Ministry of Higher Education and Scientific Research

Scientific Supervision and Evaluation System

Department of Quality Assurance and Academic Accreditation

Accreditation Department

# Mathematics Department Academic Program and Course Description Guide

# Faculty of Education for Girls/Tikrit University

# 2025-2026


# Introduction:

The educational program is a coordinated and structured package of courses that include procedures and experiences that are organized in the form of a vocabulary of study whose main purpose is to build and refine the skills of graduates to make them qualified to meet the requirements of the labor market, which is reviewed and evaluated annually through internal or external audit procedures and programs such as the external examiner program.

The description of the academic program provides a brief summary of the main features of the program and its courses, indicating the skills that are being worked on to acquire students based on the objectives of the academic program, and the importance of this description is evident because it represents the cornerstone of obtaining program accreditation and is co-written by the teaching staff under the supervision of the scientific committees in the scientific departments.

This guide includes a description of the academic program after updating the vocabulary and paragraphs of the previous manuals in light of the

developments and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the description of the academic program circulated under the letter of the Department of Studies TE3/2906 on 3/5/2023 regarding the programs that adopt the Bologna track as the basis for their work.

In this regard, we can only stress the importance of writing descriptions of academic programs and courses to ensure the smooth functioning of the educational process.

## Concepts and Terms:

Academic Program Description: The academic program description provides a brief summary of its vision, mission, and goals, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: It provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether he or she has made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious vision of the future of the academic program to be a cutting-edge, inspiring, stimulating, realistic and viable program.

Program Mission: Briefly outlines the goals and activities needed to achieve them and outlines the program's development paths and directions.

Program Objectives: These are phrases that describe what the academic program intends to achieve over a specific period of time and are measurable and observable.

Curriculum Structure: All courses/subjects included in the academic program according to the approved learning system (semester, yearly, Bologna track), whether they are a requirement (ministry, university, college and scientific department) with the number of study units.

Learning Outcomes: A consistent set of knowledge, skills, and values that the student has acquired after the successful completion of the academic program and must define the learning outcomes of each course in a way that achieves the goals of the program.

Teaching and Learning Strategies: These are the strategies used by a faculty member to develop student teaching and learning, and they are plans that are followed to reach learning goals. That is, they describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

# Model Description

## Academic Program Description Form

**University Name: Tikrit University**

**College/ Institute: College of Education for Girls**

**Scientific Department : Department of Mathematics**

**Academic or Professional Program Name: Bachelor of Mathematics**

**Final Certificate Name : Bachelor of Mathematics**

**Curriculum : Annual**

**Description Preparation Date : 21/9/2025**

**File Date Filled : 21/9/2025**

**Signature:** **Signature:**

**Head of Department: Prof. Rana Bahgat Yassin** **Scientific Assistant Name: Prof. Dr. Ashraf Jamal Mahmoud**

**Date:** 21/9/2025 **Date:** 21/9/2025

**File Verified by:**

**Division of Quality Assurance and University Performance**

**Name of Director of the Division of Quality Assurance and University Performance: Eng. Shahd Khaled Hamid**

**Date:** 21/9/2025

**Signature :**

**Endorsed by the Dean**

**Prof. Dr. Najla Abdulhussain Aliwi**

21 , 9 - 2025

## 1. Program Vision

The Department of Mathematics aspires to be one of the most important departments of mathematics at the educational and research level in Iraq and the Arab world in the coming years.

## 2. Program Mission

Providing distinguished mathematics programs that serve education and scientific research, help to possess their skills, and create a sound scientific environment that encourages creativity and cooperation between students and faculty members, and shows the beauty and splendor of mathematics and its applications in various sciences and community service.

## 3. Program Objectives

Based on the vision, mission and general objectives of Tikrit University. The Department of Mathematics at the College of Education for Girls seeks to achieve a set of goals, including:

- Providing high-quality educational programs that meet international standards and cover the needs of the community.
- Students gain knowledge and provide them with the practical skills necessary to enable them to use modern technology.
- Ensure the achievement of learning outcomes for the programs provided through assessment and follow-up programs.
- Deepening concepts and raising the scientific level of faculty members by organizing scientific seminars and conferences to deepen concepts and raise their efficiency.
- Exchanging experiences and conducting research papers by signing scientific agreements with corresponding institutions at the local and international levels.

| 4. Program Accreditation |
|---|
| None , but the department plans to obtain programmatic accreditation at the national level |

| 5. Other External Influences |
|---|
| One of the most prominent external influences is the difficulty of obtaining job opportunities in the community |

| 6. Program Structure | | | | |
|---|---|---|---|---|
| **Reviews** | **Percentage** | **Study Unit** | **Number of Courses** | **Program Structure** |
| **Essential** | | 162 | 36 | Enterprise Requirements |
| | | | There isn't any | College Requirements |
| | | | There isn't any | Department Requirements |
| | | | There isn't any | |
| | | | There is a field training in secondary schools | Other |

***** Notes may include whether the course is basic or elective.

| 7 . Program Description | | | | |
|---|---|---|---|---|
| **Credit Hours** | | **Course or course name** | **Course or course code** | **Year/Level** |
| **practical** | **theoretical** | | | **2025-2026 / First** |
| 2 | 3 | Calculus | | The first |

| | | | | |
|---|---|---|---|---|
| 2 | 2 | Foundations of Mathematics | | The first |
| 2 | 2 | Linear algebra | | The first |
| 2 | | Computers | | The first |
| | 2 | General Physics | | The first |
| | 2 | Educational Psychology | | The first |
| | 2 | Fundamentals of Education | | The first |
| | 1 | Arabic Language | | The first |
| | 1 | Human Rights and Democracy | | The first |
| | 1 | English | | The first |
| | | | | **2025-2026 / Second** |
| 2 | 3 | Advanced Calculus | | Second |
| 2 | 2 | Normal differential equations | | Second |
| 1 | 2 | Al-Zumar | Math.201 | Second |
| 1 | 2 | Engineering | | Second |
| | 1 | Teaching thinking | | Second |
| **2** | | Advanced Computing | | Second |
| | 1 | English | | Second |
| | 1 | Arabic Language | | Second |
| | 1 | Crimes of the Baath regime | | Second |
| 1 | 2 | Curriculum and Textbooks | | Second |
| | 2 | Educational Leadership and Management | | Second |
| | | | | **2025-2026 / III** |
| 2 | 2 | Mathematical analysis | | Third |
| 2 | 2 | Statistics and Probability | | Third |
| 2 | 2 | Partial differential equations | | Third |
| 2 | 2 | Algebra Episodes | Math.303 | Third |
| 2 | 2 | Numerical analysis | | Third |
| | 2 | Teaching Methods | | Third |
| | 2 | Educational guidance | | Third |
| | 1 | English | | Third |
| | | | | **2025-2026 / IV** |
| 2 | 2 | Topology | | Fourth |
| 2 | 2 | Nodal analysis | | Fourth |

| | | | | |
|---|---|---|---|---|
| 2 | 2 | Sports Statistics | | Fourth |
| 2 | 2 | Blurry topology | | Fourth |
| | 2 | Graduation Research | | Fourth |
| | 2 | Measurement and Evaluation | | Fourth |
| 2 | 1 | Practical teaching | | Fourth |
| 2 | 2 | Data Theory | | Fourth |
| | 1 | English | | Fourth |

## Professional Development

### Mentoring new faculty members

1. Working with expert professors
2. Participation in Workshops
3. Assignment of seminars.

### Faculty Professional Development

1. Introducing them into development courses.
2. Participation in seminars .
3. Participation in the committees for the discussion of theses and theses .
4. Participating in writing books and conducting scientific research .

## 12. Acceptance Standard

First, Admission Requirements for the College:
1- Approval of the admission conditions for students in accordance with the regulations of the Ministry of Higher Education and Scientific Research (Central Admission)
2. Successfully pass any special test or personal interview deemed by the College or University Council.
3- The applicant must be medically fit for the specialization to which he is applying.

Second: Admission Requirements for the Scientific Department:

1. - Choosing the student's desire from more than one wish, arranged according to preference.
2. - Admission to high school. 3-
3. - The average of the course of the department in which the student wishes to study
4. - The capacity of the scientific department.

## 13. The most important sources of information about the program

1. The department's website within the website of the College of Education for Girls ( link .....)
2. Administrative orders for the staff, goals, vision and mission .
3. Directions of the Sectoral Committee for Symmetrical Sections.
4. Recommendations of the Scientific Committee in the Department.

## 14. Program Development Plan

1. Review the goals, vision, and decisions according to the needs of the community.
2. View the programs of the corresponding departments .
3. Review the programs of the mathematics departments in the Arab and regional countries .

| 8. Expected Learning Outcomes of the Program | |
|---|---|
| **Knowledge** | |
| Learning Outcomes Statement 1 | To provide students with basic facts and concepts in modern mathematics and to develop their abilities to apply mathematical theories, laws, principles, rules and facts. |
| **Skills** | |
| Learning Outcomes Statement 2 | Develop problem-solving skills and various mathematical problems in mathematical topics |
| Learning Outcomes Statement 3 | Developing academic and social skills. |
| **Values** | |
| Learning Outcomes Statement 4 | Developing scientific values in objectivity and scientific honesty and employing the scientific method. |
| Learning Outcomes Statement 5 | Learning Outcomes 5 |

**9. Teaching and Learning Strategies**

1. Giving lectures and using methodological books.
2. Solving mathematical problems using the brainstorming method.
3. Self-learning strategies.

4. Writing scientific reports and data analysis.
5. Employing e-learning and blended learning.
6. Using the method of discussion and seminar.
7. Employing active learning methods.
8. Assignments and homework.
9. Employing collaborative learning and peer tutoring methods.

## 10. Evaluation Methods

1. Conducting daily, weekly, monthly and year-end exams.
2. Correcting homework assignments and granting grades.

## 11. Faculty

### Faculty Members

| Preparing the teaching staff | | Requirements/skills (if applicable) | Specialization | | Academic Rank |
|---|---|---|---|---|---|
| lecturer | angel | | special | year | |
| | √ | | Tablogue | mathematics | Prof. Dr. Rana Bahgat Yassin |
| | √ | | Numerical analysis | mathematics | Assoc. Prof. Dr. Mohamed Abdel Muhaimeed |
| | √ | | Applied Mathematics | mathematics | Assoc. Prof. Dr. Amer Fadel Nassar |
| | √ | | Daly Analysis | mathematics | Prof. Elaph Sabah Abdel Wahid |
| | √ | | Solid physics | physics | Assoc. Prof. Dr. Sarwa Abdel Qader Mohamed Saleh |
| | √ | | Tablogue | mathematics | Assoc. Prof. Heba Omar Moussa |
| | √ | | Methods of Teaching Mathematics | mathematics | Assoc. Prof. Dr. Sundus Nouri Shukr |
| | √ | | Time Chains | mathematics | Assoc. Prof. Dr. Heba Hani Abdullah |
| | √ | | Tablogue | mathematics | Assoc. Prof. Dr. Zeina Taha Abdulqader |
| | √ | | Networks and communications | computer | Assoc. Prof. . Mohamed Moayyad Sultan |
| | √ | | coercion | mathematics | Lecturer . Nada Jassim Mohammed |
| | √ | | computer | computer | Lecturer . Kholoud Gamal Mouloud |
| | √ | | Statistics | mathematics | Lecturer . Asma Saleh Kadouri |
| | √ | | Artificial Intelligence | computer | Lecturer . fadya Abdul Fattah Habeeb |
| | √ | | Statistics | mathematics | Assist.Lect . Raghad Wamid Fares |
| | √ | | physics | physics | Assist.Lect . Faten Haitham Mouloud Mohamed |
| | √ | | Differential equations | mathematics | Assist.Lect . Estabraq Ismail Fadel Abbas |
| | √ | | Statement Theory | mathematics | Assist.Lect . Aseel Alaa Awad |

| Program Skills Outline | | | | | | |
|---|---|---|---|---|---|---|
| Learning Outcomes Required from the Program | | | | | | |
| Values | Skills | Knowledge | Basic or | Course Name | Course Code | Year/Level |

| | | | | | | | | | | | | optional | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C4 | C3 | C2 | A1 | B4 | B3 | B2 | B1 | A4 | A3 | A2 | A1 | | | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Calculus | | 2025-2026<br>First |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Foundations of Mathematics | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Linear algebra | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Computers | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | General Physics | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Educational Psychology | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Fundamentals of Education | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Arabic Language | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Human Rights and Democracy | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | English | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Advanced Calculus | | 2025-2026<br>Second |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Normal differential equations | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Al-Zumar | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Engineering | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Teaching thinking | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Advanced Computing | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | English | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Arabic Language | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Crimes of the Baath regime | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Curriculum and Textbooks | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Educational Leadership and Management | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Mathematical analysis | | 2025-2026<br>Third |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Statistics and Probability | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Partial differential equations | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Algebra Episodes | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Numerical analysis | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Teaching Methods | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Educational guidance | | |
| | | | | | | | | | | | | | English | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Topology | | 2025-2026<br>Fourth |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Nodal analysis | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Sports Statistics | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Blurry topology | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Graduation Research | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Measurement and Evaluation | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Practical teaching | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Data Theory | | |

*Please indicate the boxes corresponding to the individual learning outcomes from the program being assessed.

# Course Description Form

1. Course Name: fuzzy mathematics / fourth year

2. Course Code: ----------

3. Semester / Year: 2025-2026

4. Description Preparation Date: 21/9/2025

5. Available Attendance Forms: Class lectures

6. Number of Credit Hours (Total) / Number of Units (Total): 90 hours / 12 Units

7. Course administrator's name (mention all, if more than one name)

Name: Asst. Prof. Hiba Omar Mousa
hiba_34@tu.edu.iq

8. Course Objectives

| | |
|---|---|
| The course develops and refines students' information about the meaning of fuzzy mathematics and fuzzy theory | **Course Objectives**<br>…..<br>….. |

9. Teaching and Learning Strategies

| | |
|---|---|
| • The standard method (giving lectures).<br>• The text method.<br>• Brainstorming method.<br>• Some modern strategies. | **Strategy** |

10. Course Structure

| Evaluation method | Learning method | Unit or subject name | Required Lea Outcomes | Hours | Week |
|---|---|---|---|---|---|
| Class performance and exams | Standard method | Identify the main idea of a specific information about the fuzzy mathematics | | 2 | October |

| | | | | | |
|---|---|---|---|---|---|
| Class performance and exams | Standard method & Brainstorming method | The difference between the fuzzy mathematics and the normal math. | | 2 | November |
| Class performance and exams | Standard method& text method | Definitions of the fuzzy sets and the fuzzy numbers | | 2 | December |
| Class performance and exams | Standard method& text method | The Algebra of fuzzy sets | | 2 | January |
| Class performance and exams | Standard method& text method | Fuzzy relations | | 2 | February |
| Class performance and exams | Standard method | The stets of pieces at alpha level | | 2 | April |
| Class performance and exams | Standard method | Fuzzy symbol | | 2 | March |
| ---------- | ---------- | Final Exams | | ------- | May 3&4 |

11. Learning Outcomes

**Cognitive objectives of Advanced Listening and speaking subject:**

A1-Remembering: At the level of remembering, the student must:

1- The student knowing the fuzzy sets and the difference between them and between the normal stets

2- Recall the ideas used of the fuzzy math

3- He has knowledge of the fuzzy theory

A2-Understanding: The student must

1- Organize ideas within each sets

2- Elicits the uses of the form of fuzzy sets and fuzzy numbers

3- Gives various ideas within the topic of each form

4- Explain the use of the fuzzy rules mentioned within each sets

A3- Application: The student must:

1- Applies the sections, union and the analog differences

2- Produces multiple ideas within each units

3- Prepare various ideas and rules in each unit

A4-Analysis: The student must...

1- Distinguishes the use of the fuzzy math.

2- knowing the types of fuzzy relationships

3- It details the expressions that used in fuzzy math.

4- Recognizes the importance of fuzzy theory in knowing the fuzzy relationships

5- solution of theorems and problems

6- knowing the types of sets and give examples and theorems.

## 12. Course Evaluation

First Course:

Monthly Exam: 20

Daily homework: 5

Total: 25

Second Course:

Monthly Exam: 20

Daily homework: 5

Total: 25

Total for the 1st and 2nd Courses: 50

Final Exam: 50

Final Grade: 100

## 13. Learning and Teaching Sources

| | |
|---|---|
| Yuan, B. " Fuzzy sets and Fuzzy Logic" | Required textbooks |

| | |
|---|---|
| Materials to be determined by course instructors | Main references (sources) |
| Encyclopedia of scientific books and journals | Recommended books and references (scientific journal, reports |
| Electronic lectures | Electronic References, Websites |

# Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| Graph theory | |
| 2. Course Code: | |
| | |
| 3. Semester / Year: | |
| 2025-2026 | |
| 4. Description Preparation Date: | |
| 2025-9-21 | |
| 5. Available Attendance Forms: | |
| Official working hours | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 60 | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Aseel Alaa Awad<br>Email: aseel.awad@tu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | To identify the fundamental concepts of Graph Theory.<br>•To distinguish between different types of graphs.<br>•To understand the concepts of path, walk, cycle, and tree.<br>•To comprehend theoretically and apply practically the concepts of graph coloring at its various levels (vertex coloring, edge coloring, and surface coloring).<br>•To recognize some graph polynomials such as Hosoya and Schultz polynomials and learn how to compute them. |
| 9. Teaching and Learning Strategies | |

| | |
|---|---|
| **Strategy** | -Conducting daily and weekly continuous assessments.<br>•Implementing in-class exercises and activities.<br>•Guiding students to specific references that include examples and exercises for further practice.<br>•Managing the lecture in an applied manner connected to real-life situations to engage students with the subject while maintaining focus on its core concepts, ensuring that the content is flexible and easy to understand and analyze.<br>•Assigning students group activities and collaborative tasks.<br>•Allocating a portion of the total grade to daily assignments and tests. |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **First** | **4** | **Graph, subgraph, simple and multiple graphs, order and size.** | **Basic Concepts of Graphs** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Second** | **4** | **Directed and undirected graphs.** | **Basic Concepts of Graphs** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Third** | **4** | **Concepts of adjacent vertex and degree of vertex with examples.** | **Adjacent Vertex and Degree of Vertex** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Fourth** | **4** | **Some of its applications.** | **The First Theorem of Graph** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |

| | | | | | |
|---|---|---|---|---|---|
| **Fifth** | **4** | **Some applications and theorems related to vertex degrees.** | **Degree Sequences** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Sixth** | **4** | **Intersection of graphs and complement of a graph.** | **Operations on Graphs** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Seventh** | **4** | **Product and composition of graphs.** | **Operations on Graphs** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Eighth** | **4** | **Definitions, theorems, and examples.** | **Connected, Disconnected, Complete, and Regular Graphs** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Ninth** | **4** | **Definitions, theorems, and examples.** | **Cycle, Wheel, and Star Graphs** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Tenth** | **4** | **Definitions, theorems, and examples.** | **Bipartite and Complete Bipartite Graphs** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Eleventh** | **4** | **Definition of path, open and closed walk, and trail.** | **Path** | **Electronic lectures, lecture** | **Discussion and exams** |

| | | | | | |
|---|---|---|---|---|---|
| | | | | **method, smart board and pen** | |
| **Twelfth** | **4** | **Important matrices: adjacency matrix and incidence matrix.** | **Matrices** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Thirteenth** | **4** | **Some theorems and applications of trees.** | **Trees** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Fourteenth** | **4** | **Definitions and basic properties.** | **Eulerian and Hamiltonian Graphs** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |
| **Fifteenth** | **4** | **Graph polynomials and methods of computation.** | **Hosoya and Schultz Polynomials** | **Electronic lectures, lecture method, smart board and pen** | **Discussion and exams** |

# 11. Course evaluation

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

# 12. Learning and teaching resources

| | |
|---|---|
| Required textbooks (methodology, if any) | Graph Theory by H. K. Taluja and D. Bhardwaj2016 |
| Main references (sources)<br>Recommended supporting books and references (scientific journals, reports... | Harary, Frank (2010), Graph Theory, Reading, MA: Addison-Wesley. |
| Electronic references, Internet sites | Discreet websites.<br>Virtual library.<br>Library locations in some international universities. |

# Course Description Form

| |
|---|
| 1. Course Name: |
| Mathematical Statistics |
| 2. Course Code: |
| |
| 3. Semester / Year: |
| 2025 - 2026 |
| 4. Description Preparation Date: |
| 21- 9- 2025 |
| 5. Available Attendance Forms: |
| Classroom and Google classroom |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| (120 hour per year) / Number of Units (6 units) |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: LEC .Asmaa Salih Qaddoori<br>Email: asmaa. salih@tu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives**<br>• Mathematical statistics is considered one of the main topics in any mathematics program. The student usually studies the subject after studying the concept of the random variable, probability functions, and the properties of some statistical distributions, as the subject of mathematical statistics includes learning about the concept of transformations and the concept of estimates and their methods, in addition to: testing statistical hypotheses.<br>• Emphasis on the study of inferring distributions using transformations<br>• Identify the concept of estimation and its types<br>• Identify estimation methods and the characteristics of a good appraiser<br>• Be careful to introduce the concept of statistical hypothesis | • .....<br>• .....<br>• .....<br>• |

| 9. Teaching and Learning Strategies | |
|---|---|
| **Strategy** | •<br>• Use explanation and clarification to present concepts.<br>• Interact with students through discussions and practical exercises.<br>• Use real-life examples and applications to illustrate mathematical ideas |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1 | 4 | Learn how to use the moment generating function to extract statistical distributions. | Using the moment generating function to extract statistical distributions for the discrete random variable and the continuous random variable | Dying and discussion | Daily and monthly testing and homework |
| 2 | 4 | Learn how to use transformations to derive statistical distributions for a discrete random variable. | The concept of transformations and their use in deriving random distributions. | = | = |
| 3 | 4 | Learn how to use transformations to derive statistical distributions for a continuous random variable. | The concept of the conversion factor and how to use it in deducing random distributions for a continuous random variable | = | = |
| 4 | 4 | Exercises and discussion. | Solve some different exercises, monthly exam | = | = |
| 5 | 4 | Identify some distributions derived from other probability distributions. | Defining the t-Student distribution and how to extract its probability function and some of its probabilistic properties | = | = |
| 6 | 4 | Introducing the student to the F distribution and the Chi-square distribution.. | The probability function of the F distribution and the Chi-square distribution, how to derive them, and their probabilistic properties | = | = |
| 7 | 4 | Solve some different exercises. | General questions and group assignments, monthly exam | = | = |
| 8 | 4 | What is the concept of estimation and random interval? | Explaining the concept of estimation and random interval and learning how to estimate with a period | = | = |

| | | | | | |
|---|---|---|---|---|---|
| 9 | 4 | Introducing the student to grading by one point. | Explain the concept of a confidence interval for a normal population mean | = | = |
| 10 | 4 | Introducing the student to the concept of variation. | Explain the concept of confidence interval for the variance of a normal population | = | = |
| 11 | 4 | To understand the concept of the difference between averages. | Find the confidence interval between the means | = | = |
| 12 | 4 | Solve some different exercises. | Exercises, discussion, and monthly exam | = | = |
| 13 | 4 | Introducing the student to grading methods. | Maximum likelihood method, least variance method, and least squares method | = | = |
| 14 | 4 | Introducing the student to the characteristics of a good appraiser. | Definition of the concept of consistency and the concept of impartiality and some examples of them. | = | = |
| 15 | 4 | Introducing the student to the concept of competence and efficiency | Identify the efficient guesser with adequate statistics and the unbiased guesser with less variance. | = | = |
| 16 | 4 | Explaining the analysis theorem and its applications. . | Learn about the concept of the analysis theorem and how to use it to extract a sufficient estimate. | = | = |
| 17 | 4 | Recognize the text of the theorem Ro-Black Well. | Presentation of the theorem and some of its applications | = | = |
| 18 | 4 | Solve some different exercises. | General questions and group assignments. | = | = |
| 19 | 4 | . The characteristic of perfection with some examples and solutions to various exercises. | Discussion and monthly exam. | = | = |
| 20 | 4 | Learn about the concept of the exponential family | Introducing the student to the concept of the exponential family and identifying the members of the exponential function | = | = |

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|---|---|---|---|---|---|
| 21 | 4 | Solve some different exercises | General exercises and group assignments | = | = |
| 22 | 4 | The concept of statistical hypothesis. | Defining the statistical hypothesis and distinguishing between the simple statistical hypothesis and the complex statistical hypothesis. | = | = |
| 23 | 4 | Introducing the student to the types of statistical hypotheses. | Definition of the null statistical hypothesis and the alternative statistical hypothesis. | = | = |
| 24 | 4 | Identify random error and its types. | Knowing random errors, their types, and how to distinguish between them. | = | = |
| 25 | 4 | Solve some different exercises. | Discussion and monthly exam. | = | = |
| 26 | 4 | Explain the concept of the critical Rigen. | . Definition of the critical region, test power, and characteristic function. | = | = |
| 27 | 4 | How to choose the best critical point | Introducing the student to the best area for testing and the best critical Rigen. | = | = |
| 28 | 4 | Various exercises on the topic. | Discussion and monthly exam | = | = |
| 29 | 4 | Define more robust tests regularly | Explain the Neyman-Pierson theorem and illustrate the concept of systematically more robust tests. | = | = |
| 30 | 4 | Solve some different exercises | General questions and group assignments | = | = |

## 11 . Course evaluation

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

- Daily preparation.
- Daily exams.
- Oral and monthly tests.
- Written tests.
- Preparing reports and research projects.
- Quarterly activities and participation in discussions.

| | |
|---|---|
| • Student performance in class and interaction with study materials | |
| 12 . Learning and teaching resources | |
| Required textbooks (methodology, if any) | • Mathematical statistics, Amir Hanna Hormuz, 1990 |
| Main references (sources) | Introduction to mathematical statistic, Robert V Hogg Allen Craig , Joseph W McKean 2005<br>• . Mathematical Statistics Amir Hanna Hormuz 1990 |
| Recommended supporting books and references (scientific journals, reports...) | Introduction to mathematical statistics Robert V Hogg Allen Craig Joseph W McKean 2005 |
| Electronic references, Internet sites | University websites that provide educational materials in statistics and probability<br>• Scientific articles and research available online in the field of statistics and probability. |

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| 11. Course Evaluation |
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| 12. Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | |

# Course Description Form

| |
|---|
| 1. Course Name: |
| Statistics and Probability |
| 2. Course Code: |
| Math . |
| 3. Semester / Year: |
| 2025- 2026 |
| 4. Description Preparation Date: |
| 21- 9- 2025 |
| 5. Available Attendance Forms: |
| Classroom and Google classroom |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| (120 hour per year) / Number of Units (6 units) |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: LEC .Asmaa Salih Qaddoori<br>Email: asmaa. salih@tu.edu.iq |
| 8. Course Objectives ..... ..... |

| | |
|---|---|
| **Course Objectives** | • ..... |
| • Learn about the concept of statistics and the most important statistical measures<br>• Study random variables and learn about their types and probability functions.<br>• Learn about the first principles of probability and random experimentation.<br>• Identify the functions that generate moments.<br>• Be careful to introduce the most important statistical distributions and know the properties of each distribution. | • |
| | • |

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| 9. Teaching and Learning Strategies |

| | |
|---|---|
| **Strategy** | • Use explanation and clarification to present concepts.<br>• Interact with students through discussions and practical exercises.<br>• Use real-life examples and applications to illustrate mathematical ideas. |

| |
|---|
| 10. Course Structure |

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1 | 4 | Definition of the principles of statistics | The concept of descriptive statistics, statistical population, the concept of sample and its types | Dying and discussion | Daily and monthly testing and homework |
| 2 | 4 | Define measures of central tendency | Definition of the arithmetic mean, median, and mode for classified and non-classified data | = | = |
| 3 | 4 | Measures of dispersion | Variance, standard deviation, range measures, and coefficient of variation | = | = |
| 4 | 4 | Definition of correlation and linear regression | Correlation coefficient and simple linear regression equation | = | = |
| 5 | 4 | Exercises and discussion | Solve some different exercises | = | = |
| 6 | 4 | Definition of probability and random experiment | The most important laws of probability, the axioms of probability, and the most important theorems of probability | = | = |
| 7 | 4 | Learn about the most important counting methods | The concept of combinations and permutations | = | = |
| 8 | 4 | Solve some different exercises | General questions and group assignments | = | = |
| 9 | 4 | The concept of random sampling | Discussion, monthly exam | = | = |
| 10 | 4 | Introducing the student to the concept of field and probability space | Identify independent, dependent, and mutually exclusive incidents | = | = |
| 11 | 4 | To understand the concept of conditional probability | Conditional probability and some of its theorems | = | = |

| | | | | | |
|---|---|---|---|---|---|
| 12 | 4 | Learn about Bayes' theorem | Bayes' theorem and its most important probabilistic applications | = | = |
| 13 | 4 | Solve some different exercises | Exercises and discussion | = | = |
| 14 | 4 | The concept of random variable and its types | The student knows the concept of discrete random variables and continuous random variables and their respective probability functions | = | = |
| 15 | 4 | Introduce the student to the concept of the distributive function. | The distribution function in the case of a discrete random variable and in the case of a continuous random variable | = | = |
| 16 | 4 | The concept of mathematical expectation and variance | Discussion and monthly exam | = | = |
| 17 | 4 | For the student to become familiar with the concept of the function generating moments | Derivation of the moment generating function for the discrete random variable and the continuous random variable | = | = |
| 18 | 4 | Solve some different exercises | General questions and group assignments | = | = |
| 19 | 4 | Identify the probability distribution of two random variables. | The joint probability function for discrete random variables and continuous random variables | = | = |
| 20 | 4 | Conditional function and conditional probability | The conditional probability of two random variables | = | = |
| 21 | 4 | The concept of expectation for two random variables. | The mathematical expectation of two random variables if the variables are discrete and if the variables are continuous | = | = |
| 22 | 4 | Solve some different exercises. | General questions and group assignments | = | = |
| 23 | 4 | Introducing the student to the function that generates the moments of two random variables. | The function generating the moments of two random variables, whether the variables are discrete or continuous | = | = |

| | | | | | |
|---|---|---|---|---|---|
| 24 | 4 | Solve some different exercises. | Discussion and monthly exam | = | = |
| 25 | 4 | Introducing the student to some statistical distributions. | Uniform distribution of discrete and continuous random variables | = | = |
| 26 | 4 | Solve some different exercises. | Exercises and discussion | = | = |
| 27 | 4 | Familiarize the student with the binomial distribution function. | The probability function of the binomial distribution and its probability properties | = | = |
| 28 | 4 | Introducing the student to the gamma | distribution. Probability function of gamma distribution and chi-square distribution | = | = |
| 29 | 4 | Familiarize the student with the normal distribution. | The probability function of the normal distribution, the exponential distribution, and the Poisson distribution | = | = |
| 30 | 4 | Solve some different exercises. | General questions, group assignments, and a monthly exam | = | = |

## 11 . Course evaluation

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

- Daily preparation.
- Daily exams.
- Oral and monthly tests.
- Written tests.
- Preparing reports and research projects.
- Quarterly activities and participation in discussions.
- Student performance in class and interaction with study materials

## 12 . Learning and teaching resources

| | |
|---|---|
| Required textbooks (methodology, if any) | • Mathematical statistics, Amir Hanna Hormuz, 1990 |
| Main references (sources) | • Introduction mathematical statistics 1980 G.P. Beaumont<br>• . Mathematical Statistics Amir Hanna Hormuz 1990 |
| Recommended supporting books and references (scientific journals, reports...) | Introduction mathematical statistics G.P. Beaumont 1980 |
| Electronic references, Internet sites | University websites that provide educational materials in statistics and probability<br>• Scientific articles and research available online in the field of statistics and probability. |

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| 11. Course Evaluation |
|---|
| |

| 12. Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | |

# Course Description Form

| |
|---|
| 1. Course Name: |
| Ring Theory |
| 2. Course Code: |
| Math.303 |
| 3. Semester / Year: |
| Year 2025-2026 |
| 4. Description Preparation Date: |
| **21/9/2025** |
| 5. Available Attendance Forms: |
| Classroom and Google classroom |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 120 / 6 units |
| 7. Course administrator's name (mention all, if more than one name) |
| **Name: Nada Jasim Mohammed**<br>.....<br>**Email: naya11415@tu.edu.iq** .....<br>..... |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | • On completion of this course; the student will be abl understand fundamentals<br>• concepts of Sequences series then study the convergence.<br>• Also, study the Rim and Lubuge Integral<br>• •Identify the concept of Ring,Modulo,Representation, its types applications |

| |
|---|
| 9. Teaching and Learning Strategies |

| Strategy | -We use examples and explain writing on board and so use discuses for more understand. So we give homeworks and discuses it.<br>- Brainstorming -Feedback at lecture time -Collaboration and feedback series |
|---|---|

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1. | 4 | -Student's ability to distinguish and understand cognitively to diagnose special theories and principles. -Practice different styles of mathematics proofs. -Prossessing thinking skills | Definitions of Ring, commutative ring and ring with identity. | | Discussion, exercises and exam |
| 2. | 4 | = | Divisors of zero,Integraldomain | | Discussion, exercises and exam |
| 3. | 4 | = | Subring,Field,Field of divisors | | Discussion, exercises and exam |
| 4. | 4 | = | Ideals,Trivial and proper,Intersection | | Discussion, exercises and exam |
| 5. | 4 | = | The center and characteristic of ring | | Discussion, exercises and exam |
| 6. | 4 | = | The principal ideal | | Discussion, exercises and exam |
| 7. | 4 | = | The smallest ideal, The principal ideal ring | | Discussion, exercises and exam |
| 8. | 4 | = | The maximal ideal - Zorn's lemma | | Discussion, exercises and exam |
| 9. | 4 | = | Cosets, Quotient ring | | Discussion, exercises and exam |
| 10. | 4 | = | The prime ideal and example | | Discussion, exercises and exam |
| 11. | 4 | = | The principal ideal domain | | Discussion, exercises and exam |
| 12. | 4 | = | The idempotent element, Boolean ring | | Discussion, exercises and exam |
| 13. | 4 | = | Nilpotent element, Primary ideal | | Discussion, exercises and exam |

| | | | | | |
|---|---|---|---|---|---|
| 14. | 4 | = | Ring homomorphism | | Discussion, exercises and exam |
| 15. | 4 | = | Theorems of the ring homomorphism, Kernel of homomorphism | | Discussion, exercises and exam |
| 16. | 4 | = | Theorems of kernel of homomorphism, Image and types of homomorphism | | Discussion, exercises and exam |
| 17. | 4 | = | The Natural mapping, Isomorphism and the 1st fundamental theorem | | Discussion, exercises and exam |
| 18. | 4 | = | The 2nd and 3rd fundamental theorem of Isomorphism | | Discussion, exercises and exam |
| 19. | 4 | = | The division ring (Skew field) | | Discussion, exercises and exam |
| 20. | 4 | = | Radical ideal | | Discussion, exercises and exam |
| 21. | 4 | = | Nil -radical ring | | Discussion, exercises and exam |
| 22. | 4 | = | Polynomials, Sum, Product, types of Polynomials | | Discussion, exercises and exam |
| 23. | 4 | = | Polynomials ring | | Discussion, exercises and exam |
| 24. | 4 | = | Polynomials field, Division algorithm | | Discussion, exercises and exam |
| 25. | 4 | = | Remainder and Factorization theorems, roots of polynomails | | Discussion, exercises and exam |
| 26. | 4 | = | Reducible& irreducible Polynomials | | Discussion, exercises and exam |
| 27. | 4 | = | Modules and submodules | | Discussion, exercises and exam |
| 28. | 4 | = | Modules homomorphism | | Discussion, exercises and exam |
| 29. | 4 | = | Representation, some types | | Discussion, exercises and exam |
| 30. | 4 | = | Examples | | Discussion, exercises and exam |

| | | | | | |
|---|---|---|---|---|---|
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## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc 50 + 50 final

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | Scientific articles and research available online in the field of statistics and probability • |
| Recommended books and references (scientific journals, reports...) | Introduction to modern abstract Algebra - by :Dvaid M. Burton |
| Electronic References, Websites | |

## Course Description Form

| |
|---|
| **1. Course Name** : |
| Nodal analysis |
| **2. Course Code:** |
| |
| **3. Semester/Year :** |
| 2026-2025 |
| **4. Date this description is prepared** |
| 21/9/2025 |
| **5. Available Forms of Attendance:** |
| Physical Classroom Attendance / Distance Learning |
| **6. Number of study hours (total) / number of units (total)** |
| 120 Hours / 6 Units |
| **7. Name of the course administrator (if more than one name mentions)** |
| Name: A.Assoc. Prof. Dr. Mohamed Abdel Muhaimeed Email : **mohammad.sabawi@tu.edu.iq** |
| **8. Course Objectives** |

| | |
|---|---|
| • The student should be familiar with the functions of the solution and the related determination, continuity and derivation.<br>• - Recognize the Cauchy-Riemann equations and their sufficient conditions and the compatibility functions.<br>• - The student should be familiar with the first functions: exponential functions, logarithms, | Course Objectives |

| | |
|---|---|
| triangley, hyperbolic triangle, and inverse functions.<br>• Trigonographic, the inverse of triangle functions, and the hyperbolic triangle.<br>• - The student should be familiar with the specific integration, linear integration, in addition to the theorems related to integration. | |

## 9. Teaching and Learning Strategies

| | |
|---|---|
| • Use explanation and clarification in presenting concepts.<br>• Interact with students through hands-on discussions and exercises.<br>• Use real-life examples and applications to illustrate mathematical ideas. | Strategy |

## 10. Course Structure

| Evaluation Method | Learning method | Unit Name or Subject | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Daily & Monthly Homework Test | Lecture & Discussion | Definition of complex analysis, a glimpse of the TarYakhiya, the most important of which is the applicationof the time | Basic Concepts | 4 | 1 |
| = | = | The subject, the complex level, the emergence of nodal numbers, Algebraic adjectives. | Basic Concepts | **4** | **2** |
| = | = | Solving some different exercises | Exercises and discussion | **4** | **3** |
| = | = | The acting cardis for the numbers of the nodes, | Representation of complex numbers | **4** | **4** |
| = | = | Solving some different exercises | Exercises and discussion | **4** | **5** |
| = | = | Polar representation of numbers of nodes, forces and roots. | Representation of complex numbers | **4** | **6** |
| = | = | Functions, Abolition and Continuity | Complex Functions | 4 | 7 |
| = | = | Functions, Abolition and Continuity | Complex Functions | 4 | 8 |
| = | = | , the functions of the solution and the Cauchy-Riemann equations, functions Compatibility, all functions. | Complex Functions | 4 | 9 |
| = | = | , the functions of the solution and the Cauchy-Riemann equations, functions Compatibility, | Complex Functions | 4 | 10 |

| | | | | | |
|---|---|---|---|---|---|
| = | = | Functions of the initial dissolution, | The first functions | 4 | 11 |
| = | = | polynomials and triangular functions, | The first functions | 4 | 12 |
| = | = | The basic proofis in algebra. | The first functions | 4 | 13 |
| = | = | All functionsare. | The first functions | 4 | 14 |
| = | = | Functions of ratios, functions of ace, | Special functions | 4 | 15 |
| = | = | Monthly Discussion and Exam | Special functions | 4 | 16 |
| = | = | Functions of ratios, functions of ace, | Special functions | 4 | 17 |
| | | Hyperbolic functions, logarithmic functions, | Solving some different exercises | 4 | 18 |
| = | = | Hyperbolic functions, logarithmic functions, | Special functions | 4 | 19 |
| = | = | General Questions and Group Assignments | Solving some different exercises | 4 | 20 |
| = | = | Nodal integrals, Cauchy's theorem in integration and adaptation. | Special functions | 4 | 21 |
| = | = | Nodal integrals, Cauchy's theorem in integration and adaptation. | Special functions | 4 | 22 |
| = | = | Nodal integrals, Cauchy's theorem in integration and adaptation. | Special functions | 4 | 23 |
| = | = | Monthly Discussion and Exam | Solving some different exercises | 4 | 24 |
| = | = | Integration and Sustainability, | Special functions | 4 | 25 |
| = | = | Exercises and discussion | Solving some different exercises | 4 | 26 |
| = | = | Specific Integral, Integral on Contour Curve, | Special functions | 4 | 27 |
| = | = | Monthly Discussion and Exam | Exercisesthat are different from the subject | 4 | 28 |
| = | = | Specific Integral, Integral on Contour Curve, | Special functions | 4 | 29 |
| = | = | Kirin theorem, Cauchy theorem, Cauchy-Korsat's theorem ,yegta koshi theorem ofYatin, mor yera's theorem, euphil's theorem. | Special functions | 4 | 30 |

## 11. Course Evaluation

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

- Daily preparation.
- Daily exams.
- Oral and monthly tests.
- Written tests.
- Preparing reports and research projects.
- Quarterly activities and participation in discussions.
- Student performance in class and interaction with the study materials

| | |
|---|---|
| • James Ward Brown & Raul V. Churchill, Complex Variables & Applications, Eight Edition, McGraw-Hill, Singapore,Sydney,New York,(2009). | Main Reference(s) |
| • Alan Jeffrey, Complex Analysis and Applications,(2006). | Recommended books and supporting references (scientific journals, reports...) |
| • Websites of universities that offer educational materials in nodal analysis | Electronic References, Websites |
| **12. Learning and Teaching Resources** | |
| • Online scientific articles and research in the field of nodal analysis<br>• **Complex Functions of Third**<br>• ( www. Freescience.info/math )<br>**Grade Physics**<br>• **Samir Bashir Hadid** | Required Textbooks (Methodology, if any) |

## Course Description Form

| |
|---|
| **1. Course Name: Numerical Analysis** |
| |
| **2. Course Code** |
| |
| **3. Term/Year: 2025-2026** |
| |
| **4. Date of creation of this description :** 9/21/2025 |
| |
| **5. Available forms of attendance: in-person or electronic** |
| |
| **6. Number of Hours of Study (Total) / Number of Units (Total): 6** |
| |
| **7. Name of the course administrator (if more than one name mentions)** |
| Name: Assoc. Prof. Dr. Mohamed Abd Muhaimeed Email: mohammad.sabawi@tu.edu.iq |

| **8. Course Objectives** | |
|---|---|
| • Definition of Numerical Analysis and its most important applications.<br>• Understand numerical methods and how to use them.<br>• Understanding numerical error and the concept of relative error.<br>• Identify numerical methods and numerical algorithms.<br>• The study of convergence and its concepts<br>  • Understanding Stability and Its Applications in Real Life | Course Objectives |
| **9. Teaching and Learning Strategies** | |
| • Use explanation and clarification in presenting concepts. | Strategy |

| | |
|---|---|
| • Interact with students through hands-on discussions and exercises.<br>Use real-life examples and applications to illustrate mathematical ideas. | |

**10. Course Structure**

| Evaluation Method | Learning method | Unit Name or Subject | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Daily & Monthly Homework Test | Lecture & Discussion | Theoretical: Error analysis/sources of errors/errors in calculations.<br>Practical: Relative error and absolute error program. | Chapter One | 4 | 11 |
| = | = | Theoretical: Nonlinear Equations / Determining the Locations of Roots / Method of Halving Periods / The Cutter Method / The Iterative Method of the Solid Point / The Convergence of Iterative Methods / The Newton-Ravson Method / Finding the Roots of Polynomials / Methods for Solving a System of Nonlinear Equations / The Bristow Method.<br>Practical: Interval Halving Method Program, Cutter Method Program, Newton-Raffson Method Program, Solid Point Recursive Method Program, Nonlinear Equation System Solution Program. | Chapter Two | 16 | 4 |
| | | Theoretical: Solutions of Linear Systems / Kauss Method of Deletion / Kauss-Jordan Method / Partial Anchor / Kramer Method / Trigonometric Analysis Method. | Chapter Three | 16 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| | | Practical: Kramer Method program to solve a system of linear equations, using a function in the MATLAB to calculate better multi-boundary parameters of data compatibility. | | | |
| = | = | Theoretical: Inclusion and Completion / Terminated Differences / Newton's Progressive and Regressive Method / Bessel Formula and Sterling Formula for Inclusion / Method of Relative Differences / LaCringe Formula / Horizontal Curves.<br>Practical: Newton's Progressive Method Program, Newton's Regressive Method Program,<br>Sterling Formula Program for Inclusion, LaCrange Method Program (First Idea), Lockrang Method Program (Second Idea). | Chapter Four | 16 | 4 |
| | | Theoretical: Integral and Numerical Virtue / Newton's Formulas for Numerical Differential / Trapezoidal Rule of Numerical Integration / Simpson's Rule / Rule of Three Eights / Paul's Rule / Weidl's Rule / Rumberke's Method for Improving Results / Numerical Integration Methods of Kauss Quadratic / Kauss's Method of Gender.<br>Practical: Trapezoidal Rule Program for Numerical Integration, Simpson Rule Program, Three Eights Rule Program. | Chapter Five | 16 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| = | = | Theoretical: Solutions to Differential Equations / Tyler Serial Method / Euler's Explicit Method / Euler's Developed Method / Ranka–Cotta Method / Solution of a System of Differential Equations.<br>Practical: The Ranka-Cota method program. | Chapter Six | 16 | 4 |
| = | = | Theoretical: The concept of convergence and the concept of stability/the concept of absolute continuity. | Chapter Seven | 8 | 2 |

## 11. Course Evaluation

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

- Daily preparation.
- Daily exams.
- Oral and monthly tests.
- Written tests.
- Preparing reports and research projects.
- Quarterly activities and participation in discussions.
- Student performance in class and interaction with the study materials

## 12. Learning and Teaching Resources

| | |
|---|---|
| Principles of Numerical Analysis, Author : Dr. Ali Mohamed Sadiq Seifi - Dr. Ibtisam Kamal El-Din | Required Textbooks (Methodology, if any) |
| Numerical Analysis" 9th Edition ; Richard L. Burden & J. Douglas Faires, 2011. | Main Reference(s) |
| Instructor's Manual for Numerical Analysis" ; Richard L. Burden & J. Douglas Faires, 2005. | Recommended books and supporting references (scientific journals, reports...) |

| | |
|---|---|
| • Websites of universities that offer educational materials in numerical analysis.<br>• Articles and scientific research available online in the field of numerical analysis. | References, Websites |

# Course Description Form

1. Course Name:

Topology

2. Course Code:

3. Semester / Year:

2025-2026

4. Description Preparation Date:

2025-9-21

5. Available Attendance Forms:

Weekly

6. Number of Credit Hours (Total) / Number of Units (Total)

2 hours every week \ Total hours are 30 hours

7. Course administrator's name (mention all, if more than one name)

Name : Ass.prof. zinah taha abdulaqder
Emil : ztaha@tu.edu.iq

8. Course Objectives

| | |
|---|---|
| **Course Objectives**<br>- Study and knowledge of Product topological spaces<br>- Study types of Nano topological spaces<br>- Study the concept Grill open sets | .....<br>..... |

9. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | Applying various teaching methods ,including<br>- Giving lectures<br>Discussion method and electronic method. |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **1** | **2** | Topological spaces | Open set ,closed set,<br>Bases and subbases | Electronic lectures, smart board | Written and daily exams with |

| | | | | | |
|---|---|---|---|---|---|
| | | | | ,pen | assignments |
| **2** | 2 | Topological spaces | Interior , exterior ,boundary, closure of a set | Electronic lectures, smart board ,pen | Written and daily exams with assignments |
| 3 | 2 | Connectedness | Separated sets , connected sets, locally connected | Electronic lectures, smart board ,pen | Written and daily exams with assignments |
| 4-5 | 2 | Continuity and topological equivalence | Continuous functions , open and closed and homeomorphism | Electronic lectures, smart board ,pen | Written and daily exams with assignments |
| 6-8 | 2 | Compactness | Covers ,compact sets , locally compact | Electronic lectures, smart board ,pen | Written and daily exams with assignments |
| 9-11 | 2 | Compactness | Covers ,compact sets , locally compact | Electronic lectures, smart board ,pen | Written and daily exams with assignments |
| 12-15 | 2 | Separation axioms | T1 –space , T2-space, regular space and normal space | Electronic lectures, smart board ,pen | Written and daily exams with assignments |

Course Name:

| |
|---|
| 1. Mathematical Analysis |
| 2. Course Code: |
| Math.301 |
| 3. Semester / Year: |
| Year 2025–2026 |
| 4. Description Preparation Date: |
| **21-9-2025** |
| 5. Available Attendance Forms: |
| Classroom and Google classroom |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 120 / 6 units |
| 7. Course administrator's name (mention all, if more than one name) |
| **Name: Rana B. Yaseen**<br>**Email: zain 2016@tu.edu.iq** |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | - Definition of mathematical analysis and its most important applications.<br><br>-Understanding real numbers and their relationship to rational number research.<br><br>- Understanding Archimedes' theorem and the concept of the real number set.<br><br>• Identify historical sequences and sequences of real numbers.<br><br>• Study metric spaces and topological concepts.<br><br>• Understanding missing propositions and their extensions in real life.<br><br>• Studying proof methods. |

| | |
|---|---|
| | • Studying the concepts of differentiation and integration. |

## 9. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | -We use examples and explain writing on board and so use discuses for more understand. So we give homeworks and discuses it.<br><br>- Brainstorming -Feedback at lecture time -Collaboration and feedback series |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1-4 | 16 | - Real numbers as a fully ordered field / Relationship between relative setting field and real setting field / Non-relative settings and real settings | Real numbers | E-lectures, smart board, and pen | Written and daily exams with assignments and reports |
| 5-8 | 16 | Real numbers sequence / Convergence of the sequence | Real setting sequence / Convergence of the sequence | E-lectures, smart board, and pen | Written and daily exams with assignments and reports |
| 9-13 | 20 | The concept of convergence / absolute convergence and conditional convergence / some theorems on the subject / multiplication of series | The concept of convergence | E-lectures, smart board, and pen | Written and daily exams with assignments and reports |
| 14- 17 | 16 | Limit / Theorems related to the Limit | Limit | E-lectures, smart | Written and daily exams with assignments and reports |

| | | | | | |
|---|---|---|---|---|---|
| | | | | board, and pen | |
| 18- 22 | 20 | The concept of continuous applications / Properties of continuous applications / Theorems on continuous monotonic applications / The concept of uniform continuity | The concept of continuous applications | E-lectures, smart board, and pen | Written and daily exams with assignments and reports |
| 23-26 | 16 | Derivatives / Algebra of derivatives / Chain rule / Rolle's theorem / Mean value theorem / Higher-order derivatives / Taylor's theorem / Some uses of the theorem | Derivatives/Algebra of Derivatives/Chain Rule/Rolle's Theorem/Mean Value Theorem | E-lectures, smart board, and pen | Written and daily exams with assignments and reports |
| 27-30 | 16 | Riemann integration / Riemann integrable applications / Properties of Riemann integrable applications / Integration as a linear transformation | Riemann Integration/Integratable Applications | E-lectures, smart board, and pen | Written and daily exams with assignments and reports |

1.Course Name:

Modern mathematics teaching methods.

2.Course Code:

Math.203

3.Semester / Year:

2025-2026

4.Description PreparationDate:

21/9/2025

5. Available Attendance Forms:

Attendance Education and E-Learning

6. Number of Credit Hours (Total) / Number of Units (Total)

40 hour/2units

7. Course administrator's name (mention all, if more than one name)

Name:Sundus Noory Shukur

Email:snory@tu.edu.iq

8. Course Objectives

| | |
|---|---|
| **Course Objectives** | Providing students with theoretical information on how to communicate the teaching method Teaching students basic and supportive sciences Providing students with scientific and theoretical information on how to face the profession and build a strong professional personality for them through the guidance and advice provided to them |

9. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | Modern learning and teaching strategies – where the teacher is prepared, trained and adequately |
| | |

10. Course Structure

| Week | Hours | Required Learning | | | Evaluation |
|---|---|---|---|---|---|

| | | Outcomes | Unit or subject name | Learning method | method |
|---|---|---|---|---|---|
| 1 | 2 | Chapter 1 | Definition of teaching methods | Lecture and discussion | Daily and monthly test Homework |
| 2 | 2 | Chapter2 | The importance of teaching methods | Lecture and discussion | Daily and monthly test Homework |
| 3 | 2 | Chapter 3 | Educational objectives and behavioral goals | Lecture and discussion | Daily and monthly test Homework |
| 4 | 2 | Chapter 4 | Types of teaching methods | Lecture and discussion | Daily and monthly test Homework |
| 5 | 2 | Chapter 5 | Planning for teaching | Lecture and discussion | Daily and monthly test Homework |
| 6 | 2 | Chapter 6 | Types of plans | Lecture and discussion | Daily and monthly test Homework |
| 7 | 2 | Chapter 7 | Thinking Maps | Lecture and discussion | Daily and monthly test Homework |
| 8 | 2 | Chapter 8 | Survey | Lecture and discussion | Daily and monthly test Homework |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc 50 + 50 final

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Rudin, W., "Principles of Mathematical Analysis", 3rd ed., McGraw-Hill, Inc., 1976. |
| Main references (sources) | |
| Recommended books and reference (scientific journals, reports...) | Royden. H.L., "Real Analysis", 3rd ed., 1988. - Ash, R.B., "Real Analysis and Probability", 1972. - |
| Electronic References, Websites | |

# Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| **Ordinary differential equations** | |
| 2. Course Code: | |
| **Math.204** | |
| 3. Semester / Year: | |
| **2025-2026** | |
| 4. Description Preparation Date: | |
| **21/9/2025** | |
| 5. Available Attendance Forms: | |
| **Actual presence/distance learning/recording video lessons** | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 4/6 | |
| 7. Course administrator's name (mention all, if more than one name) | |
| **Name: Amer Fadhel Nassar Email:** amer6767@tu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | ● Ordinary differential equations are considered one of the main topics in mathematics, and the student usually studies the topic after studying several chapters on the topic of calculus and integration, especially methods of integration<br>● Emphasis on studying the concepts themselves and how they develop, and on the logical structure of the topic as a whole.<br>● Emphasizing the importance of ordinary differential equations in our lives.<br>● Ensure to demonstrate the role of ordinary differential equations and their applications.<br>● Emphasis on studying the types of solutions.<br>● Emphasizing the importance of studying theorems and their most important applications.<br>● Emphasis on studying theorems that provide shortened solutions in time and effort. |

| | |
|---|---|
| | |

| 9. Teaching and Learning Strategies | |
|---|---|
| **Strategy** | ● Use explanation and clarification to present concepts.<br>● Interact with students through discussions and practical exercises.<br>● Use real-life examples and applications to illustrate mathematical ideas. |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 3 | 12 | Chapter 1 | Types of differential equations - the order of the differential equation - the degree of the differential equation - linear differential equations - solving the differential equations - forming the differential equation from its general solution - the theorem of the existence of the solution of the differential equation and the unity of the solution and its generalization to order n | Electronic lectures, smart board and pen | Exam, reports |
| 10 | 40 | Chapter 2 | Equations whose variables separate - equations of the homogeneous type - differential equations with linear coefficients - exact differential equations - linear differential equations - Bernoulli's equation - reducing the order of equations | Electronic lectures, smart board and pen | Exam, reports |
| 2 | 8 | Chapter 3 | Higher order equations - simultaneous differential equations - engineering applications - physical applications | Electronic lectures, smart board and pen | Exam, reports |

| | | | | | |
|---|---|---|---|---|---|
| 6 | 24 | Chapter 4 | Linear differential equations - the operator- solving linear differential equations - Euler's equation | Electronic lectures, smart board and pen | Exam, reports |
| 2 | 8 | Chapter 5 | Laplace transforms - inverse Laplace transforms | Electronic lectures, smart board and pen | Exam, reports |
| 8 | 32 | Chapter 6 | Solving differential equations with series - Frobenus method - Frobenus equation - Bessel differential equation | Electronic lectures, smart board and pen | Exam, reports |

## 11. Course Evaluation

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

- Daily preparation.
- Daily exams.
- Oral and monthly tests.
- Written tests.
- Preparing reports and research projects.
- Quarterly activities and participation in discussions.
- Student performance in class and interaction with study materials

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | [1] Khaled Ahmed Al-Samarrai, Yahya Abdel Saeed: Methods of solving differential equations.<br><br>[2] Salim Ismail Al-Gharabi, Sabah Hadi Al-Jassim: Differential equations. |
| Main references (sources) | [3] S. K. Kate: Engineering Mathematics - II |
| Recommended books and references (scientific journals, reports...) | Thomas calculus 12th edition |
| Electronic References, Websites | • University websites that provide educational materials on differential equations |

| | |
|---|---|
| | • Scientific articles and research available online in the field of differential equations. |

| 11. Course Evaluation |
|---|
| Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.:<br>• Daily preparation.<br>• Daily exams.<br>• Oral and monthly tests.<br>• Written tests.<br>• Preparing reports and research projects.<br>• Quarterly activities and participation in discussions.<br>• Student performance in class and interaction with study materials |

| 12. Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricular books, if any) | [1] Khaled Ahmed Al-Samarrai, Yahya Abdel Saeed: Methods of solving differential equations.<br><br>[2] Salim Ismail Al-Gharabi, Sabah Hadi Al-Jassim: Differential equations. |
| Main references (sources) | [3] S. K. Kate: Engineering Mathematics - II |
| Recommended books and references (scientific journals, reports...) | Thomas calculus 12th edition |
| Electronic References, Websites | • University websites that provide educational materials on differential equations<br>• Scientific articles and research available online in the field of differential equations. |

# Course Description Form

| 1. Course Name: |
|---|
| **Group Theory** |
| 2. Course Code: |
| **Math.201** |
| 3. Semester / Year: |
| **2025-2026** |
| 4. Description Preparation Date: |
| **21/9/2025** |
| 5. Available Attendance Forms: |
| Classroom and Google Classroom |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 120 hour / 6 unite |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: **Nada Jasim Mohammed**<br>Email: naya11415@tu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | • Identify the concept of group, its types an Applications |

| 9. Teaching and Learning Strategies | |
|---|---|
| **Strategy** | -Brainstorming -Feedback at lecture time -Collaboration and feedback series |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1-4 | 12 | Student's ability to - principles. theories and diagnose special cognitively to understand distinguish and Practice different - proofs. styles of mathematics | system, Mathematics Definitions of binary operation, Group and semi group. | Deductive - Induction - Discussion - Using Data Show and white board . | Oral discussion -Daily exams Monthly exams Homework - assignments – |
| 5-8 | 12 | Prossessing thinking skills. = | Define agroup , Basic theorems of group ,Symmetric group , Group of modulo n . | = | = |
| 9-12 | 12 | = | Theorems of group of modulo n ,Cyclic group , Subgroups | = | = |
| 13-16 | 12 | = | Lagrange theorem, Normal groups , The normal elements and subgroups,Simple groups, Quotient group. | = | = |
| 17-20 | 12 | = | Internal and External direct product , Homomorphism, Isomorphism. | = = | = = |
| 21-25 | 15 | = | The 1st fundamental theorem of Isomorphism, The 2nd and 3rd fundamental theorem of Isomorphism. | = | = |
| 26-30 | 15 | = | Chain, Jorden-Holder theorem , Cayley's theorem , P-group, Sylow theorems | = | = |

| | | | | | |
|---|---|---|---|---|---|
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## 11. Course Evaluation

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

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | |

# Course Description Form

| |
|---|
| 1. **Course Name**: |
| **Advanced Calculus** |
| 2. **Course Code:** |
| **Math.101** |
| 3. **Semester / Year:** |
| **2025-2026** |
| 4. **Description Preparation Date:** |
| **21-9-2025** |
| **5. Available Attendance Forms:** |
| **Weekly** |
| **6. Number of Credit Hours (Total) / Number of Units (Total)** |
| **150 hours / 8 unit** |
| **7. Course administrator's name (mention all, if more than one name)** |
| **Name: Elaf Sabah Abdulwahid**<br>**Email: elafs.math@tu.edu.iq** |
| 8. Course Objectives |
| - **Study and knowledge of sequences and series.**<br>- **Study and knowledge of some types test of the series.**<br>- **Study some properties of absolute converge and conditionally converge.**<br>- **Study and knowledge polar coordinates.**<br>- **Study draw in a polar coordinates.**<br>- **Study and knowledge intersection in a polar coordinates**<br>- **Study and knowledge double integrals and some applications.**<br>– **Study and knowledge triple integrals.** |
| 9. Teaching and Learning Strategies |

| Strategy | Applying various teaching methods ,including<br>- Giving lectures<br>Discussion method and electronic method. |
|---|---|

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1-2 | 10 | Study of infinite sequences | Infinite sequences | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 3-4 | 10 | Study of some type of infinite series with some examples. | Infinite series | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 5-8 | 20 | Study of some type test of infinite series with examples | Infinite series | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 9-11 | 15 | Study of Absolute converge and conditionally converge | Absolute converge and conditionally converge | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 12-15 | 20 | Study of first and second derivatives | Derivatives | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 16-18 | 15 | Study of Taylor and Maclorin series. | Taylor and Maclorin series. | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 19-21 | 15 | Study of Polar coordinates | Polar coordinates | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 22-24 | 15 | Study area and length of a Polar coordinates | Application of Polar coordinates | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 25-27 | 15 | Study of Double integrals | Double integrals | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 28-30 | 15 | Study of Triple integrals | Triple integrals | Electronic lectures, smart board ,pens | Written and daily exams with assignments |

## 11. Course Evaluation

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

## 12. Learning and Teaching Resources

| | |
|---|---|
| **Required textbooks (curricular books, if any)** | • **Advanced calculus , second edition** Thomas. |
| **Main references (sources)** | **التفاضل والتكامل تاليف رمضان محمد جهيميه واحمد عبد العالي** |
| **Recommended books and references (scientific journals, reports…)** | **سلسلة شوم في التفاضل المتقدم** |
| **Electronic References, Websites** | |

# Course Description Form

| | |
|---|---|
| **1. Course name** | |
| **Educational administration** | |
| **2. Course code** | |
| **The second stage** | |
| **3. Chapter /quarterly** | |
| **For a year 2025 //2026** | |
| **4. Date this description was prepared** | |
| **2025/9/21** | |
| **5. Available forms of attendance** | |
| **Classroom lectures** | |
| **6. Number of study hours (total) / Number of units (total)** | |
| **2 hours per week = 60 hours -Number of units (total) (four)** | |
| **7. Course administrator name** | |
| **M.D. Mubdar Mohammed Ali**<br>**mobder.ma@tu.edu.iq** | |
| **8. Course objectives** | |
| **Cognitive objectives**<br>**1-** What is the definition of educational administration and educational supervision?<br>**2-** What are the modern trends in educational administration?<br>**3-** What is the appropriate approach to studying educational administration?<br>**4-** whatWhat is planning, and what are the components of effective planning?<br>**5-** What is itThe most prominent modern theories In school administration? | **Course objectives** |

| | |
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| | |

| **9. Teaching and learning strategies** | |
|---|---|
| - **Standard method (Giving lectures)**<br>- **Discussion and interrogation method** | **Strategy** |

**10. Course structure:**

| Evaluation method | Learning method | Name of unit or topic | Required learning outcomes | hours | week |
|---|---|---|---|---|---|
| Classroom performance and exams | Discussion and interrogation | **Introduction, general idea and definition of educational administration** | **Introducing students to the science of educational administration** | 2 | October |
| Performance The class And exams | Discussion And the interrogation | **Planning Educational And the administrative Its types, principles, elements, and role in to improve quality education.** | **identification Students With knowledge Management Educational** | 2 | October the first |
| Classroom performance and exams | Discussion and interrogation | **Introduction to Socialization** | **Introducing students to socialization institutions** | 2 | November |
| Classroom performa | Discussion and interrogation | **Genetic and environmental factors** | **Introducing students to environmental and genetic factors** | 2 | December |

| | | | | | |
|---|---|---|---|---|---|
| nce and exams | | | | | |
| Classroom performance and exams | Discussion and interrogation | **The importance of the post-graduation stage as a teacher, school principal, or educational supervisor** | **Introducing students to administrative processes** | 2 | January |
| Classroom performance and exams | Discussion and interrogation | **Educational leadership and school leadership** | **Explaining the features of education and management science** | 2 | February |
| Classroom performance and exams | Discussion and interrogation | **Research methods in educational administration** | **Enabling students to apply examples of research types** | 2 | March |
| Classroom performance and exams | Discussion and interrogation | **Introducing students to leadership styles and educational administrative systems** | **Enabling students to compare aspects of contemporary educational leadership** | 2 | March |
| Classroom performance and exams | Discussion and interrogation | **The relationship of the school principal with the social environment** | **Introducing students to educational supervision methods** | 2 | April |
| Classroom performance and exams | Discussion and interrogation | Duties of the educational supervisor | Introducing students to the duties of the educational supervisor | 2 | May |

| 11. Course Evaluation |
| --- |
| **30degree of priceIn the quarterlyIn fact30One degree for each chapter and divided as follows:**<br>**25Written Exam Score**<br>**5 marks per day distributed between daily exams or reports**<br>**70Exam scoreEnd of chapter** |
| 12. Learning and teaching resources |

| Management, leadership and supervision methodologies | Required textbooks (methodology if any) |
| --- | --- |
| 1- Educational administration and educational supervision<br>2: Introduction to Educational Administration, Dr. Al-Qaryouti, 2017.<br>3: Principles of Educational Administration and Supervision. Abdullah Al-Saad, 2018<br>4: Educational Leadership. Dr. Sami Abdel Fattah Raouf 2018<br>5- Educational Planning. Heba Majeed Issa | **Main References (Sources)** |
| View all that is new and published in peer-reviewed scientific journals | Recommended supporting books and references (scientific journals, reports...) |
| http://www.alkutubcafe.com/book/83rjar.html | Electronic references, websites |

# Course Description Form

| |
|---|
| 1. Course Name: |
| **partial differential equations** |
| 2. Course Code: |
| **Math.406** |
| 3. Semester / Year: |
| **2026-2025** |
| 4. Description Preparation Date: |
| **21/9/2025** |
| 5. Available Attendance Forms: |
| **Actual presence/distance learning/recording video lessons** |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 90/4 units |
| 7. Course administrator's name (mention all, if more than one name) |
| **Name: Astbrq Asmeel Fadhil,Email:** Astbrq.fadhil@tu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | • To learn about integration methods.<br>• To understand the reality of the derivative and the reality of integration<br>• To learn the connection between them<br>• To learn about ordinary differential equations<br>• To learn about partial differential equations<br>• To learn about types of partial differential equations<br>• To understand the classification of partial differential equations<br>• To understand some applications of partial differential equations<br>• To understand derivation and integration and their relationship to partial differential equations<br>• To know the relationship between ordinary differential equations and partial differential equations |

| | |
|---|---|
| | |

## 9. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | ● Use explanation and clarification to present concepts.<br>● Interact with students through discussions and practical exercises.<br>● Use real-life examples and applications to illustrate mathematical ideas. |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 3 | 12 | Chapter 1 | Second order partial differential equations | Classification of equations: second order partial differential equations, nth order partial differential equations, Fourier series | Exam, reports |
| 10 | 40 | Chapter 2 | Types of second order partial differential equations with variable coefficients and methods of solving them | Study of different types of equations with variable coefficients and methods of solving them, Laplace transform to solve this type of partial equations | Exam, reports |
| 2 | 8 | Chapter 3 | Heat diffusion equation | Heat diffusion equation in an isolated metal arm and homogeneous boundary conditions, Heat diffusion equation in an isolated metal arm and heterogeneous boundary conditions, Heat diffusion equation in an isolated metal arm limits | Exam, reports |

| | | | | | |
|---|---|---|---|---|---|
| 6 | 24 | Chapter 4 | | Electronic lectures, smart board and pen | Exam, reports |
| 2 | 8 | Chapter 5 | Wave equation in one dimension and in two dimensions | Forming the wave equation and methods of solving it in one or two dimensions, applied problems on the wave equation | Exam, reports |
| 8 | 32 | Chapter 6 | Laplace-Poisson equation | Solving Laplace's equation in two dimensions using the method of separation of variables, Laplace's equation in polar coordinates and its solution | Exam, reports |

## 11. Course Evaluation

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- Written tests.
- Preparing reports and research projects.
- Quarterly activities and participation in discussions.
- Student performance in class and interaction with study materials

## 12. Learning and Teaching Resources

| | |
|---|---|
| 1- Partial Differential Equations for Scientific and Engineering Colleges / Translated by Dr. Atta Allah Thamer Al-Ani 1989<br>2- Partial Differential Equations / Dr. Atta Allah Thamer Al-Ani<br>3- Introduction to Partial Differential Equations / Dr. Atta Allah Thamer Al-Ani | -1Required textbooks |

| | |
|---|---|
| 4- Khaled Ahmed Al-Samarrai, Yahya Abdul Saeed: Methods of Solving Differential Equations.<br>5- Salim Ismail Al-Gharabi, Sabah Hadi Al-Jassim: Differential Equations. | |
| • . K. Kate: **Engineering Mathematics – II**<br>• **Partial differential Equations Jhon. F.** | Main references (sources)-2 |
| , **Thomas calculus 12th edition** Websites | • University websites that provide educational materials Recommended books and references (scientific journals, reports, etc on differential equations. |

# Course Description Form

| | |
|---|---|
| 1. | Course Name: |
| Euclidean geometry | |
| 2. | Course Code: |
| Math.203 | |
| 3. | Semester / Year: |
| 2025-2026 | |
| 4. | Description Preparation Date: |
| 2025-9-21 | |
| 5. Available Attendance Forms: | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 90 hour/ 5 units | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name:Aseel Alaa Awad<br>Email: aseel.awad@tu.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | • Good, correct, and integrated knowledge and understanding of engineering.<br>• Identify the concept of the intuitive system<br>• Learn about the concept of the intuitive system. |
| 9. Teaching and Learning Strategies | |
| **Strategy** | • Using explanation and clarification to present concepts through discussion, analysis and scientific thinking<br>• Using different proof methods to prove the basic theorems of geometry |

10. Course Structure

| W | Unit or subject | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1-4 | 12 | Knowledge of the origins and development of the intuitive system | The Yonck/Fano axiomatic system | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |
| 5-8 | 12 | Properties of the axiomatic system: consistency/independence | Properties of the axiomatic system | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |
| 9-12 | 12 | The Hilbertian system definition/cuts and convex sets | Evaluation of Euclid's geometry (foundations of geometry) | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |
| 13-16 | 12 | Re-proof of some of Euclid's theorems | Elementary engineering | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |

| | | | | | |
|---|---|---|---|---|---|
| 17-20 | 12 | Elliptical definitions and theorems | Euclidean geometry | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |
| 21-25 | 15 | Study of structural projective geometry | Synthetic projective plane | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |
| 26-40 | 15 | Study of the analytical damage level | The analytical projective level | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |

| 11. Course Evaluation | |
|---|---|
| Distributing the score out of 100 according to the tasks assigned to the student such as daily etc….preparation, daily oral, monthly, or written exams, reports | |
| 12. Learning and Teaching Resources | |
| Required textbooks (curricular books, if any) | • Basic concepts in engineering (Amal Shehab Al-Mukhtar). |
| Main references (sources) | • Axiom, geometry, and non-Euclidean systems (Nouri Farhan Al-Mayahi)<br>• Axiom and geometry systems (Abdul Wahab Ahmed Al-Sarraj) |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | Internet sites |

# Course Description Form

## 1. Course Name

Computers

## 2. Course Code

## 3. Semester/Year

2026-2025

## 4. Date of Preparation

21/9/2025

## 5. Available Attendance Forms

Distance Learning / In-person

## 6. Total Study Hours / Units

60 hours / 3 units

## 7. Course Coordinator

Name: Mohammed Muayad Sultan

Email: mmsultan@tu.edu.iq

## 8. Course Objectives

- To teach students how to use computers in ready-made applications like Microsoft Office through interactive learning, dealing with windows, saving programs, and writing notes to ensure the execution of applications and programs.
- To describe ready-made applications and software and acquire computer skills.
- To develop self-improvement skills that enable students to compete with others.
- To meet the needs of the education sector with highly efficient staff.

## 9. Teaching and Learning Strategies

- Using explanation and clarification to present concepts.
- Interaction with students through discussions and practical exercises.
- Practical application in the laboratory.
- Video lectures.
- Electronic presentations.

## 10. Course Structure

| Week | Hours | Intended Learning Outcomes | Unit / Topic | Learning Method | Assessment Method |
|---|---|---|---|---|---|
| **1** | 2 Theoretical | Define networks and their types | Security & Networking | Lecture + Discussion | In-class questions |
| **2** | 2 Practical | Identify basic network components | Security & Networking | Lab practice | Lab report |
| **3** | 2 Theoretical | Understand basic network security | Security & Networking | Lecture | Quiz |
| **4** | 2 Practical | Diagnose network threats | Security & Networking | Lab + Case study | Practical evaluation |
| **5** | 2 Theoretical | Understand e-commerce concepts | E-Commerce | Lecture | In-class questions |
| **6** | 2 Practical | Use online banking and ATM services | E-Commerce | Lab practice | Lab report |
| **7** | 2 Theoretical | Explain Phone Banking and SMS Banking | E-Commerce | Lecture | Quiz |
| **8** | 2 Practical | Experiment with Mobile Banking | E-Commerce | Lab practice | Practical evaluation |
| **9** | 2 Theoretical | Identify common software issues | Computer Troubleshooting | Lecture | In-class questions |
| **10** | 2 Practical | Diagnose hardware problems | Computer Troubleshooting | Lab practice | Lab report |
| **11** | 2 Theoretical | Understand troubleshooting steps | Computer Troubleshooting | Lecture | Quiz |
| **12** | 2 Practical | Fix basic hardware issues | Computer Troubleshooting | Lab practice | Practical evaluation |
| **13** | 2 Practical | Fix common software problems | Computer Troubleshooting | Lab practice | Lab report |
| **14** | 2 Practical | General review + practical training | Computer Troubleshooting | Lab + Discussion | Practical evaluation |
| **15** | 2 Theoretical | Define AI + its history | Introduction to AI | Lecture | Quiz |
| **16** | 2 Theoretical | Understand AI techniques and approaches | Introduction to AI | Lecture | In-class questions |
| **17** | 2 Practical | Apply simple AI experiment (image/text classification) | Introduction to AI | Lab practice | Lab report |
| **18** | 2 Theoretical | Identify challenges in AI | Introduction to AI | Lecture | Quiz |
| **19** | 2 Theoretical | Discuss ethical considerations | Introduction to AI | Lecture + Discussion | In-class questions |
| **20** | 2 Practical | Mini AI project | Introduction to AI | Lab project | Project presentation |
| **21** | 2 Theoretical | AI in smartphones | AI in Daily Life | Lecture | In-class questions |
| **22** | 2 Practical | Experiment with Chatbots/Assistants | AI in Daily Life | Lab practice | Practical evaluation |

| | | | | | |
|---|---|---|---|---|---|
| **23** | 2 Theoretical | AI in daily use (recommendations, maps) | AI in Daily Life | Lecture | Quiz |
| **24** | 2 Practical | Apply daily AI techniques | AI in Daily Life | Lab practice | Lab report |
| **25** | 2 Theoretical | AI in education and healthcare | Applications of AI | Lecture | In-class questions |
| **26** | 2 Theoretical + Practical | AI in finance and transportation | Applications of AI | Lecture + Lab | Practical evaluation |
| **27** | 2 Practical | AI in marketing and advertising + project | Applications of AI | Lab project | Project presentation |
| **28** | 2 Theoretical | AI and its impact on society | AI & Society | Lecture | In-class questions |
| **29** | 2 Theoretical + Practical | Ethical challenges (privacy, surveillance, job market) | Ethical Challenges in AI | Lecture + Discussion | Quiz + Practical evaluation |
| **30** | 2 Theoretical + Practical | The future of AI + course review | Future of AI | Lecture + Lab | Final exam + Project |

## 11. Course Evaluation:

- Daily preparation.
- Daily exams.
- Oral and monthly tests.
- Written tests.
- Preparing reports and research projects.
- Classroom activities and participation in discussions.
- Student performance in class and interaction with study materials.

## 12. Learning and Teaching Resources:

- Required textbooks (if available): Basics of Computers and Office Applications.
- Main references (sources): Recommended books and supporting references (e.g., reports, scientific journals).
- Electronic references, websites: Many educational websites and video clips on YouTube.

## 1. Course Name
Computers

## 2. Course Code

## 3. Semester/Year
2026-2025

## 4. Date of Preparation
21/9/2025

## 5. Available Attendance Forms
Distance Learning / In-person

## 6. Total Study Hours / Units
60 hours / 3 units

## 7. Course Coordinator
Name: Kholood Jamal Moulood

Email: kjamal@tu.edu.iq

## 8. Course Objectives
- To teach students how to use computers in ready-made applications like Microsoft Office through interactive learning, dealing with windows, saving programs, and writing notes to ensure the execution of applications and programs.
- To describe ready-made applications and software and acquire computer skills.
- To develop self-improvement skills that enable students to compete with others.
- To meet the needs of the education sector with highly efficient staff.

## 9. Teaching and Learning Strategies
- Using explanation and clarification to present concepts.
- Interaction with students through discussions and practical exercises.
- Practical application in the laboratory.
- Video lectures.
- Electronic presentations.

## 10. Course Structure

| Week | Hours | Intended Learning Outcomes | Unit / Topic | Learning Method | Assessment Method |
|---|---|---|---|---|---|
| **1** | 2 Theoretical | Define networks and their types | Security & Networking | Lecture + Discussion | In-class questions |
| **2** | 2 Practical | Identify basic network components | Security & Networking | Lab practice | Lab report |
| **3** | 2 Theoretical | Understand basic network security | Security & Networking | Lecture | Quiz |
| **4** | 2 Practical | Diagnose network threats | Security & Networking | Lab + Case study | Practical evaluation |
| **5** | 2 Theoretical | Understand e-commerce concepts | E-Commerce | Lecture | In-class questions |
| **6** | 2 Practical | Use online banking and ATM services | E-Commerce | Lab practice | Lab report |
| **7** | 2 Theoretical | Explain Phone Banking and SMS Banking | E-Commerce | Lecture | Quiz |
| **8** | 2 Practical | Experiment with Mobile Banking | E-Commerce | Lab practice | Practical evaluation |
| **9** | 2 Theoretical | Identify common software issues | Computer Troubleshooting | Lecture | In-class questions |
| **10** | 2 Practical | Diagnose hardware problems | Computer Troubleshooting | Lab practice | Lab report |
| **11** | 2 Theoretical | Understand troubleshooting steps | Computer Troubleshooting | Lecture | Quiz |
| **12** | 2 Practical | Fix basic hardware issues | Computer Troubleshooting | Lab practice | Practical evaluation |
| **13** | 2 Practical | Fix common software problems | Computer Troubleshooting | Lab practice | Lab report |
| **14** | 2 Practical | General review + practical training | Computer Troubleshooting | Lab + Discussion | Practical evaluation |
| **15** | 2 Theoretical | Define AI + its history | Introduction to AI | Lecture | Quiz |
| **16** | 2 Theoretical | Understand AI techniques and approaches | Introduction to AI | Lecture | In-class questions |
| **17** | 2 Practical | Apply simple AI experiment (image/text classification) | Introduction to AI | Lab practice | Lab report |
| **18** | 2 Theoretical | Identify challenges in AI | Introduction to AI | Lecture | Quiz |
| **19** | 2 Theoretical | Discuss ethical considerations | Introduction to AI | Lecture + Discussion | In-class questions |
| **20** | 2 Practical | Mini AI project | Introduction to AI | Lab project | Project presentation |
| **21** | 2 Theoretical | AI in smartphones | AI in Daily Life | Lecture | In-class questions |

| | | | | | |
|---|---|---|---|---|---|
| **22** | 2 Practical | Experiment with Chatbots/Assistants | AI in Daily Life | Lab practice | Practical evaluation |
| **23** | 2 Theoretical | AI in daily use (recommendations, maps) | AI in Daily Life | Lecture | Quiz |
| **24** | 2 Practical | Apply daily AI techniques | AI in Daily Life | Lab practice | Lab report |
| **25** | 2 Theoretical | AI in education and healthcare | Applications of AI | Lecture | In-class questions |
| **26** | 2 Theoretical + Practical | AI in finance and transportation | Applications of AI | Lecture + Lab | Practical evaluation |
| **27** | 2 Practical | AI in marketing and advertising + project | Applications of AI | Lab project | Project presentation |
| **28** | 2 Theoretical | AI and its impact on society | AI & Society | Lecture | In-class questions |
| **29** | 2 Theoretical + Practical | Ethical challenges (privacy, surveillance, job market) | Ethical Challenges in AI | Lecture + Discussion | Quiz + Practical evaluation |
| **30** | 2 Theoretical + Practical | The future of AI + course review | Future of AI | Lecture + Lab | Final exam + Project |

## 11. Course Evaluation:

- Daily preparation.
- Daily exams.
- Oral and monthly tests.
- Written tests.
- Preparing reports and research projects.
- Classroom activities and participation in discussions.
- Student performance in class and interaction with study materials.

## 12. Learning and Teaching Resources:

- Required textbooks (if available): Basics of Computers and Office Applications.
- Main references (sources): Recommended books and supporting references (e.g., reports, scientific journals).
- Electronic references, websites: Many educational websites and video clips on YouTube.

# Course Description Form

| |
|---|
| 1. Course Name: |
| **Computer** |
| 2. Course Code: |
| |
| 3. Semester / Year: |
| **2025/2026** |
| 4. Description Preparation Date: |
| **21/9/2025** |
| 5. Available Attendance Forms: |
| Classroom and Google classroom |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| **60 hours** |
| 7. Course administrator's name (mention all, if more than one name) |
| **Name:fadya abdullfatah habeeb**<br>**Email:fadya.habeeb@tu.edu.iq** |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | The computer science course aims to provide students with basic digital skills that support their studies and daily work in the modern technological environment. It introduces students to the fundamentals of cybersecurity, networks, e-commerce, and methods of protecting data from digital threats, in addition to presenting the principles of artificial intelligence and its applications in daily life. The course gives the student a simplified understanding of modern technologies and their role in enhancing security and improving their understanding of digital systems. |

| |
|---|
| 9. Teaching and Learning Strategies |

| | |
|---|---|
| **Strategy** | The student is introduced to the basic concepts of networks, e-commerce, and cybersecurity, distinguishes between types of digital threats and common protection methods, explains the principles of artificial intelligence, and can explain its uses in various daily applications. The student employs basic digital skills to apply simple security practices. |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Week | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 6 | 12 hours | Communication in our lives | - Definition of communications<br>- Cables<br>- Types of cables<br>- Benefits of wired and wireless networks | lectures, Computer, board and pen. | Exams with homework and reports |
| 6 | 12 hours | Networks | - Definition of a network<br>- Benefits of networks<br>- Components of computer networks<br>- Types of networks<br>- Protocols<br>- Types of protocols<br>- Network standards and layers | lectures, Computer, board and pen. | Exams with homework and reports |
| 6 | 12 hours | Network security | -Understanding the fundamentals of network security<br>-Identifying network threats | lectures, Computer, board and pen. | Exams with homework and reports |
| 6 | 12 hours | Troubleshooting and repairing computer problems | -Hardware problems<br>-Software problems<br>-Hardware repair<br>-Software repair | lectures, Computer, board and pen. | Exams with homework and reports |

| | | | | | |
|---|---|---|---|---|---|
| 4 | 8 hours | E-commerce | - Understanding the concept of e-commerce<br>- Using online banking and ATMs<br>- Explanation of phone banking and SMS banking<br>- Experiencing mobile banking | lectures, Computer, board ,computer and pen. | Exams with homework and reports |
| 2 | 4 hours | artificial intelligence | - Definition and history of artificial intelligence<br>- Artificial intelligence techniques and methods<br>- Applications of artificial intelligence in various fields<br>- Challenges in artificial intelligence<br>- A small-scale artificial intelligence project | lectures, Computer, board ,computer , printer and pen | Exams with homework and reports |

## 11. Learning course evaluation

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

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

# Course Description Form

| |
|---|
| 1. Course Name: |
| Teaching thinking methods |
| 2. Course Code: |
| Math . |
| 3. Semester / Year: |
| 2025- 2026 |
| 4. Description Preparation Date: |
| 21- 9- 2025 |
| 5. Available Attendance Forms: |
| Classroom and Google classroom |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| (120 hour per year) / Number of Units (6 units) |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: LEC .Sundus Noory Shukur<br>Email: snory@tu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives**<br>Introducing students to the concept of thinking, its patterns, characteristics, and levels<br><br>• Understanding the importance of teaching thinking skills and its role in lifelong learning and sustainable development<br>• Distinguishing between different thinking skills and their areas of application<br>• Analyzing the relationship between thinking and the concepts of intelligence, learning, and curriculum<br><br>• • Familiarization with leading international thinking skills programs such as CORT, Montessori, SCAMPER, and the Six Thinking Hats<br><br>• Application of thinking skills strategies in real-life learning situations<br>• Development of students' critical, creative, and metacognitive thinking skills<br><br>The student is expected to:<br>• Understand the concept of thinking and its basic characteristics.<br><br>• Explain the concept of thinking, its levels, and types. | • .....<br>• .....<br>• ..... |

| | |
|---|---|
| • Explain the importance of teaching thinking and the role of thinking skills in learning.<br><br>• Identify the different levels and patterns of thinking.<br><br>• Explain the relationship between thinking and intelligence, and the types of thinking (logical, critical, creative, intuitive, metacognitive).<br><br>• Lists the factors influencing and hindering the teaching of thinking skills.<br><br>• Recognizes key thinking skills training programs such as Montessori, Pestalozzi, CoRT, and the Six Thinking Hats.<br><br>• Applies core thinking skills and information processing techniques in educational and real-life situations.<br><br>• Applys problem-solving, critical thinking, and creative thinking strategies in case studies and designs exercises.<br><br>• Models for teaching thinking in different contexts.<br><br>• Uses well-known thinking skills training programs to develop learners' thinking skills.<br><br>• Distinguishes between thinking styles and skills.<br><br>• Applys thinking skills teaching strategies in classroom situations.<br><br>• Evaluates obstacles to teaching thinking and ways to overcome them.<br><br>• Analyzes learning situations using critical and creative thinking skills. | |

## 9. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | • Utilizing educational discussion (educational dialogue), which relies on the exchange of ideas to arrive at facts.<br><br>• Employing modern scientific technologies (such as a slide projector). • Group journaling to engage all students in classroom activities. • Classroom exercises to participate in finding appropriate solutions for certain aspects of the assessment. |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1 | 1 | Meeting with students and providing educational guidance<br>Introducing them to the subject matter<br>The concept of thinking, | Meeting with students and providing educational guidance<br>Introducing them to the course content | Dying and discussion | Daily and monthly testing and homework |

| | | | | | |
|---|---|---|---|---|---|
| | | characteristics of thinking | | | |
| 2 | 1 | The importance of teaching and learning thinking, the nature of thinking and its levels | The concept of thinking, characteristics of thinking<br>The importance of teaching and learning thinking, the nature and levels of thinking | = | = |
| 3 | 1 | Factors affecting the teaching of thinking skills, obstacles to teaching thinking skills, educational objectives and their importance in the educational process | Factors affecting the teaching of thinking, obstacles to teaching thinking<br>Educational objectives and their importance in the educational process | = | = |
| 4 | 1 | Thinking skills, the difference between thinking and thinking skills | Thinking Skills: The Difference Between Thinking and Thinking Skills | = | = |
| 5 | 1 | Teaching Thinking Skills with Practical Applications | Teaching Thinking Skills with Applications | = | = |
| 6 | 1 | Quality in Thinking Skills Education | Quality in Thinking Education | = | = |
| 7 | 1 | Lifelong Learning | Lifelong Learning | = | = |
| 8 | 1 | Education for Sustainable Development | Education for Sustainable Development | = | = |

| | | | | | |
|---|---|---|---|---|---|
| 9 | 1 | Thinking Styles and Examples | Thinking Styles and Examples | = | = |
| 10 | 1 | The Relationship Between Thinking and Intelligence | The Relationship Between Thinking and Intelligence | = | = |
| 11 | 1 | Types of Thinking – Logical-Mathematical Thinking | Types of Thinking – Logical-Mathematical Thinking | = | = |
| 12 | 1 | Central Thinking Skills | Central Thinking Skills | = | = |
| 13 | 1 | Information Processing Skills | Information Processing Skills | = | = |
| 14 | 1 | Intuitive Thinking | Intuitive Thinking | = | = |
| 15 | 1 | Deductive Thinking | Deductive Thinking | = | = |
| 16 | 1 | Critical Thinking | Critical Thinking | = | = |
| 17 | 1 | Creative Thinking | Creative Thinking | = | = |
| 18 | 1 | Metacognitive Thinking | Metacognitive Thinking | = | = |
| 19 | 1 | Problem Solving | Problem Solving | = | = |
| 20 | 1 | Introducing Some Thinking Skills Training Programs | Introducing Some Thinking Skills Training Programs | = | = |

| | | | | | |
|---|---|---|---|---|---|
| 21 | 1 | Montessori Program | Montessori Program | = | = |
| 22 | 1 | Pestaluzzi Program | Pestaluzzi Program | = | = |
| 23 | 1 | SCAMPER Model | SCAMPER Model | = | = |
| 24 | 1 | CORT Program | CORT Program | = | = |
| 25 | 1 | SCAMPER Model | SCAMPER Model | = | = |
| 26 | 1 | First Semester Exam | First Semester Exam | = | = |
| 27 | 1 | Six Thinking Hats Program | Six Thinking Hats Program | = | = |
| 28 | 1 | Thinking and Methodology | Thinking and Methodology | = | = |
| 29 | 1 | Exercises for Applying | Exercises for Applying | = | = |
| 30 | 1 | Thinking Skills in Different Life Situations | Thinking Skills in Different Life Situations | = | = |

## 11 . Course evaluation

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

- Daily preparation.
- Daily exams.
- Oral and monthly tests.
- Written tests.
- Preparing reports and research projects.
- Quarterly activities and participation in discussions.
- Student performance in class and interaction with study materials

| 12 . Learning and teaching resources | |
|---|---|
| Required textbooks (methodology, if any) | • • Teaching Thinking, Dr. Ibrahim bin Ahmed Muslim Al-Harthi, 4th edition, 2009, Dar Al-Maqasid for Publishing and Distribution |
| Main references (sources) | • Thinking: Its Teaching Programs and Measurement Methods, by Dr. Hanaa Ragab Hassan, 1st Edition, 2014, Dar Al-Kutub Al-Ilmiyah for Publishing and Distribution |
| Recommended supporting books and references (scientific journals, reports...) | The CoRT Thinking Skills Program (translated), Edward de Bono, 1st edition, 2007, De Bono Printing, Publishing and Distribution |
| Electronic references, Internet sites | University websites that provide educational materials in Teaching Thinking Methods<br>• Scientific articles and research available online in Teaching Thinking Methods |

| |
|---|
| 1. Course Name: |
| Foundations of mathematics |
| 2. Course Code: |
| |
| 3. Semester / Year: 2025_2026 |
| |
| 4. Description Preparation Date: |
| 21-9- 2025 |
| 5. Available Attendance Forms: |
| |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 4 Hours |
| 7. Course administrator's name (mention all, if more than one name)<br>Name : hiba omar musa<br>Emil : hom_34@tu.edu.iq |
| Name:<br>Email: |
| 8. Course Objectives |

| | |
|---|---|
| .<br>.<br>. | **Course Objectives**<br>- Study and know mathematical logic<br>- Relationship concept relationships and application and its types<br>- Study of numbers ,their origins. |

| 9. Teaching and Learning Strategies | |
|---|---|
| Applying various teaching methods ,including<br>- Giving lectures<br>- Discussion method and electronic method | Strategy |

10. Course Structure

| Evaluat method | Learning method | Unit or subject name | Require Outcomes | Hours | Week |
|---|---|---|---|---|---|
| Written and daily exams with assignments | Electro nic lectures , smart board ,pen | The concept logic and mathematics proof | Logic | 12 | **4-1** |
| Written and daily exams with assignments | Electro nic lectures , smart board ,pen | algebraic operations | The sets | **12** | **8-5** |
| Written and daily exams with assignments | Electro nic lectures , smart board ,pen | Types of relations | Relations | **12** | **12-9** |

| | | | | | |
|---|---|---|---|---|---|
| Written and daily exams with assignments | Electro nic lectures , smart board ,pen | Types of mapping | Mapping | **12** | **16-13** |
| Written and daily exams with assignments | Electro nic lectures , smart board ,pen | Number capacity | Number capacity | **12** | **20-17** |
| Written and daily exams with assignments | Electro nic lectures , smart board ,pen | their origins and group | Natural number , Integers number ,Real number and group | **15** | **25-21** |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |

## 11. Course Evaluation

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

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | |
|  | Foundations of mathematics |
|  Learning and Teaching Resources<br>Required textbooks ( | |
| Electronic References, Websites | |

# Course Description Form

| |
|---|
| 1. Course Name: |
| physics |
| 2. Course Code: |
| |
| 3. Semester / Year: |
| 2025-2026 |
| 4. Description Preparation Date: |
| 21/9/2025 |
| 5. Available Attendance Forms: |
| |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 66 hour/ 2 units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name : SarwaA.Mohammed<br>Emil : srwa.muhammed@tu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| Course Objectives | • -Learn about the basics of general physics<br>-The student acquires information about natural phenomena. |
| method | |
| **Strategy** | • -Applying various teaching methods ,including<br>-Giving lectures<br>-Discussion method and electronic method. |

10. Course Structure

| Course Evaluation / Week | Hours | Required Learning Outcomes | Unit or subject name | 2. method | Evaluation method |
|---|---|---|---|---|---|
| 1-4 | 12 | Physical quantities and motion | Scalar, vector, and motion quantities | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |

| | | | | | |
|---|---|---|---|---|---|
| 5-8 | 8 | Knowledge of the laws of motion and its types | Circular motion and rotational motion | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |
| 9-12 | 8 | Discovering the relationship between work, energy, capacity and the importance of flexibility | Work, energy, capacity and elasticity | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |
| 13-16 | 8 | Identifying the laws of attraction and their importance for maintaining cosmic balance, the importance of harmonic motion, and the importance of their applications | Gravitational attraction harmonic motion | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |

| | | | | | |
|---|---|---|---|---|---|
| 17-20 | 8 | Identify vibration and its importance | Vibration of strings and air columns | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |
| 21-25 | 12 | Learn about the importance of Newton's law | Newton's laws of motion | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |
| 26-30 | 12 | Heat and its common methods of transmission | the heat | Electronic lectures, lecture method, smart board and pen | Exams with homework and reports |

## 11. Course Evaluation

Distributingthescoreoutof100accordingtothetasksassignedtothestudentsuchasdaily preparation, daily oral, monthly, or written exams, reports

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | 1-University Physics, Part One: Mechanics, properties of matter, wave motion, and heat, written by Dr. Talib Nahi Al-Khafaji. Dr. Fayyad Abdel Latif Al-Najm.<br>• 2-University Physics, Part Two, written by Dr. Talib Nahi Al-Khafaji and Dr. Fayyad Abdul Latif Al-Najm |
| Main references (sources) | - Physics theories Friedrich Bosch David Gerd |
| Recommended books and **Outcomes** (scientific journals, reports…) | Encyclopedia of scientific books and journals |
| Electronic References, Websites | Electronic references, Internet sites |

# Course Description Form

| |
|---|
| 1. Course Name: |
| **Computer** |
| 2. Course Code: |
| |
| Unit or subject Semester / Year: |
| **2025/2026** |
| name Description Preparation Date: |
| **21/9/2025** |
| 5. Available Attendance Forms: |
| Classroom and Google classroom |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| **60 hours** |
| 7. Course administrator's name (mention all, if more than one name) |
| Name Fatin Haitham Moulood<br><br>Emil : Fatin.Haitham@tu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | • The student gets to know the concept of computer science<br>• The student should be familiar with the personal computer<br>• For the student to recognize the difference and relationship between software and the physical parts inside the computer<br>• For the student to recognize the importance of using a computer<br>• The student gets to know how the internal computer parts work<br>• The student gets to know the concept of information that the computer deals with and its classification |

| | |
|---|---|
| | • The student will know how information enters and exits to and from the computer<br>• The student gets to know some operating systems<br>• The student gets to know the relationship between operating systems and hardware<br>• That the student be able to maintain some parts of the computer<br>• For the student to learn about the benefits of the computer in his general life<br>• The student will know how used the Microsoft Word<br>•The student will know how used the Microsoft PowerPoint<br>•The student will know how used the printer to Print documents<br>•The student will know how used the Internet, networking, and email creation<br>• That the student be able to know the internal parts of the computer in a concrete way<br>• Introducing the student to concepts and strategies for computer operation |

## Learning

| | |
|---|---|
| 12. | To apply what he has learned for the purpose of solving many issues and problems in the same subject<br>-Distinguishes how information enters and exits from and to the computer<br>-Distinguishes between different types of operating systems.<br>-Recognizes the internal parts of the computer in a tangible way |

10. Course Structure

| WW | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 4 | 8 hours | Chapter One(p1) | Computer fundamentals | lectures, Computer, board and pen. | Report, Exams and discussions. |
| 6 | 12 hours | Chapter two(p1) | Computer's components | lectures, Computer, board and pen. | Report, Exams and discussions |
| 4 | 8 hours | Chapter four(p1) | operating systems | lectures, Computer, board and pen. | Report, Exams and discussions |
| 4 | 8 hours | Chapter One(p2) | the Microsoft Word | lectures, Computer, board and pen. | Report, Exams and discussions |
| 4 | 8 hours | Chapter three(p2) | the Microsoft PowerPoint | lectures, Computer, board ,computer and pen. | Report, Exams and discussions |
| 4 | 8 hours | | Print documents | lectures, Computer, board ,computer , printer and pen | Report, Exams and discussions |
| 4 | 8 hours | | the Internet, networking, and email creation | lectures, Computer, board ,net and pen. | Report, Exams and discussions |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |

## 11. Course Evaluation

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

## 12. Learning and Teaching Resources

| | |
|---|---|
| 12- curricular books, if any) | |
| Required textbooks ( | |
| Recommended books and Learning and Teaching Resources (scientific journals, reports…) | |
| Electronic References, Websites | |

# Course Description Form

| |
|---|
| 1. Course Name: |
| **Calculus** |
| 2. Course Code: |
| **Math.204** |
| Unit or subject Semester / Year: |
| **2025-2026** |
| name Description Preparation Date: |
| **21/9 /2025** |
| 5. Available Attendance Forms: |
| **Actual presence/distance learning/recording video lessons** |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 5/140 |
| 7. Course administrator's name (mention all, if more than one name) |
| **Name: Hiba Hani Abdullah Email:** hiba.h.a.83@tu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | • Differentiation and integration are considered one of the main topics in mathematics, and the student usually studies the subject in several areas, including the topic of calculus of differentiation and integration, especially integration methods.<br>• Emphasis on studying the differentiation and integration of special functions, including trigonometric, hyperbolic, logarithmic, inverse, etc.<br>• . Learn about several concepts in calculus<br>• Ensure knowledge of the applications and benefits of derivatives |
| **Learning** | |
| 12. | ● Use explanation and clarification to present concepts.<br>● Interact with students through discussions and practical exercises.<br>● Use real-life examples and applications to illustrate mathematical ideas. |

| 10. Course Structure | | | | | |
|---|---|---|---|---|---|
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 2 | 10 | Chapter one | Real numbers - intervals - inequalities - functions - algebra of functions - finding the domain and range - complex function - drawing functions | Electronic lectures, smart board and pen | Written exam with assignments and reports |
| 2 | 10 | The second and third chapter | Limits and their properties - The method of finding the limit - Theorems about limits - Infinite limits and limits at infinity - Continuity - Theories of continuity | Electronic lectures, smart board and pen | Written exam with assignments and reports |
| 4 | 20 | Chapter four | Derivation - Properties of differentiation - Derivation of the complex function - Chain law - Implicit derivative - Higher order derivatives - Rolle's theorem - Mean value theorem - Increasing and decreasing functions, maximum and minimum limits, points of concavity, convexity, and alignments | Electronic lectures, smart board and pen | Written exam with assignments and reports |
| 3 | 15 | Chapter five | Special functions (trigonometric functions, hyperbolic functions, logarithmic functions, and exponential functions) - drawing special functions - deriving special functions and finding their inverse functions | Electronic lectures, smart board and pen | Written exam with assignments and reports |
| 4 | 20 | Chapter six | Integration - indefinite integration - properties of integration - integration of functions (trigonometric - hyperbolic functions - exponential and logarithmic functions) | Electronic lectures, smart board and pen | Written exam with assignments and reports |

| | | | | | |
|---|---|---|---|---|---|
| 8 | 40 | Chapter seven | Integration methods | Electronic lectures, smart board and pen | Written exam with assignments and reports |
| 2 | 10 | Chapter eight | Applications to definite integration | Electronic lectures, smart board and pen | Written exam with assignments and reports |
| 1 | 5 | Chapter ninth | Infinite series - Naylor polynomial - Taylor and Maclaurin series | Electronic lectures, smart board and pen | Written exam with assignments and reports |
| 2 | 10 | Chapter tenth | Differential equations - the order of the equation and the solution of the differential equation - differential equations whose variables separate - the first-order and first-order complete differential equation | Electronic lectures, smart board and pen | Written exam with assignments and reports |

## 11. Course Evaluation

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

- Daily preparation.
- Daily exams.
- Oral and monthly tests.
- Written tests.
- Preparing reports and research projects.
- Quarterly activities and participation in discussions.
- Student performance in class and interaction with study materials

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Finney/Thomas calculus |

| | |
|---|---|
| Main references (sources) | Khaled Ahmed Al-Samarrai,, Calculus and Integration |
| Recommended books and references (scientific journals, reports...) | Thomas calculus 12th edition |
| Electronic References, Websites | 1-Encyclopedia of scientific books and journals, Tikrit University Journal of Pure Sciences and the Shome series<br>2- Reliable websites.<br>3- Virtual library.<br>4- Library locations in some international universities<br>. |

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# Course Description Form

| |
|---|
| 1. Course Name: |
| Linear algebra |
| 2. Course Code: |
| |
| 3. Semester / Year: |
| Academic Year (2025-2026) |
| 4. Description Preparation Date: |
| 21-9-2025 |
| 5. Available Attendance Forms: |
| Weekly |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 120 hours / 6 unit |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Assist . Lec . raghad wamedh faris .....<br>.....<br>.....<br>Email: rwamedh@tu.edu.iq |
| 8. Course Objectives |
| - Introducing the basic characteristics of the nature of scientific material<br>- Understanding the mathematical system and matrices and learning the types of -----matrices, operations on them, and their properties<br>- Differential equations and methods for solving them<br>- Study vector space and operations on vectors<br>Find the kernel and the image of the linear application |

How to calculate distinct values, eigenvectors and polynomials

## 9. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | - Use explanation and clarification to present concepts<br>- Interact with students through discussions and practical exercises<br>- Use real-life examples and applications to illustrate mathematical ideas<br>. |

## 10. Course Structure

| Course Eek | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 4 | 16 | System of linear equation ,matrices and operation on them | System of linear equation ,matrices and operation on them | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 4 | 16 | Finding determinants and methods for solving linear equations | Finding determinants and methods for solving linear equations | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 4 | 16 | Vectors in 2-spaces and 3-spaces | Vectors in 2-spaces and 3-spaces | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 3 | 12 | Vector spaces and subspaces | Vector spaces and subspaces | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 2 | 8 | Internal product spaces | Internal product spaces | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 3 | `2 | Liner transformation | Liner transformation | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 4 | 16 | Eigenvalue and Eigenvector | Eigenvalue and Eigenvector | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 4 | 16 | Complex vector spaces | Complex vector spaces | Electronic lectures, smart board ,pens | Written and daily exams with assignments |
| 3 | 12 | Application | Application | Electronic lectures, smart board ,pens | Written and daily exams with assignments |

## 11. Course Evaluation

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

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | • . Daige, L. S Wift, J and Slobko, T; .Elements of Linear Algebra, XEROX 1974 • |
| Main references (sources) | S rang. G; Linear Algebra and its Applications, A cademic Press, 1976 |
| Recommended books and references (scientific journals, reports…) | • Lang S; Linear Algebra, Addison Wesley Publishing Co., 1973. |
| Electronic References, Websites | |

# Course Description Form

| |
|---|
| 1. Course Name: Headway for all Stages |
| |
| 2. Course Code: ---------- |
| |
| 3. Semester / Year: 2025-2026 |
| |
| 4. Description Preparation Date: 21/9/2025 |
| |
| 5. Available Attendance Forms: Class lectures |
| |
| 6. Number of Credit Hours (Total) / Number of Units (Total): 60 hours / 14 Units |
| |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Assist.Lect. Basma Faisal Ali<br>Email: basma.faisal@tu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | Enabling the students to: .1<br>❖ Read and write in English<br>❖ Follow the basic rules of the English language.<br>❖ Understand the ways of life in English-speaking societies, especially the British and American, and some of the differences between them.<br>❖ Communicate linguistically.<br>❖ Understand the language of films and the internet.<br>.2 Teaching the students English language in smooth and simple manner.<br>.3 Urging the students to solve the exercises and apply the rules.<br>.4 Encouraging them to continue learning English language lessons by following programs in English and listening to conversation.<br>.5 Developing the Students' skills in expressing himself and his ability to speak orally.<br>.6 Developing the students' conversational skills |

| | |
|---|---|
| | and reading skills through the exercises in the student book |

## 9. Teaching and Learning Strategies

| Strategy | |
|---|---|
| | The standard method (giving lectures).<br>The text method.<br>Brainstorming method.<br>Some modern strategies. |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| October 1 Unit One & Two | 1 | | 1st Stage: Introduction use auxiliary /am/is/are In speaking and reading. Unit two: use the subjects /he/she/they/we/I/you In practice grammar.<br>2nd Stage: Teaching tenses of English language<br>3rd Stage: Introduction to auxiliary verbs<br>4th Stage: Teaching zero condition | Lecture | Discussion and exam |
| October 2 Unit Three | 1 | | 1st Stage: using negative and positive on short answers and<br>2nd Stage: Teaching how to ask questions<br>3rd Stage: Introduction to tenses and auxiliary verbs | Lecture | Discussion and exam |

| | | | | | |
|---|---|---|---|---|---|
| | | | 4th Stage:<br>Teaching first and second condition of IF | | |
| October<br>3<br>Unit Four | 1 | | 1st Stage:<br>Using possessives in adj. and plural nouns<br>2nd Stage:<br>Teaching got /have got in every day conversation .<br>3rd Stage:<br>Teaching present simple<br>4th Stage:<br>Teaching tenses informal English spoken | Lecture | Discussion and exam |
| October<br>4<br>Unit Five | 1 | | 1st Stage:<br>Teaching present simple<br>2nd Stage:<br>Teaching how can identify sentences in present or past<br>3rd Stage:<br>Teaching short answers and auxiliary verbs<br>4th Stage:<br>Introduction to auxiliary verbs: be/do/have | Lecture | Discussion and exam |
| November<br>1<br>Unit Six | 1 | | 1st Stage:<br>Teaching past simple<br>2nd Stage:<br>Using much/many<br>3rd Stage:<br>Teaching questions and auxiliary verbs<br>4th Stage:<br>Introduction to full verbs | Lecture | Discussion and exam |
| | | | 1st Stage: | | |

| | | | | | |
|---|---|---|---|---|---|
| November 2<br>Unit Seven | 1 | | Teaching present continuous<br>2nd Stage:<br>Using countable a few/a little of one syllable<br>3rd Stage:<br>Teaching the adverbs of present simple<br>4th Stage:<br>Teaching verbs of mind | Lecture | Discussion and exam |
| November 3<br>Unit Eight | 1 | | 1st Stage:<br>Teaching past continuous<br>2nd Stage:<br>The use of comparative and superlative<br>3rd Stage:<br>Teaching the adverbs of past simple<br>4th Stage:<br>Teaching verbs of mind | Lecture | Discussion and exam |
| November 4<br>Unit Nine | 1 | | 1st Stage:<br>Teaching past simple – irregular verbs<br>2nd Stage:<br>Adding er to adjectives<br>3rd Stage:<br>Teaching the state verb of present continuous<br>4th Stage:<br>Teaching verbs possession | Lecture | Discussion and exam |
| December 1<br>Unit Ten | 1 | | 1st Stage:<br>teach past simple in using questions and negatives | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | 2nd Stage: Practicing of present perfect<br>3rd Stage: Introduction to passive<br>4th Stage: Teaching verbs certain other verbs | Lecture | Discussion and exam |
| December 2 Unit Eleven | 1 | | 1st Stage: Using can in positive and negatives<br>2nd Stage: Teaching adverbs<br>3rd Stage: Present simple and present continuous passives<br>4th Stage: Teaching active and passive | Lecture | Discussion and exam |
| December 3 Unit Twelve | 1 | | 1st Stage: Teaching model verbs<br>2nd Stage: Using word pairs<br>3rd Stage: Teaching past perfect<br>4th Stage: Teaching question forms | Lecture | Discussion and exam |
| December 4 Unit Thirteen | 1 | | 1st Stage: Teaching adverbs<br>2nd Stage: Using short answers<br>3rd Stage: Teaching past perfect in positives and negatives<br>4th Stage: Asking for directions | Lecture | Discussion and exam |
| January 1 Unit Fourteen | 1 | | 1st Stage: using would like in questions<br>2nd Stage: making plural with regular and irregular<br>3rd Stage: Introduction to modal verbs<br>4th Stage: Asking for | Lecture | Discussion and exam |

| | | | | | |
|---|---|---|---|---|---|
| | | | descriptions | | |
| January 2 | 1 | | 1st Stage: Teaching some/any and the differences<br>2nd Stage: How can use determiners in formulating questions and answers<br>3rd Stage: The form of modal verbs<br>4th Stage: Teaching direct questions | Lecture | Discussion and exam |
| January 3 | 1 | | 1st Stage: Teaching like and would like<br>2nd Stage: Formulating positive and negative<br>3rd Stage: Modal verbs in obligation and positive<br>4th Stage: Using indirect questions | Lecture | Discussion and exam |
| January 4 | 1 | | 1st Stage: Teaching like and would like<br>2nd Stage: Practicing two forms of present and past<br>3rd Stage: modal verbs in affirmatives and negatives<br>4th Stage: Practicing possessives in different forms | Lecture | Discussion and exam |
| February 1 | 1 | | 1st Stage: Teaching present simple and present continuous<br>2nd Stage: Practicing question words<br>3rd Stage: Using should/ought to/must | Lecture | Discussion and exam |

| | | | | | |
|---|---|---|---|---|---|
| | | | 4th Stage:<br>Forming negative questions | | |
| February<br>2 | 1 | | 1st Stage:<br>Teaching Yes/No questions | Lecture | Discussion and exam |
| | | | 2nd Stage:<br>Practicing can/can't | | |
| | | | 3rd Stage:<br>Modal verbs making request:<br>can/could/will/would | | |
| | | | 4th Stage:<br>Using will for prediction | | |
| March<br>1 | 1 | | 1st Stage:<br>Teaching future plans | Lecture | Oral Test |
| | | | 2nd Stage:<br>Practicing was/were | | |
| | | | 3rd Stage:<br>Modal verbs making offers:<br>will/shall/should | | |
| | | | 4th Stage:<br>Using going to make prediction | | |
| March<br>2 | 1 | | 1st Stage:<br>Teaching countable and uncountable | Lecture | Oral Test |
| | | | 2nd Stage:<br>Practicing /s'/ plural | | |
| | | | 3rd Stage:<br>Introduction to future forms | | |
| | | | 4th Stage:<br>Using will/going to for make decisions and intentions | | |
| March<br>3 | 1 | | 1st Stage:<br>Teaching the determiner the | Lecture | Discussion and exam |
| | | | 2nd Stage:<br>How to indicate time | | |
| | | | 3rd Stage:<br>Introduction to present continuous in using will/going to | | |
| | | | 4th Stage:<br>using will and shall | | |

| | | | | | |
|---|---|---|---|---|---|
| March 4 | 1 | | 1st Stage: Teach the determiners a/an | Lecture | Discussion and exam |
| | | | 2nd Stage: Negative short answers | | |
| | | | 3rd Stage: Using will/going to | | |
| | | | 4th Stage: Introduction to express quantities | | |
| April 1 | 1 | | 1st Stage: Teaching prepositions | Lecture | Discussion and exam |
| | | | 2nd Stage: Using some/any, each /every, more/most | | |
| | | | 3rd Stage: Introduction to like | | |
| | | | 4th Stage: Introduction to modal verbs | | |
| April 2 | 1 | | 1st Stage: Teaching numbers | Lecture | Discussion and exam |
| | | | 2nd Stage: How to indicate place | | |
| | | | 3rd Stage: The use of relative clauses | | |
| | | | 4th Stage: Other uses to model verbs and related verbs | | |
| April 3 | 1 | | 1st Stage: Teaching collars | Lecture | Discussion and exam |
| | | | 2nd Stage: Teach jobs | | |
| | | | 3rd Stage: The use of time clauses | | |
| | | | 4th Stage: Introduction relative clauses | | |
| April 4 | 1 | | 1st Stage: Teaching question words | Lecture | Discussion and exam |
| | | | 2nd Stage: Teach plural pronouns | | |
| | | | 3rd Stage: The use of If conditions | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | 4th Stage: Expressing habits | | |
| May 1 | 1 | | Revision for all the Stages | Lecture | Discussion and exam |
| May 2 | 1 | | Revision for all the Stages | Lecture | Discussion and exam |
| May 3&4 | ------- | | Final Exams | ---------- | ---------- |

## 11. Course Evaluation

First Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Second Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Total for the 1st and 2nd Courses: 50
Final Exam: 50
Final Grade: 100

## 12. Learning and Teaching Sources

| | |
|---|---|
| Required textbooks (curricular books, if any) | The Ministry's prescribed book for all the stages |
| Main references (sources) | ---------- |
| Recommended books and references (scientific journal, reports | |
| Electronic References, Websites | https://elt.oup.com/student/headway/beg/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/preint4/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/int/?cc=global&selLanguage=en. https://sc.nahrainuniv.edu.iq/lectures/7092_new-headway-upper-intermediate-students-book.pdf. |