basic presentation by utilizing templates provided by the program, as well as learn how to save and edit the presentation. | Basics of Presentations | Theory + Practical | |
| 56- | 2 P | Use professional navigation between slides, both manually and automatically. | Transitions between Slides | Theory + Practical | |
| 8-7 | 1 T | Animate objects within the slides (entry, movement, and exit). | Animations in Slides | Theory + Practical | |
| 9 | 2 P | Student presentations to practice delivery techniques. | Seminar | Theory + Practical | |
| 14-10 | 1 T | Use artificial intelligence techniques in preparing and designing slides. | AI Apps for preparing and design Slides | Theory + Practical | |
| 20 - 15 | 2 P | Design presentations for graduation projects. | Presentations of Final Year Projec | Theory + Practical | |
| 30-21 | 1 T | Utilize advanced CAD-CAM applications. | CAD – CAM Applications | Theory + Practical | |

| 13. Course Evaluation | |
|---|---|
| Annual effort (50 points) is divided as follows: 25 points for each semester, which consists of the written exam (10 points), practical exam (10 points), and reports and attendance (5 points). | |
| **14. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | |
| Main References<br>(sources) | - Microsoft PowerPoint Best Practices, Tips, a Techniques: An indispensable guide to master PowerPoint's advanced tools to create engag presentations<br><br>- The Power of Ai Presentation Maker: Unleash Your Creative Potential |
| Recommended Books & References<br>(Scientific Journals, Reports …) | |
| Websites or Electronic References | https://support.microsoft.com/home/ |

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# Course Description **(8)**

| | |
|---|---|
| **1. Course Title** | English Language |
| **2. Course Code** | |
| **3. Semester/Year** | **2024-2025** |
| **4. Description Preparation Date** | 27/9/2024 |
| **5. Available Attendance Form** | In-person lectures |
| **6. No. of Hours (Total)** | 60 |
| **7. No. of Credits (Total)** | 30 |
| **8. Course Administrator Name** | Asst. Lect. Hiba Jasim Mohammed |
| **9. E-mail** | hibairaq32@gmail.com |

**10. Course Objectives:**
A. Practice conversation in English.
B. Construct and use grammatically correct sentences.
C. Improve the four skills in general: reading, writing, speaking, and listening.

| | | |
|---|---|---|
| **Knowledge** | **A1** | Learn new vocabulary related to various topics in the coursebook. |
| | **A2** | Learn more about different cultures and lifestyles by reading about them. |
| **Skills** | **B1** | Improve the student's speaking skills. |
| | **B2** | Teach them how to write emails using formal language. |
| | **B3** | Improve their reading skills. |
| | **B4** | Improve their presentation skills in English. |
| **Values** | **C1** | **Global Communication** |
| | **C2** | **Career Opportunities** |
| | **C3** | **Cultural Exchange** |
| | **C4** | **Personal Development** |

**10. Teaching and Learning Strategies**

| | | | |
|---|---|---|---|
| **1.** | **Communicative Approach** | **4.** | **A mix of individual, pair, and group activities** |
| **2.** | **Task-Based Learning** | **5.** | **Authentic Materials** |

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| 11. The Structure of the Course | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **RLOs** | **Topic/Subject Name** | **Learning Method** | **Evaluation Method** |
| 1 | 3 | See the coursebook's Language Input | Unit 1/No place like home | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 2 | 3 | See the coursebook's Language Input | Unit 1/No place like home | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 3 | 3 | See the coursebook's Language Input | Unit 2/ Been there, done that! | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 4 | 3 | See the coursebook's Language Input | Unit 2/ Been there, done that! | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 5 | 3 | See the coursebook's Language Input | Unit 3/What a story! | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 6 | 3 | See the coursebook's Language Input | Unit 3/What a story! | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 7 | 3 | See the coursebook's Language Input | Unit 4/Nothing but the truth | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |

| | | | | | |
|---|---|---|---|---|---|
| 8 | 3 | See the coursebook's Language Input | Unit 5/An eye to the future | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 9 | 3 | See the coursebook's Language Input | Unit 6/Making it big | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 10 | 3 | See the coursebook's Language Input | Unit 7/Getting together | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 11 | 3 | See the coursebook's Language Input | Unit 8/Going to extremes | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 12 | 3 | See the coursebook's Language Input | Unit 9/Forever friends | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 13 | 3 | See the coursebook's Language Input | Unit 10/Risking life and limb | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 14 | 3 | See the coursebook's Language Input | Unit 11/In your dreams | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |
| 15 | 3 | See the coursebook's Language Input | Unit 12/It's never too late | **1. Communicative Approach<br>2. Task-Based Learning<br>3. A mix of individual, pair, and group activities** | Quiz |

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| 12. Course Evaluation | |
|---|---|
| 10 marks for daily participation and homework<br>10 marks for a test<br>20 for a monthly exam<br>60 for the final exam | |
| **13. Learning & Teaching Resources** | |
| Required textbooks<br>(curricular if any) | Soars, L. and Soars, J. (2003).<br>New Headway Upper-Intermediate,<br>Oxford University Press. |
| Main References<br>(sources) | New Headway Plus [Intermediate] by Liz and John Soars, Oxford: Oxford University Press (2006), |
| Recommended Books & References<br>(Scientific Journals, Reports …) | Morphy,A.J (1983) English Grammar in use. Cambridge:CUP |
| Websites or Electronic References | https://www.internationalstudent.com/essay_writing/essay_tips/<br>https://owl.purdue.edu/owl/general_writing/academic_writing/essay_writing/index.html<br>https://www.ukessays.com/guides/how-to-write-an-essay.php<br>https://www.grammarly.com/blog/verb-tenses/ |