| 11. Course Structure | | | | | |
|---|---|---|---|---|---|
| Week | Hours | Unit/Module or Topic Title | ILOs | Teaching Method | Assessment Method |
| 2&1 | 2 | Introduction to the computer / computer system / information technology / types of computers / input units / central processing unit / output units / main memory and its types / data storage in memory / factors affecting computer performance<br>Definition of software and its types / systems software: operating systems / programming languages and software systems / applied software. | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 3 | 2 | Introduction to Windows / its features / operating the device / shutting down the device / using the mouse / windows screen components: taskbar: icons: and their types (standard and general.( | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 4 | 2 | Control Panel / Desktop Control / Screen Saver / Window Colors and Lines / Screen Settings / Adjust Screen Colors / Modify Time and Date / Volume / Change Between Mouse Buttons / Double-Click Speed Control / Change Mouse Pointer / Control Mouse Speed / Install and Uninstall Programs | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 5 | 2 | Minimize and enlarge the window / final closure / temporary closure / move the window / control the capacity of the window / ways to run applications and programs | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 6 | 2 | Order start menu items / delete start menu items / add submenu to start menus / add new button to start menu | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 7 | 2 | Basic System Information / Stop Unwanted Applications<br>Windows explorer window finder / My computer icon / my computer window parts | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 8&9 | 2 | Recycle Bin (delete, retrieve and empty the basket) / My Document icon | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 10&11 | 2 | Definition of files and folders / Identification of files and folders / Properties of files Definition of folders / Create files and folders / Change the name of files and folders / Move file or folder / Copy file or folder / Search for file or folder / Create a shortcut icon for an application or file | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |

| 12&13 | 2 | Calculator / Notepad / WordPad / Use the memo to edit and create the file<br>Paint / Screen components / Create drawings / Select front and background colors / Choose brush font size / Select and select the drawing tool / Save drawing / Make drawing desktop background / Quit Paint Entertainment programs Media player | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
|---|---|---|---|---|---|
| 14&15 | 2 | Viruses / Reason for naming / Definition / Ways of spreading the virus / Symptoms of infection with the virus / Protection methods / Types of viruses<br>Computer crimes / theft / hackers | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |

| 12.Infrastructure | |
|---|---|
| Required reading: | Available in the free department and library of the institute |
| Main references (sources) | Available in the free department and library of the institute |
| Recommended books and references (scientific journals, reports,...) | Internet |

| 13.Course development plan |
|---|
| 1- Developing curricula adapted to the labor market<br>2- Holding seminars and scientific conferences aimed at updating the curricula<br>3- Follow-up scientific developments in the field of specialization |

| 1. Teaching Institution | Ministry of Higher Education and Scientific Research / Northern Technical University |
|---|---|
| 2. University/ Department | Mosul Technical Institute/ Electronic and Communications Techniques |
| 3. Course title/code | Arabic Language NTU103 |
| 4. Programme (s) to which it contributes | Technical diploma |
| 5. Modes of Attendance offered | * Weekly lesson schedule (theoretical)<br>* Discussions and reports |
| 6. Semester/Year | Annual |
| 7. Number of hours tuition (total) | 30 |
| 8. Date of production/revision of this specification | 8 / 1 / 2024 |

**9. Aims of the Course**
 1- Enabling the student to read correctly.
 2- Enabling the student to write correctly and use punctuation marks.
 3- The student should acquire the ability to use the Arabic language correctly.
 4- Introducing the student to the correct Arabic language words, structures and sound methods in an interesting way.
 5- Accustom the student to sound and clear expressions of his ideas.
 6- Helping the student to understand complex structures and mysterious methods.

**10. Course outcomes and teaching, learning and evaluation methods**

| | |
|---|---|
| A.Cognitive objectives |
| A- The student should recognize common mistakes in writing Arabic in order to avoid them |
| B - The student should recognize the punctuation marks and use them correctly |
| C - The student should distinguish between the solar lam and the lunar lam, which helps to pronounce it correctly |
| D - The student differentiates between Dhad and Zaa, and this is what helps him to avoid falling into a spelling error |
| E - To distinguish between the verb, the noun and the letter, as this is what his Arabic speech is based on.<br>　F- He must be able to write the hamza in its correct position correctly. |
| B - The skills objectives of the course. |
| B1 – Providing the student with a linguistic wealth that makes him more able to correctly express what he wants.<br>　B2- Correcting the student's tongue and preventing it from error |
| Teaching and learning methods |
| ((Theoretical lectures / listening lectures / conversation lectures / interactive lectures / research in libraries and the Internet on specific topics)). |
| **Evaluation methods** |
| ((Oral tests / written tests / weekly reports / daily attendance / participation and interaction in lectures / semester and final exams)) |
| C- Emotional and value goals |
| C1- Thinking, activation and organization development |
| C2- Working to make the student's imagination fertile imagination by highlighting the aesthetics of the language and thus enabling him to express the essence of the soul in a proper way. |
| **Teaching and learning methods** |
| ((Theoretical lectures / seminars / conducting debates between students / making reports)) |
| **Evaluation methods** |
| ((Oral Tests / Written Tests / Observation / Student Cumulative Record)) |
| D - Transferable general and qualifying skills (other skills related to employability and personal development).<br>D1- The ability to develop and develop his expressive skills such as poetry and story.<br>D2- The ability to communicate with the outside world properly. |

**11. Course Structure**

| Week | Hours | Unit/Module or Topic Title | ILOs | Teaching Method | Assessment Method |
|---|---|---|---|---|---|
| 1 | 2 | Introduction to linguistic errors – Taa Al-Marbouta and Al-Taa Al-Maktaba | 1. Identify the types of linguistic errors.<br>2. Differentiate between open Taa and Taa tethered | Discussion method, lecture method | Oral test |

| 2 | 2 | Rules for writing the elongated and compartment thousand – solar and lunar letters | 1. Differentiate between the writing of the extended thousand and the compartment and the positions of the writing of the two thousand<br>2. Differentiate between solar letters and lunar letters | Discussion method, lecture method | Oral test |
|---|---|---|---|---|---|
| 3 | 2 | Al-Daad and Al-Zaa | Differentiate between Dhad and Z | Discussion method, lecture method | Oral test |
| 4 | 2 | Hamza writing | Enable the student to write the hamza correctly | Discussion method, lecture method | Oral test |
| 5 | 2 | Punctuation | Recognize punctuation and write it in the correct location | Discussion method, lecture method | Oral test |
| 6 | 2 | Noun and verb and differentiate between them | 1.Recognize the noun and verb and indicate the sign of each<br>2. Differentiate between noun and verb<br>3. Indication of the types of verb<br>4. Differentiate between types of verbs | Discussion method, lecture method | Oral test |
| 7 | 2 | Effects | identify the types of effects and differentiate between them | Discussion method, lecture method | Oral test |
| 8 | 2 | Number | Enable the student to write numbers correctly | Discussion method, lecture method | Oral test |
| 9 | 2 | Applications of common linguistic errors | Recognize and avoid common language errors | Discussion method, lecture method | Oral test |
| 10 | 2 | Applications of common linguistic errors | Recognize and avoid common language errors | Discussion method, lecture method | Oral test |
| 11 | 2 | Noon and Tanween meanings of prepositions | 1. Differentiate between Nun and Tanween<br>2.Recognize the meanings of prepositions | Discussion method, lecture method | Oral test |
| 12 | 2 | Formal aspects of administrative discourse | Identify the formal aspects of administrative discourse | Discussion method, lecture method | Oral test |
| 13 | 2 | The language of administrative discourse | Recognize the language of administrative discourse | Discussion method, lecture method | Oral test |
| 14 | 2 | The language of administrative discourse | Recognize the language of administrative discourse | Discussion method, | Oral test |

| 15 | 2 | Samples of administrative correspondence | Identify samples of administrative correspondence | Discussion method, lecture method | Oral test |
|---|---|---|---|---|---|
| | | | | lecture method | |

**12.Infrastructure**

| Required reading: | Textbooks: General Arabic Language Binding for Technical Universities by (Dr. Safaa Kazem Makki and Dr. Lama Muhammad Younis |
|---|---|
| Main references (sources) | 1- Clear dictation: Abdul Majeed Al-Nuaimi, Daham Al-Kayyal, Dar Al-Mutanabbi Library, Baghdad, 6th edition, 1987 AD. 2- Lessons in language, grammar and spelling for state employees: Ismail Hammoud Atwan and others, Ministry of Education Press No. (3), Baghdad, 2nd edition, 1984. 3- Arabic language for the third intermediate grade: Fatima Nazem Al-Attabi, et al., 1st edition, 2018. 4 - General Arabic language for sections other than specialization: Abdul Qadir Hassan Amin and others, Ministry of Higher Education and Scientific Research, 2nd Edition, 2000. 5- Inspired by Arabic literature: Haval Muhammad Amin, Al-Saadoun Press, Baghdad. |
| Electronic references, Internet sites... | World Wide Web |

**13.Course development plan**

Correcting the linguistic errors that occurred in the manual to be taught and trying to add a definition to some of the terms contained in the fascicle, especially since the Arabic language fascicle was prepared for non-specialists in the Arabic language, and this leads to making the prescribed vocabulary more accurate and clear.

| 1. Teaching Institution | Ministry of Higher Education and Scientific Research / Northern Technical University |
|---|---|
| 2. University/ Department | Mosul Technical Institute/ Electronic and Communications Techniques |
| 3. Course title/code | Sport NTU104 |
| 4. Programme (s) to which it contributes | Technical Diploma |
| 5. Modes of Attendance offered | * Weekly lesson schedule (theoretical and practical) * Sports discussions and activities |
| 6. Semester/Year | Annual |
| 7. Number of hours tuition (total) | 30 |
| 8. Date of production/revision of this specification | 8 / 1 / 2024 |

9. **Aims of the Course**

 1- The student should be able to identify the most important types of sports and          what are the laws and skills of some sports

     2- Identify the motor mechanism of the human body and what are the common injuries that occur in the human body.

    3. Perform his duties at the workplace for professional motives.

**10. Course outcomes and teaching, learning and evaluation methods**

 A. Cognitive objectives

| | |
|---|---|
| A1- The student should be able to identify the most important types of sports and what are the laws and skills of some sports | |
| B - The skills objectives of the course. B1- Identify the motor mechanism of the human body and what are the common injuries that occur in the human body. | |
| Teaching and learning methods | |
| ((Theoretical lectures / practical lectures / field visits / solving examples / seminars)) | |
| **Evaluation methods** | |
| ((Oral exams / written tests / weekly reports / daily attendance / semester and final exams)) | |
| C- Emotional and value goals C1- Perform his duties at the workplace for professional motives. | |
| **Teaching and learning methods** | |
| ((Theoretical lectures / practical lectures / field visits / solving examples / seminars)) | |
| **Evaluation methods** | |
| ((Oral Tests / Written Tests / Observation / Student Cumulative Record)) | |
| D - Transferable general and qualifying skills (other skills related to employability and personal development). D1- Improve their discussion skills. D2- Raising their research perceptions and transferring the student from the stage of teaching to learning. | |

**11. Course Structure**

| Week | Hours | Unit/Module or Topic Title | ILOs | Teaching Method | Assessment Method |
|---|---|---|---|---|---|
| 1 | 2 | Sport definition, importance and types | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 2 | 2 | The mechanism of movement of the human body | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 3 | 2 | Common sports injuries | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 4 | 2 | Basic skills of the game of basketball | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 5 | 2 | International Basketball Law | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 6 | 2 | Basic skills of table tennis and its international law | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 7 | 2 | Basic skills of volleyball and its international law | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 8 | 2 | Swimming sport | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 9 | 2 | Basic skills of tennis and its international law | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 10 | 2 | Basic skills of handball | Knowledge and practical application | theoretical and practical | Tests & Reports |

| 11 | 2 | International Handball Law | Knowledge and practical application | theoretical and practical | Tests & Reports |
|----|---|---------------------------|------------------------------------|---------------------------|-----------------|
| 12 | 2 | Arena and field games (types, international law of the game) | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 13 | 2 | Basic Football Skills | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 14 | 2 | Management of sports competitions and competitions | Knowledge and practical application | theoretical and practical | Tests & Reports |
| 15 | 2 | Sports Laws and Legislations | Knowledge and practical application | theoretical and practical | Tests & Reports |

| **12.Infrastructure** | |
|------------------------|---|
| Required reading: | Available in the free department and library of the institute |
| Main references (sources) | Available in the free department and library of the institute |
| Electronic references, Internet sites. | Internet |

**13.Course development plan**

1- Developing curricula adapted to the labor market
2- Holding seminars and scientific conferences aimed at updating the curricula
3- Follow-up scientific developments in the field of specialization

| 1. Educational institution | Ministry of Higher Education and Scientific Research / Northern Technical University |
|-----------------------------|--------------------------------------------------------------------------------------|
| 2. Academic department/center | Mosul Technical Institute/ Electronic and Communications Techniques |
| 3. Course name/code | DC circuits |
| 4. Available forms of attendance | theoretical + Practical |
| 5. Semester/year | courses |
| 6. Number of study hours (total) | 4 hours / week x decision =60 hours (theoretical And my work) |
| 7. Date this description was prepared | 7/1/2024 |

**1.  Course objectives**

- Apply Ohm's law and find the voltage, current and power in an electrical circuit.
- How to calculate the equivalent resistance in series, parallel and mixed connections
- Converting the connection from star to triangular and vice versa and finding the equivalent resistance.
- Kirchhoff's law and how to analyze the circuit using Kirchhoff's law
- How to solve using the mesh method which depends on Kirchhoff's voltage law.
- Analyse complex electrical circuits using some theories such as Thevenin and Norton's theorem and the cumulative theory.
- How to convert the voltage and current source from one to the other to facilitate solving the circuit and finding the current or voltage in any resistance in the electrical circuit.
- The theory of maximum possible power transfer and how to derive it and find it in the electrical circuit.

**11.structure The decision / Level the first**

| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
|---|---|---|---|---|---|
| the first | 2 | | | | |
| the second | 2 | Knowing the units of the international system and the special components in the electrical circuit. Finding the voltage, current and power in a simple electrical circuit. | Electrical Quantities and Units Multiple and Submultiple of the Internal System Units (SI): Electrical Circuit Components Ohm's law Electrical Power Resistor Power Absorption | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | Exams Daily Short Duties Home, Exams Quarterly And final |
| the third | 2 | Applying the special law to find the resistance based on the length, area and specific resistance of the material, and finding the resistance value before or after being exposed to a temperature change based on the thermal coefficient of the material. | Resistance and Resistivity Resistor temperature coefficient | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | Exams Daily Short Duties Home, Exams Quarterly And final |
| Fourth | 2 | Applying the special laws for both series and parallel circuit connection, finding the voltage for each resistor in series connection using a voltage divider, and finding the current for each resistor in parallel connection using a current divider. | • Series Circuit • Voltage divider's law • Parallel circuit • Current divider's law | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | Exams Daily Short Duties Home, Exams Quarterly And final |
| Fifth | 2 | Finding the equivalent resistance and both voltage and current for each resistor in a series-parallel connection in an electrical circuit | • Series-Parallel combination • examples | | |
| Sixth And the seventh | 4 | Converting delta to star and vice versa, finding the equivalent resistance | Wye-delta transformations | = | = |

| | | and both voltage and current for each resistance in the electrical circuit | Examples Solve various examples of types of connection | | |
|---|---|---|---|---|---|
| The eighth | 2 | Apply Kirchhoff's law and find both the voltage and current for each resistance in the electrical circuit | Kirchhoff's law method (Branch current method) Examples | | |
| Ninth | 4 | Analysis of the electrical circuit that is difficult to solve using Ohm's law and apply and solve the electrical circuit using the Mesh method and find both the voltage and current for each resistance in the electrical circuit. | Mesh method (Maxwell current loop method) Examples | = | = |
| tenth | 2 | Apply and solve the electric circuit using the superposition theory and find both the voltage and current for each resistance in the electric circuit. | superposition theorem: Examples | = | = |
| eleventh | 2 | Apply and solve the electrical circuit using Thevenin's theorem and find the load current in the electrical circuit. | Thevenin's theorem Examples | | |
| twelfth | 2 | Apply and solve the electrical circuit using Norton's theorem and find the load resistance current in the electrical circuit | Norton's Theorem Examples | | |
| thirteenth | 2 | Apply and solve the electrical circuit using source conversion.. | Source transformation Example | | |
| fourteenth | 2 | Apply and solve the electrical circuit and | Maximum power transfer theorem | Theoretical lectures | Exams Daily Short Duties |

| | | | | | |
|---|---|---|---|---|---|
| | | find the maximum power transfer. | Example | and scientific discussion Showing scientific films, the latest developments and means of clarification | Home, Exams Quarterly And final |
| fifteenth | 2 | Solve examples | Solve examples of all theories | | |

| . | 1- Books The reporter Required |
|---|---|
| 1- Charles K. Alexander, Mathew NO Sadiku "Fundamental of electric circuit",3rd. | 2- the reviewer Home (Sources) |
| | A Books References that Recommended With it (Magazines Scientific , reports ,....) |
| Technical Institute website / Mosul | for - the reviewer Electronic, Sites The Internet .... |

| 13.Curriculum Development Plan |
|---|
| 1- Curriculum Development<br>2- Laboratories Development<br>3- Continuing Education Courses<br>4- Showing Scientific Films<br>5- Holding Scientific Visits<br>6- Organizing Study Groups |

| 1. Educational institution | the university Technology Northern |
|---|---|
| 2. Academic department/center | Mosul Technical Institute/ Electronic and Communications Techniques |
| 3. Course name/code | Basic of Digital circuits |
| 4. Available forms of attendance | theoretical + Practical |
| 5. Semester/year | courses |
| 6. Number of study hours (total) | 4 hours / week x decision =60 hours (theoretical And my work) |
| 7. Date this description was prepared | 7/1/2024 |

**8. Course Objectives**
- To introduce the basic principles of digital circuits and how they work.
- Develop the ability to design and analyze logical circuits.
- Theories and applications of digital logic, logic gates, counters, comparators, and numerical systems
- Identify the applications of digital circuits in electronic devices and communication systems.
- Use the tools and techniques necessary to design and test digital circuits.

**9. Course outcomes, teaching, learning and assessment methods**

 B - Course specific cognitive objectives.

A1-Understanding the basic principles of digital circuits and numerical systems.

A2-Identifying logic gates* and how to use them in building circuits.

A3-Analyzing and designing logic circuits using specific tools and techniques for digital circuits in various electronic devices and communication systems.

**B - Course specific skill objectives.**

B1- Perform various operations on numerical systems.

B2- Design and implement various logical circuits.

B3- Simplify and analyze logical circuits.

B4- Implement practical applications of logical circuits.

**Teaching and learning methods**

- Theoretical lectures
- Scientific discussion in classrooms
- Small group method
- Conducting practical experiments in laboratories
- Study seminars and presentation of the latest scientific developments globally by students
- Scientific films and other means of clarification
- Methodological training
- Summer training

**Methods Evaluation**

- Evaluation Methods
- Oral and written tests
- Semester and final exams
- Practical reports
- Homework
- Daily assessment

**C- Emotional and value-based objectives**

C1- Developing students' sense of scientific curiosity towards digital circuits and their technologies.

C2- Encouraging teamwork and cooperation between students in projects and practical applications.

C3- Stimulating innovation and creativity in the design and analysis of digital circuits.

**D- General and transferable skills (other skills related to employability and personal development).**

D1 Design and analyze logic circuits* accurately.

D2 Use the software tools* necessary to design and test circuits.

D3- Understand the practical applications* of digital circuits in modern devices and systems.

D4- Develop logical thinking and problem solving* by dealing with the challenges of circuit design

**11.structure The decision / Level the first**

| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
|---|---|---|---|---|---|
| the first | 2 | Knowledge and Practical Application | مقدمة عن المقرر، أهداف التعلم، محتوى المقرر | Theoretical lectures | Exams Daily Short Duties Home, Exams |

| | | | | and scientific discussion Showing scientific films, the latest developments and means of clarification | Quarterly And final |
|---|---|---|---|---|---|
| the second | 2 | Knowledge and Practical Application | **Number Systems**<br>• Decimal System<br>• Binary System<br>• Octal System<br>• Hexadecimal System | = | = |
| the third | 2 | Knowledge and Practical Application | **Conversions Between Number Systems.**<br>• Conversion from Decimal to Other Systems and vice versa.<br>• Conversion from Binary to Hexadecimal and vice versa.<br>• Conversion of Fractional Numbers. | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | Exams Daily Short Duties Home, Exams Quarterly And final |
| Fourth | 2 | Knowledge and Practical Application | Arithmetic Operations in Binary and Hexadecimal Systems<br>• Addition, Subtraction, Multiplication, and Division in the Binary System.<br>• Addition and Subtraction in the Hexadecimal System | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | Exams Daily Short Duties Home, Exams Quarterly And final |
| Fifth | 2 | Knowledge and Practical Application | • Complements in the Binary System (One's Complement and Two's Complement)<br>• Subtraction Using Complements | = | = |
| Sixth | 2 | Knowledge and Practical Application | **Basic Logic Gates**<br>• **AND Gate**: Circuit diagram, gate symbol, truth table, and timing diagram for the gate.<br>• **OR Gate**: Circuit diagram, gate symbol, | = | = |

| | | | truth table, and timing diagram for the gate.<br>• **NOT Gate**: Circuit diagram, gate symbol, truth table, and timing diagram for the gate. | | |
|---|---|---|---|---|---|
| Seventh | 2 | Knowledge and Practical Application | **Composite Gates**<br>• **NAND Gate**: Gate symbol, truth table, and timing diagram for the gate.<br>• **NOR Gate**: Gate symbol, truth table, and timing diagram for the gate.<br>• **XOR Gate**: Gate symbol, truth table, and timing diagram for the gate.<br>• **XNOR Gate**: Gate symbol, truth table, and timing diagram for the gate. | = | = |
| The eighth | 2 | Knowledge and Practical Application | **Gate Transformation Using Inverters**<br>• Effect of Inverting Gate Inputs<br>• Effect of Inverting Gate Outputs<br>• Effect of Inverting Both Inputs and Outputs of Gates. | = | = |
| Ninth | 2 | Knowledge and Practical Application | **Aggregation of Logic Gates**<br>• Aggregation of Gates Using AND-OR Logic<br>• Aggregation of Logic Gates Using NAND Logic | = | = |
| tenth | 2 | Knowledge and Practical Application | De Morgan's Theorems<br>• First De Morgan's Theorem<br>• Second De Morgan's Theorem | = | = |
| eleventh | 2 | Knowledge and Practical Application | **Boolean Algebra Relations**<br>• OR Relations<br>• AND Relations | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means | Exams Daily Short Duties Home, Exams Quarterly And final |

| | | | | of clarification | |
|---|---|---|---|---|---|
| twelfth | 2 | Knowledge and Practical Application | Boolean Algebra Laws • Commutative Laws • Associative Laws • Distributive Laws | = | = |
| thirteenth | 2 | Knowledge and Practical Application | Boolean Expressions for Logic Circuits •Representation of a Logic Circuit Using Boolean Expression •Representation of a Logic Circuit Through a Truth Table •Conversion of Boolean Expression to Truth Table | = | = |
| fourteenth | 2 | Knowledge and Practical Application | Simplification of Logical Equations Using Boolean Algebra Laws and Rules • Reduction in the Number of Gates Used in the Design | = | = |
| fifteenth | 2 | Knowledge and Practical Application | Solving Questions and General Review | | |

| 7 | Structure Infrastructure |
|---|---|

| | 1- Books The reporter Required |
|---|---|
| | 2- the reviewer Home (Sources) |
| **1- Logic Circuits and Microprocessors - Communications Specialization.** **Technical and Vocational Training Corporation - Saudi Arabia** **2-Digital Fundamentals, Thomas L.Floyd, Eleventh Edition.** **3-Digital Design, M.Morris Mano,**Prentice-Hall, 5th, 2013. **4- Digital Technology, Misty E. Vemaat, Discovering Computers 2018.** **5- Computing Essentials,**Timothy J. O'Leary, McGraw-Hill Education, **2017.** | A Books References that Recommended With it (Magazines Scientific , reports ,....) |
| Technical Institute website / Mosul | for - the reviewer Electronic, Sites The Internet .... |

| **13.Plan Curriculum Development** |
|---|
| 1- Curriculum Development 2- Laboratories Development 3- Continuing Education Courses 4- Showing Scientific Films 5- Holding Scientific Visits 6- Organizing Study Groups |

| | |
|---|---|
| 1. Educational institution | the university Technology Northern |
| 2. Academic department/center | Mosul Technical Institute/ Electronic and Communications Techniques |
| 3. Course name/code | Digital circuits |
| 4. Available forms of attendance | theoretical + Practical |
| 5. Semester/year | courses |
| 6. Number of study hours (total) | 4 hours / week x decision =60 hours (theoretical And my work) |
| 7. Date this description was prepared | 7/1/2024 |

**8. Course Objectives**
- • Introduce and teach students how to build logic and digital circuits and utilize them in their field.
- • Link theoretical knowledge to practical applications.
- • Develop students' scientific thinking and research skills.

**9. Course outcomes, teaching, learning and assessment methods**
Learning and teaching methods: Discussion, lecture, problem-solving, practical.
Assessment methods: Oral tests, written tests, weekly reports, daily attendance, and midterm and final exams.

 B - Course specific cognitive objectives.
The course aims to provide students with a comprehensive understanding of the design of various digital circuits, both combinational and sequential. It also aims to develop their skills in analyzing and designing digital circuits using various tools and techniques, as well as linking these concepts to practical applications in computing and electronics.
• Digital Circuit Analysis:
Students learn how to analyze complex digital circuits, identify their functions, and represent them using Boolean algebra.
• Combinational Circuit Design:
Students learn how to design combinational circuits (such as comparators, binary adders and subtractors, etc.) using logic gates.
• Sequential Circuit Design:
Students learn how to design sequential circuits (such as counters, registers, etc.) that rely on the previous state of the circuit.
• Linking Theoretical and Practical Concepts:
The course seeks to clarify the relationship between the theoretical concepts of digital circuits and their practical applications in electronic devices and computers.

**B - Course specific skill objectives.**
• Problem Solving: The student must be able to solve problems related to logic circuit design and apply logic circuit concepts effectively.
• Collaboration and Communication: The student must be able to work within a team and collaborate with others in designing digital circuits.
• Critical Thinking: The student must be able to evaluate different logic circuit designs and select the optimal design based on specific criteria.

**C- Emotional and value-based objectives**
• Developing students' respect for science and technology: Instilling in students a sense of value and respect for the efforts expended in circuit design and logical analysis, and encouraging them to appreciate the importance of digital engineering in society.
• Developing a sense of responsibility: Motivating students to take responsibility for their learning, and encouraging them to adhere to deadlines and maintain quality in academic and practical work.
• Enhancing self-confidence: Helping students build confidence in their ability to understand and design complex circuits and their applications, which increases their motivation and ongoing motivation.

• Connecting to the profession and innovation: Convincing students of the value of a professional field in digital engineering, and motivating them to be creative and proactive in circuit design.

**D- General and transferable skills (other skills related to employability and personal development).**
• Problem-solving skills:
Use logical thinking and systematic analysis to address challenges in circuit design.
• Teamwork and communication skills:
Collaborate with colleagues on design and testing projects.
Exchange knowledge and ideas effectively.
• Professional and ethical skills:
Adhere to quality and safety standards when designing and using circuits.
Delivery of sustainable, performance- and cost-effective solutions.
• Flexibility and adaptability:
Ability to keep pace with technological developments in the field of digital circuits.
Continuous learning and self-development.

| 11.structure The decision / Level the first | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required learning outcomes** | **Unit name/topic** | **Teaching method** | **Evaluation method** |
| the first | 2 | Knowledge and Practical Application | Introduction to the course, learning objectives, course content | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | Exams Daily Short Duties Home, Exams Quarterly And final |
| the second | 2 | Knowledge and Practical Application | •Universal Gates (NAND & NOR) | = | = |
| the third | 2 | Knowledge and Practical Application | •Designing logic circuits using universal gates Deriving the logical • equation from the truth table using SOP (Sum of Products) method. Deriving the logical • equation from the truth table using POS (Product of Sums) method. | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | Exams Daily Short Duties Home, Exams Quarterly And final |
| Fourth | 2 | Knowledge and Practical Application | Karnaugh Map (K-map) | Theoretical lectures | Exams Daily Short Duties |

| | | | | and scientific discussion Showing scientific films, the latest developments and means of clarification | Home, Exams Quarterly And final |
|---|---|---|---|---|---|
| Fifth | 2 | Knowledge and Practical Application | Simplifying Logical Equations Using Karnaugh Map | = | = |
| Sixth | 2 | Knowledge and Practical Application | Digital Arithmetic Circuits (Binary Adder Circuits) •Half Adder Circuit, Full Adder Circuit, Parallel Adder Circuit. | = | = |
| Seventh | 2 | Knowledge and Practical Application | Digital Arithmetic Circuits (Binary Subtractor Circuits) Half • Subtractor Circuit, Full Subtractor Circuit, Parallel Subtractor Circuit. | = | = |
| The eighth | 2 | Knowledge and Practical Application | Digital Comparator Circuit. •Single-bit comparator circuit, Two-bit comparator circuit. | = | = |
| Ninth | 2 | Knowledge and Practical Application | Decoder Circuit | = | = |
| tenth | 2 | Knowledge and Practical Application | Decoder Circuit | = | = |
| eleventh | 2 | Knowledge and Practical Application | Encoder Circuit | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | Exams Daily Short Duties Home, Exams Quarterly And final |

| | | | | | |
|---|---|---|---|---|---|
| twelfth | 2 | Knowledge and Practical Application | Designing Sequential Logic Circuits. Flip-Flops, S-R Flip-Flop (Synchronous and Asynchronous) | = | = |
| thirteenth | 2 | Knowledge and Practical Application | J-K Flip-Flop | = | = |
| fourteenth | 2 | Knowledge and Practical Application | Applications of Sequential Logic Circuits. Shift Registers | = | = |
| fifteenth | 2 | Knowledge and Practical Application | Applications of Sequential Logic Circuits Asynchronous Counters, Synchronous Counters. | | |

| 8 Structure Infrastructure | |
|---|---|
| 1- Books The reporter Required | |
| 2- the reviewer Home (Sources) | |
| A Books References that Recommended With it (Magazines Scientific , reports ,....) | |
| for - the reviewer Electronic, Sites The Internet .... | |

**13.Plan Curriculum Development**

1- Reviewing educational objectives: Ensure that the objectives align with labor market requirements and community needs.
2- Adding practical elements: Increasing the number of practical activities, applied projects, and simulations.
3- Training workshops: To develop teaching skills using technology.
4- Participating in conferences: Keeping abreast of the latest developments in digital circuit design.

5- Periodic course evaluation: Through student surveys and performance reports.

| 1. Educational institution | the university Technology Northern |
|---|---|
| 2. Academic department/center | Mosul Technical Institute/ Electronic and Communications Techniques |
| 3. Course name/code | AC circuits |
| 4. Available forms of attendance | theoretical + Practical |
| 5. Semester/year | courses |
| 6. Number of study hours (total) | 4 hours / week x decision =60 hours (theoretical And my work) |
| 7. Date this description was prepared | 7/1/2024 |
| • **Course objectives** | |

• The student should be able to find the frequency, period and wavelength of an AC sine wave.

• The student should be able to find the average voltage and square root of an AC sine wave.

• The student should learn how to calculate the impedance of capacitor, inductor and resistance in AC circuits.

• The student should be able to calculate the voltage, current and phase difference of capacitor, inductor and resistance in pure AC circuits.

• The student should learn how to calculate the voltage, current and phase difference of capacitor, inductor and resistance in series AC circuits.

• The student should learn how to calculate the voltage, current and phase difference of capacitor, inductor and resistance in parallel AC circuits.

• The student should be able to find the resonant frequency, quality factor and bandwidth difference in series and parallel.

• The student should be able to apply Thevenin and Norton theorems to AC circuits.

**8 Course Outcomes, Teaching, Learning and Evaluation Method**

A- Cognitive Objectives

A1- The student will learn the basics of alternating current and its related components such as inductors and capacitors.

A2- Enabling students to analyze alternating current circuits using mathematical tools and modern techniques.

A3- Understanding the practical applications of alternating current in various devices and systems.

A4- Studying electrical theories related to alternating current such as Kirchhoff's laws..

    B - Course specific skill objectives.

B1- The student should have the ability to think and solve problems and electrical circuits.

B2- The student should have the ability to analyze and think scientifically by applying laws.

B3- The ability to conduct scientific investigations related to aspects of electrical circuits -

**Teaching and learning methods**

1- Theoretical lectures

-2 Scientific discussion in classrooms

-3 Small group method

-4 Conducting practical experiments in laboratories

-5 Study seminars and presentation of the latest scientific developments globally by students

6- Scientific films and other means of clarification

7- Methodological training

8- Summer training

**Evaluation Methods**

    ☐ Oral and written tests

    ☐ Midterm and final exams

    ☐ Practical reports

    ☐ Homework

    ☐ Daily assessment

**C- Emotional and value-based objectives**

C1- Motivating students to be interested in studying alternating current and understanding its importance in daily life applications.

C2- Building confidence in the ability to understand, analyze and apply the concepts of alternating current.

C3- Instilling values of accuracy and commitment in working on alternating current circuits, whether in design or analysis.

C4- Enhancing the ability to work in teams and exchange ideas about designing and analyzing circuits.

| 10. structure The decision / Level the first | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required learning outcomes** | **Unit name/topic** | **Teaching method** | **Evaluation method** |
| the first | 2 | - | Course introduction, learning objectives, course content | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |
| the second | 2 | Finding the frequency and wavelength of the sine function and the constants of the form constant and the maximum constant | Sinewave function, frequency period, wavelength, angular measurement characteristic value of the voltage and current of sinewave form factor, peak factor | = | = |
| the third | 2 | Finding the phase difference, lead and delay between sinusoidal signals | Phase angle, lead and leg, phasor diagram examples | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |
| Fourth | 2 | Finding the impedance, voltage and current for pure resistive, capacitive and inductive circuits | Purely resistive circuit Purely inductive circuit Purely capacitive circuit | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |

| | | | | | |
|---|---|---|---|---|---|
| Fifth | 2 | Find the impedance, voltage and current for each of the RL-RC series circuits. | RL series circuits RC series circuits Examples | = | = |
| Sixth | 2 | Finding the impedance, voltage and current for each of the RLC series circuits | RLC series circuits examples | = | = |
| Seventh | 2 | Finding the impedance, voltage and current for each of the RL – RC parallel circuits | RL parallel circuits RC parallel circuits Example | = | = |
| The eighth | 2 | Finding the impedance, voltage and current for each of the RLC parallel circuits | RLC parallel circuits Examples | | |
| Ninth | 2 | | RLC parallel-series circuits Examples | | |
| tenth | 2 | Finding the series resonant frequency and the specificity constant | Resonance series and Quality factor | | |
| eleventh | 2 | | Resonance Parallel circuits Examples | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |
| twelfth | 2 | | Solving various examples of series and parallel resonant circuits | = | = |
| thirteenth | 2 | Knowing the power triangle and the relationship between them and how to apply its laws | Power consumed, power factor, power triangular | = | = |
| fourteenth | 2 | | Examples about power triangular | = | = |

| fifteenth | 2 | Application of theories in AC circuits | Thevenin's theorem and Norton theorem in AC circuits | | |
|---|---|---|---|---|---|

| 9 | Structure Infrastructure | |
|---|---|---|
| 1- Books The reporter Required | |
| 2- the reviewer Home (Sources) | |
| A Books References that Recommended With it (Magazines Scientific , reports ,....) | 1- Charles K. Alexander, Mathew NO Sadiku "Fundamental of electric circuit",3rd.<br><br>2- Road M. Rasheed, "Lectures electric circuits", Part2. |
| for - the reviewer Electronic,<br><br> Sites The Internet .... | Technical Institute website / Mosul |

**13.plan development The decision Academic**

1- development Curricula
2- development Laboratories
3- Courses education continuous
4- an offer films Scientific
5- stay Visits Scientific
6- to organize Episodes Academic

| 1. Educational institution | the university Technology Northern |
|---|---|
| 2. Academic department/center | Mosul Technical Institute/ Electronic and Communications Techniques |
| 3. Course name/code | AC circuits |
| 4. Available forms of attendance | theoretical + Practical |
| 5. Semester/year | courses |
| 6. Number of study hours (total) | 4 hours / week x decision =60 hours (theoretical And my work) |
| 7. Date this description was prepared | 7/1/2024 |
| • **Course objectives** | |

- The student should be able to find the frequency, period and wavelength of an AC sine wave.
- The student should be able to find the average voltage and square root of an AC sine wave.
- The student should learn how to calculate the impedance of capacitor, inductor and resistance in AC circuits.
- The student should be able to calculate the voltage, current and phase difference of capacitor, inductor and resistance in pure AC circuits.
- The student should learn how to calculate the voltage, current and phase difference of capacitor, inductor and resistance in series AC circuits.
- The student should learn how to calculate the voltage, current and phase difference of capacitor, inductor and resistance in parallel AC circuits.
- The student should be able to find the resonant frequency, quality factor and bandwidth difference in series and parallel.
- The student should be able to apply Thevenin and Norton theorems to AC circuits.

## 8 Course Outcomes, Teaching, Learning and Evaluation Method

A- Cognitive Objectives

A1- The student will learn the basics of alternating current and its related components such as inductors and capacitors.

A2- Enabling students to analyze alternating current circuits using mathematical tools and modern techniques.

A3- Understanding the practical applications of alternating current in various devices and systems.

A4- Studying electrical theories related to alternating current such as Kirchhoff's laws..

B - Course specific skill objectives.

B1- The student should have the ability to think and solve problems and electrical circuits.

B2- The student should have the ability to analyze and think scientifically by applying laws.

B3- The ability to conduct scientific investigations related to aspects of electrical circuits -

### Teaching and learning methods

1- Theoretical lectures

-2 Scientific discussion in classrooms

-3 Small group method

-4 Conducting practical experiments in laboratories

-5 Study seminars and presentation of the latest scientific developments globally by students

6- Scientific films and other means of clarification

7- Methodological training

8- Summer training

### Evaluation Methods

- ☐ Oral and written tests
- ☐ Midterm and final exams
- ☐ Practical reports
- ☐ Homework
- ☐ Daily assessment

C- Emotional and value-based objectives

C1- Motivating students to be interested in studying alternating current and understanding its importance in daily life applications.

C2- Building confidence in the ability to understand, analyze and apply the concepts of alternating current.

C3- Instilling values of accuracy and commitment in working on alternating current circuits, whether in design or analysis.

C4- Enhancing the ability to work in teams and exchange ideas about designing and analyzing circuits.

| 11. structure The decision / Level the first | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required learning outcomes** | **Unit name/topic** | **Teaching method** | **Evaluation method** |
| the first | 2 | - | Course introduction, learning objectives, course content | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |
| the second | 2 | Finding the frequency and wavelength of the sine function and the constants of the form constant and the maximum constant | Sinewave function, frequency period, wavelength, angular measurement characteristic value of the voltage and current of sinewave form factor, peak factor | = | = |
| the third | 2 | Finding the phase difference, lead and delay between sinusoidal signals | Phase angle, lead and leg, phasor diagram examples | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |
| Fourth | 2 | Finding the impedance, voltage and current for pure resistive, capacitive and inductive circuits | Purely resistive circuit Purely inductive circuit Purely capacitive circuit | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |

| | | | RL series circuits | | |
|---|---|---|---|---|---|
| Fifth | 2 | Find the impedance, voltage and current for each of the RL-RC series circuits. | RL series circuits RC series circuits Examples | = | = |
| Sixth | 2 | Finding the impedance, voltage and current for each of the RLC series circuits | RLC series circuits examples | = | = |
| Seventh | 2 | Finding the impedance, voltage and current for each of the RL – RC parallel circuits | RL parallel circuits RC parallel circuits Example | = | = |
| The eighth | 2 | Finding the impedance, voltage and current for each of the RLC parallel circuits | RLC parallel circuits Examples | | |
| Ninth | 2 | | RLC parallel-series circuits Examples | | |
| tenth | 2 | Finding the series resonant frequency and the specificity constant | Resonance series and Quality factor | | |
| eleventh | 2 | | Resonance Parallel circuits Examples | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |
| twelfth | 2 | | Solving various examples of series and parallel resonant circuits | = | = |
| thirteenth | 2 | Knowing the power triangle and the relationship between them and how to apply its laws | Power consumed, power factor, power triangular | = | = |
| fourteenth | 2 | | Examples about power triangular | = | = |

| fifteenth | 2 | Application of theories in AC circuits | Thevenin's theorem and Norton theorem in AC circuits | | |
|---|---|---|---|---|---|

| 10 | Structure Infrastructure | |
|---|---|---|
| 1- Books The reporter Required | |
| 2- the reviewer Home (Sources) | |
| A Books References that Recommended With it (Magazines Scientific , reports ,....) | 3- Charles K. Alexander, Mathew NO Sadiku "Fundamental of electric circuit",3rd. <br><br> 4- Road M. Rasheed, "Lectures electric circuits", Part2. |
| for - the reviewer Electronic, <br><br> Sites The Internet .... | Technical Institute website / Mosul |

**13.plan development The decision Academic**

- 7- development Curricula
- 8- development Laboratories
- 9- Courses education continuous
- 10- an offer films Scientific
- 11- stay Visits Scientific
- 12- to organize Episodes Academic

| 1. Educational institution | Northern Technical University |
|---|---|
| 2. Academic department/center | Department of Electronic and Communication Technologies / Mosul Technical Institute |
| 3. Course name/code | Computer Programming |
| 4. Available forms of attendance | First-stage students |
| 5. Semester/year | First semester / 2024 AD |
| 6. Number of study hours (total) | Two hours per week for 15 weeks (course) |
| 7. Date this description was prepared | 9/1/2024 |

**• 8. Course objectives**

-:1 Identify the programs used to write codes in C++

-:2 Identify the basics of C++

-:3 How to write conditional statements and the types of commands to execute them

-:4 Identify recursive operations and the most important commands used in repetition

-:5 Identify single commands in C++

**9. Course Outcomes and Teaching and Learning Methods**

Learning and Teaching Method: Discussion Method, Lecture Method

Evaluation Method: Daily Exams, Term Exams, Final Exam

**A- Cognitive objectives**

A1- Knowing the basics and how to call variables and the type of data that is entered

A2- Knowing how to use conditional statements and applying their special programs

A3- Identifying the libraries used and the purpose of calling them

D A4- Identifying how to implement logical and mathematical operations**.**

**B- Course specific skill objectives**

B1- The ability to identify, formulate and solve technical problems.

B2 - The ability to write programming code and know how to deal with programming errors.

B-3 The ability to apply knowledge in science and engineering

**C- Emotional and value-based objectives**

C1- Developing, activating and organizing thinking

C2- Working to make the student's imagination fertile by highlighting the beauty of the language and thus enabling him to express the inner self in a sound manner.

**D- General and transferable qualification skills (other skills related to employability and personal development).**

D-1 Enabling students to conduct job interviews and demonstrate the required engineer personality in the workplace

D-2 Enabling students to make the right decision as quickly as possible to manage work matters in the workplace

D-3 Enabling students to pass professional tests organized by local/regional/international bodies

D-4 Enabling students to develop themselves continuously after graduation to keep pace with the development taking place in the field of specialization

**12.structure The decision / Level the first**

| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
|---|---|---|---|---|---|
| First | 2 hours | | Introduction to the course, learning objectives, course content | Discussion method, lecture method | Daily Oral Test |
| Second | 2 hours | Learn the difference between programming and a program and the types and levels of programming | •A simple definition of programming and the program<br>•Types of programs<br>•Programming levels<br>•Programming language levels | Discussion method, lecture method | Daily Oral Test |
| Third | 2 hours | Know the features, form and environmental interface of the C++ program | •A simple definition of the C++ language<br>•Features of the C++ language<br>•The general form of writing a program<br>•The environmental interface of the C++ language program | Discussion method, lecture method | Daily Oral Test |
| Fourth | 2 hours | Know the basics of the C++ language | 3. Basics of the C++ language<br>  1- Letters<br>  2- Special symbols<br>  3- Reserved words<br>  4- Variables<br>  5- Constants<br>  6- Uses of the slash | Discussion method, lecture method | Daily Oral Test |
| Fifth | 2 hours | Know how to enter and output the value, and represent arithmetic values in the C++ language | •Input and output instructions | Discussion method, lecture method | Daily Oral Test |
| Sixth | 2 hours | Know how to represent the comparison process and logical operations in the C++ language | Simple arithmetic operations in the C++ language<br>Representing comparison and logical operations in the C++ language | Discussion method, lecture method | Daily Oral Test |

| | | | | | |
|---|---|---|---|---|---|
| Seventh | 2 hours | Know how to represent mathematical function instructions in the C++ language | Instructions of mathematical functions in the C++ language | Discussion method, lecture method | Daily Oral Test |
| Eighth | 2 hours | Know how to represent conditional statements in the C++ language | Conditional statements (IF……else) | Discussion method, lecture method | Daily Oral Test |
| Ninth | 2 hours | Know how to represent nested conditional statements in the C++ language | Nested conditional statements (IF……else…..else) | Discussion method, lecture method | Daily Oral Test |
| Tenth | 2 hours | | Solving examples of writing various programs about arithmetic | Discussion method, lecture method | Daily Oral Test |
| Eleventh | 2 hours | Know how to represent nested rotation statement in the C++ language | Loop statement •For •Do … while | Discussion method, lecture method | Daily Oral Test |
| Twelfth | 2 hours | Know how to represent a single matrix in the C++ language and how to deal with it | The concept of an array in C++ | Discussion method, lecture method | Daily Oral Test |
| Thirteenth | 2 hours | Know how to represent a binary matrix in the C++ language and how to deal with it | How to access the elements of a single array in C++ with solutions to examples of writing programs | Discussion method, lecture method | Daily Oral Test |
| Fourteenth | 2 hours | Know how to represent a function in the C++ language and how to formulate it and how to call it | How to deal with the elements of a binary array in C++ with solutions to examples of writing programs | Discussion method, lecture method | Daily Oral Test |
| Fifteenth | 2 hours | | Writing a function and how to define it, formulate it, and methods of calling it | Discussion method, lecture method | Daily Oral Test |

| 12. Infrastructure | |
| --- | --- |
| 1- Required textbooks | |
| 2- Main references (sources) | |
| A- Recommended books and references (scientific journals, reports, ....) | |
| B- Electronic references, Internet sites .... | |

| **13. Curriculum Development Plan** |
| --- |
| 1. Curriculum Development<br>2. Laboratory Development<br>3. Continuing Education Courses<br>4. Showing Scientific Films<br>5. Holding Scientific Visits<br>6. Organizing Study Groups |

| 1. Educational institution | Northern Technical University |
| --- | --- |
| 2. Academic department/center | Department of Electronic and Communication Technologies / Mosul Technical Institute |
| 3. Course name/code | Electronic physics |
| 4. Available forms of attendance | First-stage students |
| 5. Semester/year | First semester / 2024 AD |
| 6. Number of study hours (total) | Two hours per week for 15 weeks (course) |
| 7. Date this description was prepared | 9/1/2024 |

**• 8. Course objectives**

Understand the energy level and atomic structure through the energy band theory of materials.

- Basic concept and internal structure of materials such as metals, insulators and semiconductors.

- Understand electrical conductivity and properties of all materials such as conductivity, mobility, and energy distribution of electrons.

- Understand the work of diode, its properties and applications.

- Identify the types of rectifiers and their work.

- Identify filters and their work.

- Identify Zener diode and its applications

**9. Course Outcomes and Teaching and Learning Methods**

Learning and Teaching Method: Discussion Method, Lecture Method

Evaluation Method: Daily Exams, Term Exams, Final Exam

**A- Cognitive objectives**

A1- Enable students to understand the principles and theoretical foundations of electronics and communications.

A2- Develop analysis and design skills for complex communication and electronics systems.

A3- Identify the latest technologies and innovations in the field of electronics and communications.

A4- Apply the acquired theories to real projects and industrial problems.

A5- Enhance research and development skills to provide new and effective solutions in the field of electronics and communications.

**B- Course specific skill objectives**

B1- Stimulating curiosity and interest in the field and understanding its importance in daily life and technological - development.

B2- Building students' confidence in their ability to understand, analyze and solve complex problems. -

B3- Instilling the values of accuracy, perseverance in work and creativity in solving problems. -

B4- Encouraging students to work in a team spirit and cooperate with others to achieve common goals. -

**C- Emotional and value-based objectives**

C1- Enhancing appreciation for the field of electronic and communications technologies and their role in developing technology and society.

C2- Instilling values of commitment and discipline in academic work and research projects.

C3- Encouraging teamwork, team spirit and cooperation among students and colleagues.

C4- Enhancing understanding of professional ethics and the importance of integrity and transparency in research and development.

**D- General and transferable qualification skills (other skills related to employability and personal development).**

D1- The ability to analyze electronic circuits and communications systems and understand their behavior.

D2- Design electronic systems and develop innovative solutions to communication problems.

D3- Use specialized tools and software in the field of electronics and communications to conduct experiments and develop applications.

D4- Conduct scientific research and laboratory experiments to provide solutions and develop new theories.

| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
|---|---|---|---|---|---|
| | | | **12.structure The decision / Level the first** | | |
| First | 2 hours | | Introduction to the course, learning objectives, course content | Discussion method, lecture method | Daily Oral Test |
| Second | 2 hours | | Semiconductor theory-Structure of the atom- Energy levels- Crystals Conductivity in crystals- Current gap- How the gap moves | Discussion method, lecture method | Daily Oral Test |
| Third | 2 hours | | Doping_ P-type positive crystal- N-type positive crystal- Current of electrons and current of gaps- Total resistance | Discussion method, lecture method | Daily Oral Test |
| Fourth | 2 hours | | Semiconductor diodes-Formation of the evacuation region- Barrier voltage- Energy hill- Thermal effects- Biased diode- Forward bias- Reverse bias- Characteristic curves in the forward and reverse directions- Evanescent crossing current- Minority carrier current- Permissive leakage current- Breakdown voltage- Breakdown voltage- Maximum forward current- Maximum reverse current- Equivalent circuit of the diode | Discussion method, lecture method | Daily Oral Test |
| Fifth | 2 hours | | Diode as a current rectifier-Half-wave rectifier- Value-Continuous value of current and its calculation- Effective-Output frequency | Discussion method, lecture method | Daily Oral Test |
| Sixth | 2 hours | | Full-wave rectifier- Using a middle-branch transformer-Bridge rectifier- Calculating continuous and effective values of voltages and currents- Output frequency- Comparison between half-wave and full-wave rectifier- Comparison between Full wave rectifiers | Discussion method, lecture method | Daily Oral Test |
| Seventh | 2 hours | | Filters - Capacitor filtering - RC - LC filters - Output voltages - Ripple - Voltage multipliers - Trimming circuits - Positive trimming - Negative trimming - Complex trimming - Atom to atom detector - Positive and negative binding posts | Discussion method, lecture method | Daily Oral Test |
| Eighth | 2 hours | | Solving various examples of rectifiers and filters | Discussion method, lecture method | Daily Oral Test |

| | | | | | |
|---|---|---|---|---|---|
| Ninth | 2 hours | | Zener diode - Its structure - Symbol - Forward and reverse properties - Breakdown voltages - Zener impedance - Power tolerance - Temperature effects - Zener approximation | Discussion method, lecture method | Daily Oral Test |
| Tenth | 2 hours | | DC voltage regulation - DC voltage source circuit - Variable capacitor diode - and its applications - Light emitting diode - Photodiode - Variable capacitance diode | Discussion method, lecture method | Daily Oral Test |
| Eleventh | 2 hours | | Introduction to the course, learning objectives, course content | Discussion method, lecture method | Daily Oral Test |
| Twelfth | 2 hours | | Semiconductor theory- Structure of the atom- Energy levels- Crystals Conductivity in crystals- Current gap- How the gap moves | Discussion method, lecture method | Daily Oral Test |
| Thirteenth | 2 hours | | Doping_ P-type positive crystal- N-type positive crystal- Current of electrons and current of gaps- Total resistance | Discussion method, lecture method | Daily Oral Test |
| Fourteenth | 2 hours | | Semiconductor diodes- Formation of the evacuation region- Barrier voltage- Energy hill- Thermal effects- Biased diode- Forward bias- Reverse bias- Characteristic curves in the forward and reverse directions- Evanescent crossing current- Minority carrier current- Permissive leakage current- Breakdown voltage- Breakdown voltage- Maximum forward current- Maximum reverse current- Equivalent circuit of the diode | Discussion method, lecture method | Daily Oral Test |
| Fifteenth | 2 hours | | Diode as a current rectifier- Half-wave rectifier- Value- Continuous value of current and its calculation- Effective- Output frequency | Discussion method, lecture method | Daily Oral Test |

| 12. Infrastructure | |
|---|---|
| 1- Required textbooks | |
| 2- Main references (sources) | |
| A- Recommended books and references (scientific journals, reports, ....) | |
| B- Electronic references, Internet sites .... | |

| **13. Curriculum Development Plan** |
|---|
| 1. Curriculum Development<br>2. Laboratory Development<br>3. Continuing Education Courses |

4. Showing Scientific Films
5. Holding Scientific Visits
6. Organizing Study Groups

| | |
|---|---|
| 1. Educational institution | Northern Technical University |
| 2. Academic department/center | Department of Electronic and Communication Technologies / Mosul Technical Institute |
| 3. Course name/code | Electronic2 |
| 4. Available forms of attendance | First-stage students |
| 5. Semester/year | First semester / 2024 AD |
| 6. Number of study hours (total) | Two hours per week for 15 weeks (course) |
| 7. Date this description was prepared | 9/1/2024 |

• **8. Course objectives**

1. Developing the skills of solving electronic circuit problems through all passive and active electronic components, transistors, and integrated circuits.
2. Understanding the basic structure of the transistor through graphical analysis of transistors and their biasing.
3. To understand the analysis of the load line, the transistor at the operating point, and the classification amplification.
4. Understanding the H coefficients.
5. Identifying the types of bias EFT and the equivalent circuit and its use

**9. Course Outcomes and Teaching and Learning Methods**

Learning and Teaching Method: Discussion Method, Lecture Method

Evaluation Method: Daily Exams, Term Exams, Final Exam

**A- Cognitive objectives**

A1- Enable students to understand the principles and theoretical foundations of electronics and communications.

A2- Develop analysis and design skills for complex communication and electronics systems.

A3- Identify the latest technologies and innovations in the field of electronics and communications.

A4- Apply the acquired theories to real projects and industrial problems.

A5- Enhance research and development skills to provide new and effective solutions in the field of electronics and communications.

**B- Course specific skill objectives**

- B1- Arouse curiosity and interest in the field and understand its importance in daily life and technological development.

- B2- Build students' confidence in their ability to understand, analyze and solve complex problems.

- B3- Instill the values of accuracy and perseverance in work and creativity in solving problems.

- B4- Encourage students to work in a team spirit and cooperate with others to achieve common goals.

**C- Emotional and value-based objectives**

C- EC1- Enhance appreciation for the field of electronic and communications technologies and their role in developing technology and society.

C2- Instilling the values of commitment and discipline in academic work and research projects.

C3- Encouraging teamwork, team spirit and cooperation among students and colleagues.

C4- Enhancing understanding of professional ethics and the importance of integrity and transparency in research and development.

**D- General and transferable qualification skills (other skills related to employability and personal development).**

D1- The ability to analyze electronic circuits and communication systems and understand their behavior.

D2- Design electronic systems and develop innovative solutions to communication problems.

D3- Using specialized tools and software in the field of electronics and communications to conduct experiments and develop applications.

D4- Conducting scientific research and laboratory experiments to provide solutions and develop new theories.

| 12.structure The decision / Level the first | | | | | |
|---|---|---|---|---|---|
| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
| First | 2 hours | | Introduction to the course, learning objectives, course content | Discussion method, lecture method | Daily Oral Test |
| Second Third | 2 hours | | Bipolar transistor - structure - symbol - regions - definition (βdc) - definition) (☐dc - relationship between them - definition of important regions on the characteristic curves - Transistor bias circuits - Emitter bias - Collector bias - Collector bias - Approximation in the transistor and the equivalent circuit | Discussion method, lecture method | Daily Oral Test |
| | 2 hours | | | Discussion method, lecture method | Daily Oral Test |
| Fourth | 2 hours | | Transistor characteristic curves - working regions | Discussion method, lecture method | Daily Oral Test |
| Fifth | 2 hours | | Transistor bias circuits - Base bias - Emitter bias | Discussion method, lecture method | Daily Oral Test |
| Sixth | 2 hours | | Continuous equivalent circuit of the transistor - Continuous load line | Discussion method, lecture method | Daily Oral Test |
| Seventh Eighth | 2 hours | | Use of transistor in small signal amplification - AC equivalent circuit - Current gain - Voltage gain - Ideal approximation - Hybrid constants - | Discussion method, lecture method | Daily Oral Test |
| | 2 hours | | | Discussion method, lecture method | Daily Oral Test |
| Ninth | 2 hours | | Equivalent circuit using h coefficients - Voltage gain - Current gain - Power gain - Input and output resistances - Small signal amplifiers. | Discussion method, lecture method | Daily Oral Test |
| Tenth | 2 hours | | Use of transistor in voltage regulation - Series regulator - Parallel regulator - DC voltage source circuit | Discussion method, lecture method | Daily Oral Test |
| Eleventh Twelfth | 2 hours | | Field effect transistor structure MOSFET curve - E MOSFET characteristic curve Comparison between JFET, BJT | Discussion method, lecture method | Daily Oral Test |
| | 2 hours | | | Discussion method, lecture method | Daily Oral Test |
| Thirteenth | 2 hours | | Solving various examples of types of transistors | Discussion method, lecture method | Daily Oral Test |
| Fourteenth | 2 hours | | Operational amplifier 741 symbol connection terminals and its use | Discussion method, lecture method | Daily Oral Test |

| Fifteenth | 2 hours | | FET bias circuits - Equivalent circuit - Its use - Types of FET | Discussion method, lecture method | Daily Oral Test |
|---|---|---|---|---|---|

| 12. Infrastructure | |
|---|---|
| 1- Required textbooks | |
| 2- Main references (sources) | |
| A- Recommended books and references (scientific journals, reports, ....) | |
| B- Electronic references, Internet sites .... | |

| 13. Curriculum Development Plan |
|---|
| 1. Curriculum Development<br>2. Laboratory Development<br>3. Continuing Education Courses<br>4. Showing Scientific Films<br>5. Holding Scientific Visits<br>6. Organizing Study Groups |

| 1. Educational institution | Northern Technical University |
|---|---|
| 2. Academic department/center | Department of Electronic and Communication Technologies / Mosul Technical Institute |
| 3. Course name/code | Engineering drawing |
| 4. Available forms of attendance | First-stage students |
| 5. Semester/year | First semester / 2024 AD |
| 6. Number of study hours (total) | Two hours per week for 15 weeks (course) |
| 7. Date this description was prepared | 9/1/2024 |

- **8. Course objectives**
- Understand basic engineering drawing principles.
- Proficiency in using AutoCAD.
- Produce accurate engineering drawings using a computer.
- Integrate hand drawing with computer-aided drawing.
- Develop documentation and professional skills.
- Prepare for advanced engineering design.

**9. Course Outcomes and Teaching and Learning Methods**

Learning and Teaching Method: Discussion Method, Lecture Method

Evaluation Method: Daily Exams, Term Exams, Final Exam

**A- Cognitive objectives**
- Understand the theoretical foundations of AutoCAD
- Gain knowledge of basic AutoCAD commands
- Know international drawing standards

**B- Course specific skill objectives**

1- Organize graphics using layers.

2- Add dimensions and text accurately.

**C- Emotional and value-based objectives**

1-Developing, stimulating, and organizing thinking.

2- Working to enrich the student's imagination by providing a deeper insight from various angles.

**D- General and transferable qualification skills (other skills related to employability and personal development).**

1 -The ability to develop and enhance one's drawing skills

2 -The ability to transform imagination into reality through computer drawing.

**12.structure The decision / Level the first**

| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
|---|---|---|---|---|---|
| First | 3 hours | | Introduction to the course, learning objectives, course content | Discussion method, lecture method | Daily Oral Test |
| Second | 3 hours | Canvas Sizes Save the Drawing File Line Command | Learn how to draw a drawing board. | Discussion method, lecture method | Daily Oral Test |
| Third | 3 hours | Draw a Straight Line Draw an Angled Line | Learn to draw using AutoCAD tools. | Discussion method, lecture method | Daily Oral Test |
| Fourth | 3 hours | Rectangle Command Chamfer Command Fillet Command | Enabling students to learn AutoCAD commands. | Discussion method, lecture method | Daily Oral Test |
| Fifth | 3 hours | Drawing Selection Move Command Delete Command Offset | Learn to draw using AutoCAD tools | Discussion method, lecture method | Daily Oral Test |
| Sixth | 3 hours | Command Radius-wise Diameter-wise | Learn to draw circles | Discussion method, lecture method | Daily Oral Test |
| Seventh | 3 hours | Two Points-wise Three Points-wise Two Tangents-wise Rays-wise Three Tangents-wise | Learn to draw circles | Discussion method, lecture method | Daily Oral Test |
| Eighth | 3 hours | Polygon command Rotate command Copy command | Learn to draw a polygon | Discussion method, lecture method | Daily Oral Test |
| Ninth | 3 hours | Arc command Trim command Extend command | Learn to draw an arc | Discussion method, lecture method | Daily Oral Test |

| | | | | | |
|---|---|---|---|---|---|
| Tenth | 3 hours | Ellipse command Mirror command | Learn to draw an oval | Discussion method, lecture method | Daily Oral Test |
| Eleventh | 3 hours | Dimension Command Linear Command Aligned Command Radius | Learn how to display the dimensions of shapes Learn how to draw a matrix | Discussion method, lecture method | Daily Oral Test |
| Twelfth | 3 hours | Command Array Command Rectangle Array Option Polar Array Option | 3D drawing | Discussion method, lecture method | Daily Oral Test |
| Thirteenth | 3 hours | Differences Between 2D and 3D Isometric Drawings | Isometric drawings | Discussion method, lecture method | Daily Oral Test |
| Fourteenth | 3 hours | Applications of Isometric Drawings | Projections | Discussion method, lecture method | Daily Oral Test |
| Fifteenth | 3 hours | Basics of Projection Drawing | Learn how to display the dimensions of shapes | Discussion method, lecture method | Daily Oral Test |

12. Infrastructure

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|---|---|
| Engineering Drawing Book | |
| Engineering Drawing Using AutoCAD (Mohammed Al-Qadi and Colleagues) | |
| Internet | |
| | |

13. Curriculum Development Plan

1. Curriculum Development
2. Laboratory Development
3. Continuing Education Courses
4. Showing Scientific Films
5. Holding Scientific Visits
6. Organizing Study Groups

| 1. Educational institution | Northern Technical University |
|---|---|

| | |
|---|---|
| 2. Academic department/center | Department of Electronic and Communication Technologies / Mosul Technical Institute |
| 3. Course name/code | electrical drawing |
| 4. Available forms of attendance | First-stage students |
| 5. Semester/year | First semester / 2024 AD |
| 6. Number of study hours (total) | Two hours per week for 15 weeks (course) |
| 7. Date this description was prepared | 9/1/2024 |

- **8. Course objectives**
- Understand basic engineering drawing principles.
- Introduce students to electrical drawing concepts and electrical and electronic symbols.
- Train students to read and interpret electrical drawings.
- Enable students to design various electrical circuit diagrams.
- Use WorkBench design software to draw and document electrical circuits.
- Enhance organizational and planning skills in implementing electrical projects.

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**9. Course Outcomes and Teaching and Learning Methods**

Learning and Teaching Method: Discussion Method, Lecture Method

Evaluation Method: Daily Exams, Term Exams, Final Exam

**A- Cognitive objectives**
- Know the types of electrical drawings
- Understand electrical symbols
- Understand the basics of the Work Bench program

**B- Course specific skill objectives**

 1- Drawing electrical and electronic circuits using Workbench

2- Organizing elements within the drawing

3- Simulating and running circuits within the program

**C- Emotional and value-based objectives**

1- Developing, activating, and organizing thinking.

2- Focusing on developing the student's attitudes, behaviors, and professional and educational values while learning the course.
.

**D- General and transferable qualification skills (other skills related to employability and personal development).**

1- Preparing reports containing circuit analysis and simulation results.

2- Presenting work in an organized and professional manner, with illustrative drawings and logical explanations

| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
|---|---|---|---|---|---|
| First | 3 hours | Familiarizing yourself with the program interface | Introduction to electrical drawing, introduction to Workbench | Discussion method, lecture method | Daily Oral Test |
| Second | 3 hours | Learn electrical symbols | Explaining and drawing electrical symbols | Discussion method, lecture method | Daily Oral Test |
| Third | 3 hours | Learn electronic symbols | Explaining and drawing electronic symbols | Discussion method, lecture method | Daily Oral Test |
| Fourth | 3 hours | Electrical installations | Drawing a panel for electrical installations | Discussion method, lecture method | Daily Oral Test |
| Fifth | 3 hours | Learn electronic circuits | Drawing an electronic wiring board containing a set of electronic circuits | Discussion method, lecture method | Daily Oral Test |
| Sixth | 3 hours | Connecting logic gates | Drawing an electronic circuit board containing logic gates | Discussion method, lecture method | Daily Oral Test |
| Seventh | 3 hours | Three-phase motors | Drawing a panel to control the speed of a three-phase motor | Discussion method, lecture method | Daily Oral Test |
| Eighth | 3 hours | Electrical mapping | Reading an electronic circuit diagram | Discussion method, lecture method | Daily Oral Test |
| Ninth | 3 hours | Ammeter | Connecting an ammeter in series | Discussion method, lecture method | Daily Oral Test |
| Tenth | 3 hours | Voltmeter | Connecting a voltmeter in parallel | Discussion method, lecture method | Daily Oral Test |
| Eleventh | 3 hours | Ammeter Circuit | Ammeter circuit for DC current | Discussion method, lecture method | Daily Oral Test |

**10.structure The decision / Level the first**

| | | | | | |
|---|---|---|---|---|---|
| Twelfth | | | | | |
| | 3 hours | Ammeter Circuit | Ammeter circuit for AC current | Discussion method, lecture method | Daily Oral Test |
| Thirteenth | 3 hours | Current Control | Current control circuit diagram using a variable resistor | Discussion method, lecture method | Daily Oral Test |
| Fourteenth | 3 hours | Measuring Instrument Distribution | How to distribute and install measuring devices (ammeter, voltmeter) and protection devices (switches, fuses) | Discussion method, lecture method | Daily Oral Test |
| Fifteenth | 3 hours | General Review | General review | Discussion method, lecture method | Daily Oral Test |

| 11. Infrastructure | |
|---|---|
| 1- Required textbooks | Electrical Drawing Binder |
| 2- Main references (sources) | Electronics Workbench |
| A- Recommended books and references (scientific journals, reports, ....) | Author: Tariq Al-Rawi |
| B- Electronic references, Internet sites .... | World Wide Web |

| 12. Curriculum Development Plan |
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| 1. Educational Institution | Northern Technical University/Mosul Technical Institute |
|---|---|
| 2. Academic Department/Center | Electronics and Communications Technologies |
| 3. Course Name/Code | Mathmatics |
| 4. Available Attendance Formats | First-year students/Second course |
| 5. Semester/Year | second semester/2024 |
| 6. Number of Class Hours (Total) | 2 hours per week for 15 weeks (semester) |
| 7. Date this Description Was Prepared | January 9, 2024 |

- Course Objectives
• Understand basic mathematical concepts and foundations such as arithmetic, algebra, and geometry.
• Apply mathematical skills to solve everyday and academic problems.
• Develop logical thinking and quantitative analysis skills.
• Use mathematical methods to interpret data and draw conclusions.
• Develop problem-solving and decision-making skills using effective mathematical strategies.
• Enhance accuracy and discipline in presenting solutions and writing mathematical proofs.

| 10 . Course Outcomes, Teaching and Learning Methods, and Assessment Learning and teaching method: Discussion method, lecture method Assessment method: Daily exams, semester exams, final exam |
|---|
| A- Cognitive Objectives<br>☐ Acquire and understand basic mathematical concepts, such as numbers, arithmetic operations, relationships, variables, functions, and matrices.<br>☐ Understand and interpret mathematical theories and laws in different contexts.<br>☐ Distinguish mathematical properties and relationships between shapes, equations, and concepts.<br>☐ Apply mathematical knowledge to solve problems and devise appropriate solution strategies.<br>☐ Develop abstract understanding by moving from the concrete to the symbolic and abstract in mathematical thinking. |

☐ Connect mathematical concepts to other fields of knowledge, such as science, economics, and engineering.

B - Course Skill Objectives.
• • Apply mathematical concepts to solve various problems accurately and efficiently.
• Use mathematical methods such as graphs, modeling, and tables to organize and analyze information.
• Follow systematic, organized steps to solve complex mathematical problems.
• Employ critical and logical thinking skills to select the most appropriate solutions.
• Develop skills in mental estimation, verifying results, and assessing their validity.
• Use appropriate tools and techniques such as calculators, educational software, or digital applications to solve mathematical problems.
• Express mathematical operations orally and in writing in an organized and clear manner.

C- Affective and Value-Based Objectives
• Develop a positive attitude toward mathematics and an appreciation of its importance in daily life and various scientific fields.
• Promote the values of accuracy and discipline in problem-solving and following systematic steps.
• Instill a spirit of perseverance and patience in dealing with challenges and complex problems.
• Encourage collaborative work and active participation in problem-solving within teams.
• Deepen a sense of academic responsibility through commitment to completing math assignments and tasks.
• Respect the opinions of others regarding different solutions and encourage constructive mathematical dialogue.
• Foster a love of self-learning and discovery by exploring new mathematical patterns and laws.

D - General and transferable skills (other skills related to employability and personal development).
• Analytical and logical thinking skills: The ability to analyze problems, organize data, and draw accurate conclusions.
• Problem-solving skills: Develop systematic strategies to address complex challenges.
• Ability to make data-driven decisions: Use numerical data and mathematical models to support practical decisions.
• Technology skills: Use software and digital tools to perform calculations, modeling, and mathematical analysis.
• Effective time and task management: Adherence to precise problem-solving steps and adherence to deadlines when implementing activities.
• Teamwork: Collaborating with others to solve mathematical problems and group projects.
• Effective communication skills: Express mathematical concepts clearly and logically, verbally and in writing.
• Learning independence: Developing curiosity and the ability to pursue mathematical learning independently.
• Flexibility and adaptability: Applying mathematical knowledge and skills in diverse and changing professional contexts.

| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
|---|---|---|---|---|---|
| | | **10 .Course structure** | | | |
| First | 2 hours | Introduction to the course, learning objectives, course content | Introduction to the course, learning objectives, course content | Discussion method, lecture method | Daily oral test |
| Second | 2 hours | Learn about matrices, their types, determinants, and properties of determinants. | matrices, their types, determinants, and properties of determinants. | Discussion method, lecture method | Daily oral test |
| Third | 2 hours | Learn about algebraic operations on matrices. | algebraic operations on matrices. | Discussion method, lecture method | Daily oral test |
| Fourth | 2 hours | Learn how to solve linear equations – Cramer's method – Applications of determinants – Use of the substitution method to find current values in a multi-source electrical circuit. | solve linear equations – Cramer's method – Applications of determinants – Use of the substitution method to find current values in a multi-source electrical circuit. | Discussion method, lecture method | Daily oral test |
| Fifth | 2 hours | Learn about trigonometric identities and trigonometric equations. | trigonometric identities and trigonometric equations. | Discussion method, lecture method | Daily oral test |
| Sixth | 2 hours | Learn about vectors / Vector analysis / Vector and scalar quantities / Vector algebra / Vector arithmetic operations in space. Phase and vector representation of alternating quantities, phase angle – Finding the resultant of vector quantities. | vectors / Vector analysis / Vector and scalar quantities / Vector algebra / Vector arithmetic operations in space. Phase and vector representation of alternating quantities, phase angle – Finding the resultant of vector quantities. | Discussion method, lecture method | Daily oral test |
| Seventh | 2 hours | Learn about the unit of orthogonal vectors / vector scale / scalar and vector products / applications of vectors / | the unit of orthogonal vectors / vector scale / scalar and vector products / applications of vectors / magnetic | Discussion method, lecture method | Daily oral test |

| | | magnetic flux / Maxwell's theory / vector multiplication using an angle / vector multiplication using coordinates. | flux / Maxwell's theory / vector multiplication using an angle / vector multiplication using coordinates. | | |
|---|---|---|---|---|---|
| Eighth | 2 hours | Learn about complex counters and algebraic operations on complex numbers. | complex counters and algebraic operations on complex numbers. | Discussion method, lecture method | Daily oral test |
| Ninth | 2 hours | Learn about polar notation / converting algebraic notation to polar and vice versa and representing it graphically. | polar notation / converting algebraic notation to polar and vice versa and representing it graphically. | Discussion method, lecture method | Daily oral test |
| Tenth | 2 hours | Learn how to find the square roots of a complex number and solve the quadratic equation of a complex number. | the square roots of a complex number and solve the quadratic equation of a complex number. | Discussion method, lecture method | Daily oral test |
| Eleventh | 2 hours | Learn about powers and roots, as well as representing roots graphically. . | powers and roots, as well as representing roots graphically. . | Discussion method, lecture method | Daily oral test |
| Twelfth | 2 hours | Learn about functions / trigonometric functions and trigonometric relationships / logarithmic functions. | functions / trigonometric functions and trigonometric relationships / logarithmic functions. | | Daily oral test |
| Thirteenth | 2 hours | Learn about exponential functions / hyperbolic functions / applications of graphing exponential functions for a first-order electrical circuit | exponential functions / hyperbolic functions / applications of graphing exponential functions for a first-order electrical circuit | Discussion method, lecture method | |
| | | | | Discussion method, lecture method | Daily oral test |
| Fourteenth | 2 hours | Learn about Limitations\ Limitations of algebraic and trigonometric functions / applications .. | Limitations\ Limitations of algebraic and trigonometric functions / applications .. | Discussion method, lecture method | Daily oral test |
| Fifteenth | 2 hours | Review various topics and solve questions | Review various topics and solve questions | Discussion method, lecture method | Daily oral test |

| □□□ Structure Infrastructure | |
|---|---|
| 1- Books The reporter Required | الكتب المقررة: ● <br><br> - **1. Thomas Calculus** <br><br> - **2. Principles of Differential and Integral Calculus by Dr. Ali Aziz Ali** <br><br> 3. Theories and Problems in Advanced Calculus: Schaum's - |

| | |
|---|---|
| | Outlines / by Murray R. Spiegel; translated by Muhammad Al-Samri; revised by Abdul Razzaq Abdul Fattah |
| 2- the reviewer Home (Sources) | • Teacher's binder and the course instructor's YouTube channel |
| A Books References that Recommended With it (Magazines Scientific , reports ,....) | |
| for - the reviewer Electronic, Sites The Internet .... | Internet |

| 12.Plan Curriculum Development |
|---|
| • Updating curriculum units to include modern and realistic concepts and eliminating duplication. <br> • Teaching methods: Adopting active learning strategies and problem-based learning. <br> • Educational aids: Using simulation programs, educational videos, and mathematics applications. <br> • Assessment and testing: Diversifying assessment methods between written tests, projects, and presentations. |

| 1. Educational Institution | Northern Technical University/Mosul Technical Institute |
|---|---|
| 2. Academic Department/Center | Electronics and Communications Technologies |
| 3. Course Name/Code | Calculus |
| 4. Available Attendance Formats | First-year students/Second course |
| 5. Semester/Year | second semester/2024 |
| 6. Number of Class Hours (Total) | 2 hours per week for 15 weeks (semester) |
| 7. Date this Description Was Prepared | January 9, 2024 |

• Course Objectives
• Enable students to understand the basic concepts of calculus, including the rules of differentiation, integration, the mean value theorem, and the fundamental theorem of calculus.
• Enhance students' ability to apply calculus tools to solve mathematical problems related to real life and other scientific disciplines, such as engineering, physics, and economics.
• Develop students' analytical and logical thinking by understanding the behavior of functions and interpreting and analyzing graphs using derivatives and integrals.
• Enhance students' proficiency in using mathematical symbols and analytical expressions to accurately and systematically present and solve problems.
• Use modern technology and interactive mathematics software to support understanding of concepts and develop mathematical analysis and practical application skills.
• Prepare students for advanced mathematics courses such as differential equations, real analysis, or statistics, which rely on the principles of calculus.

| |
|---|
| • Encourage students to think critically and solve problems independently or within a team, while enhancing their skills in self-research and continuous learning. |

| |
|---|
| 10 . Course Outcomes, Teaching and Learning Methods, and Assessment<br>Learning and teaching method: Discussion method, lecture method<br>Assessment method: Daily exams, semester exams, final exam |
| A- Cognitive Objectives<br>• Understand the basic concepts of differentiation, such as derivatives, differentiation rules, and rates of change.<br>• Understand the principles of indefinite and definite integration and their geometric and physical interpretation.<br>• Understand the relationship between differentiation and integration through the mean value theorem and the fundamental theorem of differentiation and integration.<br>• Analyze functions and explain their behavior through first and second derivatives. |
| B - Course Skill Objectives.<br>• Apply differential and integral calculus techniques to solve various mathematical problems.<br>• Draw and analyze curves using differentiation and integration.<br>• Solve real-world problems involving calculating areas, volumes, and associated rates of change.<br>• Employ logical and analytical reasoning to derive and verify solutions.. |
| C- Affective and Value-Based Objectives<br>• Enhance self-confidence when dealing with complex mathematical problems.<br>• Develop a sense of curiosity and mathematical exploration.<br>• Appreciate the role of mathematics and its applications in daily life and other sciences.<br>• Commitment to accuracy and order when presenting solutions and analyzing results.<br>• Collaboration and teamwork in problem-solving and classroom discussions.. |
| D - General and transferable skills (other skills related to employability and personal development).<br>• Analytical and critical thinking skills: The ability to analyze complex problems and break them down into solvable parts.<br>• Teamwork and communication: Collaborate in study groups to solve exercises and participate in class discussions.<br>• Use of technology in learning: Use computer software, graphing calculators, and math applications to support understanding and analysis.<br>• Independence and self-directed learning: Develop the ability to learn independently by exploring mathematical concepts outside of the classroom.<br>• Flexibility and adaptability: Confidently face mathematical challenges and seek alternative solutions. |

| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
|---|---|---|---|---|---|
| | | | 10 .Course structure | | |
| First | 2 hours | Introduction to the course, learning objectives, course content | Introduction to the course, learning objectives, course content | Discussion method, lecture method | Daily oral test |
| Second | 2 hours | Learn differentiation / derivative / derivative of algebraic functions / chain rule. | about differentiation, derivatives, derivatives of algebraic functions, and the chain rule. | Discussion method, lecture method | Daily oral test |
| Third | 2 hours | Identify implicit functions / higher-order standard derivatives. | implicit functions and higher-order standard derivatives. | Discussion method, lecture method | Daily oral test |
| Fourth | 2 hours | Identify the derivative of trigonometric functions / the derivative of logarithmic functions / calculate the effective current in an R-L-C circuit. | the derivative of trigonometric functions / Derivative of logarithmic functions / Calculating the effective value of current in an R-L-C circuit | Discussion method, lecture method | Daily oral test |
| Fifth | 2 hours | Learn about the derivative of exponential functions / the derivative of hyperbolic functions / calculating the time constant. | the derivative of exponential functions / Derivative of hyperbolic functions / Calculating the time constant. | Discussion method, lecture method | Daily oral test |
| Sixth | 2 hours | Learn about derivative applications / the tangent and normal equations / velocity and acceleration / calculations of the rate of change of voltage and current with respect to time. | derivative applications / tangent and normal equations / velocity and acceleration / change calculations of the rate of change of voltage and current with respect to time. | Discussion method, lecture method | Daily oral test |
| Seventh | 2 hours | Learn about increasing and decreasing, maxima and minima, inflection points, graphing functions, and the C-L-R equation for a quadratic circle. | increase and decrease / maximum and minimum limits / inflection points / graphing functions Response of a second-order C-L-R circuit. | Discussion method, lecture method | Daily oral test |
| Eighth | 2 hours | Learn about integration, indefinite integration, and integration of algebraic and logarithmic functions. | integration, indefinite integration, and integration of algebraic and logarithmic functions. | Discussion method, lecture method | Daily oral test |
| Ninth | 2 hours | Learn about the integration of exponential and trigonometric functions. | integration of exponential and trigonometric functions. | Discussion method, lecture method | Daily oral test |

| | | | | | |
|---|---|---|---|---|---|
| Tenth<br>Eleventh | 2 hours<br>2 hours | Learn about general methods of integration, including substitution, partitioning, and the use of partial fractions, exponentials, and logarithmics. Construct an integrator circuit using resistance and inductance / represent an electrical circuit using integral equations. | methods of integration, including substitution, partitioning, and the use of partial fractions, exponentials, and logarithms. Construct an integrator circuit using resistance and inductance. Represent an electrical circuit using integral equations | Discussion method, lecture method | Daily oral test |
| | | | | Discussion method, lecture method | Daily oral test |
| Twelfth<br>Thirteenth | 2 hours<br>2 hours | Learn about definite integration / applications of definite integration / area under a curve / area between two curves / approximating area using the trapezoidal and Simpson's rules. | definite integration. Applications of definite integration. Area under a curve. Area between two curves. Approximate area using the trapezoidal and Simpson's rules. | Discussion method, lecture method | Daily oral test |
| | | | | Discussion method, lecture method | Daily oral test |
| Fourteenth | 2 hours | Learn about solving discrete, homogeneous, and linear differential equations with their various applications within the field of specialization. | Learn how to solve discrete, homogeneous, and linear differential equations and their various applications within the field of specialization. | Discussion method, lecture method | Daily oral test |
| Fifteenth | 2 hours | Review various topics and solve questions | Review various topics and solve questions. | Discussion method, lecture method | Daily oral test |

| □□□ Structure Infrastructure | |
|---|---|
| 1- Books The reporter Required | • الكتب المقررة:<br><br>- **1. Thomas Calculus**<br><br>- **2. Principles of Differential and Integral Calculus by Dr. Ali Aziz Ali**<br><br>3. Theories and Problems in Advanced Calculus: Schaum's Outlines / by Murray R. Spiegel; translated by Muhammad Al-Samri; revised by Abdul Razzaq Abdul Fattah |
| 2- the reviewer Home (Sources) | • Teacher's binder and the course instructor's YouTube channel |
| A Books References that Recommended With it         (Magazines Scientific , reports ,....) | |

| for - the reviewer Electronic, Sites The Internet .... | Internet |
|---|---|
| | |

| 12.Plan Curriculum Development |
|---|
| •Updating examples to include applications from physics and economics, organizing the topics in a logical sequence, and adding advanced optional topics.<br> •Incorporating active learning, problem-based learning, and the use of computer simulations and interactive presentations.<br> •Incorporating programs such as GeoGebra, MATLAB, or Wolfram Alpha to explain concepts visually.<br> •Diversifying assessment methods to include projects, quizzes, analytical assignments, and oral assessments.<br> • Organizing math competitions, advanced problem-solving workshops, and discussion groups. |

| 1. Teaching Institution | Ministry of Higher Education and Scientific Research / Northern Technical University |
|---|---|
| 2. University/ Department | Department of Electronic and Communication Technologies / Mosul Technical Institute |
| 3. Course title/code | Crimes of the Baath regime in Iraq NTU203 |
| 4. Programme (s) to which it contributes | Technical diploma |
| 5. Modes of Attendance offered | * Weekly lesson schedule (theoretical) Scientific discussions |
| 6. Semester/Year | Annual |
| 7. Number of hours tuition (total) | 30 |
| 8. Date of production/revision of this specification | 8 / 1 / 2024 |

9. **Aims of the Course**

 1- Providing students with basic concepts related to the definition of crimes, their                      types and divisions.

2- Definition of crimes and violations of the former regime and types of                      international crimes

3-Introducing mass grave crimes and violations of Iraqi laws

4- Addressing environmental crimes, the destruction of cities, policies of                      demographic change and extrajudicial detention

5- Explaining the role of the Supreme Criminal Court in dealing with the crimes of the Baath regime

**10. Course outcomes and teaching, learning and evaluation methods**

 A. Cognitive objectives

A1- Enabling students to understand the concept of crime and the types of national and international crimes.

A2- Developing the knowledge aspects of the protection and guarantees of human rights.

| A3- Developing students' ability to distinguish between crimes and human rights violations and how to confront them |
|---|
| B - The skills objectives of the course. B1 – Enable students to understand the concept of national and international crime. B2 - Enable students to know human rights and how to defend these rights. And know the guarantees related to them. |
| Teaching and learning methods |
| ((Theoretical lectures, periodic reports / periodic tests / practical case studies)). |
| **Evaluation methods** |
| ((Periodic exams / direct questions / preparation of special reports)) |
| C- Emotional and value goals C1- Development of legal culture C2- Carrying out his duties in the workplace with professional motives. C3- Instilling the values of tolerance and cooperation in society. |
| **Teaching and learning methods** |
| ((Student groups / case studies / preparation of special reports)) |
| **Evaluation methods** |
| ((Periodic exams / direct questions / preparation of special reports)) |
| D - Transferable general and qualifying skills (other skills related to employability and personal development). D1- Developing the skills of students in the field of public service or the private sector. D2- Developing personal skills to develop students' legal culture. |

### 11. Course Structure/ Level the second

| Week | Hours | Unit/Module or Topic Title | ILOs | Teaching Method | Assessment Method |
|---|---|---|---|---|---|
| 1 | 2 | -Crimes of the Baath regime under the Law of the Supreme Iraqi Criminal Tribunal in 2005 -The concept of crimes and their divisions -Definition of crime linguistically and idiomatically | Knowledge and practical application | theoretical | Tests & Discussion |
| 2 | 2 | -Crime sections -Crimes of the Baath regime as documented in the Law of the Supreme Iraqi Criminal Tribunal in 2005 | Knowledge and practical application | theoretical | Tests & Discussion |
| 3 | 2 | - Types of international crimes - Decisions issued by the Supreme Criminal Court | Knowledge and practical application | theoretical | Tests & Discussion |
| 4 | 2 | - Psychological and social crimes and their effects. - Mental Crimes - Mechanisms of psychological crimes - Effects of mental crimes | Knowledge and practical application | theoretical | Tests & Discussion |

| | | | | | |
|---|---|---|---|---|---|
| 5 | 2 | - Social crimes<br>- Militarization of society<br>- The position of the Baath regime on religion | Knowledge and practical application | theoretical | Tests & Discussion |
| 6 | 2 | - Violations of Iraqi laws<br>- Photos of human rights violations and crimes of the authority | Knowledge and practical application | theoretical | Tests & Discussion |
| 7 | 2 | - Some decisions on political and military violations of the Baath regime | Knowledge and practical application | theoretical | Tests & Discussion |
| 8 | 2 | - Places of Prisons and Detention of the Baath Regime | Knowledge and practical application | theoretical | Tests & Discussion |
| 9 | 2 | - Environmental crimes of the Baath regime in Iraq | Knowledge and practical application | theoretical | Tests & Discussion |
| 10 | 2 | - War and radioactive contamination and mine explosions | Knowledge and practical application | theoretical | Tests & Discussion |
| 11 | 2 | - Destruction of towns and villages<br>- Scorched earth policy | Knowledge and practical application | theoretical | Tests & Discussion |
| 12 | 2 | - Drainage of marshes<br>- Dredging palm groves, trees and plantings | Knowledge and practical application | theoretical | Tests & Discussion |
| 13 | 2 | - Mass grave crimes<br>- Mass graves | Knowledge and practical application | theoretical | Tests & Discussion |
| 14 | 2 | - Mass graves and genocide committed by the Baathist regime | Knowledge and practical application | theoretical | Tests & Discussion |
| 15 | 2 | - Chronological classification of genocide graves in Iraq | Knowledge and practical application | theoretical | Tests & Discussion |

| 12.Infrastructure | |
|---|---|
| 1 Required textbooks | General Books |
| 2 Main references (sources) | Literature on crimes, penal law and human rights available in the college library and the central library of the university |
| 3      Electronic references, websites | Human rights websites. |

| 13.Course development plan |
|---|

Access to modern scientific literature
There are no proposals because the subject is taught in the current academic year for the first time

| | |
|---|---|
| 1. Teaching Institution | Ministry of Higher Education and Scientific Research / Northern Technical University |
| 2. University/ Department | Department of Electronic and Communication Technologies / Mosul Technical Institute |
| 3. Course title/code | Professional Ethics NTU204 |
| 4. programmer (s) to which it contributes | Technical Diploma |
| 5. Modes of Attendance offered | 1 -Weekly lesson schedule (theoretical( 2- Discussions |
| 6. Semester/Year | Second semester/second level |
| 7. Number of hours tuition (total) | 30 hours (the number of theoretical hours during the 15 weeks) |
| 8. Date of production/revision of this specification | 5/1/2024 |

.Course objectives

1-Teaching students that their commitment to the ethics of their professions is an integral part of the correct practice of them, and this commitment is their duty toward

2-Teaching the professional ethics course is considered the cornerstone of preparing future generations professionally and ethically.

3-Teaching a professional ethics course to institute students represents the right beginning for any society that seeks to raise the level of ethical practice among professionals.

2.Course outcomes and teaching, learning and evaluation methods

A- Cognitive objectives

a1- Identify the principles of ethical analysis and thinking In various professional situations.

a2- Know the difference between Work and profession

a3-.RecognitionPatient rights

B - The skills objectives of the course.

B1 –Brainstorming skill inside the hall.

B2 -Give examples and modern applications to enhance understanding.

**Teaching and learning methods**

Traditional lecture, report writing, discussion

Evaluation methods

Daily written and oral tests, semester and final exams, commitment to assignments, attendance and commitment, feedback (testing the student on the previous subject), self-evaluation (questions are set for the student by the teacher and the student answers the questions, and the teacher also answers the same questions and asks the student to evaluate himself in light of Teacher's answers (analytical and deductive questions).

C- Emotional and value goals

C1-The student understands the meaning of the basic terms of the curriculum.

C2- That the student understands Characteristics and duties of a medical technician.

C3- That The student distinguishes the importance of ethics for the individual and society.

C4- That The student compares the concept of work, profession and craft.

**Teaching and learning methods**

Traditional lecture, feedback, deductive and analytical thinking questions.

**Evaluation methods**

Written tests, semester and final exams, daily tests, and commitments to assignments such as making reports and then discussing the reports, attendance and commitment.

D - Transferable general and qualifying skills (other skills related to employability and personal development).

D1- Skills of modern interactive teaching methods among students.

D2- Scientific competition skills among students through asking questions.

## 11. Course structure\ Level the second

| week | hours | Required learning outcomes | Name of the unit/topic | Teaching method | Evaluation method |
|------|-------|----------------------------|------------------------|-----------------|-------------------|
| 1 | 2 | identification requester Concept Moral | Moral. | Theoretical lectures Group discussions | Duties Quizzes Reports |
| 2 | 2 | Define the student the difference between work and profession | Work and profession. | Theoretical lectures Group discussions | Duties Quizzes Reports |
| 3 | 2 | The student understands the nature of professional ethics | Professional ethics. | Theoretical lectures Group discussions | Duties Quizzes Reports |
| 45& | 2 | Introducing the student to the values and ethics of the profession | Values and professional ethics. | Theoretical lectures Group discussions | Duties Quizzes Reports |
| 6&7 | 2 | Introducing the student to patterns of unethical behavior Administrative corruption + bribery + fraud at work | Patterns of unethical behavior In the profession. | Theoretical lectures Group discussions | Duties Quizzes Reports |
| 8 | 2 | Understand the means of consolidating values | Means and methods of consolidating professional ethics. | Theoretical lectures Group discussions | Duties Quizzes Reports |
| 9 | 2 | Introducing the student to the duties of medical staff | Ethics of practicing medical professions Characteristics and duties of a medical technician. | Theoretical lectures Group discussions | Duties Quizzes Reports |
| 10 | 2 | Introducing the student to patient rights | .Patient rights. | Theoretical lectures Group discussions | Duties Quizzes Reports |

| | | | | | |
|---|---|---|---|---|---|
| 11&12 | 2 | Introducing the student to the role of the medical technician in society | 2.The medical technician's relationship with society and his responsibility towards the environment and public safety. | Theoretical lectures Group discussions | Duties Quizzes Reports |
| 13&14 | 2 | Clarifying the medical technician's relationship with his co-workers and his subordinates | 3.Professional relations (the medical technician's relationship with his colleagues in the health institution. | Theoretical lectures Group discussions | Duties Quizzes Reports |
| 15 | 2 | Understand and explain the ethics of teaching and learning to patients | 4.Ethics of teaching and learning for patients. | Theoretical lectures Group discussions | Duties |

**12.Infrastructure**

| | |
|---|---|
| Unified curriculum for technical universities in Iraq | 1- Required prescribed books |
| •Abu Al-Khair, Muhammad Saeed (B.T): Guide to Professional Ethics, Faculty of Arts, Zagazig University.<br><br>•Hassan, Abdul Mahdi Abdul Reda (bt): Rules of professional ethics for nurses and midwives in Iraq, website. www.uobabylon.edu.iq/eprints/pubdoc_10_6984_150.doc<br><br>•Al-Hourani, Ghaleb Saleh Watanash, Salama Youssef (2007): Academic ethics for university professors**fromFaculty members' point of view University of Jordan**Studies Journal, Educational Sciences, Vol.34), Issue (2), Jordan.<br>**Rabhi, Israa (2018): The concept of bribery,**Internet site.https://mawdoo3.com<br><br>•Mohamed Ahmed (2018): What is the difference between a gift and a bribe?https://mawdoo3.com/<br><br>•National Center for Developing Faculty and Leadership Capabilities (2011): Ethics of Scientific Research, Program Series, Egypt.<br><br>•Mishal, Talal (2018): What is the importance of ethics, website. https://mawdoo3.com/<br>Al-Mashharawi, Ahmed Hussein (2014):The role of professional ethics in promoting social responsibility in Palestinian government hospitals (Al-Shifa Medical Complex as an example), Master's thesis in the program<br><br>•Saudi Commission for Health Specialties (2012): Health Practitioner Ethics, 3rd edition, p. 44. | 2- Main references (sources) |

| | |
|---|---|
| •Quality Assurance Unit (2017): Guide to Professional Ethics, Faculty of Arabic Language, Al-Azhar University, Cairo. | |
| •Iraqi Ministry of Health (2018): Code of Medical Research Ethics, National Center for Training and Human Development. Iraqi Ministry of Health (2017): Principles of medical ethics in Iraqi health institutions. | |
| | Recommended books and references (scientific journals, reports,...) |
| Modern sources via the Internet | B - Electronic references, Internet sites... |

| 13.Course development plan |
|---|
| -Access to modern scientific literature<br>2-Periodic review of the course |

| 1. Teaching Institution | Ministry of Higher Education and Scientific Research / Northern Technical University |
|---|---|
| 2. University/ Department | Department of Electronic and Communication Technologies / Mosul Technical Institute |
| 3. Course title/code | Computer |
| 4. Programme (s) to which it contributes | Technical diploma |
| 5. Modes of Attendance offered | * Weekly lesson schedule (theoretical and practical)<br>* Scientific discussions, seminars, other activities |
| 6. Semester/Year | Annual |
| 7. Number of hours tuition (total) | 30 |
| 8. Date of production/revision of this specification | 8 / 1 / 2024 |

**9. Aims of the Course**

    1- Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization.

    2- Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization.

    3. Perform his duties at the workplace for professional motives.

**10. Course outcomes and teaching, learning and evaluation methods**

A.Cognitive objectives

    A1- Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization.

B - The skills objectives of the course.

   B1 - Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization.

Teaching and learning methods

((Theoretical lectures / practical lectures / field visits / solving examples / seminars / summer training))

**Evaluation methods**

((Oral exams / written tests / weekly reports / daily attendance / semester and final exams))

C- Emotional and value goals
C1- Perform his duties at the workplace for professional motives.

| Teaching and learning methods |
|---|
| ((Theoretical lectures / practical lectures / field visits / solving examples / seminars / summer training)) |
| **Evaluation methods** |
| ((Oral Tests / Written Tests / Observation / Student Cumulative Record)) |
| D - Transferable general and qualifying skills (other skills related to employability and personal development).<br>D1- Improve their discussion skills.<br>D2- Raising their research perceptions and transferring the student from the stage of teaching to learning. |

| | 11. Course Structure | | | | |
|---|---|---|---|---|---|
| Week | Hours | Unit/Module or Topic Title | ILOs | Teaching Method | Assessment Method |
| 2&1 | 2 | Features of the word processor / running the word / the basic elements of the word window / flipping the language / definition of the paragraph / merging and splitting the paragraph / selecting (shading) the text. | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 3 | 2 | New / Open Inventory File / Close Document / Save New Document / Save Existing Document / Preview Before Printing / Close Document / End Word | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 4 | 2 | Clipboard: Cut / Copy / Paste / Copy Format<br>Font: Change font / font size / enlarge and reduce font / clear formatting / change font color / text highlight color / subscript / superscript text / change case / underline style / effects / character spacing<br>Paragraph: Numbering / Bullets / Create a bulleted list to existing text<br>/ Cancel bullets / Indent / Paragraph spacing / Line spacing / Text direction / Alignment / Borders & Shading<br>Styles: Normal / No Spacing / Heading 1 / Heading 2 / Subtitle / Change Styles / Show Preview / Disable Linked Styles / Options<br>Edit: Find/Go/Replace/Select | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 5 | 2 | Pages: Blank Page / Cover Page / Page Break<br>Table: Insert Table / Draw Table / Convert Text to Table / Excel Data Table / Quick Tables / Table Styles / Draw Table Borders<br>Illustrations: Picture / Clip Art / Prepared Shapes / Smart Art Drawing / Chart | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |
| 6 | 2 | Header and footer: header / footer / page number Text: text box / ornate text Word art | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |

| 7 | 2 | / signature line / date and time / object / equation / symbol. | | | |
|---|---|---|---|---|---|
| 7 | 2 | Features: Themes / Colors / Fonts / Effects. | Knowledge and practical application | Practical + Theoretical | Tests & Discussion |

| 1. Teaching Institution | Ministry of Higher Education and Scientific Research / Northern Technical University |
|---|---|
| 2. University/ Department | Department of Electronic and Communication Technologies / Mosul Technical Institute |
| 3. Course title/code | Arabic Language NTU103 |
| 4. Programme (s) to which it contributes | Technical diploma |
| 5. Modes of Attendance offered | * Weekly lesson schedule (theoretical) <br> * Discussions and reports |
| 6. Semester/Year | Annual |
| 7. Number of hours tuition (total) | 30 |
| 8. Date of production/revision of this specification | 8 / 1 / 2024 |

9. **Aims of the Course**

 1- Enabling the student to read correctly.

     2- Enabling the student to write correctly and use punctuation marks.

     3- The student should acquire the ability to use the Arabic language correctly.

     4- Introducing the student to the correct Arabic language words, structures

and                           sound methods in an interesting way.

     5- Accustom the student to sound and clear expressions of his ideas.

   6- Helping the student to understand complex structures and mysterious methods.

**10. Course outcomes and teaching, learning and evaluation methods**

 A.Cognitive objectives

A- The student should recognize common mistakes in writing Arabic in order to avoid them

B - The student should recognize the punctuation marks and use them correctly

C - The student should distinguish between the solar lam and the lunar lam, which helps to pronounce it correctly

D - The student differentiates between Dhad and Zaa, and this is what helps him to avoid falling into a spelling error

E - To distinguish between the verb, the noun and the letter, as this is what his Arabic speech is based on.

 F- He must be able to write the hamza in its correct position correctly.

B - The skills objectives of the course.

B1 – Providing the student with a linguistic wealth that makes him more able to correctly express what he wants.

   B2- Correcting the student's tongue and preventing it from error

Teaching and learning methods

((Theoretical lectures / listening lectures / conversation lectures / interactive lectures / research in libraries and the Internet on specific topics)).

   **Evaluation methods**

((Oral tests / written tests / weekly reports / daily attendance / participation and interaction in lectures / semester and final exams))

C- Emotional and value goals

C1- Thinking, activation and organization development
C2- Working to make the student's imagination fertile imagination by highlighting the aesthetics of the language and thus enabling him to express the essence of the soul in a proper way.

**Teaching and learning methods**

((Theoretical lectures / seminars / conducting debates between students / making reports))

**Evaluation methods**

((Oral Tests / Written Tests / Observation / Student Cumulative Record))

D - Transferable general and qualifying skills (other skills related to employability and personal development).
D1- The ability to develop and develop his expressive skills such as poetry and story.
D2- The ability to communicate with the outside world properly.

**11. Course Structure**

| Week | Hours | Unit/Module or Topic Title | ILOs | Teaching Method | Assessment Method |
|------|-------|----------------------------|------|-----------------|-------------------|
| 1 | 2 | Introduction to linguistic errors – Taa Al-Marbouta and Al-Taa Al-Maktaba | 1. Identify the types of linguistic errors. 2. Differentiate between open Taa and Taa tethered | Discussion method, lecture method | Oral test |
| 2 | 2 | Rules for writing the elongated and compartment thousand – solar and lunar letters | 1. Differentiate between the writing of the extended thousand and the compartment and the positions of the writing of the two thousand 2. Differentiate between solar letters and lunar letters | Discussion method, lecture method | Oral test |
| 3 | 2 | Al-Daad and Al-Zaa | Differentiate between Dhad and Z | Discussion method, lecture method | Oral test |
| 4 | 2 | Hamza writing | Enable the student to write the hamza correctly | Discussion method, lecture method | Oral test |
| 5 | 2 | Punctuation | Recognize punctuation and write it in the correct location | Discussion method, lecture method | Oral test |
| 6 | 2 | Noun and verb and differentiate between them | 1.Recognize the noun and verb and indicate the sign of each 2. Differentiate between noun and verb | Discussion method, lecture method | Oral test |

| | | | 3. Indication of the types of verb<br>4. Differentiate between types of verbs | | |
|---|---|---|---|---|---|
| 7 | 2 | Effects | identify the types of effects and differentiate between them | Discussion method, lecture method | Oral test |
| 8 | 2 | Number | Enable the student to write numbers correctly | Discussion method, lecture method | Oral test |
| 9 | 2 | Applications of common linguistic errors | Recognize and avoid common language errors | Discussion method, lecture method | Oral test |
| 10 | 2 | Applications of common linguistic errors | Recognize and avoid common language errors | Discussion method, lecture method | Oral test |
| 11 | 2 | Noon and Tanween meanings of prepositions | 1. Differentiate between Nun and Tanween<br>2.Recognize the meanings of prepositions | Discussion method, lecture method | Oral test |
| 12 | 2 | Formal aspects of administrative discourse | Identify the formal aspects of administrative discourse | Discussion method, lecture method | Oral test |
| 13 | 2 | The language of administrative discourse | Recognize the language of administrative discourse | Discussion method, lecture method | Oral test |
| 14 | 2 | The language of administrative discourse | Recognize the language of administrative discourse | Discussion method, lecture method | Oral test |
| 15 | 2 | Samples of administrative correspondence | Identify samples of administrative correspondence | Discussion method, lecture method | Oral test |

| 12.Infrastructure | |
|---|---|
| Required reading: | Textbooks:<br>General Arabic Language Binding for Technical Universities by (Dr. Safaa Kazem Makki and Dr. Lama Muhammad Younis |

| | |
|---|---|
| Main references (sources) | 1- Clear dictation: Abdul Majeed Al-Nuaimi, Daham Al-Kayyal, Dar Al-Mutanabbi Library, Baghdad, 6th edition, 1987 AD.<br>2- Lessons in language, grammar and spelling for state employees: Ismail Hammoud Atwan and others, Ministry of Education Press No. (3), Baghdad, 2nd edition, 1984.<br>3- Arabic language for the third intermediate grade: Fatima Nazem Al-Attabi, et al., 1st edition, 2018.<br>4 - General Arabic language for sections other than specialization: Abdul Qadir Hassan Amin and others, Ministry of Higher Education and Scientific Research, 2nd Edition, 2000.<br>5- Inspired by Arabic literature: Haval Muhammad Amin, Al-Saadoun Press, Baghdad. |
| Electronic references, Internet sites... | World Wide Web |

| **13.Course development plan** |
|---|
| Correcting the linguistic errors that occurred in the manual to be taught and trying to add a definition to some of the terms contained in the fascicle, especially since the Arabic language fascicle was prepared for non-specialists in the Arabic language, and this leads to making the prescribed vocabulary more accurate and clear. |

| 1. Educational institution | the university Technology Northern |
|---|---|
| 2. Academic department/center | Department of Electronic and Communication Technologies / Mosul Technical Institute |

| 3. Course name/code | control |
|---|---|
| 4. Available forms of attendance | theoretical + Practical |
| 5. Semester/year | courses |
| 6. Number of study hours (total) | 4 hours / week x decision =60 hours (theoretical And my work) |
| 7. Date this description was prepared | 7/1/2024 |

**1. Course Objectives**

• Understand the principles of electrical control in medical devices.

• Distinguish between open-circuit and closed-circuit control circuits.

• Examine control components of both open and closed-circuit types.

• Design and analyze control systems.

**10. Course Outcomes, Teaching, Learning and Evaluation Methods**

**A- Cognitive Objectives**

After completing the lesson (lecture) the student will be able to:

A1- Know the technology of automatic control systems.

A2- Distinguish between open-loop and closed-loop control systems.

A3- Know the types of industrial controllers.

A4- Evaluate the performance of the control system**.**

**B - Course specific skill objectives.**

B1- Knowledge of automatic control systems technology.

B2- Distinguishing between open-loop and closed-loop control systems.

B3- Knowledge of types of industrial controllers.

B4- Evaluation of the performance of the control system.

**Teaching and learning methods**

1- Theoretical lectures

-2 Scientific discussion in classrooms

-3 Small group method

-4 Conducting practical experiments in laboratories

-5 Study seminars and presentation of the latest scientific developments globally by students

6- Scientific films and other means of clarification

7- Methodological training

8- Summer training

**Evaluation Methods**

☐ Oral and written tests

☐ Midterm and final exams

☐ Practical reports

☐ Homework

☐ Daily assessment

**C- Emotional and value-based objectives**

C1- He has academic and technical information, experience and skill in the field of control circuits and control systems of various types.

C2- He can keep pace with the rapid development in the field of modern control devices

C3- He can manage, prepare and implement periodic programs for maintenance and continuity of control devices..

**Teaching and learning methods**

- Theoretical lectures
- Scientific discussion in classrooms
- Small group method
- Conducting practical experiments in laboratories
- Study seminars and presentation of the latest scientific developments globally by students
- Scientific films and other means of clarification
- Methodological training
- Summer training

**Evaluation Methods**

- Oral and written tests
- Midterm and final exams
- Practical reports
- Homework
- Daily assessment

**D- General and transferable skills (other skills related to employability and personal development).**

D1- Gaining the experiences that qualify them to deal with the necessities of life, including experience in the field of maintenance of control devices.

D2- Gaining the experiences that qualify them to deal with control circuits.

D3- Gaining the experiences in reverse engineering electronic maps for control devices.

D4- Gaining the skills necessary to identify and repair faults and maintain various control devices

| 12. structure The decision / Level the second | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required learning outcomes** | **Unit name/topic** | **Teaching method** | **Evaluation method** |
| the first | 2 | Distinguish between open-loop and closed-loop control system | Introduction and knowledge about control engineering, open circuit and closed circuit | Theoretical lectures, scientific discussions, screening of scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |
| the second | 2 | Knowing the components of the receiver and how it works | Industrial control of electric motors (receiver) | = | = |
| the third | 2 | Knowing what a relay is, its types, and how to connect it to motors to protect it | Use of relays in controlling motor operation | Theoretical lectures, scientific discussions, screening of | **Exams Daily Short Duties Home,** |

| | | | | scientific films, the latest developments and means of clarification | **Exams Quarterly And final** |
|---|---|---|---|---|---|
| Fourth | 2 | Knowing the structure of a single-phase motor and building the power circuit and control circuit for a single-phase and three-phase motor to achieve the motor start and stop | Control system for single and three phase motor | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |
| Fifth | 2 | Know the purpose of the block diagram and the theories used to simplify simple systems. | Transfer function - Block diagrams - Algebra and simplification | = | = |
| Sixth | 2 | Learn Mason's Rule and how to simplify a complex control system using Mason's Rule, | Signal Flow Graph, and Mason's Rule. | = | = |
| Seventh | 2 | The purpose of using the Laplace transform and how to use it | Math Review - Laplace Transform | = | = |
| eighth | 2 | Ability to convert sine and exponential functions to algebraic functions | Solving linear differential equations using Laplace's method | | |
| Ninth | 2 | Draw the s-plane by identifying the poles and zeros to determine the stability of the system | Identify the s-plane Identify the poles and zeros of s-plane control systems Determine the stability level | | |
| tenth | 2 | Distinguish between types of input signals (step function, slope function, and | Types of input signals | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | acceleration function) | | |
| eleventh | 2 | How to be able to classify control systems by type and rank of the system | Classification of control systems (type and rank of the system)) | Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification | **Exams Daily Short Duties Home, Exams Quarterly And final** |
| twelfth | 2 | Finding the steady-state error of a different input signal by finding the error coefficients | Steady-state error | = | = |
| thirteenth | 2 | Finding the transient response of the system by the denominator of the transfer function | Transient response of second-order systems | = | = |
| fourteenth | 2 | Analysis of the control system by finding the time specifications of the system (delay time, peak time, rise time, maximum overshoot, dwell time) | Time response of a second-order system - factors determining stability | = | = |
| fifteenth | 2 | Drawing a closed-loop control system using proportional, differential and integral controllers and knowing the operating principle of each controller. | Electronic controllers - their types - proportional, differential and integral. | | |

| 13. Structure Infrastructure | |
|---|---|
| The Control Book by Assistant Professor Diaa Mahdi Faris | 1- Books The reporter Required |

| | |
|---|---|
| Electrical control technology book233 | 2- the reviewer Home (Sources) |
| | A Books References that Recommended With it (Magazines Scientific , reports ,....) |
| Technical Institute website / Mosul | for - the reviewer Electronic, Sites The Internet .... |

| 14. Plan Curriculum Development |
|---|
| 6- Curriculum Development<br>7- Laboratories Development<br>8- Continuing Education Courses<br>9- Showing Scientific Films<br>10- Holding Scientific Visits<br>11- Organizing Study Groups |

| 1. Educational Institution | Northern Technical University/Mosul Technical Institute |
|---|---|
| 2. Academic Department/Center | Electronics and Communications Technologies |
| 3. Course Name/Code | Basic Electronic Circuits ETEC201/ |
| 4. Available Attendance Formats | Second-year students/Second course |
| 5. Semester/Year | First semester/2024 |
| 6. Number of Class Hours (Total) | 2 hours per week for 15 weeks (semester) |
| 7. Date this Description Was Prepared | January 9, 2024 |

- Course Objectives
- • Understand the operation of operational amplifiers.
- • Study operational amplifiers and their applications in various circuits.
- • Apply theoretical concepts in practical laboratory settings.
- • Develop problem-solving skills and use of simulation tools..

| 10 . Course Outcomes, Teaching and Learning Methods, and Assessment<br>Learning and Teaching Method: Discussion Method, Lecture Method<br>Assessment Method: Daily Exams, Midterm Exams, Final Exam |
|---|

A- Cognitive Objectives
• Understand the basic concepts of operational amplifiers.
• Distinguish between different types of amplifiers (such as inverting amplifiers and others) and identify their characteristics.
• Design and analyze various operational amplifier circuits using different laws.
• Explain how to perform mathematical operations using operational amplifiers.
• Design circuits that represent specific mathematical equations.
• Apply these circuits practically using simulation programs or in practice.
• Define the concept of an analog computer and its basic functions.
.

B - Course Skill Objectives.
B1 - Focuses on the practical and technical skills students acquire through applying theoretical concepts in laboratories, projects, and simulation programs.
B2 - Assemble and build electronic circuits in the laboratory.
B3 - Properly use electronic measuring devices such as the oscilloscope, multimeter, and function generator.
B4 - Simulate electronic circuits using Multisim to analyze performance before actual implementation.
B5 - Read and interpret laboratory experiment results and analyze the results.
B6 - Apply electrical safety measures while working in the laboratory.
B7 - Construct circuits that simulate mathematical operations (such as addition, subtraction, integration, etc.) in an analog computer using Op-Amps..

C- Affective and Value-Based Objectives
C1- Develop a sense of responsibility and adherence to laboratory regulations and instructions.
C2- Commitment to engineering work ethics, such as accuracy, honesty, and scientific integrity.
C3- Work effectively within a team while implementing group projects and experiments.
C4- Ensure the safety of electronic devices and components during use.
C5- Respect the views of others and share ideas positively during classroom and laboratory discussions.

D - General and transferable skills (other skills related to employability and personal development).
D1 - Ability to solve technical problems.
D2 - Logical reasoning to arrive at effective solutions.
D3 - Interpret results and analyze circuit performance.
D4 - Learn to write detailed technical reports.
D6 - Conduct laboratory experiments within teams.
D7 - Use simulation software in design and analysis.
D8 - Commitment to submitting reports and projects on time.
D9 - The student must be proficient in using simulation software tools.

| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
|---|---|---|---|---|---|
| First | 2 hours | Operational Amplifier | Operational Amplifier Applications | Discussion method, lecture method | Daily oral test |
| Second | 2 hours | Operational Amplifier | Operational Amplifier Construction and Specifications | Discussion method, lecture method | Daily oral test |
| Third | 2 hours | Operational Amplifier | Reflective/Mould Amplifier | Discussion method, lecture method | Daily oral test |
| Fourth | 2 hours | Operational Amplifier | Non-Reflective/Mould Amplifier | Discussion method, lecture method | Daily oral test |
| Fifth | 2 hours | Operational Amplifier | Reflective/Mould Collector | Discussion method, lecture method | Daily oral test |
| Sixth | 2 hours | Operational Amplifier | Non-reflective/non-moldable collector | Discussion method, lecture method | Daily oral test |
| Seventh | 2 hours | Operational Amplifier | Subtractor | Discussion method, lecture method | Daily oral test |
| Eighth | 2 hours | Operational Amplifier | (Comparator Analog) Comparison table between the subject and the comparator | Discussion method, lecture method | Daily oral test |
| Ninth | 2 hours | Operational Amplifier | Zero Crossing ) (Detector | Discussion method, lecture method | Daily oral test |
| Tenth | 2 hours | Operational Amplifier | Integrator | Discussion method, lecture method | Daily oral test |
| Eleventh | 2 hours | Operational Amplifier | Differentiator | Discussion method, lecture method | Daily oral test |
| Twelfth | 2 hours | Operational Amplifier | Nonlinear Uses of Operational Amplifiers Full Wave Rectifier- | Discussion method, lecture method | Daily oral test |
| Thirteenth | 2 hours | Operational Amplifier | | Discussion method, lecture method | Daily oral test |
| Fourteenth | 2 hours | Analog Computer | (Computer Analogue) | Discussion method, lecture method | Daily oral test |
| Fifteenth | 2 hours | Analog Computer | (Computer Analogue) | Discussion method, lecture method | Daily oral test |

## 11. Structure Infrastructure

| 1- Books The reporter Required | • الكتب المقررة: |
|---|---|
| | • |
| | **DESIGN WITH OPERATIONAL AMPLIFIERS AND ANALOG INTEGRATED CIRCUITS** |
| | **ELECTRONIC DEVICES AND CIRCUIT THEORY** |

| The week | Hours | Required learning outcomes | Unit name/topic | Teaching method | Evaluation method |
|---|---|---|---|---|---|
| First | 2 hours | Multivibrators by using Transistor | Transistor as Switch<br><br>Astable Multivibrators (A.M) | Discussion method, lecture method | Daily oral test |
| Second | 2 hours | Multivibrators by using Transistor | Monostable Multivbrator (M.M) | Discussion method, lecture method | Daily oral test |
| Third | 2 hours | Multivibrators by using Transistor | Bistable Multivbrator (B.M) | Discussion method, lecture method | Daily oral test |
| Fourth | 2 hours | 555 Integrated Circuit | integrated circuit 555 components | Discussion method, lecture method | Daily oral test |
| Fifth | 2 hours | Multivibrators by using 555 | Timer 555 As Monostable Multivibrator | Discussion method, lecture method | Daily oral test |
| Sixth | 2 hours | Multivibrators by using 555 | Timer 555 in Astable Multivibrator Mode | Discussion method, lecture method | Daily oral test |
| Seventh | 2 hours | Schmitt Trigger | How to Design a Schmitt Trigger | Discussion method, lecture method | Daily oral test |
| Eighth | 2 hours | Schmitt Oscillator | How to Design a Schmitt Oscillator | Discussion method, lecture method | Daily oral test |
| Ninth | 2 hours | Triangle Wave Generator | Assembling a Triangular Waveform Generator | Discussion method, lecture method | Daily oral test |
| Tenth | 2 hours | Oscillator Using an Operational Amplifier | Monostable Oscillator Using an Operational Amplifier | Discussion method, lecture method | Daily oral test |
| Eleventh | 2 hours | Active Filters | HPF Design | Discussion method, lecture method | Daily oral test |
| Twelfth | 2 hours | Active Filters | LPF Design | Discussion method, lecture method | Daily oral test |
| Thirteenth | 2 hours | feedback | Oscillators Feedback Definition and Types | Discussion method, lecture method | Daily oral test |
| Fourteenth | 2 hours | Oscillators | Designing Three Types of Oscillators | Discussion method, lecture method | Daily oral test |
| Fifteenth | 2 hours | Oscillators and silicon-controlled rectifiers | Designing Three Types of Oscillators Controlled Silicon Rectifier | Discussion method, lecture method | Daily oral test |
| □□□ Structure Infrastructure | | | | | |

| 1- Books The reporter Required | • الكتب المقررة: |
|---|---|
| | **Multivibrators Edited by Alexander Schure, Ph. D., Ed. D.** |

| | **Fundamentals of Electric Circuits"** by Charles K. Alexander and Matthew N. O. Sadiku<br><br>**Electronic Devices and Circuit Theory"** by Robert L. Boylestad and Louis Nashelsky |
|---|---|
| 2- the reviewer Home (Sources) | • Teacher's binder and the course instructor's YouTube channel |
| A Books References that Recommended With it        (Magazines Scientific , reports ,....) | |
| for - the reviewer Electronic,<br>    Sites The Internet .... | Internet |

| 12.Plan Curriculum Development |
|---|
| 1. Updating the course content to keep pace with recent developments in the field of electronics.<br>2. Linking theoretical concepts to industrial and real-life applications.<br>3. Updating examples and applications to include modern technologies.<br>4. Preparing advanced and additional content. |

| 1. Educational Institution | Northern Technical University/Mosul Technical Institute |
|---|---|
| 2. Academic Department/Center | Electronics and Communications Technologies |
| 3. Course Name/Code | Analog Communications/ETEC203 |
| 4. Available Attendance Formats | Second-year students/Second course |
| 5. Semester/Year | First semester/2024 |
| 6. Number of Class Hours (Total) | 2 hours per week for 15 weeks (semester) |
| 7. Date this Description Was Prepared | January 9, 2024 |

- Course Objectives
• It aims to provide students with the knowledge, understanding, and skills necessary to understand communication systems based on analog signals, both theoretically and practically, with a focus on modulation, transmission, and reception.

• Understand analog signals, classify them, and analyze their properties, such as time, frequency, amplitude, and phase.
• Study the concepts and techniques of amplitude modulation (AM), frequency modulation (FM), and phase modulation (Ph.M).
• Calculate the required bandwidth for each type of modulation.
• Provide students with practical skills and develop their ability to use devices such as oscilloscopes and frequency generators.
• Link theoretical knowledge to practical applications.
• Develop students' scientific thinking and research skills..

10 . Course Outcomes, Teaching and Learning Methods, and Assessment
Learning and Teaching Method: Discussion Method, Lecture Method
Assessment Method: Daily Exams, Midterm Exams, Final Exam

A- Cognitive Objectives
The Analog Communications course aims to provide students with a theoretical and analytical understanding of the fundamentals of communication systems that rely on analog signals, establishing a solid foundation for understanding modern communication systems. The cognitive objectives can be summarized as follows:
• Understand the basics of signals.
• Define and differentiate analog signals.
• Understand signal characteristics such as amplitude, frequency, phase, and frequency spectrum.
• Familiarize themselves with the concepts of modulation.
• Understand the need for modulation in communication systems.
• Learn the basic modulation techniques of amplitude modulation (AM), angle modulation (FM), frequency modulation (FM), and phase modulation (Ph.M).
• Analyze the frequency spectrum of modulated signals.
• Calculate bandwidth and power efficiency.
• Understand the signal-to-noise ratio (SNR) and its impact on communication quality.
• Understand the basic components of an analog communication system, as follows:
• Transmitters and receivers.
• Modulators and demodulators.
• Ability to solve problems related to analog communications..

B - Course Skill Objectives.
• B1 - Develop skills in practical application, technical analysis, and the use of devices and tools related to communications systems. These objectives aim to prepare students to apply theoretical concepts in a practical or laboratory setting.
• B2 - Build AM and FM circuits using electronic components and use measuring devices (signal generators and oscilloscopes) to test the performance of these circuits.
• B3 - Measure signal characteristics such as frequency, amplitude, and phase using an oscilloscope.
• B4 - Apply programs such as Multisim to simulate analog communications systems.
• B5 - Link theoretical aspects to practical applications.

C- Affective and Value-Based Objectives
• C1- Develop an interest in the field of communications
• C2- Demonstrate enthusiasm for learning analog communications concepts and applications.
• C3- Appreciate the role of analog communications in the development of technology and science.
• C4- Adhere to safety regulations and use equipment responsibly in the laboratory
• C5- Develop technical problem-solving skills using logical reasoning.

D - General and transferable skills (other skills related to employability and personal development).
D1- The ability to analyze problems related to signals.
D2- Planning and completing laboratory tasks within a specified time.
D3- Using simulation software (such as Multisim) to analyze signals.
C4- Preparing comprehensive and organized laboratory reports.