

Ministry of Higher Education and Scientific Research
Scientific Supervision and Evaluation Authority
Quality Assurance and Academic Accreditation Department
Accreditation Division



Academic Program and Course Descriptions

Department of Mathematics

Academic Year: 2026-2025

Ministry of Higher Education and Scientific Research
The Supervision and Scientific Evaluation Apparatus
Department of Quality Assurance and Academic Accreditation



College Academic Program Description Form For The Academic Year 2025-2026

University: Diyala

College/Institute: Basic Education

Scientific Department: Mathematics

Final Degree Name/Bachelor of Education / Mathematics

Academic system /semester

Date of Filling out the File: 1/10/2025

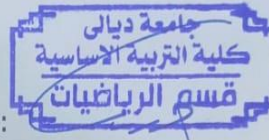
Signature:

Name of the Department Head

Prof. Dr. Mohammed Ali Murad

Date: 26/4/2026

Signature:



Scientific Associate Name:

Asst. Prof. Dr. Haider Abdel-Baqi

Date: 26/4/2026

Check the file before:

Name of the Director of the Division of Quality Assurance and
University Performance:

Instructor. Dr. Wedyan Habeeb Hameed

Date: 26/4/2026

Signature:

Approval of the Dean of the College:

Asst.Prof.Dr.Ayman Abed Aoun Nazzal

Third Year – Fifth Semester Program Description

Year \ Level	Course Code	Course Name	Credit Hours		Total Hours	Number of Units
			Theoretical	Practical		
Third \ Fifth	MAB03NA311	Numerical Analysis	3	1	4	3.5
	MAB03AS223	Advanced Statistics	3	1	4	3.5
	Math 3320	Differential Equations	3	1	4	3.5
	Math 3321	Group Theory	2	1	3	2.5
	Math 3318	Mathematical Thinking	2	-	2	2
	ED-RE-TH-1	Educational Research Methodology	3	-	3	3
	Coll 3212	General Teaching Methods	3	-	3	3
	Math 3322	Computer (Specialized)	1	2	3	2
Total			20	6	26	23

Third Year – Sixth Semester Program Description

Year \ Level	Course Code	Course Name	Credit Hours		Total Hours	Number of Units
			Theoretical	Practical		
Third \ Sixth	Math 3325	Mathematical Analysis	2	2	4	3
	Math 3326	Graph Theory	3	-	3	3
	MAB03SD329	Sustainable	2	-	2	2

Year \ Level	Course Code	Course Name	Credit Hours			
		Development				
	Coll 3211	Measurement and Evaluation	2	-	2	2
	Math 3323	Ring Theory	2	1	3	2.5
	Math 3324	Specialized Teaching Methods	3	-	3	3
	Coll 4214	Curricula and Textbooks	2	-	2	2
Total			16	3	19	17.5

Course Description Form

Field	Details
Course Name	Advanced Statistics
Course Code	MAB03AS223
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Fifth / Third Year
Total Study Hours	60 hours / Number of Units: 3
Date of Description Preparation	1/10/2025
Course Coordinator	Dr. Israa Amer Fleih
Email	basicmathte7te@uodiyala.edu.iq

Course Objectives

By the end of the academic year, the student should be able to:

- 1- Learn probability distributions.
- 2- Learn sampling theory, sample designs, and sampling distributions.
- 3- Learn hypothesis testing, steps of hypothesis testing, tests related to means and proportions.
- 4- Learn the Z-test, T-distribution, Chi-square distribution, and F-distribution.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Knowledge and understanding.
A2	Enable students to acquire knowledge and understanding of probability distributions.
A3	Enable students to acquire knowledge and understanding of sampling theory, sample designs, and sampling distributions.
A4	Enable students to acquire knowledge and understanding of hypothesis testing, steps of hypothesis testing, tests related to means and proportions.
A5	Enable students to acquire knowledge and understanding of the Z-test, T-distribution, Chi-square distribution, and F-distribution.

Code	Skill
B1	Skills in probability distributions.
B2	Skills in sampling theory.
B3	Skills in hypothesis testing.
B4	Skills in the Z-test and T-distribution.

B. Skills Objectives of the Course

Teaching and Learning Methods

- 1- Clarify and explain the course material.
- 2- Model presentation method.
- 3- Lecture method.
- 4- Self-learning method.

Assessment Methods

- 1- Daily tests with specific questions.
- 2- Assign grades for homework and class participation.
- 3- Assign students to complete research and reports on the course material.
- 4- Monthly exams with objective and essay questions and problem-solving related to the topic.

C. Affective and Value Objectives

Code	Objective
C1	Appreciate the importance of studying the subject and its life applications.

Teaching and Learning Methods (Affective)

- 1- Explanation and clarification.
- 2- Model presentation method.
- 3- Self-learning method.

Assessment Methods (Affective)

- 1- Theoretical tests.
- 2- Reports and studies.

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Skills in using references and terminology.
D2	Skills in collecting and analyzing data on the topic.
D3	Skills in interpreting theorems.
D4	Skills in making comparisons.
D5	Skills in preparing specific concepts on the topic.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	4	Random variables, discrete and continuous probability distributions, binomial distribution	Probability Distribution	Lecture	Formative Assessment
2	4	Poisson distribution, normal curve, area under the normal curve, normal distribution	Probability Distribution	Lecture	Formative Assessment
3	4	Relationship between normal distribution and binomial distribution	Probability Distribution	Explanation and Clarification	Formative Assessment
4	4	Mean of a single sample drawn from a normal population	Sampling Theory, Sample Designs, Sampling Distribution	Explanation and Clarification	Formative Assessment
5	4	Difference between two arithmetic means	Sampling Theory, Sample Designs, Sampling Distribution	Explanation and Clarification	Formative Assessment
6	4	First Month Exam – Various tests and problem-solving related to the topic			
7	4	Proportion test for a single sample	Sampling Theory, Sample Designs, Sampling Distribution	Explanation and Clarification	Formative Assessment
8	4	Test of the difference	Sampling Theory,	Explanation and	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
		between two proportions from two samples drawn from the population	Sample Designs, Sampling Distribution	Clarification	
9	4	Steps of hypothesis testing	Hypothesis Testing	Explanation and Clarification	Formative Assessment
10	4	Tests related to means	Hypothesis Testing	Explanation and Clarification	Formative Assessment
11	4	Tests related to proportions	Hypothesis Testing	Explanation and Clarification	Formative Assessment
12	4	Z-test and T-distribution	Z-test, T-distribution, Chi-square distribution, F-distribution	Explanation and Clarification	Formative Assessment
13	4	Chi-square distribution and F-distribution	Z-test, T-distribution, Chi-square distribution, F-distribution	Explanation and Clarification	Formative Assessment
14	4	In terms of distribution shape, derivation, and finding tabulated values	Z-test, T-distribution, Chi-square distribution, F-distribution	Explanation and Clarification	Formative Assessment
15	4	Second Month Exam – Objective tests and problem-solving			

Infrastructure

Category	Details
1. Required Prescribed Books	None

Category	Details
2. Main References (Sources)	Introduction to Statistics. Dr. Khash'a Mahmoud Al-Rawi, 2000, 2nd Edition.
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Utilizing any sources related to the topic.
b. Electronic References, Internet Sites, etc.	Seriyamath

Course Development Plan

Adherence to the sectoral framework.

Course Description Form

Field	Details
Course Name	Educational Research Methodology
Course Code	ED-RE-TH-1
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Fifth / Third Year
Total Study Hours	45 hours / Number of Units: 2
Date of Description Preparation	1/10/2025
Course Coordinator	Dr. Mohammed Waheeb Mahdi
Email	mohammed.whaed@uodiyala.edu.iq

Course Objectives

By the end of the academic year, the student should be able to:

1. Learn science and scientific research.
2. Learn the research problem and its hypotheses.
3. Learn the study participants.
4. Learn data collection tools.

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| 5. Learn how to prepare a research report. |
| 6. Learn libraries and scientific research. |
| 7. Learn how to summarize a master's or doctoral thesis by students. |

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Knowledge and understanding.
A2	Enable students to acquire knowledge and understanding of the stages of reaching knowledge.
A3	Enable students to acquire knowledge and understanding of the nature of science, objectives of science, and characteristics of research.
A4	Enable students to acquire knowledge and understanding of reviewing literature related to the research problem.
A5	Enable students to acquire knowledge and understanding of libraries and scientific research.

Code	Skill
B1	Skills in educational research and its steps.
B2	Skills related to sources of obtaining the problem.
B3	Skills related to data collection tools.
B4	Skills in preparing a research report.
B5	Skills in summarizing a master's or doctoral thesis by students.

B. Skills Objectives of the Course

Teaching and Learning Methods

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| 1- Clarify and explain the course material.
2- Model presentation method.
3- Lecture method.
4- Self-learning method. |
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Assessment Methods

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| 1- Daily tests with specific questions.
2- Assign grades for homework and class participation. |
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- 3- Assign students to complete research and reports on the course material.
- 4- Monthly exams with objective and essay questions.

C. Affective and Value Objectives

Code	Objective
C1	Appreciate the importance of studying the subject and its life applications.
C2	Understand the importance of ethical considerations in educational research.

Teaching and Learning Methods (Affective)

- 1- Explanation and clarification.
- 2- Model presentation method.
- 3- Self-learning method.

Assessment Methods (Affective)

- 1- Theoretical tests.
- 2- Reports and studies.

Code	Skill
D1	Skills in using references and terminology.
D2	Skills in collecting and analyzing data on the topic.
D3	Skills in interpreting theorems.
D4	Skills in making comparisons.
D5	Skills in preparing specific concepts on the topic.

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	3	Learn the stages of reaching knowledge, Learn the nature of science, objectives of science, and characteristics of research, Learn	Science and Scientific Research	Explanation and Clarification	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
		educational research and its steps, Learn ethical considerations in educational research			
2	3	Learn the classification of research: • Descriptive research • Experimental research • Historical research	Science and Scientific Research	Explanation and Clarification	Formative Assessment
3	3	Learn sources of obtaining the problem, Rules for formulating the problem	Research Problem and Its Hypotheses	Explanation and Clarification	Formative Assessment
4	3	Learn research variables, Research hypotheses, Reviewing literature related to the research problem	Research Problem and Its Hypotheses	Explanation and Clarification	Formative Assessment
5	3	Learn conducting surveys and interviews	Study Participants	Model Presentation	Formative Assessment
6	3	Learn observation	Study Participants	Lecture	Formative Assessment
7	3	First Month Exam – Objective and essay tests			
8	3	Learn preparing a research report	Preparing a Research Report	Lecture	Formative Assessment
9	3	Learn preparing a research report	Preparing a Research Report	Lecture	Formative Assessment
10	3	Learn libraries and scientific research	Libraries and Scientific Research	Lecture	Formative Assessment
11	3	Learn libraries and scientific research	Libraries and Scientific	Lecture	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
			Research		
12	3	Summarizing a master's or doctoral thesis by students	Summarizing a Master's or Doctoral Thesis by Students	Lecture	Formative Assessment
13	3	Summarizing a master's or doctoral thesis by students	Summarizing a Master's or Doctoral Thesis by Students	Lecture	Formative Assessment
14	3	Summarizing a master's or doctoral thesis by students	Summarizing a Master's or Doctoral Thesis by Students	Model Presentation	Formative Assessment
15	3	Second Month Exam – Objective and essay tests			

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	1. Al-Azzawi, Rahim Younis Karo, 2008, Introduction to Scientific Research Methodology, 1st Edition, Dar Dijla for Printing and Publishing, Amman, Jordan.
a. Recommended Books and References (Scientific Journals, Reports, etc.)	1. Daoud, Aziz Hanna and Abdul Rahman, Anwar Hussein, 1990, Educational Research Methodologies, Ministry of Higher Education and Scientific Research, Dar Al-Hikma for Printing and Publishing, University of Baghdad, Iraq.
b. Electronic References, Internet Sites, etc.	Any site related to educational research.

Course Development Plan

Adherence to the sectoral framework.

Course Description Form

Field	Details
Course Name	Numerical Analysis
Course Code	MAB03NA311
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Fifth / Third Year
Total Study Hours	60 hours / Number of Units: 3
Date of Description Preparation	1/10/2025
Course Coordinator	Asst. Lect. Nada Mohsen Khalil
Email	basicmathte5@uodiyala.edu.iq

Course Objectives

By the end of the academic year, the student should be able to:

- 1- Learn solutions of nonlinear equations.
- 2- Learn solutions of linear equations.
- 3- Learn numerical integration and differentiation.
- 4- Learn solving ordinary differential equations.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Knowledge and understanding.
A2	Enable students to acquire knowledge and understanding of solutions of nonlinear equations.
A3	Enable students to acquire knowledge and understanding of solutions of linear equations.
A4	Enable students to acquire knowledge and understanding of numerical integration and

Code	Objective
	differentiation.
A5	Enable students to acquire knowledge and understanding of solving ordinary differential equations.

B. Skills Objectives of the Course

Code	Skill
B1	Skills in locating roots.
B2	Skills in Gaussian elimination method.
B3	Skills in Newton's formulas for numerical differentiation.
B4	Skills in the Runge-Kutta method.

Teaching and Learning Methods

- 1- Clarify and explain the course material.
- 2- Model presentation method.
- 3- Lecture method.
- 4- Self-learning method.

Assessment Methods

- 1- Daily tests with specific questions.
- 2- Assign grades for homework and class participation.
- 3- Assign students to complete research and reports on the course material.
- 4- Monthly exams with objective and essay questions and applied problem-solving.

C. Affective and Value Objectives

Code	Objective
C1	Appreciate the importance of studying the subject and its life applications.

Teaching and Learning Methods (Affective)

- 1- Explanation and clarification.
- 2- Model presentation method.
- 3- Self-learning method.

Assessment Methods (Affective)

- 1- Theoretical tests.
- 2- Reports and studies.

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Skills in using references and terminology.
D2	Skills in collecting and analyzing data on the topic.
D3	Skills in preparing specific concepts on the topic.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	4	Solutions of linear equations	Solutions of Nonlinear Equations	Explanation and Clarification	Formative Assessment
2	4	Newton's method	Solutions of Nonlinear Equations	Explanation and Clarification	Formative Assessment
3	4	Convergence of iterative methods (finding roots of polynomials)	Solutions of Nonlinear Equations	Explanation and Clarification	Formative Assessment
4	4	Gaussian elimination method	Solutions of Linear Equations	Explanation and Clarification	Formative Assessment
5	4	Gauss-Jordan method	Solutions of Linear Equations	Explanation and Clarification	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
6	4	Gauss-Jordan method	Solutions of Linear Equations	Explanation and Clarification	Formative Assessment
7	4	First Periodic Exam – Solving the exam and discussing errors with students			
8	4	Numerical differentiation	Numerical Integration and Differentiation	Explanation and Clarification	Formative Assessment
9	4	Newton's formulas for numerical differentiation	Numerical Integration and Differentiation	Explanation and Clarification	Formative Assessment
10	4	Simpson's rule	Numerical Integration and Differentiation	Explanation and Clarification	Formative Assessment
11	4	Numerical integration and differentiation	Numerical Integration and Differentiation	Explanation and Clarification	Formative Assessment
12	4	Numerical integration and differentiation	Numerical Integration and Differentiation	Explanation and Clarification	Formative Assessment
13	4	Numerical integration and differentiation	Numerical Integration and Differentiation	Explanation and Clarification	Formative Assessment
14	4	Second Periodic Exam – Solving the exam and discussing errors with students			
15	4	General Review			

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	Numerical Methods. Dr. Ali Saifi, 1990.
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Introduction to Numerical Analysis. Dr. Ahmed Saleh Al-Alusi. Utilizing any sources related to the topic.
b. Electronic References, Internet Sites, etc.	

Course Development Plan

Adherence to the sectoral framework.

Course Description Form

Field	Details
Course Name	Mathematical Thinking
Course Code	Math 3318
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Fifth / Third Year
Total Study Hours	30 hours / Number of Units: 2
Date of Description Preparation	1/10/2025
Course Coordinator	Asst. Lect. Shahd Thamer Jasim
Email	basicmathte9@uodiyala.edu.iq

Course Objectives

By the end of the academic year, the student should be able to:

1. Define thinking, the meaning of thinking in the Qur'anic verses, the philosophical approach, and the psychological approach.
2. Enumerate the levels of thinking: learning how to learn, metacognitive controls, content-related thinking, reflective thinking.
3. Compare between types of thinking: critical, inductive, reflective, mathematical, cognitive, logical, deductive, scientific.
4. Define mathematical thinking.
5. Mention the most important objectives of mathematical thinking in basic education.
6. Enumerate the fields of mathematical thinking.
7. Define methods of developing mathematical thinking.
8. Develop thinking in students.
9. Develop mathematical thinking.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Define thinking as mentioned in the Qur'anic verses.
A2	Provide examples of levels of thinking.
A3	Enumerate types of thinking.
A4	Mention the objectives of mathematical thinking.
A5	Compare between mathematical thinking development programs.

B. Skills Objectives of the Course

Code	Skill
B1	Explain the objectives of thinking.
B2	Distinguish between levels of thinking.
B3	Compare between methods of developing mathematical thinking.
B4	Analyze using mathematical thinking.
B5	Apply by writing a paper or research on any topic in mathematical thinking.

Code	Skill
B6	Collect information about mathematical thinking programs.

Teaching and Learning Methods

- 1- Provide students with the fundamentals and topics related to mathematical thinking.
- 2- Clarify and explain the course material.
- 3- Require students to visit the library and review sources.
- 4- Improve students' skills through visiting electronic sites to gain additional knowledge of mathematical thinking.
- 5- Use lecture, presentation, questioning, and discussion methods in some topics that require discussion

Assessment Methods

- 1- Daily tests with specific questions.
- 2- Assign grades for homework and class participation.
- 3- Assign students to complete research and reports on topics related to mathematical thinking.
- 4- Monthly exams with objective and essay questions.

C. Affective and Value Objectives

Code	Objective
C1	Understand the importance of studying the philosophical approach to mathematical thinking.
C2	Apply some methods of mathematical thinking.
C3	Evaluate some activities related to mathematical thinking.
C4	Compare between mathematical thinking development programs.

Teaching and Learning Methods (Affective)

- 1- Use of presentation methods.
- 2- Drawing illustrative diagrams.
- 3- Brainstorming method.

Assessment Methods (Affective)

- Analytical exam to measure the student's ability to think, analyze, and deduce.
- Request comparisons between mental thinking programs.
- Writing research that includes skills for developing mathematical thinking.
- Daily exams with intellectual and deductive questions.

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Skills in using references and terminology.
D2	Skills in collecting and analyzing data on the topic.
D3	Skills in utilizing available resources.
D4	Skills in making comparisons on the topic.
D5	Skills in preparing specific concepts on the topic.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	2	Understand the meaning of thinking (definition – philosophical approach – psychological approach)	Mathematical Thinking in the Qur'anic Verses – Philosophical Approach	Discussion and Questioning	Formative Assessment
2	2	Understand the levels of thinking	How to Learn	Discussion and Questioning	Formative Assessment
3	2	Understand critical, reflective, and inductive thinking	Types of Thinking	Discussion and Questioning	Formative Assessment
4	2	Understand cognitive, deductive, and scientific thinking	Types of Thinking	Discussion and Questioning	Formative Assessment
5	2	First Month Exam – Essay test			
6	2	Define the meaning of	Mathematical Thinking	Discussion and	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
		mathematical thinking	(Meaning – Definition)	Questioning	
7	2	Enumerate the objectives of mathematical thinking	Objectives of Mathematical Thinking in Basic Education	Discussion and Questioning	Formative Assessment
8	2	Compare between fields of mathematical thinking (induction, deduction, expression, generalization, abstraction)	Fields of Mathematical Thinking	Discussion and Questioning	Formative Assessment
9	2	Compare between fields of mathematical thinking (formal logic, investigation, proof, problem-solving)	Fields of Mathematical Thinking	Discussion and Questioning	Formative Assessment
10	2	Second Monthly Exam			
11	2	Understand methods of developing mathematical thinking	Methods of Developing Mathematical Thinking	Discussion and Questioning	Formative Assessment
12	2	Understand stages of developing thinking in children	Stages of Developing Thinking in Children	Discussion and Questioning	Formative Assessment
13	2	Understand stages of developing thinking in children	Stages of Developing Thinking in Children	Discussion and Questioning	Formative Assessment
14	2	Understand mathematical thinking development programs	Mathematical Thinking Development Programs	Discussion and Questioning	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
15	2	Understand mathematical thinking development programs	Mathematical Thinking Development Programs	Discussion and Questioning	Formative Assessment

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	
a. Recommended Books and References (Scientific Journals, Reports, etc.)	
b. Electronic References, Internet Sites, etc.	Lectures by experts in the field of mathematics teaching methods.

Course Development Plan

The course should include: Arab contributions to the development of mathematics, manifestations of mathematical thinking and its developments.

Course Description Form

Field	Details
Course Name	Differential Equations
Course Code	Math 3320
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Fifth / Third Year
Total Study Hours	60 hours / Number of Units: 3

Field	Details
Date of Description Preparation	1/10/2025
Course Coordinator	Dr. Shaker Mahmoud Salman
Email	basicmath6te@uodiyala.edu.iq

Course Objectives

The student should be familiar with the following concepts:

1.	Concept of first-order differential equations (separation of variables, homogeneous and non-homogeneous, etc.).
2.	Concept of general and particular solutions of differential equations.
3.	Knowledge of linear equations of higher order reduced to first order.
4.	Using the method of variation of parameters to find the particular solution of a non-homogeneous differential equation.
5.	Euler's equation and its solution.
6.	Reduction of order of a differential equation.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	The student should understand the concept of differential equations, degree and order of the equation.
A2	The student should know the concept of general and particular solutions of differential equations.
A3	The student should know methods of solving differential equations.
A4	The student should know the method of variation of parameters to find the particular solution of a non-homogeneous differential equation.
A5	The student should know Euler's equation and its solution.
A6	The student should know reduction of order of a differential equation.

B. Skills Objectives of the Course

The student should develop skills in the following concepts:

Code	Skill
B1	Concept of differential equations, degree and order of the equation.
B2	Concept of general and particular solutions of differential equations.
B3	Methods of solving differential equations.
B4	Euler's equation and its solution.
B5	Reduction of order of a differential equation.

Teaching and Learning Methods

At the beginning of the semester, students are informed of the course syllabus and information sources (related books, periodicals, university theses). The syllabus is distributed across the weeks of the semester, along with the assessment methods to be followed, as follows:

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| 1. Preparation of lectures according to the sequence outlined in the course syllabus using the aforementioned information sources. |
| 2. Informing students about the topic of the upcoming lecture for preparation purposes. |
| 3. Requesting students to submit papers on one or more of the topics under study. |

Assessment Methods

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| 1. Conducting two mid-semester exams: the first after the fifth week of the semester and the second after the eleventh week. Each exam considers cognitive levels (recall, application, exploration). Assessment contributes 40% of the total achievement, taking into account student attendance and daily participation. |
| 2. End-of-semester exam accounting for 60% of achievement according to ministry timings. When setting questions, comprehensiveness of the course content and cognitive levels (recall, application, exploration) are considered. |

C. Affective and Value Objectives

The student should be able to:

Code	Objective
C1	Define differential equations.

Code	Objective
C2	Define general and particular solutions of differential equations.
C3	Define Euler's equation and its solution.
C4	Define reduction of order of a differential equation.

Teaching and Learning Methods (Affective)

The direct instruction method is typically used, where skills are taught directly and explicitly, reinforced with examples from mathematics for basic education levels.

Assessment Methods (Affective)

These are included within the course assessment processes conducted during and at the end of the semester.

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Employ acquired skills in teaching mathematical knowledge to basic education students.
D2	Select examples from the basic education mathematics curriculum, each with skills addressed in the course.
D3	Evaluate the extent to which basic education students acquire application skills.
D4	Construct tests specific to mathematical thinking areas for basic education students.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	4	Concept of differential equations with examples	Concept of Differential Equations with Examples	Discussion and Questioning	Formative Assessment
2	4	Order and degree of the equation with examples	Order and Degree of the Equation with Examples	Discussion and Questioning	Formative Assessment
3	4	Separation of variables method with examples	Separation of Variables Method with Examples	Discussion and Questioning	Formative Assessment
4	4	Homogeneous with examples	Homogeneous with Examples	Discussion and Questioning	Formative Assessment
5	4	Non-homogeneous with examples	Non-homogeneous with Examples	Discussion and Questioning	Formative Assessment
6	4	Monthly Exam	Monthly Exam	-	Formative Assessment
7	4	General and particular solutions with examples	General and Particular Solutions with Examples	Discussion and Questioning	Formative Assessment
8	4	Linear equations with examples	Linear Equations with Examples	Discussion and Questioning	Formative Assessment
9	4	General solution of homogeneous equations with examples	General Solution of Homogeneous Equations with Examples	Discussion and Questioning	Formative Assessment
10	4	Particular solution of homogeneous equations with examples	Particular Solution of Homogeneous Equations with Examples	Discussion and Questioning	Formative Assessment
11	4	Monthly Exam	Monthly Exam	-	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
12	4	Method of variation of parameters	Method of Variation of Parameters	Discussion and Questioning	Formative Assessment
13	4	Euler's equation with examples	Euler's Equation with Examples	Discussion and Questioning	Formative Assessment
14	4	Reduction of order with examples	Reduction of Order with Examples	Discussion and Questioning	Formative Assessment
15	4	Final Exam	Final Exam	Discussion and Questioning	Formative Assessment

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	Methods of Solving Ordinary Differential Equations. Dr. Khalid Ahmed Al-Samarrai. Introduction to Differential Equations.
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Utilizing periodicals and sources related to the course.
b. Electronic References, Internet Sites, etc.	Utilizing the Internet as a known source of information.

Course Development Plan

1. The course is developed according to requirements that emerge from curriculum development in basic education stages.
2. The course is developed according to requirements that emerge from curriculum development in the global system.

Course Description Form

Field	Details
Course Name	Group Theory
Course Code	Math 3321
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Fifth / Third Year
Total Study Hours	45 hours / Number of Units: 2
Date of Description Preparation	1/10/2025
Course Coordinator	Asst. Prof. Dr. Hamid Kadhim Dawood
Email	basicmath5te@uodiyala.edu.iq

Course Objectives

- 1- Learn the meaning of mathematical systems.
- 2- Learn groups.
- 3- Learn abelian groups.
- 4- Learn non-abelian groups.
- 5- Learn subgroups, cyclic groups, finite groups, and quotient groups.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	The student should understand the meaning of mathematical systems.
A2	The student should know groups with examples.
A3	The student should know abelian and non-abelian groups.
A4	Subgroups, cyclic groups, finite groups, and quotient groups.

B. Skills Objectives of the Course

Code	Skill
B1	Meaning of mathematical systems.
B2	Meaning of mathematical systems.
B3	Groups with examples.
B4	Abelian and non-abelian groups.
B5	Subgroups, cyclic groups, finite groups, and quotient groups.

Teaching and Learning Methods

At the beginning of the semester, students are informed of the course syllabus and information sources (related books, periodicals, university theses, professor's expertise). The syllabus is distributed across the weeks of the semester, along with the assessment methods to be followed. The methods used in presenting the course syllabus are as follows:

- | |
|--|
| 1. Preparation of lectures according to the sequence outlined in the course syllabus using the aforementioned information sources. |
| 2. Informing students about the topic of the upcoming lecture for preparation purposes. |
| 3. Using effective discussion methods, constructive questioning, and feedback. |
| 4. Requesting students to submit papers on one or more of the topics under study. |

Assessment Methods

- | |
|---|
| 1. Conducting two mid-semester exams: the first after the fifth week of the semester and the second after the tenth week. Each exam considers cognitive levels (recall, application, exploration). Assessment contributes 40% of the total achievement, taking into account student attendance and daily participation. |
| 2. End-of-semester exam accounting for 60% of achievement according to ministry timings. When setting questions, comprehensiveness of the course content and cognitive levels (recall, application, exploration) are considered. |

C. Affective and Value Objectives

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Employ group theory skills in teaching statistical knowledge to basic education students.
D2	Select examples from the basic education mathematics curriculum, each with skills addressed in the course.

Code	Skill
D3	Evaluate the extent to which basic education students acquire group skills.
D4	Construct tests specific to groups for basic education students.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	3	Groups	Mathematical Systems	Explanation and Clarification	Formative Assessment
2	3	Groups with examples	Mathematical Systems	Explanation and Clarification	Formative Assessment
3	3	Abelian groups	Mathematical Systems	Explanation and Clarification	Formative Assessment
4	3	Non-abelian groups	Mathematical Systems	Explanation and Clarification	Formative Assessment
5	3	Abelian and non-abelian groups	Mathematical Systems	Explanation and Clarification	Formative Assessment
6	3	Subgroups	Mathematical Systems	Explanation and Clarification	Formative Assessment
7	3	Exam with various objective questions			
8	3	Cyclic groups	Mathematical Systems	Explanation and Clarification	Formative Assessment
9	3	Finite groups	Mathematical Systems	Explanation and Clarification	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
10	3	Infinite groups	Mathematical Systems	Explanation and Clarification	Formative Assessment
11	3	Finite and infinite groups	Mathematical Systems	Explanation and Clarification	Formative Assessment
12	3	Quotient groups	Mathematical Systems	Explanation and Clarification	Formative Assessment
13	3	Quotient groups	Mathematical Systems	Explanation and Clarification	Formative Assessment
14	3	Exam with objective questions and problem-solving			
15	3	Review			

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	1. Artin, "Algebra" 2008, Pearson Education, Inc. (India).
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Introduction to Group Theory. Authored by Dr. Adel Ghassan Naoum and others. Abstract Algebra. Dr. Adel Ghassan Naoum, Dr. Basil Atta Al-Hashimi. Utilizing periodicals and sources related to the course.
b. Electronic References, Internet Sites, etc.	Utilizing the Internet as a known source of information.

Course Development Plan

Adherence to the sectoral framework.

Course Description Form

Field	Details
Course Name	Computer (Specialized)
Course Code	Math 3322
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Fifth / Third Year
Total Study Hours	45 hours / Number of Units: 2
Date of Description Preparation	1/10/2025
Course Coordinator	Asst. Lect. Haneen Abbas Saleh
Email	basicmathte6@uodiyala.edu.iq

Course Objectives

By the end of the academic year, the student should be able to:

- 1- Learn an introduction to the MATLAB technical computing language.
- 2- Learn constants and variables.
- 3- Learn matrices and operations on matrices.
- 4- Learn symbolic strings.
- 5- Learn MATLAB data files.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Knowledge and understanding.
A2	Enable students to acquire knowledge and understanding of the MATLAB technical computing language.

Code	Objective
A3	Enable students to acquire knowledge and understanding of constants and variables.
A4	Enable students to acquire knowledge and understanding of matrices and operations on matrices.
A5	Enable students to acquire knowledge and understanding of symbolic strings.

B. Skills Objectives of the Course

Code	Skill
B1	Skills in operations on matrices.
B2	Skills in input and output statements.
B3	Skills in set and bit instructions and basic instructions.
B4	Skills in graphing.

Teaching and Learning Methods

- 1- Clarify and explain the course material.
- 2- Model presentation method.
- 3- Lecture method.
- 4- Self-learning method.

Assessment Methods

- 1- Daily tests with specific questions.
- 2- Assign grades for homework and class participation.
- 3- Assign students to complete research and reports on the course material.
- 4- Monthly exams with objective and essay questions and applied problem-solving.

C. Affective and Value Objectives

Code	Objective
C1	Appreciate the importance of studying the subject and its life applications.

Teaching and Learning Methods (Affective)

1- Explanation and clarification.
2- Model presentation method.
3- Self-learning method.

Assessment Methods (Affective)

1- Theoretical tests.
2- Reports and studies.

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Skills in using references and terminology.
D2	Skills in collecting and analyzing data on the topic.
D3	Skills in preparing specific concepts on the topic.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	3	Learn an introduction to the MATLAB technical computing language	Introduction to the MATLAB Technical Computing Language	Explanation and Clarification	Formative Assessment
2	3	Learn constants and variables	Constants and Variables	Explanation and Clarification	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
3	3	Learn matrices and operations on matrices	Matrices and Operations on Matrices	Explanation and Clarification	Formative Assessment
4	3	Learn multidimensional matrices	Multidimensional Matrices	Explanation and Clarification	Formative Assessment
5	3	Learn cell arrays	Cell Arrays	Explanation and Clarification	Formative Assessment
6	3	Learn symbolic strings	Symbolic Strings	Explanation and Clarification	Formative Assessment
7	3	First Periodic Exam – Solving the exam and discussing errors with students			
8	3	Learn input and output statements	Input and Output Statements	Explanation and Clarification	Formative Assessment
9	3	Learn conditional statements	Conditional Statements	Explanation and Clarification	Formative Assessment
10	3	Learn loop and iteration statements	Loop and Iteration Statements	Explanation and Clarification	Formative Assessment
11	3	Learn MATLAB data files	MATLAB Data Files	Explanation and Clarification	Formative Assessment
12	3	Learn set and bit instructions and basic instructions	Set and Bit Instructions and Basic Instructions	Explanation and Clarification	Formative Assessment
13	3	Learn functions and subroutines	Functions and Subroutines	Explanation and Clarification	Formative Assessment
14	3	Learn graphing	Graphing	Explanation and Clarification	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
15	3	Second Periodic Exam – Solving the exam and discussing errors with students			

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Utilizing any sources related to the topic.
b. Electronic References, Internet Sites, etc.	

Course Development Plan

Adherence to the sectoral framework.

Course Description Form

Field	Details
Course Name	Measurement and Evaluation
Course Code	Coll 3211
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Sixth / Third Year
Total Study Hours	30 hours / Number of Units: 2
Date of Description Preparation	1/10/2025

Field	Details
Course Coordinator	Asst. Lect. Shahd Thamer Jasim
Email	basicmathte9@uodiyala.edu.iq

Course Objectives

This course aims to help students achieve the following:

- 1- Understand the scientific meaning of measurement and evaluation concepts and the difference between them.
- 2- Understand the importance of evaluation and its main areas, steps, and types.
- 3- Acquire the skill of preparing various types of tests.
- 4- Acquire applied skills in the basics of statistics in educational measurement and evaluation.
- 5- Understand evaluation tools and their use appropriate to different aspects of the learner.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Enable students to acquire knowledge and understanding of the concept of measurement and evaluation.
A2	Enable students to acquire knowledge and understanding of the concept of personality tests.
A3	Enable students to acquire knowledge and understanding of the concept of oral and written tests.
A4	Enable students to acquire knowledge and understanding of the concept of objective and essay tests.
A5	Enable students to acquire knowledge and understanding of how to prepare tests.
A6	Enable students to acquire knowledge and understanding of how to prepare a test blueprint.

B. Skills Objectives of the Course

Code	Skill
B1	Skills in distinguishing between measurement and evaluation concepts.
B2	Skills in preparing a table of specifications or test blueprint.

Code	Skill
B3	Skills in choosing the appropriate test to measure the achievement of set objectives.
B4	Skills in preparing a set of behavioral objectives.

Teaching and Learning Methods

- Questioning and discussion.
- Requiring students to prepare models of objective and essay tests.

Assessment Methods

- 1- Daily, monthly, and semester exams.
- 2- Delivering a micro-lesson in front of students.
- 3- Practical tests in creating models of objective and essay tests.

C. Affective and Value Objectives

Code	Objective
C1	Develop students' attitudes toward using innovations and developments in teaching methods.
C2	Keep up with developments in educational and psychological sciences.
C3	Develop students' attitudes toward the teaching profession.

Teaching and Learning Methods (Affective)

- Brainstorming.
- Problem-solving method.
- Programmed instruction.

Assessment Methods (Affective)

- | |
|--|
| <ul style="list-style-type: none">• Daily and monthly tests. |
| <ul style="list-style-type: none">• Practical tests (application). |

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Skills in using modern sources.
D2	Skills in benefiting from the latest developments in the educational field.
D3	Skills in delivering a practical lesson in front of students.
D4	Skills in preparing tests according to scientific foundations.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	2	Ability to define and understand evaluation and measurement and the relationship between them	Evaluation: Concept, Types, Areas – Measurement: Concept, Characteristics, and Relationship with Evaluation	Lecture and Questioning	Daily Quiz
2	2	Enable students to know and understand the steps of constructing achievement tests prepared by the teacher, including determining the importance of behavioral objectives	Types of Tests and Educational and Psychological Measures – Steps of Constructing Achievement Tests Prepared by the Teacher, Including Determining the Importance of Behavioral	Cooperative Learning	Daily Class Participation

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
			Objectives		
3	2	Enable students to know and understand the foundations for determining test items / distribution of test items in light of the weights of objectives and content	Foundations for Determining Test Items / Distribution of Test Items in Light of the Weights of Objectives and Content – Behavioral Objectives: Definition, Characteristics, Levels	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation
4	2	Enable students to know and understand types of test items, their characteristics, and foundations of formulation	Types of Test Items: Characteristics and Foundations of Formulation	Group Discussion	Class Participation in Lecture Preparation
5	2	Enable students to know and understand the formulation of test items and their types, foundations of item arrangement, principles of test administration	Formulation of Test Items and Their Types – Foundations of Item Arrangement – Principles of Test Administration	Lecture	Class Participation in Lecture Preparation
6	2	Monthly Exam			
7	2	Enable students to know and understand validity: definition, types, methods of extracting validity – Reliability: definition, characteristics	Validity: Definition, Types, Methods of Extracting Validity – Reliability: Definition, Characteristics	Lecture and Discussion	Class Participation in Lecture Preparation

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
8	2	Enable students to know and understand oral tests	Oral Tests	Lecture and Questioning	Class Participation in Lecture Preparation
9	2	Enable students to know and understand intelligence tests: definition and types	Intelligence Tests: Definition and Types	Lecture and Questioning	Class Participation in Lecture Preparation
10	2	Enable students to know and understand personality and interest scales	Personality and Interest Scales	Lecture, Questioning, and Discussion	Class Participation in Lecture Preparation
11	2	Enable students to know and understand non-test measurement tools	Non-Test Measurement Tools	Lecture and Questioning	Class Participation in Lecture Preparation
12	2	Monthly Exam			

Infrastructure

Category	Details
1. Required Prescribed Books	-
2. Main References (Sources)	School Achievement Tests (Foundations of Construction and Analysis of Their Questions) by Prof. Dr. Abdul Wahid Hamid Al-Kubaisi and Prof. Dr. Hadi Mish'an Rabi'.
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Educational and Psychological Evaluation and Measurement, Ramziya Al-Gharib. Principles of Educational Measurement and Evaluation for the University Student and the Arab Teacher, Sab'a Abu Labda.
b. Electronic References, Internet Sites, etc.	Various educational websites.

Course Development Plan

Course Description Form

Field	Details
Course Name	General Teaching Methods
Course Code	Coll 3212
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Fifth / Third Year
Total Study Hours	45 hours / Number of Units: 2
Date of Description Preparation	1/10/2025
Course Coordinator	Asst. Lect. Jaber Mohammed Jaber
Email	basicmath12te@uodiyala.edu.iq

Course Objectives

1. Students' knowledge of the concept of teaching methods.
2. Students' knowledge of the importance of teaching methods.
3. Understanding the most commonly used methods.
4. Understanding the most important trends and innovations in teaching methods.
5. Understanding teaching methods for mastery and creativity.
6. Students' knowledge of diversifying teaching and its strategies.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Enable students to acquire knowledge and understanding of the concept of teaching methods.
A2	Enable students to acquire knowledge and understanding of the concept of teaching strategies.
A3	Enable students to acquire knowledge and understanding of the concept of teaching techniques.

Code	Objective
A4	Enable students to acquire knowledge and understanding of commonly used teaching methods.
A5	Enable students to acquire knowledge and understanding of the concept of diversifying teaching.
A6	Enable students to acquire knowledge and understanding of trends and innovations in teaching methods.

B. Skills Objectives of the Course

Code	Skill
B1	Skills in distinguishing between methods.
B2	Skills in analyzing and interpreting each method in terms of advantages and disadvantages.
B3	Skills in choosing the best teaching method.
B4	Skills in integrating more than one method in a single lesson.

Teaching and Learning Methods

1. Lecture delivery.
2. Questioning and discussion.
3. Requiring students to write a daily lesson plan.
4. Requiring students to prepare and deliver a micro-lesson.

Assessment Methods

1. Daily, monthly, and semester exams with objective and essay questions.
2. Practical tests in writing a daily lesson plan.
3. Delivering a micro-lesson in front of peers.

C. Affective and Value Objectives

Code	Objective
C1	Develop a spirit of innovation and renewal.

Code	Objective
C2	Keep up with the latest innovations and developments in teaching methods.
C3	Keep pace with the use of technology in education.
C4	Communicate with developments in global educational and psychological sciences.

Teaching and Learning Methods (Affective)

• Brainstorming.
• Problem-solving method.
• Programmed instruction.

Assessment Methods (Affective)

• Written exams.
• Practical tests (application).

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Use modern and advanced sources.
D2	Benefit from technology in learning and teaching.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	2	Enable students to know and	Teaching Methods:	Lecture, Questioning,	Class Participation in

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
		understand the nature of teaching methods, their curricula, and the need for them	Nature, Curricula, and Need for Them	Discussion	Lecture Preparation
2	2	Enable students to know and understand the basic elements in teaching	Basic Elements in Teaching Curricula	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation
3	2	Enable students to know and understand the appropriate teaching method and factors affecting its selection, evaluation, and follow-up	Appropriate Teaching Method and Factors Affecting Its Selection, Evaluation, and Follow-up	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation
4	2	Enable students to know and understand the concept of lecture method, its forms, advantages, and disadvantages	Lecture Method – Forms, Advantages, Disadvantages, and Reasons for Preference	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation
5	2	Enable students to know and understand the concept of group discussion	Group Discussion: Advantages and Disadvantages	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation
6	2	Enable students to know and understand the concept of induction and deduction method	Induction and Deduction Method: Steps, Advantages, and Disadvantages	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation
7	2	Enable students to know and understand the concept of live questioning	Live Questioning Method and Types of Classroom Questions	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation – Daily Exams

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
8	2	Enable students to know and understand the concept of team teaching and programmed instruction	Team Teaching and Programmed Instruction	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation
9	2	Enable students to know and understand micro-teaching and correspondence teaching	Micro-Teaching and Correspondence Teaching	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation – Applied
10	2	Enable students to know and understand planning for teaching	Planning for Teaching	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation – Applied
11	2	Enable students to know and understand the concept of diversifying teaching and its psychological and educational foundations	Concept of Diversifying Teaching and Its Psychological and Educational Foundations	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation
12	2	Enable students to know and understand important skills for applying the strategy of diversifying teaching	Important Skills for Applying the Strategy of Diversifying Teaching	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation – Daily Exams
13	2	Enable students to know and understand important skills for applying the strategy of diversifying teaching	Learning for Mastery Method	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation – Daily Exams
14	2	Enable students to know and	Role-Playing Method	Lecture, Questioning,	Class Participation in

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
		understand the role-playing method		Discussion	Lecture Preparation – Applied
15	2	Enable students to know and understand the brainstorming method	Brainstorming Method	Lecture, Questioning, Discussion	Class Participation in Lecture Preparation – Applied

Infrastructure

Category	Details
1. Required Prescribed Books	Latest publications in teaching methods and strategies covering the prescribed syllabus.
2. Main References (Sources)	Dr. Dawood Maher Mohammed and Majid Mahdi Mohammed: Fundamentals of General Teaching Methods. Shaker Al-Amin: General Teaching Methods for Social Subjects. Al-Hila: Teaching Methods and Strategies.
a. Recommended Books and References (Scientific Journals, Reports, etc.)	
b. Electronic References, Internet Sites, etc.	

Course Development Plan

- Provide the college with the latest sources in scientific research and teaching methods.
- Provide a school for training the student-teacher under the supervision of the supervising professor.

Course Description Form

Field	Details
Course Name	Ring Theory
Course Code	Math 3323
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Sixth / Third Year
Total Study Hours	45 hours / Number of Units: 2
Date of Description Preparation	1/10/2025
Course Coordinator	Asst. Lect. Nada Mohsen Khalil
Email	basicmathte5@uodiyala.edu.iq

Course Objectives

By the end of the academic year, the student should be able to:

- 1- Learn the concept of rings.
- 2- Learn subrings.
- 3- Learn ideals and quotient rings.
- 4- Learn maximal ideals.
- 5- Learn prime ideals.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Knowledge and understanding.
A2	Enable students to acquire knowledge and understanding of the concept of rings.
A3	Enable students to acquire knowledge and understanding of subrings.
A4	Enable students to acquire knowledge and understanding of ideals and quotient rings.

Code	Objective
A5	Enable students to acquire knowledge and understanding of maximal ideals.
A6	Enable students to acquire knowledge and understanding of prime ideals.

B. Skills Objectives of the Course

Code	Skill
B1	Skills in solving problems related to the topic.

Teaching and Learning Methods

- 1- Clarify and explain the course material.
- 2- Model presentation method.
- 3- Lecture method.
- 4- Self-learning method.

Assessment Methods

- 1- Daily tests with specific questions.
- 2- Assign grades for homework and class participation.
- 3- Assign students to complete research and reports on the course material.
- 4- Monthly exams with objective and essay questions and applied problem-solving.

C. Affective and Value Objectives

Code	Objective
C1	Appreciate the importance of studying the subject and its life applications.

Teaching and Learning Methods (Affective)

- 1- Explanation and clarification.
- 2- Model presentation method.
- 3- Self-learning method.

Assessment Methods (Affective)

- 1- Theoretical tests.
- 2- Reports and studies.

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Skills in using references and terminology.
D2	Skills in collecting and analyzing data on the topic.
D3	Skills in preparing specific concepts on the topic.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	3	Learn the concept of rings	Concept of Rings	Model Presentation	Formative Assessment
2	3	Learn the concept of rings	Concept of Rings	Explanation and Clarification	Formative Assessment
3	3	Learn subrings	Subrings	Explanation and Clarification	Formative Assessment
4	3	Learn subrings	Subrings	Explanation and Clarification	Formative Assessment
5	3	Learn subrings	Subrings	Explanation and Clarification	Formative Assessment
6	3	Learn ideals and quotient rings	Ideals and Quotient Rings	Explanation and Clarification	Formative Assessment
7	3	First Periodic Exam – Solving the exam and discussing errors with students			
8	3	Learn ideals and	Ideals and	Explanation	Formative

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
		quotient rings	Quotient Rings	and Clarification	Assessment
9	3	Learn ideals and quotient rings	Ideals and Quotient Rings	Explanation and Clarification	Formative Assessment
10	3	Learn maximal ideals	Maximal Ideals	Explanation and Clarification	Formative Assessment
11	3	Learn maximal ideals	Maximal Ideals	Explanation and Clarification	Formative Assessment
12	3	Learn prime ideals	Prime Ideals	Explanation and Clarification	Formative Assessment
13	3	Learn prime ideals	Prime Ideals	Explanation and Clarification	Formative Assessment
14	3	Learn prime ideals	Prime Ideals	Explanation and Clarification	Formative Assessment
15	3	Second Periodic Exam – Solving the exam and discussing errors with students			

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	1. Dr. Mohammed Jawad, Ring Theory, University of Baghdad, College of Science.
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Abstract Algebra. Dr. Adel Ghassan Naoum, Dr. Basil Atta Al-Hashimi. Utilizing any sources related to the topic.
b. Electronic References, Internet Sites, etc.	

Course Development Plan

Adherence to the sectoral framework.

Course Description Form

Field	Details
Course Name	Specialized Teaching Methods
Course Code	Math 3324
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Sixth / Third Year
Total Study Hours	45 hours / Number of Units: 3
Date of Description Preparation	1/10/2025
Course Coordinators	Asst. Prof. Dr. Iman Kadhim + Asst. Lect. Sara Natiq
Email	basicmath2te@uodiyala.edu.iq / basicmath8te@uodiyala.edu.iq

Course Objectives

• Areas of objectives for teaching mathematics at the elementary level and how to formulate them.
• Classification of specific objectives, how to formulate them, and modern trends in that regard.
• Preparing lesson plans on mathematical topics from school mathematics for the elementary level.
• Teaching concepts (arithmetic and geometric) and Van Hiele levels in geometric thinking.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Classification of specific objectives, how to formulate them, and modern trends.
A2	Examples from school mathematics on how to present them according to both methods.

Code	Objective
A3	Concept of achievement in mathematics and reasons for low student achievement in mathematics.
A4	Dienes' model in games (definition + examples), Piaget's model and mathematics teaching (definition + examples).

B. Skills Objectives of the Course

Code	Skill
B1	Planning skills.
B2	Implementation skills.
B3	Evaluation skills.

Teaching and Learning Methods

- Lecture method (presentation).
- Dialogue and discussion method.

Assessment Methods

- Achievement exams (daily, monthly, semester).
-

C. Affective and Value Objectives

Code	Objective
C1	Remedial methods for some problems in teaching mathematics at the elementary level and their treatment.
C2	Some different teaching methods and modern trends.

Teaching and Learning Methods (Affective)

- Lecture method (presentation).
- Dialogue and discussion method.

Assessment Methods (Affective)

- Achievement exams (daily, monthly, semester).

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Learner's ability to deal positively with the course material.
D2	Raise the scientific and practical level of the learner.
D3	Give the learner an opportunity to demonstrate their talent.
D4	Learner's ability to perform computational skills in dealing with the course material.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	3	Areas of objectives for teaching mathematics at the elementary level and how to formulate them	Objectives of Teaching Mathematics	Discussion and Questioning	Formative Assessment
2	3	Classification of specific objectives, how to formulate them, and modern trends	Classification of Educational Objectives	Discussion and Questioning	Formative Assessment
3	3	The spiral and	Methods of	Discussion	Formative

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
		centered approaches: concept, definition, and characteristics of each	Presenting Mathematical Topics	and Questioning	Assessment
4	3	Examples from school mathematics on how to present them according to both methods	Methods of Presenting Mathematical Topics	Discussion and Questioning	Formative Assessment
5	3	Presenting mathematical topics at the elementary level according to modern trends based on modern learning theories	Modern Trends in Presenting Mathematical Topics	Discussion and Questioning	Formative Assessment
6	3	Monthly Exams (Essay + Objective)	Monthly Exam (Essay + Objective)	Discussion and Questioning	Formative Assessment
7	3	Concept of achievement in mathematics and reasons for low student achievement in mathematics	Mathematical Achievement	Discussion and Questioning	Formative Assessment
8	3	Remedial methods for some problems in teaching mathematics at the elementary level	Mathematical Achievement	Discussion and Questioning	Formative Assessment
9	3	Concept of planning, types of educational planning	Planning for Teaching Mathematics	Discussion and Questioning	Formative Assessment
10	3	Preparing lesson plans on mathematical topics from school mathematics for the elementary level	Planning for Teaching Mathematics	Discussion and Questioning	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
11	3	Monthly Exam (Essay + Objective)	Monthly Exam (Essay + Objective)	Discussion and Questioning	Formative Assessment
12	3	Some different teaching methods and modern trends	Specialized Teaching Methods in Mathematics	Discussion and Questioning	Formative Assessment
13	3	Teaching concepts (arithmetic and geometric) and Van Hiele levels in geometric thinking	Mathematical Concepts	Discussion and Questioning	Formative Assessment
14	3	Dienes' model in games (definition + examples), Piaget's model and mathematics teaching (definition + examples)	Educational Models	Discussion and Questioning	Formative Assessment
15	3	End of Semester Exam (Essay + Objective)	End of Semester Exam (Essay + Objective)	Discussion and Questioning	Formative Assessment

Category	Details
1. Required Prescribed Books	1. Teaching Methods of Mathematics / Farid Abu Zina.
2. Main References (Sources)	
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Sources related to the course content.
b. Electronic References, Internet Sites, etc.	

Infrastructure

Course Development Plan

Expand the course syllabus in line with the cognitive development of the subject matter.

Course Description Form

Field	Details
Course Name	Mathematical Analysis
Course Code	Math 3325
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Sixth / Third Year
Total Study Hours	45 hours / Number of Units: 3
Date of Description Preparation	1/10/2025
Course Coordinator	Asst. Lect. Anfal Hassan Dhiab
Email	basicmath9te@uodiyala.edu.iq

Course Objectives

By the end of the academic year, the student should be able to:

- 1- Learn real numbers.
 - 2- Learn the completeness and Archimedean properties.
 - 3- Learn sequences of functions and series of functions.
 - 4- Learn integration theorems.
-

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Knowledge and understanding.
A2	Enable students to acquire knowledge and understanding of real numbers.
A3	Enable students to acquire knowledge and understanding of completeness and Archimedean properties.
A4	Enable students to acquire knowledge and understanding of sequences of functions and series of functions.
A5	Enable students to acquire knowledge and understanding of integration theorems.

B. Skills Objectives of the Course

Code	Skill
B1	Skills in solving problems related to the topic.

Teaching and Learning Methods

- 1- Clarify and explain the course material.
- 2- Model presentation method.
- 3- Lecture method.
- 4- Self-learning method.

Assessment Methods

- 1- Daily tests with specific questions.
- 2- Assign grades for homework and class participation.
- 3- Assign students to complete research and reports on the course material.
- 4- Monthly exams with objective and essay questions and applied problem-solving.

C. Affective and Value Objectives

Code	Objective
C1	Appreciate the importance of studying the subject and its life applications.

Teaching and Learning Methods (Affective)

- 1- Explanation and clarification.
 - 2- Model presentation method.
 - 3- Self-learning method.
-

Assessment Methods (Affective)

- 1- Theoretical tests.
 - 2- Reports and studies.
-

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Skills in using references and terminology.
D2	Skills in collecting and analyzing data on the topic.
D3	Skills in preparing specific concepts on the topic.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	4	Learn real numbers	Real Numbers	Model Presentation	Formative Assessment
2	4	Learn order axioms	Order Axioms	Explanation and Clarification	Formative Assessment
3	4	Learn the completeness property	Completeness Property	Explanation and Clarification	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
4	4	Learn the Archimedean property	Archimedean Property	Explanation and Clarification	Formative Assessment
5	4	Learn the concept of limits	Concept of Limits	Explanation and Clarification	Formative Assessment
6	4	Learn continuity and uniform continuity	Continuity and Uniform Continuity	Explanation and Clarification	Formative Assessment
7	4	First Periodic Exam – Solving the exam and discussing errors with students			
8	4	Learn sequences of functions	Sequences of Functions	Explanation and Clarification	Formative Assessment
9	4	Learn series of functions	Series of Functions	Explanation and Clarification	Formative Assessment
10	4	Learn convergence	Convergence	Explanation and Clarification	Formative Assessment
11	4	Learn uniform convergence	Uniform Convergence	Explanation and Clarification	Formative Assessment
12	4	Learn Riemann integration theorem	Riemann Integration Theorem	Explanation and Clarification	Formative Assessment
13	4	Learn Lebesgue integration theorem	Lebesgue Integration Theorem	Explanation and Clarification	Formative Assessment
14	4	Review		Explanation and Clarification	Formative Assessment
15	4	Second Periodic Exam – Solving the exam and discussing errors with students			

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Utilizing any sources related to the topic.
b. Electronic References, Internet Sites, etc.	Seriyamath

Course Development Plan

Adherence to the sectoral framework.

Course Description Form

Field	Details
Course Name	Graph Theory
Course Code	Math 3326
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Sixth / Third Year
Total Study Hours	45 hours / Number of Units: 3
Date of Description Preparation	1/10/2025
Course Coordinator	Dr. Shaker Mahmoud Salman
Email	basicmath6te@uodiyala.edu.iq

Course Objectives

The student should be familiar with the following concepts:

1. Concept of graph, degree of a graph, definition of vertices and edges.
2. Concept of directed and undirected graphs and subgraphs.
3. Knowledge of the incidence matrix of vertices and the incidence matrix of graphs.
4. The Handshaking Theorem.
5. Paths, circuits, connectivity, disconnection, Hamiltonian graphs, trees and their characteristics.
6. Graph coloring, Kuratowski's theorem, the Four Color Theorem and its applications.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	The student should understand the concept of graph, degree of a graph, definition of vertices and edges.
A2	The student should know the concept of directed and undirected graphs and subgraphs.
A3	The student should know the incidence matrix of vertices and the incidence matrix of graphs.
A4	The student should know the Handshaking Theorem.
A5	Paths, circuits, connectivity, disconnection, Hamiltonian graphs, trees and their characteristics.
A6	The student should know the concept of graph coloring, Kuratowski's theorem, the Four Color Theorem and its applications.

B. Skills Objectives of the Course

The student should develop skills in the following concepts:

Code	Skill
B1	Graph and its types.
B2	Incidence matrix of vertices and incidence matrix of graphs.
B3	Handshaking Theorem.

Code	Skill
B4	Paths, circuits, connectivity, disconnection, Hamiltonian graphs, trees and their characteristics.
B5	Graph coloring, Kuratowski's theorem, the Four Color Theorem and its applications.

Teaching and Learning Methods

At the beginning of the semester, students are informed of the course syllabus and information sources (related books, periodicals, university theses). The syllabus is distributed across the weeks of the semester, along with the assessment methods to be followed, as follows:

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|--|
| 1. Preparation of lectures according to the sequence outlined in the course syllabus using the aforementioned information sources. |
| 2. Informing students about the topic of the upcoming lecture for preparation purposes. |
| 3. Requesting students to submit papers on one or more of the topics under study. |

Assessment Methods

- | |
|--|
| 1. Conducting two mid-semester exams: the first after the fifth week of the semester and the second after the eleventh week. Each exam considers cognitive levels (recall, application, exploration). Assessment contributes 40% of the total achievement, taking into account student attendance and daily participation. |
| 2. End-of-semester exam accounting for 60% of achievement according to ministry timings. When setting questions, comprehensiveness of the course content and cognitive levels (recall, application, exploration) are considered. |

C. Affective and Value Objectives

The student should be able to:

Code	Objective
C1	Define graphs and their types.
C2	Define the incidence matrix of vertices and the incidence matrix of graphs.
C3	The Handshaking Theorem.
C4	Graph coloring, Kuratowski's theorem, the Four Color Theorem and its applications.

Teaching and Learning Methods (Affective)

The direct instruction method is typically used, where skills are taught directly and explicitly, reinforced with examples from mathematics for basic education levels.

Assessment Methods (Affective)

These are included within the course assessment processes conducted during and at the end of the semester.

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Employ acquired skills in teaching mathematical knowledge to basic education students.
D2	Select examples from the basic education mathematics curriculum, each with skills addressed in the course.
D3	Evaluate the extent to which basic education students acquire application skills.
D4	Construct tests specific to mathematical thinking areas for basic education students.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	3	Concept of graph, degree, vertices, and edges	Concept of Graph, Degree, Vertices, and Edges	Discussion and Questioning	Formative Assessment
2	3	Examples of graphs	Examples of Graphs	Discussion and	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
				Questioning	
3	3	Directed and undirected graphs with examples	Directed and Undirected Graphs with Examples	Discussion and Questioning	Formative Assessment
4	3	Subgraphs with examples	Subgraphs with Examples	Discussion and Questioning	Formative Assessment
5	3	Handshaking Theorem	Handshaking Theorem	Discussion and Questioning	Formative Assessment
6	3	Monthly Exam	Monthly Exam	-	Formative Assessment
7	3	Incidence matrix of vertices with examples	Incidence Matrix of Vertices with Examples	Discussion and Questioning	Formative Assessment
8	3	Incidence matrix of graphs with examples	Incidence Matrix of Graphs with Examples	Discussion and Questioning	Formative Assessment
9	3	Paths, circuits, connectivity, and disconnection	Paths, Circuits, Connectivity, and Disconnection	Discussion and Questioning	Formative Assessment
10	3	Trees and their characteristics with examples	Trees and Their Characteristics with Examples	Discussion and Questioning	Formative Assessment
11	3	Monthly Exam	Monthly Exam	-	Formative Assessment
12	3	Hamiltonian graphs	Hamiltonian Graphs	Discussion and Questioning	Formative Assessment
13	3	Graph coloring, Kuratowski's theorem	Graph Coloring, Kuratowski's Theorem	Discussion and Questioning	Formative Assessment
14	3	The Four Color Theorem with applications	The Four Color Theorem with Applications	Discussion and Questioning	Formative Assessment

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
15	3	Final Exam	Final Exam	Discussion and Questioning	Formative Assessment

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	Introduction to Graph Theory. Dr. Ali Aziz Ali.
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Utilizing periodicals and sources related to the course.
b. Electronic References, Internet Sites, etc.	Utilizing the Internet as a known source of information.

Course Development Plan

1. The course is developed according to requirements that emerge from curriculum development in basic education stages.
2. The course is developed according to requirements that emerge from curriculum development in the global system.

Course Description Form

Field	Details
Course Name	Curricula and Textbooks
Course Code	Coll 4214
Available Attendance Modes	Mandatory (In-Person)

Field	Details
Semester / Year	Sixth / Third Year
Total Study Hours	30 hours / Number of Units: 2
Date of Description Preparation	1/10/2025
Course Coordinator	Asst. Prof. Dr. Ahmed Dawood Salman
Email	basicmath4te@uodiyala.edu.iq

Course Objectives

By the end of the academic year, the student should be able to:

1. Define curricula.
2. Enumerate the characteristics of curricula.
3. Explain the importance of curricula.
4. Explain the foundations of curriculum construction.
5. Analyze the elements of the school curriculum.
6. Compare between types of curricula.
7. Evaluate curricula.
8. Explain the reasons and models for curriculum development.
9. Define the textbook in terms of its concept.
10. Enumerate the importance of the textbook.
11. Evaluate the textbook.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A2	Enable students to acquire knowledge and understanding of curricula, their characteristics, and importance.
A3	Enable students to acquire knowledge and understanding of the foundations of curriculum construction.
A4	Enable students to acquire knowledge and understanding of the elements of the school curriculum.
A5	Enable students to acquire knowledge and understanding of types of curricula.

Code	Objective
A6	Enable students to acquire knowledge and understanding of curriculum evaluation.
A7	Enable students to acquire knowledge and understanding of curriculum development, its models, and reasons.
A8	Enable students to acquire knowledge and understanding of the textbook.

B. Skills Objectives of the Course

Code	Skill
B1	Compare between the old concept and the modern concept of curricula.
B2	Explain the foundations of curriculum construction.
B3	Analyze the school curriculum into its elements.
B4	Collect information about types of school curricula.
B5	Explain the reasons for evaluating school curricula.
B6	Explain curriculum development and its models.
B7	Write a research paper on the textbook.

Teaching and Learning Methods

- 1- Provide students with the fundamentals and topics related to curricula.
- 2- Clarify and explain the course material.
- 3- Require students to visit the library and review curriculum sources.
- 4- Improve students' skills through visiting electronic sites to gain additional knowledge of school curricula.
- 5- Use lecture, presentation, questioning, and discussion methods in some topics that require discussion.

Assessment Methods

- 1- Daily tests with specific questions.
- 2- Assign grades for homework and class participation.
- 3- Assign students to complete research and reports.
- 4- Monthly exams with objective and essay questions.

C. Affective and Value Objectives

Code	Objective
C1	Understand the importance of curriculum theories.
C2	Appreciate the importance of the textbook.
C3	Connect curriculum activities to the environment.
C4	Evaluate activities.

Teaching and Learning Methods (Affective)

- 1- Use of presentation methods.
- 2- Drawing illustrative diagrams.
- 3- Brainstorming method.

Assessment Methods (Affective)

- Analytical exam to measure the student's ability to think, analyze, and deduce.
- Request comparisons between curricula in Iraq and in developed countries.
- Writing research on phenomena and problems related to curricula.
- Daily exams with intellectual and deductive questions.

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Skills in using references and terminology.
D2	Skills in collecting and analyzing data on the topic.
D3	Skills in utilizing available resources.
D4	Skills in making comparisons on the topic.

Code	Skill
D5	Skills in preparing specific concepts on the topic.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	2	Understand the concept of curricula, their characteristics, and importance	Curricula	Discussion and Questioning	Formative Assessment
2	2	Understand the philosophical (intellectual) foundation	Foundations of Curricula	Discussion and Questioning	Formative Assessment
3	2	Understand the cultural (social) foundation	Foundations of Curricula	Discussion and Questioning	Formative Assessment
4	2	Understand the psychological (developmental) foundation	Foundations of Curricula	Discussion and Questioning	Formative Assessment
5	2	Understand educational objectives and content analysis	Elements of the School Curriculum	Discussion and Questioning	Formative Assessment
6	2	First Month Exam – Essay questions			
7	2	Understand the subject curriculum	Types of Curricula	Discussion and Questioning	Formative Assessment
8	2	Understand the activity curriculum	Types of Curricula	Discussion and Questioning	Formative Assessment
9	2	Understand the core curriculum	Types of Curricula	Discussion and Questioning	Formative Assessment
10	2	Understand the	Curriculum	Discussion	Formative

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
		concept of curriculum evaluation, its objectives, standards, methods, and steps	Evaluation	and Questioning	Assessment
11	2	Understand curriculum development and its motivations	Curriculum Development	Discussion and Questioning	Formative Assessment
12	2	Understand the principles of curriculum development and basic models for its development	Curriculum Development	Discussion and Questioning	Formative Assessment
13	2	Understand the concept of the textbook and its importance	The Textbook	Discussion and Questioning	Formative Assessment
14	2	Understand the printed and electronic textbook	The Textbook	Discussion and Questioning	Formative Assessment
15	2	Second Month Exam – Essay questions			

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	Curriculum and Book Analysis, Awad Jasim Mohammed Al-Tamimi, 2009. The Textbook, Awad Jasim Mohammed Al-Tamimi, 1980.
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Curriculum and Book Analysis, Awad Jasim Mohammed Al-Tamimi, 2009. The Textbook, Awad Jasim Mohammed Al-Tamimi, 1980.
b. Electronic References, Internet Sites,	Quality lectures and hosting on electronic websites.

Category	Details
etc.	

Course Development Plan

The course should include: stages of curriculum development, modern curriculum theories, the importance of curriculum development, the need of educational institutions for curriculum development, models of curricula from some developed countries.

Course Description Form

Field	Details
Course Name	Sustainable Development
Course Code	MAB03SD329
Available Attendance Modes	Mandatory (In-Person)
Semester / Year	Sixth / Third Year
Total Study Hours	30 hours / Number of Units: 2
Date of Description Preparation	1/10/2025
Course Coordinator	Asst. Lect. Sara Maad Abbas
Email	SARAMAAD@UODIYALA.EDU.IQ

Course Objectives

By the end of the academic year, the student should be able to:

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| 1. Understand the concept of sustainable development and its most important definitions (environmental, economic, social, technological). |
| 2. Understand the reasons for setting sustainable development goals. |
| 3. Understand the characteristics of sustainable development and its sustainability requirements. |
| 4. Understand the historical development of sustainable development. |

5.	Understand the requirements and main elements of sustainable development: economic aspect, social aspect, environmental aspect, technological aspect.
6.	Understand the dimensions and main areas of sustainable development (social dimension, economic dimension, technological dimension).
7.	Understand the trends of sustainable development in local communities and the factors affecting them.
8.	Understand the philosophy of sustainable development: values and ethics of sustainable development, facts on which sustainable development is based.
9.	Understand the pillars of sustainable development and indicators of their achievement.
10.	Understand the role of sustainable development in achieving goals and confronting problems.
11.	Understand the goals and principles of sustainable development (targets, indicators, objectives): Goal 1: No Poverty, Goal 2: Zero Hunger, Goal 3: Good Health and Well-being, Goal 4: Quality Education, Goal 5: Gender Equality, Goal 6: Clean Water and Sanitation, Goal 7: Affordable and Clean Energy, Goal 8: Decent Work and Economic Growth, Goal 9: Industry, Innovation, and Infrastructure, Goal 10: Reduced Inequalities.
12.	Goal 11: Sustainable Cities and Communities, Goal 12: Responsible Consumption and Production, Goal 13: Climate Action, Goal 14: Life Below Water, Goal 15: Life on Land, Goal 16: Peace, Justice, and Strong Institutions, Goal 17: Partnerships for the Goals.
13.	Iraq's vision for the Sustainable Development Goals 2030.
14.	The international community's vision for the Sustainable Development Goals.
15.	Challenges and obstacles to achieving the Sustainable Development Goals.

Course Outcomes, Teaching, Learning, and Assessment Methods

A. Knowledge Objectives

Code	Objective
A1	Understand the concept of sustainable development, its history, and development.
A2	Distinguish between sustainable development and traditional development.
A3	Understand the environmental, economic, and social dimensions.
A4	Comprehend environmental, economic, and social challenges such as climate change, poverty, hunger, education, energy, and others.
A5	Understand global and local policies and strategies for achieving sustainable development, such as the Paris Climate Agreement and Agenda 2030.
A6	Understand the relationship between education and sustainable development and the role of awareness and education in bringing about positive change.

B. Skills Objectives of the Course

Code	Skill
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Code	Skill
B1	Analyze environmental, social, and economic problems.
B2	Design practical and sustainable solutions, such as proposing realistic solutions to problems like water waste and pollution.
B3	Evaluate policies and development programs, such as the ability to read and analyze public policies from a sustainability perspective.

Teaching and Learning Methods

- 1- Clarify and explain the course material.
- 2- Model presentation method.
- 3- Lecture method.
- 4- Self-learning method.

Assessment Methods

- 1- Daily tests with specific questions.
- 2- Assign grades for homework and class participation.
- 3- Assign students to complete research and reports on the course material.
- 4- Monthly exams with objective and essay questions and applied problem-solving.

C. Affective and Value Objectives

Code	Objective
C1	Appreciate the importance of studying the subject and its life applications.

Teaching and Learning Methods (Affective)

- 1- Explanation and clarification.
- 2- Model presentation method.
- 3- Self-learning method.

Assessment Methods (Affective)

- 1- Theoretical tests.
- 2- Reports and studies.

D. General and Transferable Qualification Skills (Other Skills Related to Employability and Personal Development)

Code	Skill
D1	Skills in using references and terminology.
D2	Skills in collecting and analyzing data on the topic.
D3	Skills in preparing specific concepts on the topic.

Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	3	Introduction to sustainable development: definition of the concept, origin and development of the term, difference between sustainable development and traditional development	Explanation and Clarification	Formative Assessment	
2	3	The three dimensions of sustainable development: environmental dimension, economic dimension, social dimension	Explanation and Clarification	Formative Assessment	
3	3	Sustainable development goals:	Explanation and	Formative Assessment	

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
		presentation of the 17 UN goals, indicators for measuring each goal	Clarification		
4	3	Challenges facing sustainable development: poverty, hunger, education, climate change, challenges of developing countries	Explanation and Clarification	Formative Assessment	
5	3	Environment and sustainability: relationship between humans and the environment, conservation of natural resources	Explanation and Clarification	Formative Assessment	
6	3	Green and circular economy: concepts of sustainable economy, difference between traditional and circular economy	Explanation and Clarification	Formative Assessment	
7	3	First Periodic Exam – Solving the exam and discussing errors with students			
8	3	Education for sustainable development: role of education in achieving sustainability, sustainable education strategies	Explanation and Clarification	Formative Assessment	
9	3	Environmental and social citizenship: individual and collective sustainable behaviors, community participation in supporting sustainability	Explanation and Clarification	Formative Assessment	
10	3	Successful	Explanation	Formative	

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
		experiences and initiatives: local and global sustainability initiatives, case studies from different countries	and Clarification	Assessment	
11	3	Projects and applied skills: designing a sustainable project or initiative, writing reports and analyzing environmental data	Explanation and Clarification	Formative Assessment	
12	3	Individual or group research reports	Reports	Assignments and Reports	Formative Assessment
13	3	Designing an initiative or awareness campaign	Applied Project	Applied Project	Formative Assessment
14	3	Review	Explanation and Clarification	Formative Assessment	
15	3	Second Periodic Exam – Solving the exam and discussing errors with students			

Infrastructure

Category	Details
1. Required Prescribed Books	None
2. Main References (Sources)	United Nations (Sustainable Development Goals: Transforming Our World).
a. Recommended Books and References (Scientific Journals, Reports, etc.)	Sustainable development reports issued by international organizations (UNEP, UNESCO, World Bank).

Category	Details
b. Electronic References, Internet Sites, etc.	Sdgs.un.org