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

Academic Program and Course Description Guide of Master Mathematics

2026-2025

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates 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 academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work. In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

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

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within 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 (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة واسط

الكلية/ المعهد: كلية التربية للعلوم الصرفة

القسم العلمي: قسم الرياضيات

اسم البرنامج الأكاديمي او المهني: ماجستير تربية رياضيات

اسم الشهادة النهائية: ماجستير تربية في الرياضيات

النظام الدراسي: فصلي

تاريخ اعداد الوصف: 13-10-2025

تاريخ ملء الملف: 13-10-2025

التوقيع: الأستاذ الدكتور ظاهر والي الركابي رئيس قسم الرياضيات

اسم رئيس القسم: أ.د. ظاهر والي فريح

التاريخ: 13-10-2025

التوقيع :

اسم المعاون العلمي: أ.م.د. عمار عواد كاظم

التاريخ : 10-3-2025

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: م.د. سجى حسين دلفي

التاريخ 2026/3/10

التوقيع

جامعة واسط الأداء الجامعي

مصادقة السيد العميد

أ.د. علي حسين شهاب

٢٠٢٦/٣/١٠

1. Program Vision

To be a leading program locally and regionally in preparing distinguished mathematical researchers capable of producing advanced scientific knowledge and contributing to research development and applications of mathematics.

2. Program Mission

To provide high-quality education in advanced mathematics and prepare academic and research professionals with strong analytical, modeling, and logical reasoning skills capable of conducting original scientific research.

3. Program Objectives

The program aims to:

1. Prepare highly qualified specialists in pure and applied mathematics.
2. Develop advanced analytical and deductive thinking skills.
3. Enhance independent scientific research capabilities.
4. Enable students to apply mathematics in modeling and solving real-world problems.
5. Prepare graduates for university teaching and research.
6. Support innovation in modern and interdisciplinary mathematics applications.

4. Program Accreditation

Not yet obtained. Accreditation standards for Colleges of Education were approved on 21/2/2024.

5. Other external influences

Is there a sponsor for the program?

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	12	36	%100	Specialized+optinal
College Requirements	3	4	%11	Specialized
Department Requirements	8	22	%61	Specialized+optinal
Summer Training	0	0	%0	Specialized
Research project (Thesis)	1	10	%28	Specialized

* This can include notes whether the course is basic or optional.

7. Program Description

First Year	Course Code	Course Name	Credit Hours		
			Theoretical	Practical	Tutorial
First course		General topology	3		
First course		Advance numerical analysis	3		
First course		Mathematical models	3		
First course		Module theory	3		
First course		Research Methodology	2		
Second course		Algebraic topology	3		
Second course		Measure theory	3		
Second course		Integral equations	2		
Second course		Applied Mathematics	2		
Second course		Teaching methods	2		
Second course		English languages	0		
Second Year		Research project (Thesis)	10		

8. Expected learning outcomes of the program (PLOs)

Knowledge & Understanding

1. PLO1: Master advanced mathematical concepts (analysis, algebra, topology).
2. PLO2: Understand mathematical modeling and real-world applications.
3. PLO3: Comprehend theories of measure and integration.

Cognitive Skills

4. PLO4: Analyze complex problems using logical methods.
5. PLO5: Construct rigorous mathematical proofs.
6. PLO6: Apply critical and deductive thinking.

Professional Skills

7. PLO7: Use modern mathematical software and numerical methods.
8. PLO8: Apply modeling techniques to real phenomena.
9. PLO9: Conduct scientific research and write academic reports.

Research Skills

10. PLO10: Scientific communication (written and oral).
11. PLO11: Publish and present research.
12. PLO12: Conduct independent thesis research.

General Skills

13. PLO13: Research ethics.
14. PLO14: Teamwork in multidisciplinary environments.
15. PLO15: Lifelong learning.

9. Teaching and Learning Strategies

The strategies and teaching methods adopted in implementing the program include:

1- Advanced lectures
2- Problem-based learning
3- Seminars
4- Research projects
5- Academic supervision
6- Guided self-learning

10. Evaluation methods

1- Midterm and final exams
2- Assignments and reports
3- Presentations
4- Research projects
5- Class participation

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof. Dr. Ali Hussein Shuaa	Mathematics	Applied mathematics			yes	
Prof. Dr. Ali Khalaf Hussain	Mathematics	Mathematical analysis			yes	
Prof. Dr. Basim Nasih Aboud	Mathematics	Numerical Analysis			yes	
Prof. Dr. Daher Waly Freh	Mathematics	Algebraic Topology			yes	
Assoc. Prof. Dr. Nasreen Najm Abd	Mathematics	Applied Mathematics			yes	
Assoc. Prof. Dr. Aqeel Jasim Noor	Mathematics	Pure Mathematics			yes	
Assoc. Prof. Haithab Aboud Shahad	Mathematics	Abstract Algebra			yes	
Assoc. Prof. Dr. Saad Mahdi Jaber	Mathematics	General Topology			yes	
Lect. Dr. Nada Mareeh Azeeb	Mathematics	Functional Analysis			yes	

Professional Development

Mentoring new faculty members

The program ensures structured support for newly appointed faculty members through organized mentoring initiatives aimed at enhancing teaching effectiveness and academic integration. This includes:

1- Development and implementation of training programs
2- Establishment of guidance and mentoring systems
3- Participation in Professional Learning Communities (PLCs)
4- Provision of academic counseling and continuous support

Professional development of faculty members

The institution adopts a systematic approach to faculty development to ensure continuous improvement in teaching, research, and academic performance:

1- Conducting needs analysis to identify professional development priorities
2- Implementation of training programs, workshops, and seminars
3- Application of modern teaching and learning strategies
4- Monitoring and evaluation of faculty performance
5- Providing structured feedback and ongoing professional support

12. Acceptance Criterion

The following conditions must be met for admission to the program:

1. Must hold a Bachelor's degree in Mathematics or relevant experience.
2. Must comply with the regulations as per the instructions of the Ministry of Higher Education.
3. Must pass the competitive selection process.
4. Must pass the academic interview (if required).
5. Must demonstrate proficiency in both Arabic and English as required by the department.
6. Admission is centralized through the Ministry of Higher Education and Scientific Research.
7. Parallel Admission Channel
8. Senior Teachers Admission Channel
9. Channel for Martyrs, People with Disabilities, and Political Prisoners

13. The most important sources of information about the program

1. Sectoral Committee and Deans' Committee of the College of Education for Pure Sciences
2. Ministerial Committees for Curriculum Update
3. University and College Websites
4. Ministry of Higher Education and Scientific Research Website

14 . Program Development Plan

1- Implementation of accreditation standards for Colleges of Education

1. Continuous review and updating of curricula
2. Alignment with labor market needs and academic advancements
3. Enhancement of teaching quality and research output

Program Skills Outline																	
				Required program Learning outcomes													
First Year	Course Code	Course Name	Specialized or optinal	Knowledge & Understanding			Cognitive Skills			Professional Skills			Research Skills			General Skills		
				P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
First course		General topology	Specialized	✓			✓	✓	✓						✓			
		Advance numerical analysis	Specialized		✓		✓		✓	✓	✓			✓	✓			✓
		Mathematical models	Specialized	✓		✓	✓	✓	✓			✓						✓
		Module theory	Specialized	✓	✓		✓		✓	✓	✓				✓			
		Research Methodology	Specialized				✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
second course		Algebraic topology	Specialized	✓	✓	✓	✓	✓	✓	✓	✓							✓
		Measure theory	Specialized	✓		✓	✓	✓	✓			✓						✓
		Integral equations	Specialized	✓			✓	✓	✓			✓						
		Applied Mathematics	Specialized	✓	✓		✓		✓	✓	✓	✓		✓	✓			✓
		Teaching methods	Specialized				✓		✓				✓	✓	✓	✓	✓	✓
		English languages	Specialized						✓			✓		✓	✓		✓	✓
Second year		Research project (Thesis)	Specialized	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- P_n represent $PLOs_n$. Where n=1,…,15.
- Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

Course Description Form

1. Course Name:

Measure theory

2. Course Code:

3. Semester / Year:

semester 2025-2026

4. Description Preparation Date:

30/01/2025

5. Available Attendance Forms:

In-person and online attendance

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

45 hours (3 units)

7. Course administrator's name

: Prof. Dr. Ali Khalaf Hussain

8. Course Objectives

CLO1. Understand measurable spaces.
CLO2. Study Lebesgue measure.
CLO3. Apply convergence theorems.
CLO4. Use measure theory in analysis.

9. Teaching and Learning Strategies

1: Define basic concepts
2: Prove properties
3: Compute integrals
4: Analyze convergence
5: Apply in research

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	CLO1+ CLO2	Introduction	Lecture	Class Activities
2	3	CLO1+ CLO2	Boolean ring	Lecture	Class Activities
3	3	CLO1+ CLO2	Lebesgue measure	Lecture	Class Activities
4	3	CLO1+ CLO2	Lebesgue measure	Lecture	Class Activities
5	3	CLO3	Outer measure	Lecture	Class Activities
6	3	CLO3	Outer measure	Lecture	Class Activities

7	3	CLO3	Outer measure	Lecture	Class Activities
8	3	CLO5+ CLO2	Exam	=	Midterm Exam
9	3	CLO4	Measurable set	=	Assignments
10	3	CLO4	Measurable set	=	Assignments
11	3	CLO4	Measurable function	=	Assignments+ Class Activities
12	3	CLO4	Egoroff theorem	=	Assignments+ Class Activities
13	3	CLO3+ CLO4	Riemann integral	=	Assignments+ Class Activities
14	3	CLO3+ CLO4	Lebesgue integral	=	Assignments+ Class Activities
15	3	CLO3	Lebesgue integral	=	Project/Report

11. Course Evaluation

The total grade is 100 points, distributed as follows:

- **30 points**: Coursework (assignments, participation, quizzes, midterm exam, report , seminar)
- **70 points**: Final Exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. H. L. Royden, *Real Analysis*, 4th Edition. 2. Gerald B. Folland, *Real Analysis: Modern Techniques and Their Applications*.
Main references (sources)	1. Measure theory by Halmose 2. Measure Lebesgue integral and Hilbert space by A. N. Kolmogorove and S. V. Famin
Recommended books and references (scientific journals, reports…)	LEBESGUE MEASURE and INTEGRATION
Electronic References, Websites	

Course Description Form

1- Course Name:

Algebraic Topology

2- Course Code:

3. Semester / Year:

2025-2026

4. Description Preparation Date:

9/2/2026

5. Available Attendance Forms:

In-person and online attendance

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

45 hours per 15 weeks and 3 units per week

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

Dr. Saad Mahdi Jaber Email: s.jaber@uowasit.edu.iq

8. Course Objectives

CLO1: Understand the fundamental concepts of algebraic topology.

CLO2: Calculate the fundamental group of certain spaces.

CLO3: Analyze spaces using homotopy tools.

CLO4: Understand the fundamentals of homology and its applications.

CLO 5: Connect algebraic concepts to topological structures.

9. Teaching and Learning Strategies

1- Defining basic concepts such as topological spaces and paths

2- Calculating fundamental groups

3- Analyzing homotopic equivalences between spaces

4- Applying homology concepts

5- Solving advanced problems in algebraic topology

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1- 3	9	CLO1+ CLO2	Introduction in algebraic topological	Using the pen and board and data show	Class Activities

4 - 6	9	CLO2+ CLO4	Homotopy theory	Using the pen and board and data show	Class Activities
7 -9	9	CLO1+ CLO3	Fundemantal Group	Using the pen and board and data show	Exams and quick exams and assignments
10 - 12	9	CLO1+ CLO2	Fiber space and fibration	Using the pen and board and data show	Assignments+ Class Activities
13- 15	9	CLO4+ CLO5	Connecting homomorphism & Homology group	Using the pen and board and data show	Project/Report

11. Course Evaluation

The total grade is 100 points, distributed as follows:

- **30 points**: Coursework (assignments, participation, quizzes, midterm exam, report , seminar)
- **70 points**: Final Exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Hatcher, A. Algebraic topology. Cambridge University Press, NewYork :, 2005.
Main references (sources)	2. Massey, W. S. A basic course in algebraic topology. Springer, 1991. 1. Rotman, J. J. An Introduction to Homological Algebra. Cambridge University Press, New York, NY, USA, 2010.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1- **Course Name:**
Research methodology 1
2- **Course Code:**
Depeartment of Mathematics
3- **Semester / Year:**
Second semester 2025-2026
4- **Description Preparation Date:**
2/1/2025
5- **Available Attendance Forms:**
Actual Attendance
6- **Number of Credit Hours (Total) / Number of Units (Total)**
30 hours per 15 weeks and 2 units per week
Course administrator's name (mention all, if more than one name)
Name Assist Prof. Dr Nisreen Najm Abd Alokbi Email nalokbi@uowasit.edu.iq

Course Objectives	
1-	Providing the necessary information about the concept of journals
2-	Providing the student with the necessary knowledge of the mechanisms of jornals work
3-	Make the student aware of how to publish in journals
4-	Make the student have the ability to distinguish between peer-reviewed and peer-reviewed journals
5-	Giving the student information about Publishing Association
6-	Make the student aware of how the impact factor of a journal is calculated
7-	To import knowledge about the importance of publishing in peer-reviewed journals
8-	Giving the student information about the PhD's thesis
9-	Giving the student knowledge of how to write each part of the thesis
10-	Providing information to students about plagiarism and how to avoid it.

Teaching and Learning Strategies	
1-	Adopting the discussion method
2-	Using of the interactive way of learning
3-	Research groups - nested discussion circles.
4-	Making the students involved in various activities

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-	2	What is Journal? Basic terminology's of journals. Publishing company , examples of publishing companies	Scientific Journals	Lecture and discussion	Exams, report and seminar
2-	2	How to choose a peer-reviewed academic journal for publication? What is peer review journal?	Scientific Journals	Lecture and discussion	Exams, report and seminar
3-	2	How can you determine if a journal is academic and peer-reviewed? What is the difference between academic journal and peer-reviewed journal?	Scientific Journals	Lecture and discussion	Exams, report and seminar
4-	2	The Impact Factor IF of the Journals. How to find impact factor of a journal in scopus?	Scientific Journals	Lecture and discussion	Exams, report and seminar
5-	2	How to publish in peer-reviewed journals? What are the important steps while publishing paper in peer-reviewed journal?	Scientific Journals	Lecture and discussion	Exams, report and seminar
6-	2	What are the Scopus and Elsevier? What are the advantages of publishing a research paper? What is the most differences between Elsevier, Springer and ACS?	Scientific Journals	Lecture and discussion	Exams, report and seminar
7-	2	Test			
8-	2	Guide to writing scientific research for Master thesis: Structuring the thesis : Writing the title of the thesis	Structure of Thesis	Lecture and discussion	Exams, report and

					seminar
9-	2	Writing the High-level summary (Abstract)	Structure of Thesis	Lecture and discussion	Exams, report and seminar
10-	2	Guide to writing scientific research for Master thesis : The introduction	Structure of Thesis	Lecture and discussion	Exams, report and seminar
11-	2	How to write literature review in MSc thesis, and How to write the Methodology.	Structure of Thesis	Lecture and discussion	Exams, report and seminar
12-	2	How to write a discussion and analyze the results in a MSc. thesis and in research paper	Structure of Thesis	Lecture and discussion	Exams, report and seminar
13-	2	How to write and arrange a MSc thesis presentation and research paper	Structure of Thesis	Lecture and discussion	Exams, report and seminar
14-	2	Plagiarism and ways to avoid it	Plagiarism	Lecture and discussion	Exams, report and seminar
15-	2	Test			

Course Evaluation

The total grade is 100 points, distributed as follows:

- **30 points**: Coursework (assignments, participation, quizzes, midterm exam, report , seminar)
- **70 points**: Final Exam

Learning and Teaching Resources

Required textbooks (curricular books, if any)

[1] There are no systematic references at the present time

Course Description Form

1- Course Name
: Module theory
2- Course Code:
3- Semester / Year:
semester 2025-2026
4- Description Preparation Date:
30/01/2026
5- Available Attendance Forms:
Actual Attendance
6- Number of Credit Hours (Total) / Number of Units (Total) :
45 hours (3 units)
7- Course administrator's name:
Asst. Prof.Dr. Haithab A. Shahad
8- Course Objectives
CLO1: Introduce advanced concepts in module theory. CLO2:Develop analytical skills in algebraic structures. CLO3:Strengthen ability to construct and prove mathematical results. CLO4: Prepare students for research in algebra and related fields.
9- Teaching and Learning Strategies
1- Defining the basic concepts of module theory 2- Analyzing submodules and their associated structures 3- Studying and operating module homomorphisms 4- Understanding free and terminating generative modules 5- Applying the theory to advanced algebraic problems
10- Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	CLO1+ CLO2	1. Modules , Factor Modules , Module Homomorphisms , 1.1 Direct Products and Direct Sums , Free Modules, 1.2 Rings with Invariant Basis Number , Problem Set	Using the pen and board and data show	Class Activities

2	3	CLO1+ CLO2	Categories, 2.1 Functors ,Properties of Morphisms , Problem Set. 2.2 Exact Sequences in Mod_R , 2,3 Split Short Exact Sequences 2.4 Problem Set.	Using the pen and board and data show	Class Activities
3	3	CLO1+ CLO2	2. Equivalent Categories and Adjoint Functors 3.1 Adjoints 3.2 Problem Set.	Using the pen and board and data show	Class Activities
4	3	CLO1+ CLO2	4.Chain Conditions 4.1 Generating and Cogenerating Classes 4.2 Problem Set.	Using the pen and board and data show	Class Activities
5	3	CLO3	5.Noetherian and Artinian Modules 5.1 Problem Set.	Using the pen and board and data show	Class Activities
6	3	CLO3	6. Modules over Principal Ideal Domains 6.1 Free Modules over a PID	Using the pen and board and data show	Class Activities
7	3	CLO3	6.2 Finitely Generated Modules over a PID 6.3 problem sets.	Using the pen and board and data show	Class Activities
8	3	CLO5+ CLO2	7.Injunctive, Projective, and Flat Modules.	Using the pen and board and data show	Midterm Exam
9	3	CLO4	invective Modules	Using the pen and board and data show	Assignments
10	3	CLO4+ CLO3	Provective Modules	Using the pen and board and data show	Assignments
11	3	CLO5	Flat modules	Using the pen and board and data show	Assignments+ Class Activities
12	3	CLO5	8. Envelopes and Covers. 8.1 Injective Envelopes 8.2 Problem Set	Using the pen and board and data show	Assignments+ Class Activities
13	3	CLO4+ CLO5	9. Projective Covers 9.1 The Radical of a Projective Module.	Using the pen and board and data show	Assignments+ Class Activities
14	3	CLO3+ CLO4	10.Modules of Quotients.	Using the pen and board and data show	Assignments+ Class Activities
15	3	CLO4+ CLO5	10.1 Goldie s Theorem , Problem Sets.	Using the pen and board and data show	Project/Report
11- Course Evaluation					

The total grade is 100 points, distributed as follows:

- **30 points**: Coursework (assignments, participation, quizzes, midterm exam, report , seminar)
- **70 points**: Final Exam

12- Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- T. Y. Lam, *A First Course in Noncommutative Rings*. 2- Anderson & Fuller, *Rings and Categories of Module*
Main references (sources)	1- Atiyah & Macdonald, *Introduction to Commutative Algebra*. 2- David S. Dummit & Richard M. Foote, *Abstract Algebra*.

Course Description Form

1- Course Name:
General Topology
2- Course Code:
3- Semester / Year:
semester 2025-2026
4- Description Preparation Date:
30/01/2026
5- Available Attendance Forms:
Actual Attendance
6- Number of Credit Hours (Total) / Number of Units (Total) :
45 hours (3 units)
7- Course administrator's name:
Prof. Dr. Daher W. Freh Al Baydli Email: daheralbayli@uowasit.edu.iq
8- Course Objectives
CLO 1: Understand the foundational concepts and language of topology. CLO 2: Analyze and classify topological spaces using topological properties. CLO 3: Apply concepts of continuity, connectedness, and compactness. CLO 4: Construct rigorous mathematical proofs involving topological structures. CLO 5: Develop abstract reasoning and problem-solving skills. CLO 6: Connect topological concepts with advanced areas of mathematics.
9- Teaching and Learning Strategies
1: Define and explain fundamental concepts of topology including topological spaces, open and closed sets, bases, and subbases. 2: Describe and distinguish topological properties such as continuity, connectedness, compactness, and separation axioms. 3: Analyze topological structures and determine their properties using formal mathematical arguments. 4: Construct and evaluate rigorous proofs of topological theorems. 5: Apply topological concepts to solve mathematical problems and investigate examples a counterexamples.
10- Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	CLO1+ CLO2	Introduction to Topology and Motivation	Using the pen and board and data show	Class Activities

2	3	CLO1+ CLO2	Topological Spaces and Examples	Using the pen and board and data show	Class Activities
3	3	CLO1+ CLO2	Open Sets and Closed Sets	Using the pen and board and data show	Class Activities
4	3	CLO1+ CLO2	Neighborhoods and Limit Points	Using the pen and board and data show	Class Activities
5	3	CLO3	Closure, Interior, and Boundary	Using the pen and board and data show	Class Activities
6	3	CLO3	Bases and Subbases	Using the pen and board and data show	Class Activities
7	3	CLO3	Generated Topologies	Using the pen and board and data show	Class Activities
8	3	CLO5+ CLO2	Midterm Examination	Using the pen and board and data show	Midterm Exam
9	3	CLO4	Continuous Functions	Using the pen and board and data show	Assignments
10	3	CLO4+ CLO3	Homeomorphisms	Using the pen and board and data show	Assignments
11	3	CLO5	Subspace Topology	Using the pen and board and data show	Assignments+ Class Activities
12	3	CLO5	Product Topology	Using the pen and board and data show	Assignments+ Class Activities
13	3	CLO4+ CLO5	Quotient Topology	Using the pen and board and data show	Assignments+ Class Activities
14	3	CLO3+ CLO4	Connectedness and Path Connectedness	Using the pen and board and data show	Assignments+ Class Activities
15	3	CLO4+ CLO5	Compactness	Using the pen and board and data show	Project/Report

11- Course Evaluation

The total grade is 100 points, distributed as follows:

- **30 points**: Coursework (assignments, participation, quizzes, midterm exam, report , seminar)
- **70 points**: Final Exam

12- Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- Munkres, James R. *Topology*. 2nd ed., Prentice Hall, Inc., 2000. 2- Simmons, George F. *Introduction to Topology and Modern Analysis*. McGraw-Hill, 1963.
Main references (sources)	1- Kelley, J. L. *General Topology*. Springer, New York, 1955. 2- Morris, Sidney A. *Topology Without Tears*, 2014. 3- Steen, Lynn Arthur, and J. Arthur Seebach. *Counterexamples in Topology*. Springer, New York, 1978

Course Description Form

1- Course Name:
Numerical Analysis
2- Course Code:
3- Semester / Year:
semester 2025-2026
4- Description Preparation Date:
19/10/2025
5- Available Attendance Forms:
6- Number of Credit Hours (Total) / Number of Units (Total) :
45 hours (3 units)
7- Course administrator's name:
Prof. Dr. Bassim Nasih Abood
8- Course Objectives
By the end of the course, students are expected to be able to: CLO 1: Understand the fundamentals of numerical analysis and its applications. CLO 2: Apply numerical methods to find approximate solutions to equations. CLO 3: Analyze numerical errors and their sources. CLO 4: Use software to implement numerical algorithms. CLO 5: Evaluate the accuracy and efficiency of different numerical methods.
9- Teaching and Learning Strategies
1: Explain the basic concepts of numerical analysis 2: Apply numerical methods to solve equations 3: Analyze numerical errors 4: Use software tools to implement algorithms 5: Evaluate the efficiency and accuracy of numerical methods
10- Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	CLO1+ CLO2	A-B methods	Using the pen and board and data show	Class Activities
2	3	CLO1+ CLO2	A-M methods	Using the pen and board and data show	Class Activities
3	3	CLO1+ CLO2	P-C methods	Using the pen and board and data show	Class Activities

4	3	CLO1+ CLO2	Least square approximation	Using the pen and board and data show	Class Activities
5	3	CLO3	Orthogonal polynomial	Using the pen and board and data show	Class Activities
6	3	CLO3	Pade Approximation	Using the pen and board and data show	Class Activities
7	3	CLO3	Trigonometric Approximation	Using the pen and board and data show	Class Activities
8	3	CLO5+ CLO2	Midterm Examination	Using the pen and board and data show	Midterm Exam
9	3	CLO4	Power method	Using the pen and board and data show	Assignments
10	3	CLO4+ CLO3	Householder method	Using the pen and board and data show	Assignments
11	3	CLO5	Inverse &symmetric method	Using the pen and board and data show	Assignments+ Class Activities
12	3	CLO5	Elliptic PDE	Using the pen and board and data show	Assignments+ Class Activities
13	3	CLO4+ CLO5	Parabolic PDE	Using the pen and board and data show	Assignments+ Class Activities
14	3	CLO3+ CLO4	Hyperbolic PDE	Using the pen and board	Assignments+ Class Activities
15	3	CLO4+ CLO5	Applications	Using data show	Project/Report

11- Course Evaluation

The total grade is 100 points, distributed as follows:

- **30 points**: Coursework (assignments, participation, quizzes, midterm exam, report, seminar)
- **70 points**: Final Exam

12- Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- Burden, R. L., & Faires, J. D. (2010). *Numerical Analysis* (9th ed.).
Main references (sources)	1- Conte, S. D., & de Boor, C. (1980). *Elementary Numerical Analysis: An Algorithmic Approach* (3rd ed.). McGraw-Hill.

Course Description Form

1. Course Name:

Teaching Methods

2. Course Code:

3. Semester / Year: 2025−2026

2025-2026 (Master's Degree - Preparatory Level)

4. Description Preparation Date:

22/10/2025

5. Available Attendance Forms:

Daily Attendance

6. Number of Credit Hours / Number of Units

(30) 2 Hour (Theoretical) pre week (2 units)

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

Name: Assoc. Prof. Dr. Mahdi Alwan Aboud
Email: malwan@uowasit.edu.iq

8. Course Objectives

CLO 1: Introduce students to modern trends in science teaching.
CLO 2: Familiarize students with teaching methods and strategies for Life Sciences.
CLO 3: Identify key skills in teaching Life Sciences.
CLO 4: Develop thinking skills.
CLO 5: Explore strategies for fostering creative thinking.
CLO 6: Understand cognitive strategies.
CLO 7 :Learn about achievement tests.

9. Teaching and Learning Strategies

1: Lecture Method
2: Questioning and Inquiry
3: Blended Learning

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Understanding teaching methods and strategies	Importance of teaching methods for teachers, students, and subjects	Lecture	Discussion
2	1	Understanding teaching skills	Types of teaching skills, first session skills	Lecture	Discussion
3	1	Effective lecture techniques	Steps to deliver a successful lecture	Lecture	Discussion

4	1	Standard and inductive teaching methods in mathematics	Definition, steps, advantages, with practical examples	Lecture	Discussion
5	1	Feedback techniques	Definition, importance, sources, and types of feedback in mathematics teaching	Lecture	Discussion
6	1	Active learning	Concept, importance, roles, and strategies	Lecture	Discussion
7	1	Student presentation of active learning strategies	Analysis and discussion	Practical	Evaluation
8	1	Continuation of active learning strategy discussions	Further analysis	Practical	Evaluation
9	1	Written Exam	Mid-term assessment	Written Exam	Evaluation
10	1	Cognitive strategies in teaching mathematics	Concept and types	Lecture	Discussion
11	1	E-learning and mathematics teaching in the digital age	Modern techniques integration	Lecture	Discussion
12	1	The relationship between mathematics instructors and students	Humanizing teacl approaches	Lecture	Discussion
13	1	Student assessment methods	Evaluation objectives, e question guidelines	Lecture	Discussion
14	1	Objective vs. essay-type questions	Features, drawbacks, improvement suggestions	Lecture	Discussion
15	1	Practical application of exam question design	Hands-on activity	Practical	Evaluation

11. Course Evaluation

The total grade is 100 points, distributed as follows:

- **30 points**: Coursework (assignments, participation, quizzes, midterm exam, report, seminar)
- **70 points**: Final Exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	• Mathematics Teaching Methods • Teaching Skills • Active Learning Strategies • Measurement and Evaluation in the Educational Process
Main references (sources)	• Supplementary books and recommended reading (scientific journals, reports, etc.) • Online References and Websites

Course Description Form

Course Name:
English Language
Course Code:
Depeartment of Mathematics
Semester / Year:
First semester 2025-2026
Description Preparation Date:
21/10/2025
Available Attendance Forms:
Actual Attendance
Number of Credit Hours (Total) / Number of Units (Total):
15 hours / one unit
Course administrator's name (mention all, if more than one name)
Name: Dr. Aqeel Jassim Noor Email: aqeel.noor@uowasit.edu.iq

Course Objectives	
1-	Familiarizing MSc students with basic language skills required for their study.
2-	Introducing them to the proper use of English language in terms of types of sentences and other basic structures in English.
3-	Increasing MSc students' knowledge in the skills of reading and writing.
4-	Exposing MSc students to real-life situations in English to foster the approporiate use of different grammatical structures to cope with such situations.

Teaching and Learning Strategies	
1-	In-class lectures
2-	Power point presentations
3-	Class discussions

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-	2	International student, Going abroad to study: Reading	Unit One	lecture	Assignment

2-	2	International student, Going abroad to study: Listining	Unit Two	lecture	Assignment
3-	2	Where in the world...?, Reading	Unit Three	lecture	Assignment / Quiz
4-	2	Where in the world...?, Listining	Unit Four	lecture	Assignment
5-	2	Newspaper articles, Reading	Unit Five	lecture	Assignment / Quiz
6-	2	Newspaper articles, Listning	Unit Six	lecture	Assignment
7-	2	Modern technology, Innovations	Unit Seven	lecture	Assignment
8-		Mid - Term Exam			
9-	2	Conferences and visits	Unit Eight	lecture	Assignment
10-	2	Science and our world, Airpollution	Unit Nine	lecture	Assignment
11-	2	People: past and present, Three famous writes	Unit Ten	lecture	Quiz
12-	2	The world of IT, Computers	Unit Ten	lecture	Assignment
13-	2	Inventions, discoveries, and processes, How things work	Unit Ten	lecture	Assignment
14-	2	Travel and tourism	Unit Ten	lecture	Assignment
15-		Final Exam			

Course Evaluation

The total grade is 100 points, distributed as follows:
30 points: Coursework (assignments, participation, quizzes, report , seminar)
70 points: Final Exam

Learning and Teaching Resources

Required textbooks (curricular books, if any)	[1] Headway: Academic Skills - Level 2

Course Description Form

1- Course Name:
Applied Mathematics
2- Course Code:
3- Semester / Year:
semester 2025-2026
4- Description Preparation Date:
19/10/2025
5- Available Attendance Forms:
Actual Attendance
6- Number of Credit Hours (Total) / Number of Units (Total) :
45 hours (3 units)
7- Course administrator's name:
Prof. Dr Ali Hussan AlTaa'i
8- Course Objectives
By the end of the course, students are expected to be able to: CLO 1: Build mathematical models of real-world problems. CLO 2: Analyze models using appropriate mathematical tools. CLO 3: Apply differential equations to describe natural phenomena. CLO 4: Use numerical methods for approximate solutions. CLO 5: Interpret results and relate them to practical applications.
9- Teaching and Learning Strategies
1- Explain mathematical modeling concepts 2- Build mathematical models of applied problems 3- Analyze models using mathematical tools 4- Use software for numerical solutions 5- Evaluate results and relate them to real-world applications
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	CLO1+ CLO2	General Description, Essential Background Mathematics, and The Exponential Integral	Using the pen and board and data show	Class Activities

2	3	CLO1+ CLO2	The Method of Multiple Scales	Using the pen and board and data show	Class Activities
3	3	CLO1+ CLO2	Straightforward Expansion, and the Rayleigh Oscillator	Using the pen and board and data show	Class Activities
4	3	CLO1+ CLO2	Mathieu's Equation and the Method of Strained Parameters	Using the pen and board and data show	Class Activities
5	3	CLO3	Regular and singular perturbations	Using the pen and board and data show	Class Activities
6	3	CLO3	Matched Asymptotic Expansion	Using the pen and board and data show	Class Activities
7	3	CLO3	Example of an internal boundary layer	Using the pen and board and data show	Class Activities
8	3	CLO5+ CLO2	Example of a nonlinear problem	Using the pen and board and data show	Midterm Exam
9	3	CLO4	Test	Using the pen and board and data show	Assignments
10	3	CLO4+ CLO3	The WKB Method: Find the WKB expansion for some boundary value problem	Using the pen and board and data show	Assignments
11	3	CLO5	Eigenvalue problems and Transition Points	Using the pen and board and data show	Assignments+ Class Activities
12	3	CLO5	Two Turning Point Problems	Using the pen and board and data show	Assignments+ Class Activities
13	3	CLO4+ CLO5	Solution of Differential Equations in terms of Contour Integrals: The Laplace Linear Equation	Using the pen and board and data show	Assignments+ Class Activities
14	3	CLO3+ CLO4	Asymptotic Evaluation of Contour Integrals	Using the pen and board	Assignments+ Class Activities
15	3	CLO4+ CLO5	Test	Using data show	Project/Report

11. Course Evaluation

The total grade is 100 points, distributed as follows:
30 points: Coursework (assignments, participation, quizzes, midterm exam, report , seminar)
70 points: Final Exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	[1] James P. Keener, Principle of Applied Mathematics: Transformation and Application, Cambridge, 1995.
Main references (sources)	13. [2] Carl M. Bender, Steven A. Orszag, Advanced mathematical methods for scientists and engineers. Springe, 1999.