


Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation

Academic Program Specification Form For The
Academic

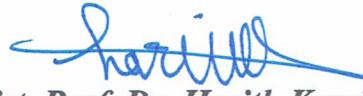
University: *Anbar*
College: *Education for Pure Science*
Department: *Mathematics*
Date Of Form Completion: *10/6/2021*


Prof. Dr. Abdul Rahman
Salman. Juma

Dean's Name

Date: / /

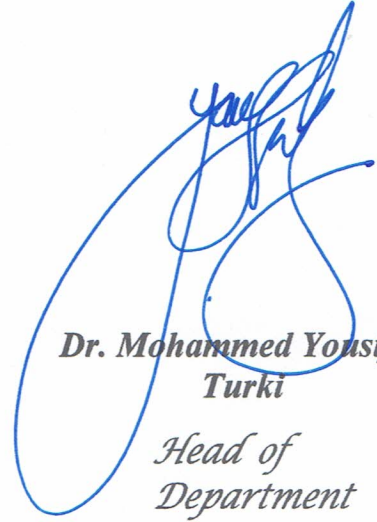
Signature


Assist. Prof. Dr. Harith Kamil
Buniya

Dean's Assistant
For Scientific
Affairs

Date: *10/6/2023*

Signature


Dr. Mohammed Yousif
Turki

Head of
Department

Date: *10/6/2023*

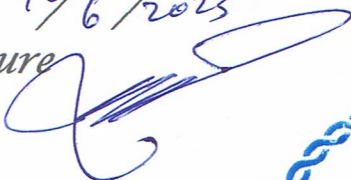
Signature

Assist. Prof. Dr. Feras Shaker Mahmood

Quality Assurance And University Performance
Manager

Date: *10/6/2023*

Signature





TEMPLATE FOR PROGRAMME SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the programme.

1. Teaching Institution	University of Anbar
2. University Department	College of education for pure science- Mathematics
3. Programme Title	Education Mathematic Sciences
4. Title of Final Award	Bachelor of Education Mathematic Sciences
5. Modes of Attendance offered	Quarterly
6. Accreditation	Nothing
7. Other external influences	School application - practical graduation research projects
8. Date of production	10/6/2023
9. Aims of the Programme	
1. Achieving the specified standards for the quality of material, human, technical and financial resources.	
2. Providing an efficient administrative staff that knows its duties and powers according to the work structures and regulations, in which the requirements of the job description are fulfilled.	
3. Providing a specialized teaching staff who is fluent in using modern techniques and methods in education with good job satisfaction.	
4. Preparing academic programs in accordance with international academic standards and providing their knowledge, training and technical requirements.	
5. Preparing students with scientific, practical and educational knowledge that meets the needs of the labor market.	
6. Paying attention to scientific research in terms of laboratory, research and researcher in order to achieve a distinguished research reputation locally and globally.	
7. Research and professional openness to community institutions to meet their needs and aspirations.	
8. Evaluate all individuals and processes to ensure quality performance and continuous improvement.	

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A1. Knowledge and Understanding

A1. Enable the student to acquire theoretical knowledge of Mathematics.

A2. Empowering the student how to teach and ways of communicating scientific information to students.

A3. The student's knowledge of the methods of measurement and evaluation and methods of modern teaching methods in Mathematics.

A4. The student is acquainted with the educational material by providing it electronically in the virtual classroom. In addition to enabling the student to know the learning theories related to the ages of students for the secondary school stage.

B. Subject-specific skills

B1. Gaining knowledge and enriching the student with the methods of laboratory work.

B2. Orienting the student to the scientific method in solving all scientific problems.

B3. Knowing the objectives and origins of the art of teaching chemistry.

B4. Enabling students to acquire the skills of using virtual classrooms

Teaching and Learning Methods

1. The method of listening and thinking deeply in order to understand the problem to solve it.

2. The method of scientific discussion and meaningful dialogue.

3. Adopting the method of monthly and final exams and submitting weekly reports.

Assessment methods

1. The treatment method using final scores.

2. Random and surprise tests.

3. Teaching tasks in the virtual classroom.

C. Thinking Skills

C1. Adopting the method of dialogue between the student and the professor.

C2. Interest in research projects and preparing organized reports

C3. Adopt the method of discussion. (Performance tests and seminars).

C4. Adopting e-learning to provide an interesting and flexible learning environment.

Teaching and Learning Methods

1. Method of application in research laboratories
2. Adopting the method of constructive dialogue and discussion
3. Adopt the trial-and-error method.
4. The adoption of multimedia in the virtual classes (image, text, audio, video)

Assessment methods

1. Preparation of the seminar (graduation research)
2. Adoption of the grading method as a basis in the evaluation process.
3. Adoption of the test method.
4. Adopting the method of discussions and dialogues between the students and the professor.
5. Create a test task in the virtual classes.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- That the student benefit from his learning and embody this in his personal and professional development.

D2- That the student is able to employ the knowledge he receives during the study stage.

D3- That the student benefit from theoretical knowledge in employing the teaching profession and mastering it in a concept-based manner.

Fundamentals of teaching chemistry.

D4 - Skills of modern technologies in communication, documentation and communication.

Teaching and Learning Methods

1. Field visits in laboratories.
2. Scientific application in laboratories.
3. Take advantage of graduation research.
4. Presentation and presentation of educational content in virtual classes using multimedia (video, recorded lecture).

Assessment Methods

1. Articles and periodical research
2. The interview
3. Final exams
4. Determining study tasks and duties periodically and regularly in the virtual classroom

11. Programme Structure				
Level/ Year	Course or Module Code	Course or ModuleTitle	Weekly hours	
			Lec.	Lab.
First	MAT105	Calculus1	2	3
	MAT106	Fundamental of mathematics1	2	2
	MAT107	Linear of Algebra 1	2	2
	UOA141	Computer 1	1	2
	PHY105	Physics 1	2	2
	MAT113	Calculus2	2	3
	MAT114	Fundamental of mathematics2	2	2
	MAT115	Linear of Algebra 2	2	2
	UOA142	Computer 2	1	2
	PHY110	Physics 2	2	2
	EPS101	Educational psychology	2	-
	EPS120	Education principles	2	-
	UOA135	Arabic language	2	
	UOA140	English language	2	
	UOA135	Human rights	1	-
	UOA136	freedom and democracy	2	-
Second	MAT201	Advance Calculus1	2	2
	MAT202	Ordinary differential equation 1	2	2
	MAT203	Groups Algebra1	2	2
	MAT204	Geometry 1	2	2
	MAT205	Advance Computer1	2	2
	MAT206	Advance Calculus2	2	2
	MAT207	Ordinary differential equation 2	2	2
	MAT208	Groups Algebra2	2	2
	MAT209	Geometry 2	2	2
	MAT210	Advance Computer2	2	2
	EPS 211	Scientific Research Methodolgy	2	-
	EPS 202	Childhood psychology	2	-
	EPS 201	Educational administration	2	-
	UOA240	English language	2	-

Third	MAT301	Analysis Mathematical1	2	2
	MAT302	Partial differential equations1	2	2
	MAT303	Rings Algebra 1	2	2
	MAT304	Probability1	2	2
	MAT305	Numerical analysis1	2	2
	MAT306	Analysis Mathematical1	2	2
	MAT307	Partial differential equations2	2	2
	MAT308	Rings Algebra 2	2	2
	MAT309	Probability2	2	2
	MAT310	Numerical analysis2	2	2
	EPS 311	Curriculum and teaching methods	2	-
	EPS312	Educational guidance	2	-
	UOA340	English language	2	-
Fourth	MAT401	Analysis complex1	2	2
	MAT402	Topology 1	2	2
	MAT403	Statistic Mathematical1	2	2
	MAT404	Analysis Functional1	2	2
	MAT405	Modules 1	2	2
	MAT406	Analysis complex2	2	2
	MAT407	Topology 2	2	2
	MAT408	Statistic Mathematical2	2	2
	MAT409	Analysis Functional2	2	2
	MAT410	Modules 2	2	2
	EPS411	Measuring and evaluating	2	-
	EPS412	Teaching apps	2	-
	EPS413	School apps	2	-
	EPS414	Graduation Project	2	-
	UOA440	English language	2	-

13. Personal Development Planning

1. Using modern scientific sources.
2. Using rapid communication networks to transfer information such as the Internet.
3. Visits and practical practices in service laboratories.
4. Acquisition of scientific and modern experiences and skills in the field of modern technical communication

14. Admission criteria

1. Admission according to the general and central average system.
2. Admission to departments is according to the student's desire and is modified.
3. It is a condition for a graduate of the preparatory school and the scientific stream exclusively.
4. The accepted student's personal and mental integrity and freedom from physical impairments

15. Key sources of information about the programmers

1. Curriculum books approved by the Sectorial Committee of the Faculties of Education for Pure Sciences.
2. Helping books.
3. Books and archaeological resources / sources in the English language.
4. Additional sources from the Internet.
5. The training courses held by the university on e-learning platforms.

Curriculum Skills Map																			
				Programmers Learning Outcomes															
Year / Level	Course Code	CourseTitle	Core (C) or Option (O)	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
First	MAT105	Calculus1	Core	√	√	√		√	√			√	√			√	√	√	√
	MAT106	Fundamental of Mathematics1	Core	√		√		√	√			√				√			
	MAT107	Linear of Algebra 1	Core	√		√		√	√			√				√			
	UOA141	Computer 1	Core	√		√		√	√			√				√			
	PHY105	Physics 1	Core	√		√		√	√			√				√			
	MAT113	Calculus2	Core	√		√		√	√			√				√			
	MAT114	Fundamental of Mathematics2	Core	√		√		√	√			√				√			
	MAT115	Linear of Algebra 2	Core	√		√		√	√			√				√			
	UOA142	Computer 2	Core	√		√		√	√			√				√			
	PHY110	Physics 2	Core	√		√		√	√			√				√			
	EPS101	Educational psychology	Core			√		√	√			√				√			
	EPS120	Education principles	Core			√		√	√			√				√			
	UOA135	Arabic language	Core			√		√	√			√				√			
	UOA140	English language	Core			√		√	√			√				√			
	UOA135	Human rights	Core	√		√		√	√			√				√			
UOA136	freedom and democracy	Core	√		√		√	√			√				√				

Curriculum Skills Map

				Programme Learning Outcomes															
Year / Level	Course Code	CourseTitle	Core (C) or Option (O)	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Second	MAT201	Advance Calculus1	Core	√		√		√	√			√				√			
	MAT202	Ordinary differential equation 1	Core	√		√		√	√			√				√			
	MAT203	Groups Algebra1	Core	√		√		√	√			√				√			
	MAT204	Geometry 1	Core	√		√		√	√			√				√			
	MAT205	Advance Computer1	Core	√		√		√	√			√				√			
	MAT206	Advance Calculus2	Core	√		√		√	√			√				√			
	MAT207	Ordinary differential equation 2	Core	√		√		√	√			√				√			
	MAT208	Groups Algebra2	Core	√		√		√	√			√				√			
	MAT209	Geometry 2	Core	√		√		√	√			√				√			
	MAT210	Advance Computer2	Core	√		√		√	√			√				√			
	EPS 211	Scientific Research Methodolgy	Core			√		√	√			√				√			

Curriculum Skills Map

				Programme Learning Outcomes															
Year / Level	Course Code	CourseTitle	Core (C) or Option (O)	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Third	MAT301	Analysis Mathematical1	Core	√		√		√	√			√				√			
	MAT302	Partial differential equations1	Core	√		√		√	√			√				√			
	MAT303	Rings Algebra 1	Core	√		√		√	√			√				√			
	MAT304	Probability1	Core	√		√		√	√			√				√			
	MAT305	Numerical analysis1	Core	√		√		√	√			√				√			
	MAT306	Analysis Mathematical1	Core	√		√		√	√			√				√			
	MAT307	Partial differential equations2	Core	√		√		√	√			√				√			
	MAT308	Rings Algebra 2	Core	√		√		√	√			√				√			
	MAT309	Probability2	Core	√		√		√	√			√				√			
	MAT310	Numerical analysis2	Core	√		√		√	√			√				√			
	EPS 311	Curriculum and teaching methods	Core			√		√	√			√				√			
	EPS312	Educational guidance	Core			√		√	√			√				√			
	UOA340	English language	Core			√		√	√			√				√			

Curriculum Skills Map																			
				Programme Learning Outcomes															
Year / Level	Course Code	CourseTitle	Core (C) or Option (O)	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Fourth	MAT401	Analysis complex1	Core	√		√		√	√			√				√			
	MAT402	Topology 1	Core	√		√		√	√			√				√			
	MAT403	Statistic Mathematical1	Core	√		√		√	√			√				√			
	MAT404	Analysis Functional1	Core	√		√		√	√			√				√			
	MAT405	Modules 1	Core	√		√		√	√			√				√			
	MAT406	Analysis complex2	Core	√		√		√	√			√				√			
	MAT407	Topology 2	Core	√		√		√	√			√				√			
	MAT408	Statistic Mathematical2	Core	√		√		√	√			√				√			
	MAT409	Analysis Functional2	Core	√		√		√	√			√		√		√			
	MAT410	Modules 2	Core	√		√		√	√			√		√		√	√	√	
	EPS411	Measuring and evaluating	Core	√		√		√	√			√		√		√	√	√	
	EPS412	Teaching apps	Core			√		√	√			√		√		√	√	√	
	EPS413	School apps	Core			√		√	√			√		√		√	√	√	
	EPS414	Graduation Project	Core			√		√	√			√		√		√	√	√	
	UOA440	English language	Core			√		√	√			√				√	√		



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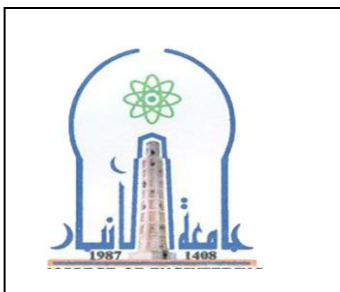
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Course Description Form

Course description

This course description provides a summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he or she has made the most of the learning opportunities available. It must be linked to the program description.

Ministry education High And search Scientific / university Anbar / College Education For science Pure	1. Enterprise Educational
mathematics	2. Section University / Center
(MAT210 Computers 1)	3. name / Code The decision
Electronically	4. shapes the audience Available
course the first	5. the chapter / the year
60 hours	6. number hours Scholarship (total)
2022-2023	7. date Preparation this the description
8. Goals The decision :A course concerned with teaching the student the history of computers and the extent of their development over the years along with operating systems	
9. Outputs The decision And methods education And learning And evaluation	
A- Objectives Cognitive <ol style="list-style-type: none"> 1. Identify on Generations Calculators . 2. Identify on Species Calculators . 3. Identify on Systems Numerical. 	



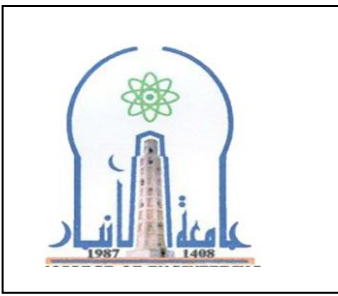
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<p>B - Objectives Marathi Private By decision. sharing requester With issues Intellectual with finding the solution For this matters.</p>
<p>Methods education And learning</p>
<p>1- Electronically on some Programs Learning Electronic like Google form and others on appearance 2- :means Different Of which an offer Lecturer on a screen an offer And use Calculator</p>
<p>Methods Evaluation</p>
<ul style="list-style-type: none"> ▪ Pursuit (10 degrees Presence , 5 degrees duty my house, 5 degrees Exam daily, 20 degrees Exam Monthly 60 total degree Exam ultimate100) ▪ on road questions Direct during lecture ▪ on road Exams Monthly ▪ on road performance Duties ▪ on road Exams Final ▪ on road Discipline And commitment By regulations And the laws
<p>C- Objectives Sentimentality And value - thinking critic (a question And Answer) 2- Skill Organization 3- Skill Interaction 4- Skill the job</p>
<p>Methods education And learning</p>
<p>Discussion, Lectures</p>
<p>Methods Evaluation</p>
<p>1. Discussion 2. the exams Editorial</p>



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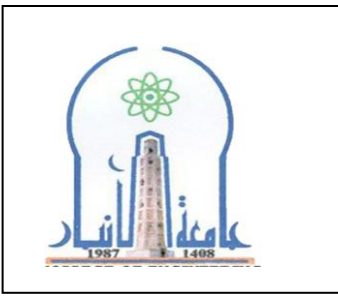
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Dr -Skills the public And qualifying Movable (Skills The other Related Capable recruitment And evolution Personal).

- sharing requester With issues Intellectual with finding the solution For this matters from Include it The derivative And integration .
- Duties addition to questions during lectur

10.structure The decision					
road Evaluation	road education	name Unit / Course or the topic	Outputs Learning required	hours	the week
the audience And the questions Motivational	a lecture Video with a lecture Textual with broadcast direct	Computer basics	fundamentals of computer	4	the first
the audience And the questions Motivational	a lecture Video with a lecture Textual with broadcast direct	Definition of computer	Definition of Computer	4	the second
the audience And the questions Motivational	a lecture Video with a lecture Textual with broadcast direct	computer components	Components of Computer	4	the third
the audience And the questions Motivational	a lecture Video with a lecture Textual with broadcast direct	Material components	Hardware	4	the fourth
the audience And the questions Motivational	a lecture Video with a lecture Textual with broadcast	Software components	Software	4	Fifth



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nal	direct				
the audience And the questions Motivatio nal	a lecture Video with a lecture Textual with broadcast direct	Learn about numerical systems	Numerical systems	4	VI
the audience And the questions Motivatio nal	a lecture Video with a lecture Textual with broadcast direct	Conversion between numerical systems	Changing Between Numerical Systems	4	Seventh
the audience And the questions Motivatio nal	a lecture Video with a lecture Textual with broadcast direct	Learn about the binary system	Arithmetic operation in Binary system	4	VIII
Class	a lecture Video And broadcast direct with Questions immanence Editorial	Learn about the octal system	Arithmetic operation in octal system	4	Ninth
the audience And the questions Motivatio nal	a lecture Video with a lecture Textual with broadcast direct	Operations on the hexadecimal system	Arithmetic operation in hexadecimal system	4	The tenth
the audience And the questions Motivatio nal	a lecture Video with a lecture Textual with broadcast direct	Algorithm	Algorithms	4	atheistic ten
the audience And the questions Motivatio nal	a lecture Video with a lecture Textual with broadcast direct	Its types	Types of Algorithms	4	the second ten



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the audience And the questions Motivational	a lecture Video with a lecture Textual with broadcast direct	Learn about operating systems	IntroductionDos	4	the third ten
the audience And the questions Motivational with Class	a lecture Video with a lecture Textual with broadcast direct with Questions Editorial immanence	Win-7	IntroductionWindows	4	the fourth ten
Class	a lecture Video with a lecture Textual with broadcast direct with Questions Editorial immanence	Word 2010	Introduction Word	4	Fifth ten

11. Structure Infrastructure	
<ul style="list-style-type: none"> ➤ Computer principles ➤ Course of the Ministry of Higher Education for computer principles 	Readings required : <ul style="list-style-type: none"> ➤ books The decision ➤ Other
some Books And lectures e To support Subject Scientific And for its chain of transmission	requirements especially
Services Social (Include on way Example Lectures guests)	

10. plan development The decision Academic
 maybe Accreditation on some Books Modern And keeping up Developments
 Research in a lot from aspects structure The decision and more And update
 structure Vocabulary For the decision in the rate of 20% annually



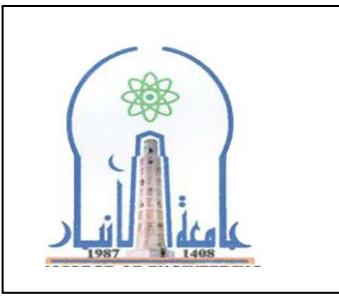
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Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program

University of Anbar	Educational institution [1]
College of Education for Pure Sciences/Department of Mathematics	University [2] department/center
Numerical analysis 1	Course name/code [3]
	The programs in which he [4] participates
Electronically	Available forms of [5] attendance
First semester/third academic year	Semester/year [6]
60	Number of study hours [7] ((total
2022-2023	Date this description was [8] prepared
:Course objectives [9]	
<ul style="list-style-type: none"> • The need of most researchers in various branches of knowledge, especially those who deal with approximate measurements and calculations in their research. 	



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- The importance of approximation is extremely important, as many topics depend on it, such as various statistics on population numbers. Temperatures and humidity levels

Devise approximate means and methods for addressing solutions to a number of problems

10 .Learning outcomes and methods of teaching, learning and evaluation

A- Knowledge and understanding

- 1-The student will gain a simple overview of errors in numerical calculations and how they accumulate.
- 2-The student acquires the concept of a numerical solution when arriving at the exact solution is more or less difficult Sometimes impossible.
- 3-The student obtains experience in dealing with numerical methods and common algorithms and analyzing them
- 4-Giving the student experience in dealing with solutions of nonlinear equations and linear systems, as well as inclusion and interpolation.

A- Subject-specific skills

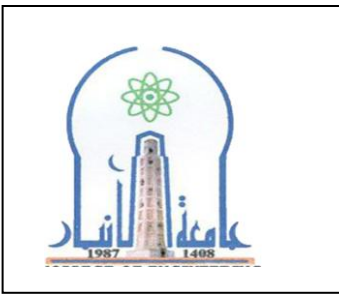
- 1-Scientific reports
- Research 2-

Teaching and learning methods

- Sudden daily and continuous weekly tests.
- Exercises and activities in the classroom.
- .Guiding students to some sources that contain examples and exercises to benefit from them.

Evaluation methods

- Participation in the classroom
- Providing activities
- Semester and final tests and activities



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C- Thinking skills
Teaching and learning methods
<p>-Managing the lecture in an applied manner linked to the reality of daily life to attract the student to the topic of the lesson without straying from the core of the topic, the material is flexible and can be understood and analysed</p> <p>Assigning the student to some group activities and duties.-</p> <p>. -Allocate a percentage of the grade to daily assignments and tests</p>
Evaluation methods
<p>-Active participation in the classroom is evidence of the student's commitment and responsibility</p> <p>-Commitment to the specified deadline for submitting assignments and research</p> <p>-Semester and final tests express commitment and cognitive and skill achievement</p> <p>Applications, exercises and daily assignments</p>
<p>D - General and transferable skills (other skills related to employability and personal development.(</p> <p>1-Developing the student's ability to deal with technical means</p> <p>2-Developing the student's ability to deal with the Internet</p> <p>3-Developing the student's ability to deal with multimedia</p> <p>4-Developing the student's ability to dialogue and discuss</p>



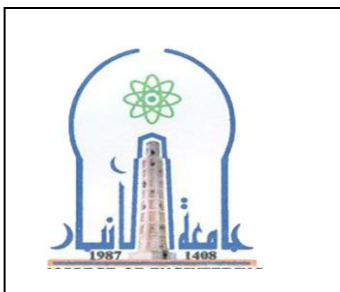
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10-Course structure					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	Hours	The Week
General questions and discussion	Theoretical + practical	Elementary numerical analysis	0The concept of Numerical analysis	2theoretical + 2 practical	the first
General questions and discussion	Theoretical + practical	The numerical error types	Absalute error, Relative errors + operation of error	2theoretical + 2 practical	the second
General questions and discussion	Theoretical + practical	Numerical solution of Nonlinear equation	Half interval method	2theoretical + 2 practical	the third
General questions and discussion	Theoretical + practical	Numerical solution of Nonlinear equation	False position method	2theoretical + 2 practical	the fourth
General questions and discussion	Theoretical + practical	Numerical solution of Nonlinear equation	secant mrthod	2theoretical + 2 practical	Fifth
General questions and discussion	Theoretical + practical	Numerical solution of Nonlinear equation	Newton_raphson method	2theoretical + 2 practical	Seventh
General questions and discussion	Theoretical + practical	Numerical solution of Nonlinear equation	Fixed point method	2theoretical + 2 practical	eighth
			Test first		Ninth
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	The concept of system linear equation	2theoretical + 2 practical	The tenth
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	Gaussian Elimination method	2theoretical + 2 practical	eleventh
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	Gauss-Jordan Reduced Method	2theoretical + 2 practical	twelveth
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	Jacobi Method	2theoretical + 2 practical	Thirteenth
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	Gauss-Seidel Method	2theoretical + 2 practical	fourteenth
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	Eigenvalue : The Power Method	2theoretical + 2 practical	Fifteenth
	Theoretical + practical		Second test		sixteen



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.- Infrastructure 10	
Introduction to numerical analysis S . Baskar 2010 Introduction To Numerical Analysis Froberg C. E 1969 .	Required readings: - Course books - Other
Follow up on electronic references and the Internet •Discreet websites- •Virtual library- -Library locations in some international universities.	Special requirements
	Social services (including, for example, guest lectures, vocational training, and field studies(

10-Acceptance	
	Prerequisites
25	The smallest number of students
50	The largest number of students



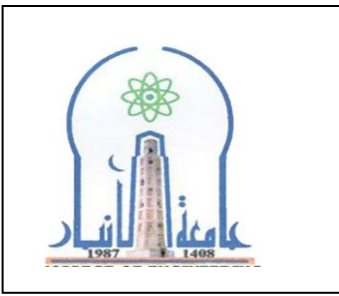
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Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program

University of Anbar	Educational institution [10]
College of Education for Pure Sciences/Department of Mathematics	University [11] department/center
Numerical analysis 2	Course name/code [12]
	The programs in which [13] he participates
Electronically	Available forms of [14] attendance
Second semester/third academic year	Semester/year [15]
60	Number of study hours [16] ((total
2022-2023	Date this description was [17] prepared
	:Course objectives [18]
<ul style="list-style-type: none"> • The need of most researchers in various branches of knowledge, especially those who deal with approximate measurements and calculations in their research. 	



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- The importance of approximation is extremely important, as many topics depend on it, such as various statistics on population numbers. Temperatures and humidity levels

Devise approximate means and methods for addressing solutions to a number of problems

10 .Learning outcomes and methods of teaching, learning and evaluation

A- Knowledge and understanding

- 1-The student will gain a simple overview of errors in numerical calculations and how they accumulate.
- 2-The student acquires the concept of a numerical solution when arriving at the exact solution is more or less difficult Sometimes impossible.
- 3-The student obtains experience in dealing with numerical methods and common algorithms and analyzing them
- 4-Giving the student experience in dealing with solutions of nonlinear equations and linear systems, as well as inclusion and interpolation.

A- Subject-specific skills

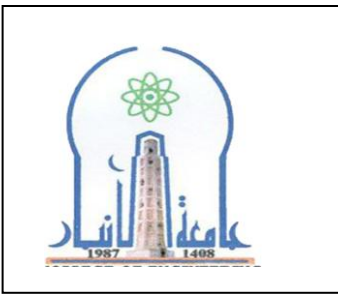
- 1-Scientific reports
- Research 2-

Teaching and learning methods

- Sudden daily and continuous weekly tests.
- Exercises and activities in the classroom.
- .Guiding students to some sources that contain examples and exercises to benefit from them.

Evaluation methods

- Participation in the classroom
- Providing activities
- Semester and final tests and activities



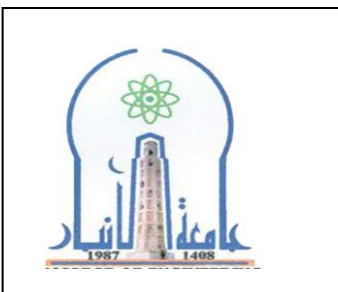
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C- Thinking skills
Teaching and learning methods
<p>-Managing the lecture in an applied manner linked to the reality of daily life to attract the student to the topic of the lesson without straying from the core of the topic, the material is flexible and can be understood and analysed</p> <p style="text-align: center;">Assigning the student to some group activities and duties.-</p> <p>. -Allocate a percentage of the grade to daily assignments and tests</p>
Evaluation methods
<p>-Active participation in the classroom is evidence of the student's commitment and responsibility</p> <p>-Commitment to the specified deadline for submitting assignments and research</p> <p>-Semester and final tests express commitment and cognitive and skill achievement</p> <p style="text-align: center;">Applications, exercises and daily assignments.</p>
<p>D - General and transferable skills (other skills related to employability and personal development.(</p> <p>1-Developing the student's ability to deal with technical means</p> <p>2-Developing the student's ability to deal with the Internet</p> <p>3-Developing the student's ability to deal with multimedia</p> <p>4-Developing the student's ability to dialogue and discuss</p>



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10-Course structure					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	Hours	The Week
General questions and discussion	Theoretical + practical	Interpolation and Polynomial Approximation	Concept of interpolation and approximation	2theoretical + 2 practical	the first
General questions and discussion	Theoretical + practical	Interpolation method	Interpolation and the Lagrange polynomial	2theoretical + 2 practical	the second
General questions and discussion	Theoretical + practical	Interpolation method	Divided Difference	2theoretical + 2 practical	the third
General questions and discussion	Theoretical + practical	Interpolation method	Newton Forward divided difference	2theoretical + 2 practical	the fourth
General questions and discussion	Theoretical + practical	Interpolation method	Newton Backward divided difference	2theoretical + 2 practical	Fifth
General questions and discussion	Theoretical + practical	Interpolation method	Center divided difference	2theoretical + 2 practical	Seventh
General questions and discussion	Theoretical + practical	Approximation with least square method	Simple linear relation Quadrature relation	2theoretical + 2 practical	eighth
General questions and discussion	Theoretical + practical	Approximation with least square method	Multi linear relation	2theoretical + 2 practical	Ninth
			First test		The tenth
General questions and discussion	Theoretical + practical	Numerical Differentiation Methods	Methods based on finite difference operators	2theoretical + 2 practical	eleventh
General questions and discussion	Theoretical + practical	Numerical Differentiation Methods	Methods based on Interpolation, undetermined coefficients	2theoretical + 2 practical	twelveth
General questions and discussion	Theoretical + practical	Numerical integral Methods	Rectangular method Trapezoidal method	2theoretical + 2 practical	Thirteenth
General questions and discussion	Theoretical + practical	Numerical integral Methods	Simpson rule	2theoretical + 2 practical	fourteenth
General questions and discussion	Theoretical + practical	Numerical integral Methods	Gaussian rule	2theoretical + 2 practical	Fifteenth
			Second test		sixteen



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Department of Quality Assurance and Academic Accreditation

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.- Infrastructure 10	
Introduction to numerical analysis S . Baskar 2010 Introduction To Numerical Analysis Froberg C. E 1969 .	Required readings: - Course books - Other
Follow up on electronic references and the Internet •Discreet websites- •Virtual library- -Library locations in some international universities.	Special requirements
	Social services (including, for example, guest lectures, vocational training, and field studies(

10-Acceptance	
	Prerequisites
25	The smallest number of students
50	The largest number of students



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International Accreditation Department

Course Description Form

This course description provides a summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he or she has made the most of the learning opportunities available. It must be linked to the program description.

Ministry of Higher Education and Scientific Research / Anbar University / College of Education for Pure Sciences	[19] Educational institution
Mathematics	[20] University department/center
(MAT210 Computers 2)	[21] Course name/code
Electronically	[22] Available forms of attendance
Second course	[23] Semester/year
60hours	[24] Number of study hours (total)
2022-2023	[25] The date this description was prepared
[26] Course objectives: A course concerned with teaching the student the art of programming using the C++ language in addition to MATLAB	

[27] Course outcomes and teaching, learning and evaluation methods
A- Cognitive objectives .1Learn how to solve problems using a calculator. .2Issue analysis. .3Practical examples



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B - The skills objectives of the course.

The student participates in intellectual problems and finds the solution to these problems, including the derivative and integration.

Teaching and learning methods

- 1- Electronically on some e-learning programs such as Google Form and other forms
- 2- Various means, including displaying the minutes on a display screen and using a calculator

Evaluation methods

1. Endeavor (10 marks for attendance, 5 marks for homework, 5 marks for daily exam, 20 marks for monthly exam, 60, total final exam score of 100)
2. Through direct questions during the lecture
3. Through monthly examinations
4. By performing duties. 5. Through final exams.
6. Through discipline and adherence to regulations and laws

C- Emotional and value goals

- Critical thinking (question and answer)
- 2Organization skill. -3Interaction skill
- 4- Work skill

Teaching and learning methods

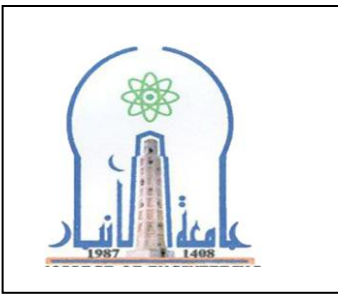
Discussion, lectures

Evaluation methods

1. Discussion. Written tests

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

- The student participates in intellectual problems and finds the solution to these problems, including the derivative and integration.
- Assignments in addition to questions during the lecture



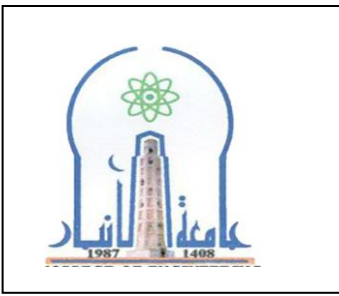
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Department of Quality Assurance and Academic Accreditation

International Accreditation Department

[28] Course structure					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	Hours	The Week
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Learn about the algorithm	Algorithms	4	First
Attendance and motivational questions	Video lecture with text lecture with live broadcast	History of the algorithm	The origin of algorithms	4	Second
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Learn about types of algorithms	Types of algorithms	4	3 rd
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Characteristics of the algorithms used	Algorithm properties	4	4 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Learn about simple examples of algorithms	Simple flow charts	4	5 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Get to know flowchart	Branching flowchart	4	6 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast	discussion	Simple rotation flowchart	4	7 th
Degree	Test-1			4	8 th



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Department of Quality Assurance and Academic Accreditation

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Attendance and motivational questions	Video lecture with text lecture with live broadcast	Various examples	Various examples of algorithms	4	9 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Various examples	Sequence algorithms	4	10 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Various examples	Array algorithms	4	11 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Various examples	One dimensional Array	4	12 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Various examples	two dimensional Array	4	13 th
Degree	Test-2			4	14 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast	review	exercises	4	15 th

[29] Infrastructure



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Department of Quality Assurance and Academic Accreditation
International Accreditation Department

<ul style="list-style-type: none"> ▪ Principles of algorithms ▪ Analyzing problems using computers 	<p style="text-align: center;">Required readings:</p> <ul style="list-style-type: none"> • Written the course • Other
<p style="text-align: center;">Some books and electronic lectures to support and support the scientific material</p>	<p style="text-align: center;">Special requirements</p>
<p style="text-align: center;">Social services (including, for example, guest lectures)</p>	

<p>10. Course development plan</p>
<p>It is possible to rely on some recent books, keep up with research developments in many aspects of the course structure, and increase and update the vocabulary structure of the course by 20% annually.</p>



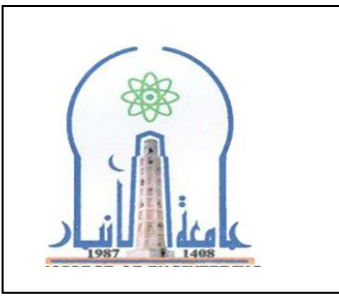
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[30] Course structure					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	Hours	The Week
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall and Attendance inside the hall	Learn about the algorithm	Algorithms	4	First
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	History of the algorithm	The origin of algorithms	4	Second
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Learn about types of algorithms	Types of algorithms	4	3 rd
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance	Characteristics of the algorithms used	Algorithm properties	4	4 th



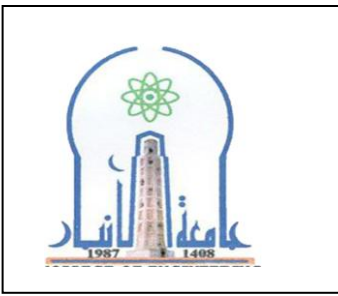
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Department of Quality Assurance and Academic Accreditation

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	inside the hall				
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Learn about simple examples of algorithms	Simple flow charts	4	5 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Get to know flowchart	Branching flowchart	4	6 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	discussion	Simple rotation flowchart	4	7 th
Degree	Test-1			4	8 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Various examples	Various examples of algorithms	4	9 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Various examples	Sequence algorithms	4	10 th



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Various examples	Array algorithms	4	11 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Various examples	One dimensional Array	4	12 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Various examples	two dimensional Array	4	13 th
Degree	Test-2			4	14 th
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	review	exercises	4	15 th

[31] Infrastructure



Ministry of Higher Education and Scientific Research
Scientific supervision and evaluation device
Department of Quality Assurance and Academic Accreditation
International Accreditation Department

<ul style="list-style-type: none"> ▪ Principles of algorithms ▪ Analyzing problems using computers 	<p>Required readings:</p> <ul style="list-style-type: none"> • Written the course • Other
<p>Some books and electronic lectures to support and support the scientific material</p>	<p>Special requirements</p>
<p>Social services (including, for example, guest lectures)</p>	

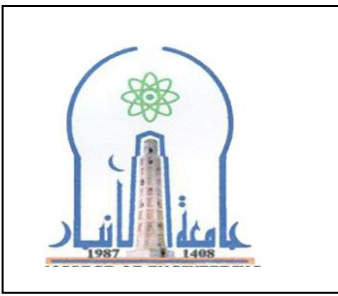
<p>11. Course development plan</p>
<p>It is possible to rely on some recent books, keep up with research developments in many aspects of the course structure, and increase and update the vocabulary structure of the course by 20% annually.</p>

Course description Sample

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

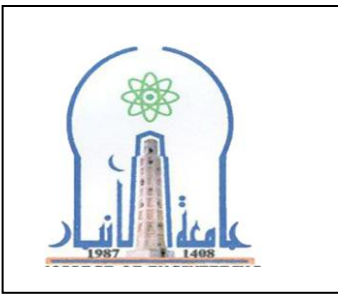
<p>- Educational institution1</p>	<p>Anbar University - College of Education for Pure Sciences</p>
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Scientific supervision and evaluation device
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International Accreditation Department

University department/center	College of Education for Pure Sciences/Department of Mathematics
Course name/code	Mathematical Statistics -1\MAT403
Programs in which it is included	Bachelor of Mathematics
Available attendance forms	Daily
Semester/year	Quarterly
Number of study hours (total)	64
Date this description was prepared	2022-2023
Course objectives:	
<p>1- For students to become familiar with the types of Mathematical Statistics.</p> <p>2- Transferring from the description stage to the decision-making stage and logical interpretation of the results.</p> <p>3- The course is concerned with studying an introduction to estimation theory (by point or by period) and how to obtain it.</p> <p>4-The concept of hypothesis testing, some probability distributions, sampling distribution theory, finding the critical region, optimal test power, and the Neyman-Pearson theorem.</p> <p>5-Informing students about Mathematical Statistics, and to show students the most important applications of mathematical statistics.</p>	

Learning outcomes, teaching, learning and assessment methods
A- Knowledge and understanding
A1- Knowledge of the topics on which understanding of the course depends (functions, differentiation, integration (especially integral by division), exponential functions, logarithm concepts, double integration, and famous series).
A2- Knowing the foundations and basic concepts of probability and statistics in mathematics, the type of distribution required that is appropriate for the data,



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Department of Quality Assurance and Academic Accreditation

International Accreditation Department

and choosing the appropriate method to find its characteristics.

A3- Knowing the foundations and methods of establishing the estimator and how to estimate its two types, point and period.

A4- Bringing the student to a level where he has the ability to interpret the results (research) and turn them into a work reality, from which he will benefit in the future during study and after graduation .

Teaching and learning methods

Blackboard + pen + data show

B- Subject-specific skills

B1 - Developing the student's mathematical and statistical skills and preparing him scientifically to be a successful statistician.

B2 - Developing the skill of estimation, hypothesis testing, and statistical analysis as functions of the statistical analyst.

B3 - Developing the student's decision-making skill as it is the essence of the educational and statistical process.

C- Thinking skills

External tests 2- Various and interconnected questions to test the student's skills

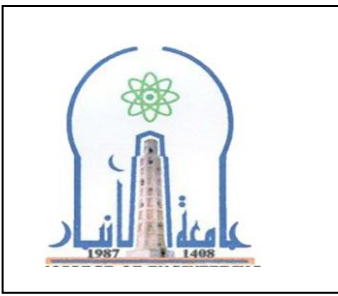
Teaching and learning methods

Blackboard + pen + data show +Electronically on some e-learning programs such as Google Form and other forms+ Extrapolation, Analysis+ Conclusion+ The lecture Empowerment+ Discussion.

Evaluation methods

Daily and monthly examinations

General and transferable skills (other skills related to employability and personal development(



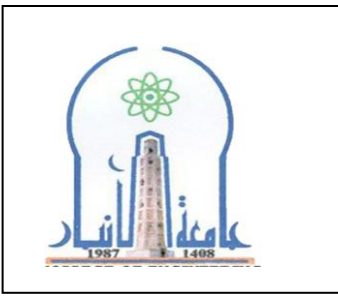
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Course structure					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	hours	The week
Attendance and motivational questions.	A video lecture with a text lecture with a live broadcast	Some discrete and continuous probability random distributions	The student learns the basic principles of probability distributions and reviews them	16	4
Exams and daily activities	A video lecture with a text lecture with a live broadcast	Nonparametric distributions	The student learns non-parametric distributions such as chi-square, chi-square, and chi-square	16	4
Exams and daily activities	A video lecture with a text lecture with a live broadcast	Distributions of functions of random variables	The student will learn methods of inference for the distribution function of random variables (cumulative function).	16	4
Exams and daily activities	A video lecture with a text lecture with a live broadcast	Distributions of functions of random variables	The student will learn to deduce distributions using the function generating the moments	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Distributions of functions of random variables	The student will learn to derive distributions using the transformation method	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Sampling theory	The student will learn the concept of sampling and restricted distributions	16	4



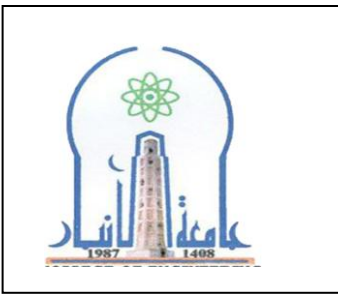
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Scientific supervision and evaluation device

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International Accreditation Department

Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Sampling theory	The student understands the theory of sampling of a natural population and sampling distributions	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Ranked statistics	The student will be familiar with ordered statistics and the distributions of their functions	16	4
Attendance and motivational questions with grade	A video lecture with a text lecture with a live broadcast	Review the subject and conduct a monthly exam	The student learns how to do a comprehensive review of the subject, and the student notices the extent of his understanding of what has been studied by taking the first month's exam.	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Appreciation theory	The student will learn the concept of estimation theory, the estimator and its properties	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Estimate in point	The student will learn the concept of an unbiased and least variable estimator	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Estimate in point	The student will learn the concept of methods for establishing estimators (maximum potential function and moment method).	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Solve the questions and assignments that have been given	The student learns how to know what has been studied	16	4



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Attendance and motivational questions with grade	A video lecture with a text lecture with a live broadcast	A comprehensive review of the material with the second month exam	To increase the student's awareness through enriching examples and questions	16	4
person written questions	a video lecture, a text lecture, a live broadcast.	The final assessment	The student learns the extent of his understanding of the material through a comprehensive review	16	4



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

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Infrastructure	
<ul style="list-style-type: none"> ➤ Introduction in Mathematical Statistics., Hogg, R. , McKean, J. and Craig, A., , Pearson Education , USA. ➤ Probability and Statistical Inference, Hogg, R. , Tanis, E., and Zimmerman, D., Pearson Education , USA. ➤ Mathematical Statistics with Applications, Dennis D. Wackerly, William Mendenhall III and Richard L. Scheaffer, SEVENTH EDITION, 2008, USA 	<p>Required readings:</p> <p>1-Course books</p> <p>2-Other</p>
Nothing	Special requirements
Graduation research projects	Social services (including, for example, guest lectures, vocational training, and field studies(

Admissions	
Central admission and academic department plan	Prerequisites
15	The smallest number of students
30-25	The largest number of students



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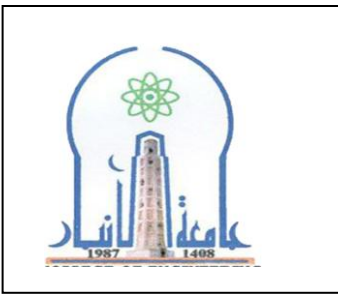
International Accreditation Department

Course description Sample

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve. Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

- Educational institution1	Anbar University - College of Education for Pure Sciences
University department/center	College of Education for Pure Sciences/Department of Mathematics
Course name/code	Mathematical Statistics -2\MAT403
Programs in which it is included	Bachelor of Mathematics
Available attendance forms	Daily
Semester/year	Quarterly
Number of study hours (total)	64
Date this description was prepared	2022-2023
Course objectives:	
<p>1- For students to become familiar with the types of Mathematical Statistics.</p> <p>2- Transferring from the description stage to the decision-making stage and logical interpretation of the results.</p> <p>3- The course is concerned with studying an introduction to estimation theory (by point or by period) and how to obtain it.</p> <p>4-The concept of hypothesis testing, some probability distributions, sampling distribution theory, finding the critical region, optimal test power, and the Neyman-Pearson theorem.</p>	



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

3-Informing students about Mathematical Statistics, and to show students the most important applications of mathematical statistics.

Learning outcomes, teaching, learning and assessment methods

A- Knowledge and understanding

A1- Knowledge of the topics on which understanding of the course depends (functions, differentiation, integration (especially integral by division), exponential functions, logarithm concepts, double integration, and famous series.

A2- Knowing the foundations and basic concepts of probability and statistics in mathematics, the type of distribution required that is appropriate for the data, and choosing the appropriate method to find its characteristics.

A3- Knowing the foundations and methods of establishing the estimator and how to estimate its two types, point and period.

A4- Bringing the student to a level where he has the ability to interpret the results (research) and turn them into a work reality, from which he will benefit in the future during study and after graduation.

Teaching and learning methods

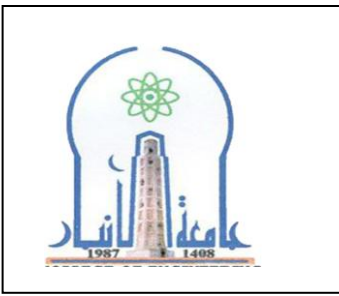
Blackboard + pen + data show

B- Subject-specific skills

B1 - Developing the student's mathematical and statistical skills and preparing him scientifically to be a successful statistician.

B2 - Developing the skill of estimation, hypothesis testing, and statistical analysis as functions of the statistical analyst.

B3 - Developing the student's decision-making skill as it is the essence of the educational and statistical process.



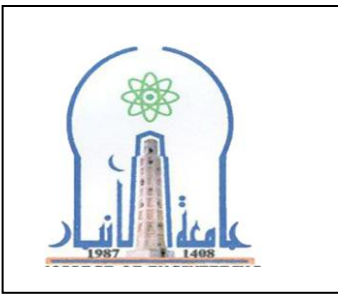
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Department of Quality Assurance and Academic Accreditation

International Accreditation Department

C- Thinking skills External tests 2- Various and interconnected questions to test the student's skills
Teaching and learning methods
Blackboard + pen + data show +Electronically on some e-learning programs such as Google Form and other forms+ Extrapolation, Analysis+ Conclusion+ The lecture Empowerment+ Discussion.
Evaluation methods
Daily and monthly examinations
General and transferable skills (other skills related to employability and personal development(



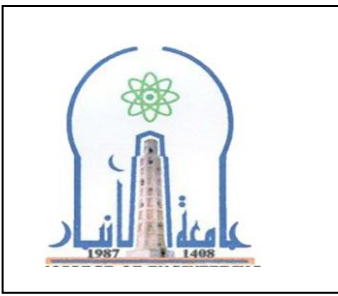
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Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Course structure					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	hours	The week
Attendance and motivational questions.	A video lecture with a text lecture with a live broadcast	estimation theory Point Estimation	The student to learn the basic principles of estimation theory	16	4
Exams and daily activities	A video lecture with a text lecture with a live broadcast	Interval Estimation	The student learns confidence intervals for the mean or variance of a normal population	16	4
Exams and daily activities	A video lecture with a text lecture with a live broadcast	Hypothesis testing	The student will learn an introduction to hypothesis testing	16	4
Exams and daily activities	A video lecture with a text lecture with a live broadcast	Hypothesis testing	The student learns to extract the critical region and test the hypothesis	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Hypothesis testing	The student learns to infer errors of the first and second types	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Sampling theory	The student learns the concept of optimal tests That the student realizes which test is more robust or regular	16	4



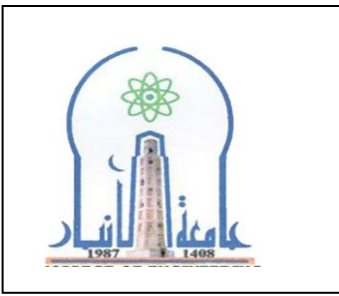
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Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Sampling theory	The student should know the Neyman-Pearson theorem	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Sampling theory	The student learns how to do a comprehensive review of the subject, and the student notices the extent of his understanding of what has been studied by taking the first month's exam.	16	4
Attendance and motivational questions with grade	A video lecture with a text lecture with a live broadcast	Review the subject and conduct a monthly exam	The student will learn the concept of Bayesian statistics	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Bayesian estimation theory	The student will learn the concept of test power	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Hypothesis testing Quality tests	The student learns the Chi-square quality tests	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	Solve the questions and assignments that have been given	The student learns how to know what has been studied	16	4
Attendance and motivational questions	A video lecture with a text lecture with a live broadcast	A comprehensive review of the material with the second month exam	To increase the student's awareness through enriching examples and questions With an assessment	16	4



Ministry of Higher Education and Scientific Research
Scientific supervision and evaluation device
Department of Quality Assurance and Academic Accreditation
International Accreditation Department

			exam		
Attendance and motivational questions with grade	A video lecture with a text lecture with a live broadcast	Final evaluation	The student learns the extent of his understanding of the material through a comprehensive review	16	4



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Infrastructure	
<ul style="list-style-type: none"> ➤ Introduction in Mathematical Statistics., Hogg, R. , McKean, J. and Craig, A., , Pearson Education , USA. ➤ Probability and Statistical Inference, Hogg, R. , Tanis, E., and Zimmerman, D., Pearson Education , USA. ➤ Mathematical Statistics with Applications, Dennis D. Wackerly, William Mendenhall III and Richard L. Scheaffer, SEVENTH EDITION, 2008, USA 	<p>Required readings:</p> <p>1-Course books</p> <p>2-Other</p>
Nothing	Special requirements
Graduation research projects	Social services (including, for example, guest lectures, vocational training, and field studies(

Admissions	
Central admission and academic department plan	Prerequisites
15	The smallest number of students
30-25	The largest number of students



Ministry of Higher Education and Scientific Research
Scientific supervision and evaluation device
Department of Quality Assurance and Academic Accreditation
International Accreditation Department

Course description Sample

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve. Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

- Educational institution1	Anbar University - College of Education for Pure Sciences
University department/center	College of Education for Pure Sciences/Department of Mathematics
Course name/code	General Topology -1\MAT402
Programs in which it is included	Bachelor of Mathematics
Available attendance forms	daily
Semester/year	quarterly
Number of study hours (total)	64
Date this description was prepared	2022-2023
Course objectives:	
1- Emphasizing the importance of the topic of topological spaces in relation to other sciences..	
2- For students to become familiar with the types of topological spaces	
3-Informing students about topological spaces, the axioms of separation, and compact spaces.	
4-To show students the most important applications of topological spaces	



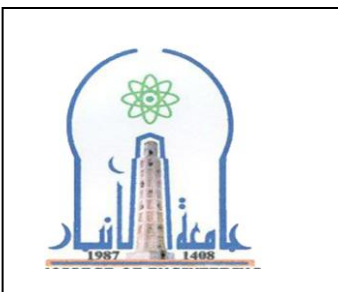
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Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Learning outcomes, teaching, learning and assessment methods
A- Knowledge and understanding
<p>1-That the student understands what is meant by topological space</p> <p>2-The student should distinguish between types of topological spaces</p> <p>3-For the student to recognize the relationship between continuous functions and isomorphism</p> <p>4-For the student to become familiar with the types of separation axioms</p> <p>5-For the student to become familiar with the concept of compact spaces and interconnected spaces and their applications</p>
Teaching and learning methods
Blackboard + pen + data show
B- Subject-specific skills
<p>1-That the student can distinguish between different topological spaces</p> <p>2-That the student can distinguish between continuous, open, and closed functions.</p> <p>3-That the student can distinguish between the axioms of separation and reach the relationships between these spaces</p> <p>4-The student must have the necessary skill to solve problems using basic concepts.</p> <p>5-That the student is able to understand compact and interconnected spaces and their connections to other spaces</p>
C- Thinking skills
External tests 2- Various and interconnected questions to test the student's skills
Teaching and learning methods
Blackboard + pen + data show
Evaluation methods
Daily and monthly examinations
General and transferable skills (other skills related to employability and personal development)



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Course structure					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	hours	The week
Exams and daily activities		1-Definition (Examples) of a Topological Space. 2- Types (Examples) of Topological Spaces.	Understand the prescribed material correctly and know its applications	16	4
Exams and daily activities		1- Definition of a closed subsets of a topological spaces - Examples – Intersection and union of a closed sets 2-Neighborhoods: Definition of a neighborhood - Definition of a neighborhood system – Examples- Properties neighborhood - Characterizations of open sets.	Understand the prescribed material correctly and know its applications	16	4
Exams and daily activities		1-Closure of a Set: Definition – Examples - Properties of closure of a set.	Understand the prescribed material correctly and know its applications	16	4
Exams and daily activities		1-Interior of a Set: Definition – Examples – Theorems.	Understand the prescribed material correctly and know its applications	16	4



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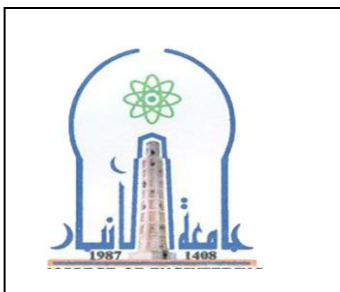
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International Accreditation Department

Infrastructure	
<ul style="list-style-type: none"> ➤ General topology, by: J.L., Kelley's. ➤ General topology, by: Bourbaki's. ➤ General topology, by: R. S. Aggarwal. A Text Book On Topology. 	Required readings: 1-Course books 2-Other
Nothing	Special requirements
Graduation research projects	Social services (including, for example, guest lectures, vocational training, and field studies(

Admissions	
Central admission and academic department plan	Prerequisites
15	The smallest number of students
30-25	The largest number of students



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Course description Sample

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve. Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

- Educational institution1	Anbar University - College of Education for Pure Sciences
University department/center	College of Education for Pure Sciences/Department of Mathematics
Course name/code	General Topology -1\MAT402
Programs in which it is included	Bachelor of Mathematics
Available attendance forms	daily
Semester/year	quarterly
Number of study hours (total)	64
Date this description was prepared	2022-2023
Course objectives:	
1- Emphasizing the importance of the topic of topological spaces in relation to other sciences..	
2- For students to become familiar with the types of topological spaces	
3-Informing students about topological spaces, the axioms of separation, and compact spaces.	
4-To show students the most important applications of topological spaces	



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Learning outcomes, teaching, learning and assessment methods
A- Knowledge and understanding
<p>1-That the student understands what is meant by topological space</p> <p>2-The student should distinguish between types of topological spaces</p> <p>3-For the student to recognize the relationship between continuous functions and isomorphism</p> <p>4-For the student to become familiar with the types of separation axioms</p> <p>5-For the student to become familiar with the concept of compact spaces and interconnected spaces and their applications</p>
Teaching and learning methods
Blackboard + pen + data show
B- Subject-specific skills
<p>1-That the student can distinguish between different topological spaces</p> <p>2-That the student can distinguish between continuous, open, and closed functions.</p> <p>3-That the student can distinguish between the axioms of separation and reach the relationships between these spaces</p> <p>4-The student must have the necessary skill to solve problems using basic concepts.</p> <p>5-That the student is able to understand compact and interconnected spaces and their connections to other spaces</p>
C- Thinking skills
External tests 2- Various and interconnected questions to test the student's skills
Teaching and learning methods
Blackboard + pen + data show
Evaluation methods
Daily and monthly examinations
General and transferable skills (other skills related to employability and personal development)



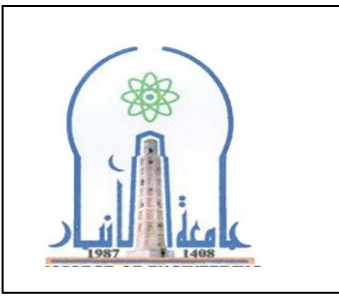
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Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Course structure					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	hours	The week
Scientific and educational visits		Application period for fourth stage students	Successfully completing the application period and benefiting from this period and applying the largest number of information that the student acquired during the study period	16	4
Exams and daily activities		<p>1- Open and Closed mappings: Examples- Results on open & closed mappings.</p> <p>2- Homeomorphisms: Examples- Results</p> <p>3- Homeomorphisms Topological and Hereditary Property: Definition – Examples – Theorems.</p>	Understand the prescribed material correctly and know its applications	16	4
Exams and daily activities		<p>1- Separation Axioms: T_0-Property, T_1 - Property and T_2 – Property: Definitions – Examples – and study relationships between them.</p> <p>2-Regular Space and T_3 - Property and Normal Space and T_4- Property: Definitions – Examples – and study relationships between them.</p>	Understand the prescribed material correctly and know its applications	16	4
Exams and daily activities		1- Compact Spaces: Definitions of a cover of a set – Open cover – Finite cover – Subcover with	Understand the prescribed material correctly and know its applications	16	4



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

		<p>examples.</p> <p>2-Definition of a compact space – Examples - Properties of compactness.</p> <p>3-Connected Spaces: Separated sets – Properties of separated sets – Connected spaces- Definitions, examples and properties about connected spaces.</p> <p>4-Theorems and properties about connected spaces.</p>			
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Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Infrastructure	
<ul style="list-style-type: none"> ➤ General topology, by: J.L., Kelley's. ➤ General topology, by: Bourbaki's. ➤ General topology, by: R. S. Aggarwal. A Text Book On Topology. 	Required readings: 1-Course books 2-Other
Nothing	Special requirements
Graduation research projects	Social services (including, for example, guest lectures, vocational training, and field studies(

Admissions	
Central admission and academic department plan	Prerequisites
15	The smallest number of students
30-25	The largest number of students



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

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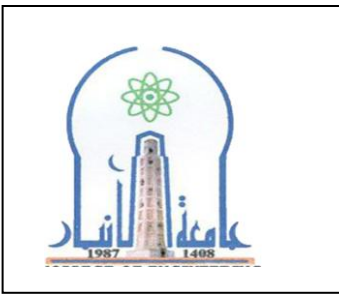
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Course description Sample

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

- Educational institution1	Anbar University - College of Education for Pure Sciences
University department/center	College of Education for Pure Sciences/Department of Mathematics
Course name/code	General Topology - 1\MAT402
Programs in which it is included	Bachelor of Mathematics
Available attendance forms	daily
Semester/year	quarterly
Number of study hours (total)	64
Date this description was prepared	2022-2023
Course objectives:	
1-Identify real numbers and their mathematical properties	
-2-Identify applications of real numbers in different fields	
3-To learn about sequences and some of their different types	
4-Identify real sequences and calculate their limits	
5-To verify the convergence of a convergent sequence	
6-To recognize the convergence of series and their different periods of	



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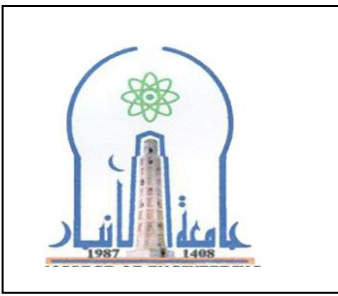
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Department of Quality Assurance and Academic Accreditation

International Accreditation Department

convergence
7-The ability to deal with some concepts in real analysis, such as sequences, limits, and complete dusty spaces

Learning outcomes, teaching, learning and assessment methods
A- Knowledge and understanding -Gaining experience and knowledge in sports analysis Linking the different topics of mathematics and their relationship to each other, where each topic is considered complementary to the other. Teaching the student to master the skills acquired over time and to have sound intuitive perception to a reasonable extent
B- Subject-specific skills -Scientific reports - Graduation research
Teaching and learning methods
.. - - Readings, self-learning, seminars - .Activities in the classroom - - -Directing students to some websites to benefit from them -Giving examples and questions that stimulate the student's thinking
Evaluation methods
Participation in electronic classes Provide activities Semester and final exams
C- Thinking skills -1External tests 2- Various and interconnected questions to test the student's skills
Developing the student's ability to work on performing assignments and submitting them on the scheduled date To think logically and mathematically in finding solutions to problems Analyze the problem, solve it mathematically, and find solutions using the available information and theorems Developing the student's ability to dialogue and discuss



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Teaching and learning methods
<p>Managing the lecture in an applied manner linked to the reality of daily life to attract the student to the topic of the lesson without straying from the core of the topic so that the material is flexible and amenable to understanding and analysis</p> <p>Assigning the student to some group activities and duties</p> <p>Allocate a percentage of the grade to daily assignments and tests</p> <p>Manage the lecture in a way that makes time feel important</p>
Evaluation methods
<p>Active participation in class is evidence of the student's commitment and responsibility</p> <p>Commitment to the deadline for submitting assignments and research</p> <p>Semester and final exams express commitment and cognitive and skill achievement .</p>
<p>D - General and transferable skills (other skills related to employability and personal development(</p> <p>Developing the student's ability to recognize types of groups</p> <p>Developing the student's ability to deal with the Internet</p> <p>Developing the student's ability to find solutions and evidence</p> <p>Developing the student's ability to dialogue and discuss</p> <p>Developing the student's ability to recognize types of functions</p>



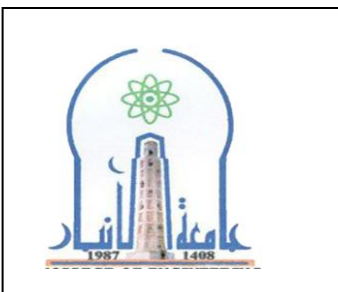
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Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Course structure [32]					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	الساعات	The week
General questions and electronic discussion	My theory/ my presence	Axioms of arithmetic - axioms of order - axioms of perfection with examples.	Axioms of real numbers	4	the first
General questions and electronic discussion	My theory/ my presence	Definition - examples - some theorems - trigonometric inequality	absolute value	4	the second
Group assignments	My theory/ my presence	The highest constraint - the smallest top constraint - the bottom constraint - the largest bottom constraint - examples - theories	Restrictions	4	the third
General questions and electronic discussion	My theory/ my presence	Definition with examples and basic theories	Rational numbers and irrational numbers	4	the fourth
Exam	My presence	-----	Exam	4	Fifth



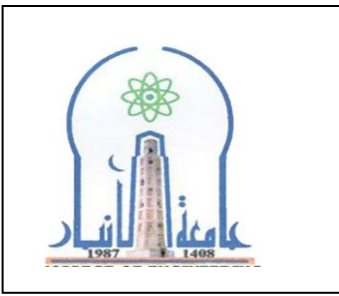
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Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

General questions and electronic discussion	My theory/ my presence	Its definition and examples - semi-dusty spaces - Euclidean spaces - equivalent metric spaces	Metric spaces	4	Sixth
Reports	My theory/ my presence	Definitions - examples - union and intersection of a finite or infinite number of such groups.	Open and closed groups	4	Seventh
General questions and electronic discussion	My theory/ my presence	Some basic principles in topology and its relationship to metric space, with examples and theories.	Metric and biological space	4	Eighth
General questions and electronic discussion	My theory/ my presence	Definitions with examples- Derived and closed sets and the relationship between them	Points of purpose and closure	4	Ninth
General questions and electronic discussion	My theory/ my presence	Stacked groups - examples - some important theorems in stacking	Lined spaces	4	The tenth
Group assignments	My theory/ my	Its definition, examples, and some special infinite series, harmonic-	Infinite series and convergence	4	Eleventh



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

	presence	geometric- alternating series - the concept of convergence - examples - theorems.			
General questions and electronic discussion + exam	My theory/ my presence	Comparison test - P test - Root comparison test - Ratio test - Root test - Definition of number - Basic theorems about the number E	Series test - number e	4	Twelfth
General questions and electronic discussion	My theory/ my presence	Definitions - examples and some theorems to clarify the relationship between them	Absolute convergence and conditional convergence	4	Thirteenth
General questions and electronic discussion	My theory/ my presence	Definition - examples and basic theorems	Multiplying Series - Power Series	4	Fourteenth
Comprehensive exam	My presence	-----	Review exam	4	Fifteenth



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

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Infrastructure [33]	
<p>1-Adel Ghassan Naoum, “Introduction to Mathematical Analysis,” University of Baghdad, Iraq, 1986, first edition.</p> <p>-2Anwar Badraneh and others: Introduction to Real Analysis, Dar Al-Awal for Publishing and Distribution, Jordan, 1992.</p> <p>3-Apostol. T.M., “Mathematical Analysis”2nd, 1974, London.</p> <p>4-Ash, R. B. ,”Real analysis and probability”, 1972. New York.</p> <p>5-Royden. H. L.,”Real Analysis”, 1988. London.</p>	<p>Required readings:</p> <p><input type="checkbox"/> Course books</p> <p style="text-align: right;"><input type="checkbox"/> Other ▪</p>
Nothing	Special requirements
Graduation research projects	Social services (including, for example, guest lectures, vocational training, and field studies(

Acceptance [34]	
Nothing	Prerequisites
15	The smallest number of students
30-25	The largest number of students



Ministry of Higher Education and Scientific Research
Scientific supervision and evaluation device
Department of Quality Assurance and Academic Accreditation
International Accreditation Department

Course description Sample

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve. Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

- Educational institution1	Anbar University - College of Education for Pure Sciences
University department/center	College of Education for Pure Sciences/Department of Mathematics
Course name/code	General Topology - 1\MAT402
Programs in which it is included	Bachelor of Mathematics
Available attendance forms	daily
Semester/year	quarterly
Number of study hours (total)	64
Date this description was prepared	2022-2023
Course objectives:	
1-Identify the basic concepts of the derivative and how to find them using the definition and its applications 2-Learn about the Riemann integral of functions and how to find them using the definition and its properties	



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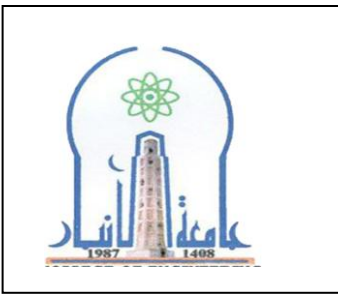
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Department of Quality Assurance and Academic Accreditation

International Accreditation Department

3-Identify function sequences, their dotted and regular convergence, and how to replace limits with integration
4-The identifier for measuring subsets of the set of real numbers
5-Identify measurable functions and their properties
6-Identify the Riemann-Esteljets integral and compare it with the Riemann integral
7-Identify the Riemann integral and its most important properties and compare it with the Riemann integral.

Learning outcomes, teaching, learning and assessment methods
A- Knowledge and understanding -Gaining experience and knowledge in sports analysis Linking the different topics of mathematics and their relationship to each other, where each topic is considered complementary to the other. Teaching the student to master the skills acquired over time and to have sound intuitive perception to a reasonable extent
B- Subject-specific skills -Scientific reports - Graduation research
Teaching and learning methods
.- - Readings, self-learning, seminars - .Activities in the classroom - - -Directing students to some websites to benefit from them -Giving examples and questions that stimulate the student's thinking
Evaluation methods
Participation in electronic classes Provide activities Semester and final exams
C- Thinking skills -1External tests 2- Various and interconnected questions to test the student's skills



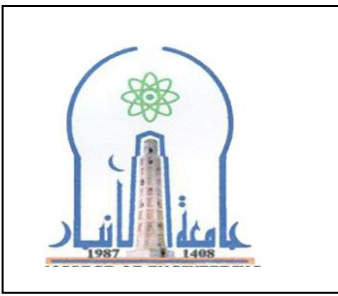
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Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

<p>Developing the student's ability to work on performing assignments and submitting them on the scheduled date</p> <p>To think logically and mathematically in finding solutions to problems</p> <p>Analyze the problem, solve it mathematically, and find solutions using the available information and theorems</p> <p>Developing the student's ability to dialogue and discuss</p>
<p>Teaching and learning methods</p>
<p>Managing the lecture in an applied manner linked to the reality of daily life to attract the student to the topic of the lesson without straying from the core of the topic so that the material is flexible and amenable to understanding and analysis</p> <p>Assigning the student to some group activities and duties</p> <p>Allocate a percentage of the grade to daily assignments and tests</p> <p>Manage the lecture in a way that makes time feel important</p>
<p>Evaluation methods</p>
<p>Active participation in class is evidence of the student's commitment and responsibility</p> <p>Commitment to the deadline for submitting assignments and research</p> <p>Semester and final exams express commitment and cognitive and skill achievement .</p>
<p>D - General and transferable skills (other skills related to employability and personal development)</p> <p>Developing the student's ability to recognize types of groups</p> <p>Developing the student's ability to deal with the Internet</p> <p>Developing the student's ability to find solutions and evidence</p> <p>Developing the student's ability to dialogue and discuss</p> <p>Developing the student's ability to recognize types of functions</p>



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Course structure [35]					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	الساعات	The week
General questions and electronic discussion	My theory/ my presence	Axioms of arithmetic - axioms of order - axioms of perfection with examples.	Continuity	4	the first
General questions and electronic discussion	My theory/ my presence	Definition - examples - some theorems - trigonometric inequality	Continuity	4	the second
Group assignments	My theory/ my presence	The highest constraint - the smallest top constraint - the bottom constraint - the largest bottom constraint - examples - theories	Derived	4	the third
General questions and electronic discussion	My theory/ my presence	Definition with examples and basic theories	Derived	4	the fourth
Exam	My presence	-----	Riemann integral	4	Fifth



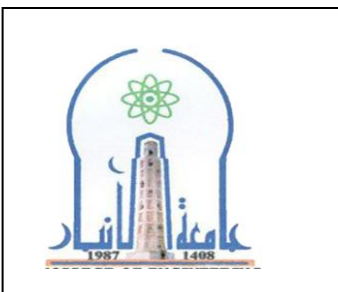
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Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

General questions and electronic discussion	My theory/ my presence	Its definition and examples - semi-dusty spaces - Euclidean spaces - equivalent metric spaces	Riemann integral	4	Sixth
Reports	My theory/ my presence	Definitions - examples - union and intersection of a finite or infinite number of such groups.	Riemann	4	Seventh
General questions and electronic discussion	My theory/ my presence	Some basic principles in topology and its relationship to metric space, with examples and theories.	Riemann	4	Eighth
General questions and electronic discussion	My theory/ my presence	Definitions with examples- Derived and closed sets and the relationship between them	Introduction to measurement theory	4	Ninth
General questions and electronic discussion	My theory/ my presence	Stacked groups - examples - some important theorems in stacking	Measurable functions	4	The tenth
Group assignments	My theory/ my	Its definition, examples, and some special infinite series, harmonic-	Integration of Libik	4	Eleventh



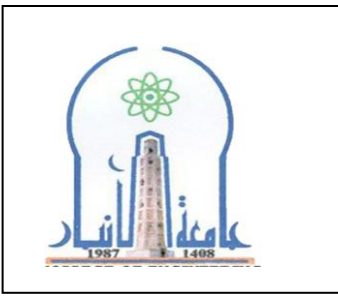
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Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

	presence	geometric- alternating series - the concept of convergence - examples - theorems.			
General questions and electronic discussion + exam	My theory/ my presence	Comparison test - P test - Root comparison test - Ratio test - Root test - Definition of number - Basic theorems about the number E	Integration of Libik	4	Twelveth
General questions and electronic discussion	My theory/ my presence	Definitions - examples and some theorems to clarify the relationship between them	Integration of Libik	4	Thirteenth
General questions and electronic discussion	My theory/ my presence	Definition - examples and basic theorems	Functions are covariance bound	4	Fourteenth
Comprehensive exam	My presence	-----	Functions are absolutely continuous.	4	Fifteenth



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

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Infrastructure [36]	
<p>1 Adel Ghassan Naoum, "Introduction to Mathematical Analysis," University of Baghdad, Iraq, 1986, first edition.</p> <p>-2 Anwar Badraneh and others: Introduction to Real Analysis, Dar Al-Awal for Publishing and Distribution, Jordan, 1992.</p> <p>3 Apostol. T.M., "Mathematical Analysis" 2nd, 1974, London.</p> <p>4 Ash, R. B. , "Real analysis and probability", 1972. New York.</p> <p>5 Royden. H. L., "Real Analysis", 1988. London.</p> <p>6 Manfred Stoll, " Introduction to Real Analysis", 1969.</p> <p>, 7- Wilted, Rudin "Principle of Mathematical Analysis", 1964.</p> <p>8- Murray R. Spiegel, " Real Variables", 1969.</p> <p>9- R.M. Dudley, " Real Analysis and Probability", 2004.</p> <p>9- Burrill and Knudsen " Real Variable", 1969.</p>	<p>Required readings:</p> <p><input type="checkbox"/> Course books</p> <p style="text-align: right;"><input type="checkbox"/> Other ■</p>
Nothing	Special requirements
Graduation research projects	Social services (including, for example, guest lectures, vocational training, and field studies(

Acceptance [37]	
Nothing	Prerequisites
15	The smallest number of students
30-25	The largest number of students



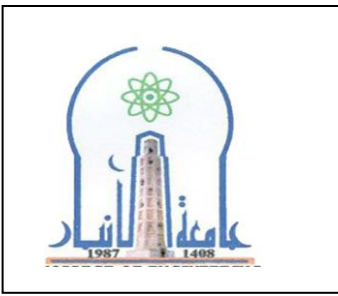
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Scientific supervision and evaluation device
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International Accreditation Department

Course description Sample

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

- Educational institution1	Anbar University - College of Education for Pure Sciences
University department/center	College of Education for Pure Sciences/Department of Mathematics
Course name/code	Partial Differential Equations 1\MAT302
Programs in which it is included	Bachelor of Mathematics
Available attendance forms	daily
Semester/year	quarterly
Number of study hours (total)	60
Date this description was prepared	2022-2023
<p style="text-align: right;">1-Course objectives</p> <p>1-That the student is familiar with the definition and concept of partial differential equations and how to form them</p> <p>2-differential equations and how to form them</p> <p>3-For the student to become familiar with the classification of partial differential equations in terms of degree and rank</p>	



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

-Identify methods for solving partial differential equations
Identify the applications of partial differential equations in various fields

Learning outcomes, teaching, learning and assessment methods

A - Teaching and learning methods

- .1 Lectures. .2 Classroom discussion from a scientific perspective.
- .3 Directing students to some websites to benefit from them.
- .4 Mini-discussions.
- .5 Training students on how to prepare scientific research.

B - Evaluation methods

- .1 Participation in the classroom.
- .2 Daily, semester and final written tests.
- .3 Oral exams in class.
- .4 Research activities

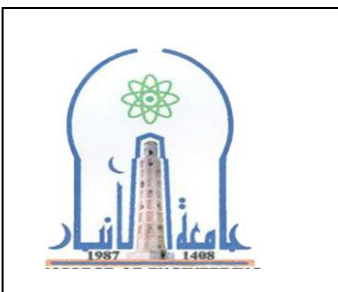
C- Thinking skills

- 1 Developing the student's ability to work on performing assignments and submitting them on the scheduled date.
- 2 The ability to think scientifically.
- 3 The ability to participate effectively in quarterly activities.
- 4 Skill in carrying out research activities and using useful sources to support the main idea required.

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

- 1 Learn how to form partial differential equations.
- 2 Employing several methods to solve partial differential equations.
- 3 The student acquires general skills to solve partial differential equations that carry scientific meanings

.1 Course structure



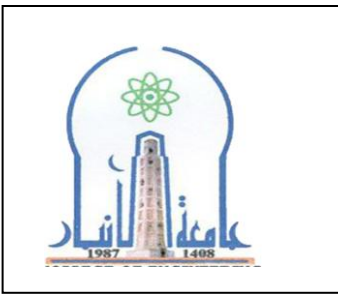
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Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Evalua tion metho d	Teaching method	Name of the unit/course or subject	Required learning outcomes	hours	The week
General questions and discussion	Lecture and discussion	introduction to partial differential equations	Partial differential equations1	4	the first
General questions and discussion	Lecture and discussion	How to get the equation	Partial differential equations1	4	the second
General questions and discussion	Lecture and discussion	Methods for solving first-order and first-order equations	Partial differential equations1	4	the third
General questions and discussion	Lecture and discussion	Nonlinear partial differential equations of the first order	Partial differential equations1	4	the fourth
General questions and discussion	Lecture and discussion	Review and test	Partial differential equations1	4	Fifth
General questions and discussion	Lecture and discussion	Using some transformations to solve first-order partial differential equations	Partial differential equations1	4	sixth
General questions and discussion	Lecture and discussion	Garbit method	Partial differential equations1	4	Seventh



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

General questions and discussion	Lecture and discussion	Adjustable equations method	Partial differential equations 1	4	eighth
General questions and discussion	Lecture and discussion	Features method	Partial differential equations 1	4	Ninth
General questions and discussion	Lecture and discussion	Review and test		4	The tenth
General questions and discussion	Lecture and discussion	Direct integration method	Partial differential equations 1	4	eleventh
General questions and discussion	Lecture and discussion	Linear partial differential equations with homogeneous terms and constant higher-order coefficients	Partial differential equations 1	4	twelveth
General questions and discussion	Lecture and discussion	Linear partial differential equations with homogeneous terms and non-homogeneous constant coefficients of higher order	Partial differential equations 1	4	The thirteenth
General questions and discussion	Lecture and discussion	Linear partial differential equations with homogeneous terms and non-homogeneous constant coefficients of higher order	Partial differential equations 1	4	fourteenth
Conducting theoretical tests	Lecture and discussion	Review and test	Partial differential equations 1	4	Fifteenth



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Infrastructure	
<p>- 1 Ordinary differential equations - written by Atallah Thamer Al-Ani. - 2 Theory of Differential Equations written by Amjad Ibrahim - 3 Differential Equations - Part Two, written by Hussein Mustafa Al-Awadhi</p>	<p>Required readings: <input type="checkbox"/> Course books <input type="checkbox"/> Other ▪</p>
nothing	Special requirements
	Social services (including, for example, guest lectures, vocational training, and field studies(

Admissions	
Calculus, ordinary differential equations	Prerequisites
60	The smallest number of students
70	The largest number of students



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Department of Quality Assurance and Academic Accreditation

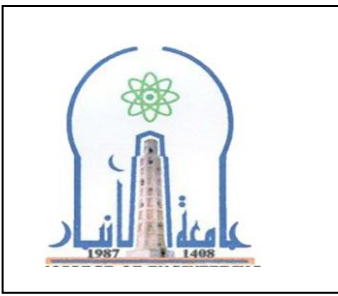
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Course description Sample

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

- Educational institution1	Anbar University - College of Education for Pure Sciences
University department/center	College of Education for Pure Sciences/Department of Mathematics
Course name/code	Partial Differential Equations 2\MAT302
Programs in which it is included	Bachelor of Mathematics
Available attendance forms	daily
Semester/year	quarterly
Number of study hours (total)	60
Date this description was prepared	2022-2023
<p>1-Course objectives</p> <p>1-That the student is familiar with the definition and concept of partial differential equations and how to form them</p> <p>2-differential equations and how to form them</p> <p>3-For the student to become familiar with the classification of partial differential equations in terms of degree and rank</p> <p>4-Identify methods for solving partial differential equations</p> <p>Identify the applications of partial differential equations in various fields</p>	



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Learning outcomes, teaching, learning and assessment methods

A - Teaching and learning methods

- .1 Lectures.
- .2 Classroom discussion from a scientific perspective.
- .3 Directing students to some websites to benefit from them.
- .4 Mini-discussions.
- .5 Training students on how to prepare scientific research.

B - Evaluation methods

- .1 Participation in the classroom.
- .2 Daily, semester and final written tests.
- .3 Oral exams in class.
- .4 Research activities.

C- Thinking skills

- 1 Developing the student's ability to work on performing assignments and submitting them on the scheduled date.
- 2 The ability to think scientifically.
- 3 The ability to participate effectively in quarterly activities.
- 4 Skill in carrying out research activities and using useful sources to support the main idea required.

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

- 1 Learn how to form partial differential equations.
- 2 Employing several methods to solve partial differential equations.
- 3 The student acquires general skills to solve partial differential equations that carry scientific meanings



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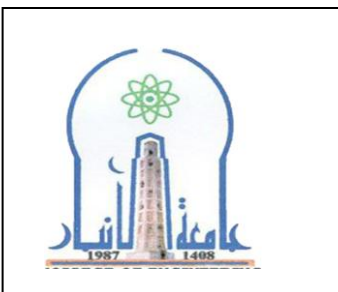
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Department of Quality Assurance and Academic Accreditation

International Accreditation Department

.1Course structure

Evalu ation metho d	Teaching method	Name of the unit/course or subject	Required learning outcomes	hours	The week
General questio ns and discussi on	Lecture and discussion	Partial differential equations with non- homogeneous terms and constant coefficients	Partial differential equations1	4	the first
General questio ns and discussi on	Lecture and discussion	Irreducible partial differential equations	Partial differential equations1	4	the second
General questio ns and discussi on	Lecture and discussion	Second-order linear partial differential equations with variable coefficients	Partial differential equations1	4	the third
General questio ns and discussi on	Lecture and discussion	Cauchy's linear partial differential equation	Partial differential equations1	4	the fourth
General questio ns and discussi on	Lecture and discussion	Review and test	Partial differential equations1	4	Fifth
General questio ns and discussi on	Lecture and discussion	Separation of variables	Partial differential equations1	4	sixth
General questio ns and discussi on	Lecture and discussion	Garbit method	Partial differential equations1	4	Seventh



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

on					
General questions and discussion	Lecture and discussion	Fourier series	Partial differential equations I	4	eighth
General questions and discussion	Lecture and discussion	Fourier series	Partial differential equations I	4	Ninth
General questions and discussion	Lecture and discussion	Review and test		4	The tenth
General questions and discussion	Lecture and discussion	Heat conduction equation	Partial differential equations I	4	eleventh
General questions and discussion	Lecture and discussion	One dimensional wave equation	Partial differential equations I	4	twelfth
General questions and discussion	Lecture and discussion	Laplace equation	Partial differential equations I	4	The thirteenth
General questions and discussion	Lecture and discussion	Solving partial differential equations using Laplace transforms	Partial differential equations I	4	fourteenth
Conducting theoretical tests	Lecture and discussion	Review and test	Partial differential equations I	4	Fifteenth



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Infrastructure	
<p>- 1 Ordinary differential equations - written by Atallah Thamer Al-Ani. - 2 Theory of Differential Equations written by Amjad Ibrahim - 3 Differential Equations - Part Two, written by Hussein Mustafa Al-Awadhi</p>	<p>Required readings: <input type="checkbox"/> Course books <input type="checkbox"/> Other</p>
nothing	Special requirements
	Social services (including, for example, guest lectures, vocational training, and field studies)

Admissions	
Calculus, ordinary differential equations	Prerequisites
60	The smallest number of students
70	The largest number of students



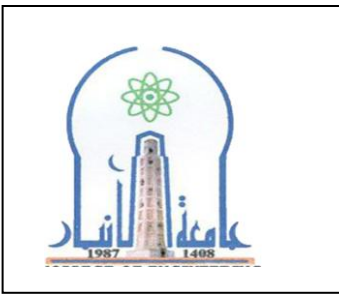
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Scientific supervision and evaluation device
Department of Quality Assurance and Academic Accreditation
International Accreditation Department

Course description form

education Reviewing the performance of higher ((academic program review))institutions

Analysis Real is one of the most important branches of mathematics and is such as)considered the basis for most other branches of mathematics numerical ,functional analysis ,nodal analysis ,theory Measurement dynamic ,erential equations topology Diff ,general topology ,analysis It gives the student a broad mathematical and logical base . (etc ,systems that allows him the opportunity to determine And absorb Many branches but calculus is ,It is the natural extension of calculus .of mathematics As for analysis .d with answering questions of the “how” typeconcerne The athlete takes care of answering “why” type questions.

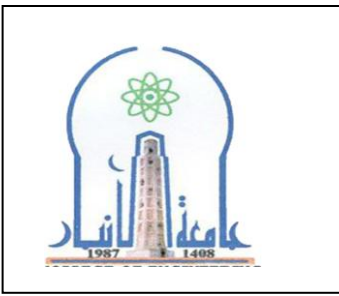
College of Education for /Anbar University Pure Sciences	Educational institution [38]
mathematics	University [39] center/department
/2Mathematical Analysis MAT301	code/name Course [40]
No D	Programs in which it is [41] included
Electronic lectures	Available attendance [42] forms
third academic year/Second semester	year/Semester [43]
60 hour	Number of study hours [44] (total)
2022-2023	Date this description was [45] prepared
: Course objectives [46]	



Ministry of Higher Education and Scientific Research
Scientific supervision and evaluation device
Department of Quality Assurance and Academic Accreditation
International Accreditation Department

Learn about the basic concepts of the derivative and how to find them using the definition And its applications	-
Learn about the Riemann integral of functions and how to find them using its definition and properties	-
and how ,their point and regular convergence ,Identify function sequences to replace limits with integration	-
.The identifier of the measure of subsets of the set of real numbers	-
. Identify measurable functions and their properties	-
Estelligs integral and compare it with the Riemann -nIdentify the Riema integral	-
Identify the Riemann integral and its most important properties and compare it with the Riemann integral	-

learning and assessment methods ,teaching ,Learning outcomes [47]
<p>Understanding Knowledge and-A .</p> <p>-- Knowing the derivatives of functions and how to find the derivatives of functions using the definition and some of its applications</p> <p>Knowing the Riemannian integral of functions and its most important - continuity and derivativeproperties and relationships By co</p> <p>. Knowing the measure of a partial group of the set of real numbers - clarifying its importance in ,Knowing and understanding the Libeck integral - . and comparing it with the Rheiman integral ,other sciences</p> <p>.nowledge in analysis The athleteGain experience and k -</p> <p>Binding to bin Different mathematics topics and their relationships With each - each position is considered complementary to the other ,other .</p>
<p>specific skills-Subject -B</p> <p>Reports Scientific -</p> <p>Graduation research-</p>
Teaching and learning methods



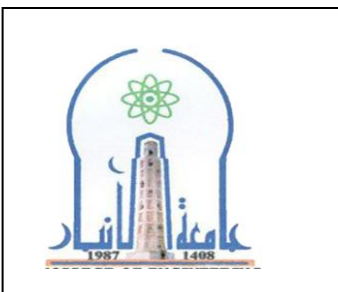
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Scientific supervision and evaluation device
Department of Quality Assurance and Academic Accreditation
International Accreditation Department

<ul style="list-style-type: none"> . seminars ,learning-self ,Readings - . Activities in the classroom - . Directing students to some websites to benefit from them - Giving examples and questions that stimulate the student's thinking - . and activities Semester and final tests -
Evaluation methods
<ul style="list-style-type: none"> Participation in electronic classes - Provide activities - Semester and final exams -
Thinking skills -C
<ul style="list-style-type: none"> Developing the student's ability to work on performing assignments and - . submitting them on the scheduled date - .Logical and mathematical thinking in finding solutions to problems - and find solutions using the ,solve it mathematically ,Analyze the problem - . available information and theorems - . Developing the student's ability to dialogue and discuss -
learning methods Teaching and
<ul style="list-style-type: none"> Managing the lecture in an applied manner linked to the reality of daily - life to attract the student to the topic of the lesson without straying from - the core of the topic so that the material is flexible and amenable to - . understanding and analysis - . ing the student to some group activities and dutiesAssign -



Ministry of Higher Education and Scientific Research
Scientific supervision and evaluation device
Department of Quality Assurance and Academic Accreditation
International Accreditation Department

<ul style="list-style-type: none"> . Allocating a percentage of the grade to daily assignments and tests - . Manage the lecture in a way that makes time feel important -
Evaluation methods
<p>participation in the electronic class is evidence of the student's commitment and responsibility.</p> <p>Commitment to the specified deadline for submitting assignments and research -</p> <p>.</p> <p>Semester and final exams express commitment and cognitive and skill achievement.</p>
<p>other skills related to employability and)neral and transferable skills Ge -D .(personal development</p> <ul style="list-style-type: none"> . Developing the student's ability to recognize types of groups - . Developing the student's ability to deal with the Internet - .Finding solutions and evidence to s ability'Developing the student - . Developing the student's ability to dialogue and discuss - . Developing the student's ability to recognize types of functions -



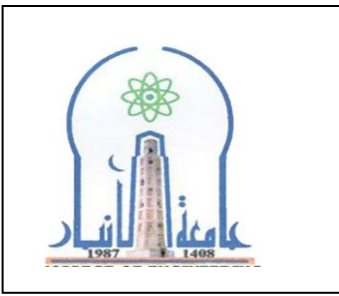
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Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Course structure [48]					
Evaluation method	Teaching method	Name of the course or/unit subject	Required learning outcomes	hours	the week
General questions and electronic discussion	Theoretical/electronic	Definition of continuity with some examples that achieve and do not achieve -continuity theories that represent equivalent definitions of continuity	Continuity	4	the first
General questions and electronic discussion	Theoretical/electronic	The relationship of continuity and -packed spaces regular the -continuity theory of the the -mean value theory of the -intervals theory of the .solid point	Continuity	4	the second
Group assignments	Theoretical/electronic	How to calculate derivatives of functions using recognition and study of the properties of	A derivative	4	the third



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

		differentiable functions and their relationships With continuity			
General questions and electronic discussion	Theoretical electronic	,Theorem Rolle the mean value theorem ,theorems mean 'Cauchy value theorem applications of .these theorems	A derivative	4	the fourth
Exam	electronic	Define Riemann integral and give examples explaining how Finding the Riemann integral ,of functions properties of Riemann integrable functions	Riemann integral	4	Fifth
General questions and electronic discussion	Theoretical electronic	The relationship of the size of discontinuity points and their Riemannian susceptibility and related General .results theoretical questions and The .discussion fifth Riemann . integral	Riemann integral	4	VI



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

		Rhymanian integrable function sequences and how to replace the limit with integration for regularly convergent . sequences			
Reports	Theoretica electroni/l c	Definition of the -Riemann Esthelij's integral with some examples	-Kamel Rayman Estellations	4	Seventh
General questions and electronic discussion	Theoretica electroni/l c	Studying the most important E properties of and comparing E with the Riemann integral	-Kamel Rayman Estellations	4	VIII
General and questions electronic discussion	Theoretica electroni/l c	Defining measurable groups and studying their properties	Introduction to theory Measurement	4	Ninth
General questions and electronic discussion	Theoretica electroni/l c Theoretica electroni/l c	Define measurable functions and give some examples Simple) ,functions distinct and (functions	Measurable functions	4	The tenth



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

		studying their properties.			
Group assignments	Theoretical electronic	Definition of Libeck integral with some -examples Properties of Libeck integral	Integration of Libik	4	eleventh
General questions and electronic +discussion exam	electronic	A comparison between the Libeck integral the Riemann and integral	Integration of Libik	4	twelveth
General questions and electronic discussion	Theoretical electronic	Liebeck integrable function sequences	Integration of Libik	4	Thirteenth
General questions and electronic discussion	Theoretical electronic	Definition of bound functions covariance with - some examples and important properties	Functions are covariance bound	4	fourteenth
Comprehensive exam	Theoretical electronic	Define absolute continuity functions with some examples and important properties	Functions are absolutely continuous.	4	Fifteenth



Infrastructure [49]	
<p>not noitcudortnI“ ,Adel Ghassan Naoum -1 Riyadh ” University of -IA ”.Analysis Baghdad- . first edition ,1986Iraq :Anwar Badrana and others -2 Haqiqi ” Dar -Introduction to analysis Al ,Awal for Publishing and Distribution -Al 1992Jordan .</p> <p>3-Apostol. TM, “Mathematical Analysis”2nd, 1974, London.</p> <p>4-Ash, R. B., “Real analysis and probability”, 1972. New York.</p> <p>5-Royden. H.L. , “Real Analysis”, 1988. London.</p> <p>6- Manfred Stoll,” Introduction to Real Analysis", 1969.</p> <p>, 7- Wilted, Rudin “Principle of Mathematical Analysis”, 1964.</p> <p>8- Murray R. Spiegel, “Real Variables”, 1969.</p> <p>9- R. M. Dudley, “Real Analysis and Probability,” 2004 .</p> <p>9 - Burrill and Knudsen, "Real Variable", 1969.</p>	<p>: readings</p> <p>Course books ■</p> <p>Other ■</p>
Nothing	Special requirements
Graduation research projects.	for ,including)Social services ,lectures guest ,example and field ,vocational training (studies



admissions [50]	
Nothing	Prerequisites
10	The smallest number of students
45	The largest number of students

Course description form

**education Reviewing the performance of higher
((academic program review))institutions**

**He provides a description The decision this Briefly required For the
most important features The decision And outputs Learning Expected
from requester Achieve it
Proven About what if He was may be Achieve Benefit Maximum from
Opportunities Learning Available. And it must from Connectivity
Between them And between a description
The program.**

-College of Education for Al/Anbar University Sarafa-Atoum Al	Educational institution [51]
mathematics	University [52] center/department
1Topology	code/Course name [53]
No D	Programs in which it is [54] included
Lectures	Available attendance [55] forms



2021-2022 First semester	year/Semester [56]
hours for the first semester 60	Number of study hours (total) [57]
2022-2023	description was prepared Date this [58]
: Course objectives [59]	
and how to form a topology ,its theories ,Identifying the topological space	-
open and ,Study of topological concepts related to the study of continuous	- closed sets and functions
-The student should know that topological properties are properties that are invariant under the influence of isomorphic functions	
The student should know that genetic properties are constant properties	- under the influence of subspaces
student should know that topological development is an extension of set theory	The -

learning and assessment methods ,teaching ,Learning outcomes [60]



<p>Knowledge and understanding -A</p> <p>Gaining experience and knowledge in dealing with groups -A</p> <p>knowledge in dealing with types of functions Gain experience and -2</p> <p>Gain experience and knowledge in dealing with groups -3.</p> <p>Gain experience and knowledge in using Data and axioms in proof Theories -4.</p>
<p>specific skills-Subject -B</p> <p style="text-align: right;">Graduation research -</p>
<p>methods Teaching and learning</p>
<p style="text-align: right;">. seminars ,learning-self ,Readings -</p> <p style="text-align: right;">. Activities in the classroom -</p> <p style="text-align: right;">. Instruct students to use The Internet to gain interest -</p> <p style="text-align: right;">. Giving examples and questions that stimulate the student's thinking -</p>
<p>Evaluation methods</p>
<p style="text-align: right;">classes Participation in electronic -</p> <p style="text-align: right;">Provide activities -</p> <p style="text-align: right;">Semester and final exams -</p>
<p>Thinking skills -C</p>
<p>Developing the student's ability to work on performing assignments and -</p> <p style="text-align: right;">. submitting them on the scheduled date -</p> <p style="text-align: right;">. Logical and mathematical thinking in finding solutions to problems -</p> <p>and find solutions using the ,solve it mathematically ,Analyze the problem -</p> <p style="text-align: right;">. available information and theorems -</p> <p style="text-align: right;">. Developing the student's ability to dialogue and discuss -</p>
<p>Teaching and learning methods</p>



<p>Managing the lecture in an applied manner linked to the reality of daily life to attract the student to the topic of the lesson Without straying from the material will be flexible and capable of being ,the core of the topic . understood and analysed</p> <p>. ing the student to some group activities and dutiesAssign</p> <p>Allocate a percentage of the grade to daily assignments and electives</p> <p>. Manage the lecture in a way that makes time feel important</p>
<p>Evaluation methods</p>
<p>Active participation in The electronic class is a guide to the student's - commitment and responsibility.</p> <p>Commitment to the specified deadline for submitting assignments and research -</p> <p>. l Semester and final tests express commitment and cognitive and skill - achievement.</p>
<p>other skills related to employability and)General and transferable skills -D .(personal development</p> <p>. Developing the student's ability to recognize types of groups -</p> <p>. Developing the student's ability to deal with the Internet -</p> <p>. Finding solutions and evidence s ability to'the student Developing -</p> <p>. Developing the student's ability to dialogue and discuss -</p> <p>. Developing the student's ability to recognize types of functions -</p>



Course structure [61]

Evaluation method	Teaching method	course /the unit Name of or subject	Required learning outcomes	hours	the week
General questions and discussion A	theoretical	Definitions, examples, some types of topological spaces such as: indiscrete, discrete, usual topology and co finite topology	Topological spaces	4	the first
General questions and discussion	theoretical	Definition of open and closed set, some examples, definition of neighborhood and relationship between them.	Open, closed sets and neighborhoods	4	the second
Group assignments	theoretical	Definition of basis and sub basis, find topology generated from basis or sub basis, some examples and theorems	Basis and subbases	4	the third
General discussion and discussion	theoretical	Definitions, some examples and theorems about interior points	Interior points and interior set	4	the fourth
General questions and discussion	theoretical	Definitions, examples, some theorems and relationships between this points and interior points	Exterior points, exterior set, boundary points and boundary set.	4	Fifth
Reports	theoretical	Definition of derived set, examples with some theorems	Derived sets	4	VI



General acetylation and discussion	theoretical	Some properties, definitions and examples about closure of a set and relationship with derived sets	Close of a set	4	Seventh
Group assignments	theoretical	Definition of dense set and study the topological space which is generated by metric space with some properties and theorems	Dense set and topological space generated by metric space.	4	VIII
General discussion and discussion	theoretical	Definition of continuity, image and invers image for topological spaces, study the relationship between continuity and interior, closure sets	Continuity, derived topological spaces and continuous at a point.	4	Ninth
Group assignments	theoretical	Definition of open and closed functions, some examples and theorems, relationship between open and closed function with continuous function.	Open and closed functions	4	The tenth
General discussion and discussion	theoretical	Definition of Homeomorphic topology, examples, theorems and topological property.	Homeomorphic topology	4	eleventh
Monthly exam	theoretical	Definition and subspace, examples, remarks and some theorems.	Subspace or induced space	4	twelveth
General discussion and discussion	theoretical	Definition of restriction function, examples and some theorems, relationship with	Restriction function	4	Thirteenth



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Department

n		continuous function			
General discussion and discussion	theoretical	Definition of Cartesian product, product space, quotient topology, some examples and theories and study relations between topics .	Product space	4	fourteenth
Comprehensive exam		-----	Review exam	4	Fifteenth



Infrastructure [62]	
<p>1-JN . Sharma , Topology , Krishna Prakashan Media, 2003.</p> <p>2- N. Bourbaki , General topology, part1, Addison Wesley, Reading, Mass, 1996.</p> <p>3- R. Englking , Outline of general topology, Amsterdam, 1989.</p> <p>4-C. Kuratowski, Topologies, Warsaw, 1952.</p> <p>5-S. Willard, General topology, AddisonWesley Publishing Company, Inc , USA, 1970.</p> <p>6- S. Michael, Elementary topology Second edition, Gemidnami , 1972. translated by Atallah ,William Pervin -7 .Basics ,Ani-Thamer Al General ,Iraq -University of Baghdad ,Topology 1986.</p> <p>1999 ,ad AslimAbd Rabh Muhamm -8 ,Palestine ,jurisprudence of topology</p>	<p>:Required readings</p> <p>Course books ■</p> <p>Other ■</p>
Nothing	Special requirements
Nothing	for ,including)Social services vocational ,guest lectures ,example (and field studies ,training

admissions [63]	
Nothing	Prerequisites
15	The smallest number of students
40	The largest number of students



Course description form

Reviewing the performance of higher education ((academic program review))institutions

He provides a description The decision this Briefly required For the most important features decision The And outputs Learning Expected from requester Achieve it Proven About what if He was may be Achieve Benefit Maximum from Opportunities Learning Available. And it must from Connectivity Between them And between a description The program.

College of Education for /Anbar University Pure Sciences	Educational institution [64]
mathematics	University [65] center/department
2Topology	code/Course name [66]
No D	Programs in which it is [67] included
Lectures	Available attendance [68] forms
semester Second 2021-2022	year/Semester [69]
hours for the second semester 60	Number of study hours [70] (total)
2022-2023	Date this description was [71] prepared



	: Course objectives [72]
and how to form a topology ,its theories ,Identifying the topological space	-
open and ,topological concepts related to the study of continuous Study of	-
	. closed sets and functions
-The student should know that topological properties are properties that are	
. invariant under the influence of isomorphic functions	
know that genetic properties are constant properties The student should	-
. under the influence of subspaces	
The student should know that topological development is an extension of set	-
theory	

learning and assessment methods ,teaching ,Learning outcomes [73]
understanding Knowledge and -A Gaining experience and knowledge in dealing with groups -A Gain experience and knowledge in dealing with types of functions -2 Gain experience and knowledge in dealing with groups -3. ms in proof TheoriesGain experience and knowledge in using Data and axio -4.
specific skills-Subject -B Graduation research -
Teaching and learning methods



<ul style="list-style-type: none"> . seminars ,learning-self ,Readings - . Activities in the classroom - . Instruct students to use The Internet to gain interest - . Giving examples and questions that stimulate the student’s thinking -
Evaluation methods
<ul style="list-style-type: none"> Participation in electronic classes - Provide activities - Semester and final exams -
Thinking skills -C
<ul style="list-style-type: none"> Developing the student’s ability to work on performing assignments and - . submitting them on the scheduled date - . Logical and mathematical thinking in finding solutions to problems - and find solutions using the ,solve it mathematically ,Analyze the problem - . available information and theorems - . Developing the student’s ability to dialogue and discuss -
Teaching and learning methods
<ul style="list-style-type: none"> Managing the lecture in an applied manner linked to the reality of daily - life to attract the student to the topic of the lesson Without straying from - the material will be flexible and capable of being ,the core of the topic - . understood and analysed - . ing the student to some group activities and dutiesAssign - Allocate a percentage of the grade to daily assignments and electives - . Manage the lecture in a way that makes time feel important -
Evaluation methods



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Department

Active participation in The electronic class is a guide to the student's -
commitment and responsibility.

Commitment to the specified deadline for submitting assignments and research -

1 Semester and final tests express commitment and cognitive and skill -
achievement.

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

- . Developing the student's ability to recognize types of groups -
- . Developing the student's ability to deal with the Internet -
- . Finding solutions and evidence s ability to'the student Developing -
- . Developing the student's ability to dialogue and discuss -
- . Developing the student's ability to recognize types of functions -



.11 Course structure					
Evaluation method	Teaching method	Name of the course or /unit subject	Required learning outcomes	hours	the week
General questions and discussion	theoretical	Definitions and examples for compact and not compact space, topological property	Compact space	4	the first
General questions and discussion	theoretical	Definition of compact subspace, some examples and theorems, also hereditary property.	Compact subspace and hereditary property.	4	the second
Group assignments	theoretical	Definition of Lindelof space and Lindelof subspace, relationship between Lindelof and compact space, topological and hereditary property	Lindelof space	4	the third
Exam	theoretical	Quiz	-----	4	the fourth
General discussion and discussion	theoretical	Definitions, examples, some theorems and relationships between these two spaces	Separation axioms , T_0 -space, T_1 -space,	4	Fifth
Reports	theoretical	Definitions, examples with some	T_2 -space, sequence in	4	VI



		theorems, relationship with T_0 -space and T_1 -space, hereditary and topological property.	topological space and convergent sequences.		
General discussion and discussion	theoretical	Some properties, definitions and examples , relationship with T_0 -space, T_1 -space and T_2 -space, hereditary and topological property.	Regular space and T_3 -space	4	Seventh
Group assignments	theoretical	Definitions and examples , relationship with T_0 -space, T_1 -space, T_2 -space and T_3 -space, hereditary and topological property. With some properties and theories	Normal space and T_4 -space	4	VIII
Exam	theoretical	Quiz	-----	4	Ninth
Group assignments	theoretical	Definition of Connected spaces and disconnected spaces, some examples and theorems .	Connected spaces	4	The tenth
General	theoretical	Some properties,	Basic theorems	4	eleventh



discussion and discussion		examples and theorems such as hereditary and topological property	of connected and disconnected spaces		
Group assignments	theoretical	Definition, examples, remarks and some theories.	Component of a point	4	twelveth
General acetylation and discussion	theoretical	Definition of locally connected space , examples and some theorems, relationship with connected space	Locally connected space	4	Thirteenth
General acetylation and discussion	theoretical	Definition of Comb space , product space, some examples and theorems and study relations between connected and locally connected space .	Comb space	4	fourteenth
Comprehensive exam		Quiz	-----	4	Fifteenth



Infrastructure [74]	
<p>1-JN . Sharma , Topology , Krishna Prakashan Media, 2003.</p> <p>2- N. Bourbaki , General topology, part1, Addison Wesley, Reading, Mass, 1996.</p> <p>3- R. Englking , Outline of general topology, Amsterdam, 1989.</p> <p>4-C. Kuratowski, Topologies, Warsaw, 1952.</p> <p>5-S. Willard, General topology, AddisonWesley Publishing Company, Inc , USA, 1970.</p> <p>6- S. Michael, Elementary topology Second edition, Gemidnami , 1972.</p> <p>translated by Atallah ,William Pervin -7 .Basics ,Ani-Thamer Al ,General Topology 1986 ,Iraq -University of Baghdad . 1999 ,h Muhammad AslimAbd Rab -8 ,Palestine ,jurisprudence of topology</p>	<p>:Required readings</p> <p>Course books ■</p> <p>Other ■</p>
Nothing	Special requirements
Nothing	for ,including)Social services ,guest lectures ,example and field ,vocational training (studies

admissions [75]	
Nothing	Prerequisites
15	The smallest number of students
40	The largest number of students



Academic program description form

Reviewing the performance of higher education ((academic program review))institutions

This academic program description provides a necessary summary of important characteristics of the program and the learning the most demonstrating ,outcomes that the student is expected to achieve It .whether he or she has made the most of the available opportunities amis accompanied by a description of each course within the progr

College of Education for Pure Sciences/Anbar University	Educational .1 institution
mathematics	University .2 center/department
class ro m	Name of the .3 academic program
s degree'Bachelor	Name of the final .4 certificate
quarterly	School system .5
Electronic lectures	Accredited .6 accreditation program
Nothing	Other external .7 influences
2022-2023	Date the description .8 was prepared
Objectives of the academic program .9	
Do not know the real numbers And its mathematical properties -	
. Identify the applications of real numbers in different fields -	



To learn about sequences and some of their different types -	
learning and assessment methods ,Required learning outcomes and teaching.10	
<p style="text-align: right;">Knowledge and understanding 1 -1</p> <p>and knowledge in analysis The athlete Gaining experience - 1A Linking to Bin Different mathematics topics and their relationships With -2A each position is considered complementary to the other ,each other . nd to have Teaching the student to master the skills acquired over time a -3A sound intuitive perception to a reasonable extent</p>	
<p>The following are the program 's skill objectives -B Reports Scientific - 1B Graduation research - 2B _ Duties - 3B</p>	
Teaching and learning methods	
<ul style="list-style-type: none"> . seminars ,learning-self ,Readings - . Activities in the classroom - . Directing students to some websites to benefit from them - . Give examples and questions that provoke thought The student - 	
Evaluation methods	
<p style="text-align: right;">Participation in electronic classes -</p>	
<p>.Emotional and value goals -C Developing the student's ability to work on performing assignments and -1C submitting them on the scheduled date .Logical and mathematical thinking in finding solutions to problems -2C - and finding solutions ,solving it mathematically ,Analyzing the problem -3C -</p>	



<p>. for it using the available information and theorems</p> <p>Developing the student's ability to dialogue and discuss -4C .</p>
Teaching and learning methods
<p>Managing the lecture in an applied manner linked to the reality of daily life to - attract the student to the topic of the lesson without straying from the core of the topic so that the material is flexible and amenable to understanding and . analysis . ing the student to some group activities and duties Assign - . Allocating a percentage of the grade to daily assignments and tests - . Manage the lecture in a way that makes time feel important -</p>
Evaluation methods
<p>participation in the electronic class is evidence of the student's commitment and responsibility. Commitment to the specified deadline for submitting assignments and research -. Semester and final exams express commitment and cognitive and skill achievement.</p>
<p>other skills related to)General and qualifying transferable skills - D . (employability and personal development</p> <p>Developing the student's ability to recognize types of groups -1D Developing the student's ability to deal with the Internet -2D. Finding solutions and evidence g the student's ability to Developin -3D Developing the student's ability to dialogue and discuss -4D</p>
Teaching and learning methods



<p>Conduct the lecture in an applied manner linked to the reality of daily life to attract the student to the topic of the lesson without straying from the core of the topic so that the material is flexible and amenable to understanding and . analysis</p> <p>. ng the student to some group activities and dutiesAssigni -</p> <p>Allocating a percentage of the grade to daily assignments and tests -</p> <p>Manage the lecture in a way that makes time feel important</p>					
Evaluation methods					
<p>Active participation in the electronic class is evidence of the student's commitment and responsibility.</p> <p>Commitment to the specified deadline for submitting assignments and research - .</p> <p>chievementSemester and final exams express commitment and cognitive and skill a.</p>					
Program structure.11					
Certificates and .12 credit hours	Hours and credit units		Name of the course or course	Course or course code	year/Level
	practical	theoretica l			
60 hour	60 hour		Mathematical l analysis	MAT301	First t/semester hird academic year



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Department

Planning for personal development.13
establishing regulations related to admission to the college or)Admission standard .14 (institute
The most important sources of information about the program.15

description form Course

Course description

He provides a description The decision this Briefly required For the most important features The decision And outputs Learning Expected from requester Achieve it Proven About what if He was may be Achieve Benefit Maximum from Opportunities Learning Available. And it must from Connectivity



**Between them And between a description
The program.**

College of Education for /Anbar University Pure Sciences	Educational institution [76]
mathematics	University [77] center/department
/1Mathematical analysis MAT301	code/name Course [78]
Electronic lectures	Available attendance [79] forms
third academic year/First semester	year/Semester [80]
hours 60	Number of study hours [81] (total)
2022-2023	Date this description was [82] prepared
: Course objectives [83]	
not know the real numbers And its mathematical properties Do -	
Identify applications of real numbers in different fields -.	
To learn about sequences and some of their different types -	
- Identify real sequences and calculate their limits .	



about sequences and some of their different types To learn -

learning and evaluation methods ,Course outcomes and teaching [84]
<p>Cognitive objectives -A Knowledge and Understanding -1A Gaining experience and knowledge in analysis The athlete -2A Different mathematics topics and their relationships With Linking BBN - 3A each position is considered complementary to the other ,each other Teaching the student to master the skills acquired over time and to have -4A sound intuitive perception to a reasonable extent.</p>
<p>. specific skills -Objectives Course -B Reports Scientific - 1B Graduation research - 2B - 3B - 4B</p>
Teaching and learning methods
<p>. seminars ,learning-self ,Readings - . – Activities in the classroom - them Directing students to some websites to benefit from - Giving examples and questions that stimulate the student’s thinking</p>
Evaluation methods
<p>Participation in electronic classes - Provide activities - Semester and final exams -</p>



<p>Emotional and value goals -C</p> <p>Developing the student's ability to work on performing assignments and -1C - . submitting them on the scheduled date</p> <p>.Logical and mathematical thinking in finding solutions to problems -2C and finding solutions ,solving it mathematically ,Analyzing the problem -3C -</p> <p>Developing the student's . for it using the available information and theorems ability to dialogue and discuss</p>
<p>Teaching and learning methods</p>
<p>Managing the lecture in an applied manner linked to the reality of daily life to - attract the student to the topic of the lesson without straying from the core of the topic so that the material is flexible and amenable to understanding and . analysis</p> <p>. ing the student to some group activities and dutiesAssign -</p> <p>Allocating a percentage of the grade to daily assignments and tests -</p> <p>. Manage the lecture in a way that makes time feel important -</p>
<p>Evaluation methods</p>
<p>Active participation in the electronic class is evidence of the student's commitment and responsibility.</p> <p>Commitment to the specified deadline for submitting assignments and research -.</p> <p>Semester and final exams express commitment and cognitive and skill achievement.</p>
<p>other skills related to employability)General and qualifying transferable skills -D .(and personal development</p> <p>. Developing the student's ability to dialogue and discuss -1D -</p> <p>.Finding solutions and evidence ...Developing the student's ability to -2D -</p> <p>. Developing the student's ability to deal with the Internet -3D -</p>



Course structure [85]					
Evaluation method	Teaching method	Name of the course or /unit subject	Required learning outcomes	hours	the week
General questions and electronic discussion	Theoretical/electronic	Axioms of -arithmetic -axioms of order axioms of perfection with .examples	Axioms of real numbers	4	the first
General questions and electronic discussion	Theoretical/electronic	-Definition some -examples -theorems trigonometric inequality	absolute value	4	the second
Group assignments	Theoretical/electronic	The highest the -constraint smallest top the - constraint bottom the -constraint largest bottom -constraint -examples .theories	Restrictions	4	the third
General questions and electronic	Theoretical/electronic	Definition with examples and basic theories	Rational numbers and irrational numbers	4	the fourth



ic discuss ion					
Exam	electronic	-----	Exam	4	Fifth
General questio ns and electron ic discuss ion	Theoretica electroni/l c	tariff Examples dusty -are semi -spaces Euclidean spaces equivalent - metric spaces	Metric spaces	4	VI
Reports	Theoretica electroni/l c	-Definitions union -examples and intersection of an infinite or infinite number .of such groups	and closed groups	4	Seventh
General questio ns and electron ic discuss ion	Theoretica electroni/l c	Some basic principles in topology and its relationship to ,metric space with examples .and theories	Metric and biological space	4	VIII
General questio ns and electron ic discuss ion	Theoretica electroni/l c	Definitions with -examples Derived and closed sets and the relationship between them	Points of purpose and closure	4	Ninth
General questio ns and electron ic	Theoretica electroni/l c Theoretica electroni/l	are Groups -stacked some -examples important theorems in	Lined spaces	4	The tenth



discussion	c	stacking			
Group assignments	Theoretical electronic	,Its definition and ,examples some special ,infinite series -harmonic -geometric alternating series the concept of - -convergence -examples .theorems	series Infinite and convergence	4	eleventh
General questions and electronic discussion +on exam	electronic	Comparison test -p root -test -comparison test root -ratio test definition -test -of number basic theorems about the numbere	-Series test numbere	4	twelveth
General questions and electronic discussion	Theoretical electronic	-Definitions examples and some theorems to clarify the relationship between them	Absolute convergence and conditional convergence	4	Thirteenth
General questions and electronic discussion	Theoretical electronic	-Definition examples and basic theorems	Multiplying Power -Series Series	4	fourteenth



Comprehensive exam	electronic	-----	Review exam	4	Fifteenth

Infrastructure .11	
Adel Ghassan Naoum “Introduction to Analysis - Riyadh ” University of Baghdad-Al- first ,1986Iraq . edition Introduction to :Anwar Badrana And others - Awal for Publishing and -Haqiqi ” Dar Al-analysis Al Jordan ,Distribution	Required prescribed books -1
3-Apostol. TM, “Mathematical Analysis”2nd, 1974, London.	(sources)Main references -2
4-Ash, R. B., “Real analysis and probability”, 1972. New York.	Recommended books and ,Scientific journals)references (...,reports
Royden. H.L. , “Real Analysis”, 1988. London.	,Electronic references -B ...Internet sites

Course development plan .12
Adding topics that can be more practical than just theoretical



Academic program description form

Reviewing the performance of higher education institutions ((academic program review))

This academic program description provides a necessary summary of the most important characteristics of the program and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the available opportunities. It is accompanied by a description of each course within the program

College of Education for Pure Sciences - Anbar University	Educational institution
Department of mathematics	/ University department .16 Center
MAT308 -Ring2	Name academic/ .17 program
Bachelor	Name of the final certificate
Season	School system .18
Daily	Approved preparation .19 program
Community	Other external influences .20
2022-2023	Date preparation of .21 description
Objectives of the academic program: Training and qualifying the student for a-8 course concerned with studying the ring, the partial ring - zero divisors - types of rings such as the integer ring - perfect and imperfect squares and some applied examples. We also study the definition of ideals and their types, such as the greatest ideal and the primary ideal, and their relationship to the perfect arena. At the end of these topics, we give the definition of the center of the ring..	

-9 Learning and learning outputs and evaluation



<p>Knowledge and understanding</p> <p>1 -Knowledge important teaching aids</p> <p>2-Learn the types of teaching methods</p> <p>-</p>
<p>B – Program specific skill objectives</p> <p style="text-align: right;">The student can solve the exercises. -1</p> <p style="text-align: right;">-The student is able to apply the topics with close topics. -2</p> <p>3—The student manages to connect the topic with reality.</p>
<p>Teaching and learning methods</p>
<p>Blackboard and pen</p>
<p>Evaluation methods</p>
<p>1 -Questions with quick exams</p> <p>2- Monthly exams</p>
<p>- Emotional and value goals -C.</p> <p>- Love of learning- C1</p> <p>- Love of communicating with the material -C2</p>
<p>- Interaction with the professor-</p>
<p>Teaching and learning methods</p>
<p>1 -Questions with quick exams</p> <p>Monthly exams-2</p>



<p>General and qualifying transferable skills (other skills related to employability and personal development). 1 -Tests are as off-topic as possible 2-Diverse and interconnected questions</p>					
Teaching and learning methods					
Using the board - using the pen					
Evaluation methods					
<p>Daily tests Monthly tests</p>					
11 .Certificates and credit hours	10 .Program structure				
	Hours and credit units		Name of the course or course	Course or course code	Level/year
practical	theoretical				
4	4		Ring 2	MAT308 -	quarterly



7 .Planning for personal development
Planning to acquire skills in learning, communicating with society, and applying vocabulary
8 .Admission standard (setting regulations related to admission to the college or institute)
Central admission
9 The most important sources of information about the program
<p style="text-align: center;">The most important sources of information about the program.-2</p> <p style="text-align: center;">3. A First Course in Abstract Algebra By J.B.F.raleigh.</p> <p>4. Intoduction to Modern Algebra (Group theory), By David Burton.</p>

se description form

Course description

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve

Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description of the program.

	1 Educational institution
	University-2 department/center
	Course name/code-1



	Available forms of-2 attendance
1. Semester/year	1. Semester/year [86]
2. Number of study hours (total)	2. Number of study hours [87] (total)
3. The date this description was prepared is 6-17-2022	3. The date this description [88] was prepared is 6-17-2021
	4. Course objectives [89]
Objectives of the academic program: Training and qualifying the student for a course concerned with studying the field, the partial field - isotopes of the field - types of fields - the primary field - perfect squares and the field and some applied examples. We also study the definition of ideals and their types, such as the greatest ideal and the primary ideal, and their relationship to the perfect arena. At the end of these topics, we give the definition of the polynomial ring and the elementary ring	

Course outcomes and teaching, learning and evaluation methods- 5



A- Cognitive objectives
First: knowledge
Understanding
A4-
B - The skills objectives of the course.
C- Emotional and value goals
C1- Developing the spirit of thinking
C2-Development of learning
C3-
-Transferable general and qualifying skills (other skills related to employability and personal development). D1- Developing the mind to accept ideas D2- Training the student to accept difficult issues-



. Course structure					
Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method	Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method	Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method	Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method	Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method	Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method

1. Infrastructure	
1- Required textbooks 3. A First Course in Abstract Algebra By J.B.F.raleigh.	1- Required textbooks 3. A First Course in Abstract Algebra By J.B.F.raleigh.



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Department

<p>2- Main references (sources) - Introduction to Modern Abstract Algebra, written by: David M. Burton - Translated by: M.D. Abdul Ali Jassim Mohammed - M.D. Sanaa Abdel Muhammad.-</p>	<p>2- Main references (sources) - Introduction to Modern Abstract Algebra, written by: David M. Burton - Translated by: M.D. Abdul Ali Jassim Mohammed - M.D. Sanaa Abdel Muhammad.-</p>
	<p>B - Electronic references, Internet sites...</p>

<p>10 .Course development plan</p>
<p>It is possible to develop new vocabulary that contributes to enhancing understanding of the material more clearly</p>



Academic program description form

Academic program description form Reviewing the performance of higher education institutions ((academic program review))

This academic program description provides a necessary summary of the most important characteristics of the program and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the available opportunities. It is accompanied by a description of each course within the program

College of Education for Pure Sciences - Anbar University	Educational institution.22
Department of mathematics	/ University department.23 Center
MAT203 -Ring 1	Name academic/.24 program
Bachelor	Name of the final .25 certificate
Season	School system.26
Daily	Approved preparation .27 program
Community	Other external influences.28
2022-2023	Date preparation of .29 description
Objectives of the academic program: Training and qualifying the student for a .30 course concerned with studying the field, the partial field - isotopes of the field - types of fields - the primary field - perfect squares and the field and some applied examples. We also study the definition of ideals and their types, such as the greatest ideal and the primary ideal, and their relationship to the perfect arena. At the end of these topics, we give the definition of the polynomial ring ..and the elementary ring	



Knowledge and understanding

1 -Knowledge important teaching aids

2-Learn the types of teaching methods

-

B – Program specific skill objectives

The student can solve the exercises. -1

-The student is able to apply the topics with close topics. -2

3—The student manages to connect the topic with reality.

Teaching and learning methods

Blackboard and pen

Evaluation methods

1 -Questions with quick exams

2- Monthly exams

- Emotional and value goals -C.

- Love of learning- C1

- Love of communicating with the material -C2

- Interaction with the professor-

Teaching and learning methods



<p>1 -Questions with quick exams Monthly exams-2</p>	
<p>General and qualifying transferable skills (other skills related to employability and personal development). 1 -Tests are as off-topic as possible 2-Diverse and interconnected questions</p>	
Teaching and learning methods	
Using the board - using the pen	
Evaluation methods	
<p>Daily tests Monthly tests</p>	
11 .Certificates and	10 .Program structure



credit hours	Hours and credit units		Name of the course or course	Course or course code	Level/year
	practical	theoretical			
4	4		Ring 1	MAT203 -	quarterly

10 .Planning for personal development

Planning to acquire skills in learning, communicating with society, and applying vocabulary

11 .Admission standard (setting regulations related to admission to the college or institute)

Central admission

REFERENCES PROGRAM-10

- . The most important sources of information about the program.-2
- 3. A First Course in Abstract Algebra By J.B.F.raleigh.
- 4. Intoduction to Modern Algebra (Group theory), By David Burton.



**This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve
Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description of the program.**

	1 Educational institution
	University-2 department/center
	Course name/code-1
	Available forms of-2 attendance
1. Semester/year	1. Semester/year [90]
2. Number of study hours (total)	2. Number of study hours [91] (total)
3. The date this description was prepared is 5-17-2022	3. The date this description [92] was prepared is 6-17-2021
	4. Course objectives [93]
Objectives of the academic program: Training and qualifying the student for a .31 course concerned with studying the field, the partial field - isotopes of the field - types of fields - the primary field - perfect squares and the field and some applied examples. We also study the definition of ideals and their types, such as the greatest ideal and the primary ideal, and their relationship to the perfect arena. At the end of these topics, we give the definition of the ..polynomial ring and the elementary ring	



Course outcomes and teaching, learning and evaluation methods- 5
A- Cognitive objectives
First: knowledge
Understanding
A4-
B - The skills objectives of the course.
C- Emotional and value goals
C1- Developing the spirit of thinking
C2-Development of learning
C3-
-Transferable general and qualifying skills (other skills related to employability and personal development). D1- Developing the mind to accept ideas D2- Training the student to accept difficult issues-3



. Course structure					
Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method	Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method	Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method	Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method	Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method	Week Hours Required learning outcomes Name of unit/course or subject Teaching method Evaluation method

1. Infrastructure	
1- Required textbooks 3. A First Course in Abstract Algebra By J.B.F.raleigh.	1- Required textbooks 3. A First Course in Abstract Algebra By J.B.F.raleigh.
2- Main references (sources) - Introduction to Modern Abstract Algebra, written by: David M. Burton - Translated by: M.D. Abdul Ali Jassim Mohammed - M.D. Sanaa Abdel Muhammad.-	2- Main references (sources) - Introduction to Modern Abstract Algebra, written by: David M. Burton - Translated by: M.D. Abdul Ali Jassim Mohammed - M.D. Sanaa Abdel Muhammad.-
	B - Electronic references, Internet sites...



10 .Course development plan

It is possible to develop new vocabulary that contributes to enhancing understanding of the material more clearly

Course description form

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve

Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Educational institution	College of Education for Pure Sciences - Anbar University
2. University department/center	Mathematics department
3. Course name/code	Advanced differentiation1
4. The programs he participates in	Bachelor's
5. Available forms of attendance	Through classrooms
6. Semester/year	quarterly
7. Number of study hours (total)	5 * 15 = 75 hours, where 5 hours per week
8. Date this description was prepared	2022-2023



9. Course objectives: Understanding the types of conic sections, how to derive equations for rotating axes, understanding the meaning of polar coordinates, how to draw polar equations, finding areas and the length of their curves, as well as understanding sequences (series) and knowing when sequences (series) are convergent or divergent, with knowledge of the two most famous series, which are Taylor and McLaurin prepared these topics for use in the third grade.the most famous **Taylor**.

1.Learning outcomes and methods of teaching, learning and evaluation
<p>The student will be able to distinguish between types of conic sections and can draw any second-degree equation with two variables by rotating the axes.</p> <p>The student will be able to draw polar coordinates, find their area and length, and learn their applications in reality</p> <p>The student can also distinguish between the concept of series and sequence and the concept of convergence and divergence</p>
<p>Teaching and learning methods</p> <ul style="list-style-type: none"> -Lecture method. -Using modern illustrative means such as Google Meet and audio recording of the lecture, as well as explaining the lecture in the classroom in person and conducting extensive discussions. <p>Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics.</p> <p>Giving students homework</p>
Lecture and conclusion
Evaluation methods



By giving assignments and questions during lectures and monthly exams	
Through external questions	C- Thinking skills
Teaching and learning methods	
Evaluation methods	
<ul style="list-style-type: none"> - Questions during lecture and daily assignments. - Daily Quizzes. - Discussions during the lecture. - Monthly exam 	
<p>D - General and transferable skills (other skills related to employability and personal development.)</p> <p>D1- Cognition: Understanding meaning and formulating new concepts.</p> <p>D2- Application: Using information extracted from the course in new situations.</p> <p>D3-Analysis: The ability to analyze the text and extract moral lessons from it.</p> <p>D4-Synthesis: Assembling scattered ideas to form new concepts that keep pace with reality.</p>	



[94] Course structure					
The week	hours	Required learning outcomes	Required learning outcomes	Teaching method	Evaluation method
the first	5	Definitions of quadratic equations in the plane	Definitions of quadratic equations in the plane	theory	Daily questions with assignments
the second	5	Sectional equations	Sectional equations	theory	Daily questions with assignments
the third	5	Sectional equations	Sectional equations	theory	Daily questions with assignments
the fourth	5	Sectional equations	Sectional equations	theory	Daily questions with assignments
Fifth	5	Sectional equations	Sectional equations	theory	Daily questions with assignments
VI	5	Polar coordinates	Polar coordinates	theory	Daily questions with assignments
Seventh	5	Polar coordinates	Polar coordinates	theory	Daily questions with assignments
VIII	5	Polar coordinates	Polar coordinates	theory	Daily questions with assignments
Ninth	5	Polar coordinates	Polar coordinates	theory	Daily questions with assignments
The tenth	5	Follow-ups	Follow-ups	theory	Daily questions with assignments
eleventh	5	Sequences	Sequences	theory	Daily questions with assignments
twelveth	5	finite series	finite series	theory	Daily questions with assignments
Thirteenth	5	finite series	finite series	theory	Daily questions with assignments
fourteenth	5	theoretical	5 theoretical exams, questions and answers	theory	5 theoretical exams, questions and answers
Fifteenth	5	Review of previous topics	Definitions of quadratic equations in the plane	theory	Daily questions with assignments



12. Infrastructure	
<input type="checkbox"/> <i>Other</i>	<p>Required readings:</p> <input type="checkbox"/> <i>Course books</i> <p>Schaum's Abstracts Series: Theories and Problems in Calculus, Frank Eiser, Cairo, 1990.</p> <p>Calculus with analytical geometry, i.e. J. Persal, Part Two, translated by Ali Azizo Yahya Abd Saeed, second edition, Baghdad, 1983.</p>
	متطلبات خاصة



Course description form

Reviewing the performance of higher education institutions ((academic program review((

**This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve
Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description of the program.**

1. Educational institution	College of Education for Pure Sciences - Anbar University
2. University department/center	Mathematics department
3. Course name/code	Advanced differentiation2
4. The programs he participates in	Bachelor's
5. Available forms of attendance	Through classrooms
6. Semester/year	quarterly
7. Number of study hours (total)	5 * 15 = 75 hours, where 5 hours per week
8. Date this description was prepared	2022-2023
9 Course objectives: The student's understanding of functions that depend on more than one variable, understanding the concept of their objective and their partial derivatives and their applications, understanding double and triple integrals and their applications such as areas and volumes, benefiting from what he learned in the first stage and applying them to the second subject, as well as studying cylindrical and spherical coordinates and studying integration on Path and Crane's theory and its applications..	



10. Learning outcomes, teaching, learning and assessment methods	
The student will be able to distinguish between functions that depend on one variable and those that depend on more than one variable in terms of the function's domain, its corresponding domain, graphing, and differentiation.	
Teaching and learning methods	
<ul style="list-style-type: none"> -Lecture method. -Using modern illustrative means such as Google Meet and audio recording of the lecture, as well as explaining the lecture in the classroom in person and conducting extensive discussions. Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics. Giving students homework 	
Lecture and conclusion	
Evaluation methods	
By giving assignments and questions during lectures and monthly exams	
Through external questions	C- Thinking skills
Teaching and learning methods	



Evaluation methods
<ul style="list-style-type: none">- Questions during lecture and daily assignments.- Daily Quizzes.- Discussions during the lecture.- Monthly exam
<p>D - General and transferable skills (other skills related to employability and personal development.)</p> <p>D1- Cognition: Understanding meaning and formulating new concepts.</p> <p>D2- Application: Using information extracted from the course in new situations.</p> <p>D3-Analysis: The ability to analyze the text and extract moral lessons from it.</p> <p>D4-Synthesis: Assembling scattered ideas to form new concepts that keep pace with reality.</p>



[95] Course structure					
The week	hours	Required learning outcomes	Name of the unit/course or subject	Teaching method	Evaluation method
the first	5	Vectors and parametric equations	Definition of parametric equations in the Cartesian plane	theory	Daily questions with assignments
the second	5	Vectors and parametric equations	Definition of vectors in the plane and operations on them	theory	Daily questions with assignments
the third	5	Vectors and parametric equations	Definition of vectors in triangular space and their properties in triangular space	theory	Daily questions with assignments
the fourth	5	Vectors and parametric equations	How to calculate vector multiplication numerically and directionally	theory	Daily questions with assignments
Fifth	5	Vectors and parametric equations	Calculating the equation of the parallel line of a vector in a triangular space	theory	Daily questions with assignments
VI	5	Vectors and parametric equations	Calculating the equation of the parallel plane of a vector in a triangular space	theory	Daily questions with assignments
Seventh	5	Continuity	Definition of continuity and limits of functions with two variables	theory	Daily questions with assignments
VIII	5	Continuity	Definition of continuity and	theory	Daily questions



			limits for functions of three variables		with assignments
Ninth	5	Partial derivatives	Calculate the partial derivatives of functions with two or more variables using the definition	theory	Daily questions with assignments
The tenth	5	Partial derivatives	Calculating partial derivatives for countries with two or more variables using mathematical laws and relationships	theory	Daily questions with assignments
eleventh	5	Partial derivatives	Calculating partial derivatives of functions with more than two variables using the chain rule	theory	Daily questions with assignments
twelveth	5	Double integrals	Calculating double integrals for functions with two variables	theory	Daily questions with assignments
Thirteenth	5	Triple integrals	Calculating double integrals for functions of three variables	theory	Daily questions with assignments
fourteenth	5	Exams	Monthly exams	theory	5 theoretical exams, questions and answers
Fifteenth	5	review	A general review of previous topics	theory	Daily questions with assignments



12. Infrastructure	
<input type="checkbox"/> <i>Other</i>	<p>Required readings:</p> <input type="checkbox"/> <i>Course books</i> <p>Schaum's Abstracts Series: Theories and Problems in Calculus, Frank Eiser, Cairo, 1990.</p> <p>Calculus with analytical geometry, i.e. J. Persal, Part Two, translated by Ali Azizo Yahya Abd Saeed, second edition, Baghdad, 1983.</p>
	متطلبات خاصة



Course description form

Reviewing the performance of higher education institutions ((academic program review((

**This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve
Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description of the program.**

1. Educational institution	College of Education for Pure Sciences - Anbar University
2. University department/center	Mathematics department
3. Course name/code	Functional analysis 1
4. The programs he participates in	Bachelor's
5. Available forms of attendance	Through classrooms
6. Semester/year	quarterly
7. Number of study hours (total)	4 * 15 = 75 hours, where 4 hours per week
8. Date this description was prepared	2022-2023
<p>Course objectives:9 Functional analysis aims to increase the knowledge of undergraduate students in the Department of Mathematics regarding mathematics topics Purely, which relies on previous topics such as linear traction and mathematical analysis, and opens horizons for students Knowledge of types of spaces and their related applications</p>	



10. Learning outcomes and methods of teaching, learning and evaluation	
<p>a. 1. Teach the student how to think about solving engineering problems</p> <p>a. 2. Motivating students on how to formulate special proofs in mathematics, as well as expanding their mental perceptions and how to think about solving problems.</p>	
<p>Teaching and learning methods</p> <ul style="list-style-type: none"> -Lecture method. -Using modern illustrative means such as Google Meet and audio recording of the lecture, as well as explaining the lecture in the classroom in person and conducting extensive discussions. Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics. Giving students homework 	
Lecture and conclusion	
Evaluation methods	
By giving assignments and questions during lectures and monthly exams	
Through external questions	C- Thinking skills



Teaching and learning methods
Evaluation methods
<ul style="list-style-type: none"> - Questions during lecture and daily assignments. - Daily Quizzes. - Discussions during the lecture. - Monthly exam
<p>D - General and transferable skills (other skills related to employability and personal development.)</p> <p style="padding-left: 40px;">D1- Cognition: Understanding meaning and formulating new concepts.</p> <p style="padding-left: 40px;">D2- Application: Using information extracted from the course in new situations.</p> <p style="padding-left: 40px;">D3-Analysis: The ability to analyze the text and extract moral lessons from it.</p> <p style="padding-left: 40px;">D4-Synthesis: Assembling scattered ideas to form new concepts that keep pace with reality.</p>



[96] Course structure					
The week	hours	Required learning outcomes	Required learning outcomes	Teaching method	Evaluation method
the first	4	Definitions of spaces	Definitions of spaces	theory	Daily questions with assignments
the second	4	Applications to spaces	Applications to spaces	theory	Daily questions with assignments
the third	4	Convergent sequences, metric space, theory of public debates	Convergent sequences, metric space, theory of public debates	theory	Daily questions with assignments
the fourth	4	Types of convergent sequences, metric space, theory of public discussions	Types of convergent sequences, metric space, theory of public discussions	theory	Daily questions with assignments
Fifth	4	Perfect spaces, metric space, theory of public debates	Perfect spaces, metric space, theory of public debates	theory	Daily questions with assignments
Sixth	4	Applications to spaces	Applications to spaces	theory	Daily questions with assignments
Seventh	4	Definitions of spaces	Definitions of spaces	theory	Daily questions with assignments
Eighth	4	Applications to spaces	Applications to spaces	theory	Daily questions with assignments
Ninth	4	Banach spaces and their applications, normative space, theory of public discussions	Banach spaces and their applications, normative space, theory of public	theory	Daily questions with assignments



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Quality Assurance Department

			discussions		
The tenth	4	Finite dimensional spaces	Finite dimensional spaces	theory	Daily questions with assignments
eleventh	4	Compact spaces	Compact spaces	theory	Daily questions with assignments
twelveth	4	Linear effects	Linear effects	theory	Daily questions with assignments



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Department

12. Infrastructure	
<input type="checkbox"/> <i>Other</i>	<p>Required readings:</p> <input type="checkbox"/> <i>Course books</i> <ul style="list-style-type: none"> -Introduction to functional analysis and its applications -Introductory of functional analysis with applications -Topics in functional analysis Functional Analysis Problems with Solutions -Papers of functional analysis with applications



Course description form

Reviewing the performance of higher education institutions ((academic program review((

**This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve
Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description of the program.**

1. Educational institution	College of Education for Pure Sciences - Anbar University
2. University department/center	Mathematics department
3. Course name/code	Functional analysis 2
4. The programs he participates in	Bachelor's
5. Available forms of attendance	Through classrooms
6. Semester/year	quarterly
7. Number of study hours (total)	4 * 15 = 75 hours, where 4 hours per week
8. Date this description was prepared	2022-2023
<p>Course objectives:9 The Functional Analysis Headquarters aims to increase the knowledge of undergraduate students in the Department of Mathematics regarding mathematics topics Purely, which relies on previous topics such as linear traction and mathematical analysis, and opens horizons for students</p>	



Knowledge of types of spaces and their related applications

10. Learning outcomes and methods of teaching, learning and evaluation

- a. 1. Teach the student how to think about solving engineering problems
- a. 2. Motivating students on how to formulate special proofs in mathematics, as well as expanding their mental perceptions and how to think about solving problems.

Teaching and learning methods

-Lecture method.

-Using modern illustrative means such as Google Meet and audio recording of the lecture, as well as explaining the lecture in the classroom in person and conducting extensive discussions.

Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics.

Giving students homework

Lecture and conclusion

Evaluation methods

By giving assignments and questions during lectures and monthly exams

C- Thinking skills

Through external questions



Teaching and learning methods
Evaluation methods
<ul style="list-style-type: none"> - Questions during lecture and daily assignments. - Daily Quizzes. - Discussions during the lecture. - Monthly exam
<p>D - General and transferable skills (other skills related to employability and personal development.)</p> <p style="padding-left: 40px;">D1- Cognition: Understanding meaning and formulating new concepts.</p> <p style="padding-left: 40px;">D2- Application: Using information extracted from the course in new situations.</p> <p style="padding-left: 40px;">D3-Analysis: The ability to analyze the text and extract moral lessons from it.</p> <p style="padding-left: 40px;">D4-Synthesis: Assembling scattered ideas to form new concepts that keep pace with reality.</p>



[97] Course structure					
The week	hours	Required learning outcomes	Required learning outcomes	Teaching method	Evaluation method
the first	4	Inner multiplication space	Inner multiplication space	theory	Daily questions with assignments
the second	4	Inner multiplication space	Inner multiplication space	theory	Daily questions with assignments
the third	4	Inner multiplication space	Inner multiplication space	theory	Daily questions with assignments
the fourth	4	Inner multiplication space	Inner multiplication space	theory	Daily questions with assignments
Fifth	4	Hilbert space	Hilbert space	theory	Daily questions with assignments
Sixth	4	Hilbert space	Hilbert space	theory	Daily questions with assignments
Seventh	4	Hilbert space	Hilbert space	theory	Daily questions with assignments
Eighth	4	Hilbert space	Hilbert space	theory	Daily questions with assignments
Ninth	4	Hilbert space	Hilbert space	theory	Daily questions with assignments



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Quality Assurance Department

The tenth	4	Hilbert space	Hilbert space	theory	Daily questions with assignments
eleventh	4	Hilbert space	Hilbert space	theory	Daily questions with assignments
twelveth	4	Hilbert space	Hilbert space	theory	Daily questions with assignments



12. Infrastructure	
<input type="checkbox"/> <i>Other</i>	<p>Required readings:</p> <input type="checkbox"/> <i>Course books</i> <ul style="list-style-type: none"> -Introduction to functional analysis and its applications -Introductory of functional analysis with applications -Topics in functional analysis Functional Analysis Problems with Solutions -Papers of functional analysis with applications



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Department

Course description form

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve

Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description of the program.

Anbar University / College of Education for Pure Sciences / Department of Mathematics	[98] Educational institution
Mathematics department	[99] University department/center
Ordinary differential equations/1	[100] Course name/code
Bachelor's	[101] The programs in which it is included
Regular official time/in-person lectures for the first semester	[102] Available attendance forms
First semester	[103] Semester/year
60 theory for the first semester.	[104] Number of study hours (total)
2022-2023	[105] The date this description was prepared
[106] Course objectives:	



- A) Identifying preliminary concepts in ordinary differential equations and how to deal with them.
- b) Developing the relationship between ordinary equations and their applications in our daily lives.
- C) Identifying several types of ordinary equations that differ in terms of rank, degree, types of coefficients, homogeneity, etc. And how to solve it.

D) Identify the Riccati equation and its role in solving ordinary equations and its various applications in physics.

h) Adding new information to complete the student's knowledge chain.

[107] Course outcomes and teaching, learning and evaluation methods

1. The student acquires knowledge and experience in dealing with Ordinary Differential Equation
2. Acquiring the ability and skill to distinguish types of ordinary differential equations and how to deal with them.
3. The student gains knowledge and experience in dealing with How to find the ODE



and how to find it.

4. The student acquires knowledge and experience in dealing with Methods of solving ODE and how to solve it in different ways depending on its type.
5. The student acquires knowledge and experience in dealing with the Riccati and Bernoulli equations, linear equations, etc. And how to use it to find the solution to the ordinary differential equation.

Scientific reports.

2. Research.

Teaching and learning methods:

1. Use the deductive method to obtain information.
2. Scientific discussions that aim to consolidate information.
3. Exercises and activities in the classroom (in-person class) or through
4. E-learning.
5. Directing students to some sources that contain examples and exercises to benefit from them.

Evaluation methods:

1. Participation in the classroom (in-person class) or through e-learning.
2. Provide activities.
3. Sudden daily and continuous weekly tests.
4. Semester and final exams



Teaching and learning methods
<ul style="list-style-type: none"> - Lecture method. -Using modern illustrative methods such as Google Meet, audio recording of the lecture, and .pdf files. <p>Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics.</p> <ul style="list-style-type: none"> -Giving students homework.
Evaluation methods
<ul style="list-style-type: none"> --Questions during lecture and daily assignments. -Daily Quizes. -Discussions during the lecture. -Monthly exams.
<p>C- Emotional and value goals</p> <p>C1- The student's response to the main goal of the course, which is to develop his four skills.</p> <p>C2- That the student understands and differentiates between various basic concepts, links them together, and benefits from them socially.</p> <p>C3- Enhancing the student's self-confidence by distinguishing the different topics that were dealt with in the course and choosing those that suit his personality and society.</p> <p>C4- Developing his ability to listen and learn from others.</p>
Teaching and learning methods
<ul style="list-style-type: none"> -Lecture method. -Using modern illustrative methods such as Google Meet, audio recording of the lecture, and .pdf files. <p>Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics.</p> <ul style="list-style-type: none"> -Giving students homework.
Evaluation methods
<ul style="list-style-type: none"> -Questions during lecture and daily assignments. -Daily Quizes. -Discussions during the lecture. -Monthly exams.



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Department

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

D1- Cognition: Understanding meaning and formulating new concepts.

D2- Application: Using information extracted from the course in new situations.

D3-Analysis: The ability to analyze the text and extract moral lessons from it.

D4-Synthesis: Assembling scattered ideas to form new concepts that keep pace with reality.



[108] Course structure					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	Hours	The week
Daily assignments and exams	Lecture	Basis of classification of ordinary differential equations	Basis of classification of ordinary differential equations	4	1
Daily assignments and exams	Lecture	✓ How to find the ODEs	✓ How to find the ODEs	4	2
Daily assignments and exams	Lecture	✓ The type of solutions and classification of problem according the type of conditions.	✓ The type of solutions and classification of problem according the type	4	3
Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of Separable type	✓ Solve the ordinary differential equation. Of Separable type	4	4
Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of Homogeneous type	✓ Solve the ordinary differential equation. Of Homogeneous type	4	5
Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of Exact type	✓ Solve the ordinary differential equation. Of Exact type	4	6



Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of Exact (by I.F) type	✓ Solve the ordinary differential equation. Of Exact (by I.F) type	4	7
		Exam 1		2	8
Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of Linear type	✓ Solve the ordinary differential equation. Of Linear type	4	9
Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of Bernoulli typ	✓ Solve the ordinary differential equation. Of Bernoulli type	4	10
Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of Recatti type	✓ Solve the ordinary differential equation. Of Recatti type	4	11
Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of Type first order and second degree	✓ Solve the ordinary differential equation. Of Type first order and second degree	4	12



Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of Type second order and first	✓ Solve the ordinary differential equation. Of Type second order and first	4	13
Daily assignments and exams	Lecture	✓ Some Applications of ODEs in physics.	Some Applications of ODEs in physics.	2	14
		Exam 2		2	15

[109] Infrastructure	
<ul style="list-style-type: none"> Differential Equations , Frank Ayres JR, McGRAW-Hill book company 1952. ODEs Lecture Notes, Erich Miersemann, Dep. Of Math, Leipzig University, version Oct. 2012. ODEs lecture notes, B.Neta, Department of Mathematics, Naval Postgraduate School, Monterey, California 93943, October 10, 2002. 	1- Required prescribed books
Progress in English through relevant activities (Al-shrafa radi) (English Program (Ibn al-Khatib))	2- Main references (sources)
	A- Recommended books and references) Scientific journals, reports (...)
Google search	B- Electronic references, Internet sites...

[110] Course development plan
- Writing a report on all the details of the course by all students, exchanging these reports and sharing information, and thus the maximum benefit will be achieved from the curriculum as a whole.



Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Department

Course description Sample

Reviewing the performance of higher education institutions ((academic program review((

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve. Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

- Educational institution1	Anbar University - College of Education for Pure Sciences
University department/center	College of Education for Pure Sciences/Department of Mathematics
Course name/code	Complex Analysis 1
Programs in which it is included	Bachelor of Mathematics
Available attendance forms	Daily
Semester/year	Quarterly
Number of study hours (total)	64
Date this description was prepared	2022-2023
Course objectives:	
1- Emphasizing the importance of the topic of topological spaces in relation to other sciences..	
2- For students to become familiar with the types of topological spaces	
3-Informing students about topological spaces, the axioms of separation, and compact spaces.	
4-To show students the most important applications of topological spaces	

Learning outcomes, teaching, learning and assessment methods



<p>A- Knowledge and understanding</p> <p>1-That the student understands what is meant by topological space</p> <p>2-The student should distinguish between types of topological spaces</p> <p>3-For the student to recognize the relationship between continuous functions and isomorphism</p> <p>4-For the student to become familiar with the types of separation axioms</p> <p>5-For the student to become familiar with the concept of compact spaces and interconnected spaces and their applications</p>
<p>Teaching and learning methods</p>
<p>Blackboard + pen + data show</p>
<p>B- Subject-specific skills</p> <p>1-That the student can distinguish between different topological spaces</p> <p>2-That the student can distinguish between continuous, open, and closed functions.</p> <p>3-That the student can distinguish between the axioms of separation and reach the relationships between these spaces</p> <p>4-The student must have the necessary skill to solve problems using basic concepts.</p> <p>5-That the student is able to understand compact and interconnected spaces and their connections to other spaces</p>
<p>C- Thinking skills</p> <p>External tests 2- Various and interconnected questions to test the student's skills</p>
<p>Teaching and learning methods</p>
<p>Blackboard + pen + data show</p>
<p>Evaluation methods</p>
<p>Daily and monthly examinations</p>
<p>General and transferable skills (other skills related to employability and personal development(</p>



Course structure

Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	hours	The week
Exams and daily activities		Complex numbers, their definition, properties. Geometric representation and polar formula Open sets, closed sets at the level of complex numbers, continuous sets Regions, smooth curves	Understand the prescribed material correctly and know its applications	12	3
Exams and daily activities		Nodal functions and purpose Continuous nodal functions Linear conversion Differentiable complex functions	Understand the prescribed material correctly and know its applications	12	3
Exams and daily activities		The basic principle in developing analytical functions Cauchy-Riemann theorem Some applications of the Cauchy-Riemann theorem Analytical functions	Understand the prescribed material correctly and know its applications	12	3
Exams and daily activities		Harmonic functions and their properties Prime functions, their functions, and their properties Trigonometric and inverse hyperbolic functions	Understand the prescribed material correctly and know its applications	12	3



Ministry of Higher Education and Scientific
Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Infrastructure	
➤ Churchill, Nodal Variables and Their Applications, Part Eight, Complex Analysis and	Required readings: 1-Course books 2-Other
Fundamentals of complex functions, Abdul Rahman Salman Jumah, 2017	Special requirements
Graduation research projects	Social services (including, for example, guest lectures, vocational training, and field studies(

Admissions	
Central admission and academic department plan	Prerequisites
15	The smallest number of students
30-25	The largest number of students