

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: *10/4/2022*

**Prof. Dr. Abdul Rahman  
Salman. Juma**

Dean's Name

Date: *12/4/2022*

Signature

**Assist. Prof. Harith Kamil  
Buniya**

Dean's Assistant  
For Scientific  
Affairs

Date: *12/4/2022*

Signature

**Dr. Mohammed Yousif Turki**

Head of  
Department

Date: *10/4/2022*

Signature

**Dr. Hiba Abbas Jasim**

Quality Assurance And University Performance  
Manager

Date: *12/4/2022*

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.

<b>1. Teaching Institution</b>	University of Anbar
<b>2. University Department</b>	College of education for pure science- Mathematics
<b>3. Programme Title</b>	Education Mathematic Sciences
<b>4. Title of Final Award</b>	Bachelor of Education Mathematic Sciences
<b>5. Modes of Attendance offered</b>	Quarterly
<b>6. Accreditation</b>	Nothing
<b>7. Other external influences</b>	School application - practical graduation research projects
<b>8. Date of production</b>	10/4/2022
<b>9. Aims of the Programme</b>	
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

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

Third	<b>MAT301</b>	Analysis Mathematicall	2	2
	<b>MAT302</b>	Partial differential equations1	2	2
	<b>MAT303</b>	Rings Algebra 1	2	2
	<b>MAT304</b>	Probability1	2	2
	<b>MAT305</b>	Numerical analysis1	2	2
	<b>MAT306</b>	Analysis Mathematicall	2	2
	<b>MAT307</b>	Partial differential equations2	2	2
	<b>MAT308</b>	Rings Algebra 2	2	2
	<b>MAT309</b>	Probability2	2	2
	<b>MAT310</b>	Numerical analysis2	2	2
	<b>EPS 311</b>	Curriculum and teaching methods	۲	-
	<b>EPS312</b>	Educational guidance	2	-
	<b>UOA340</b>	English language	2	-
Fourth	<b>MAT401</b>	Analysis complex1	2	2
	<b>MAT402</b>	Topology 1	2	2
	<b>MAT403</b>	Statistic Mathematical1	2	2
	<b>MAT404</b>	Analysis Functionall	2	2
	<b>MAT405</b>	Modules 1	2	2
	<b>MAT406</b>	Analysis complex2	2	2
	<b>MAT407</b>	Topology 2	2	2
	<b>MAT408</b>	Statistic Mathematical2	2	2
	<b>MAT409</b>	Analysis Functional2	2	2
	<b>MAT410</b>	Modules 2	2	2
	<b>EPS411</b>	Measuring and evaluating	2	-
	<b>EPS412</b>	Teaching apps	2	-
	<b>EPS413</b>	School apps	2	-
	<b>EPS414</b>	Graduation Project	2	-
<b>UOA440</b>	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 programme

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

				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
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

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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			√		√	√			√				√	√			



## 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	<b>1. Enterprise Educational</b>
<b>mathematics</b>	<b>2. Section University / Center</b>
<b>(MAT210 Computers 1)</b>	<b>3. name / Code The decision</b>
Electronically	<b>4. shapes the audience Available</b>
<b>course the first /2021-2022</b>	<b>5. the chapter / the year</b>
60 hours	<b>6. number hours Scholarship (total)</b>
12/1/2022	<b>7. date Preparation this the description</b>
<b>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</b>	
<b>9. Outputs The decision And methods education And learning And evaluation</b>	
<b>A- Objectives Cognitive</b>	
1. Identify on Generations Calculators . 2. Identify on Species Calculators . 3. Identify on Systems Numerical.	



<p><b>B - Objectives Marathi Private By decision.</b>          sharing requester With issues Intellectual with finding the solution For this matters.</p>
<p><b>Methods education And learning</b></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><b>Methods Evaluation</b></p>
<ul style="list-style-type: none"> <li>▪ Pursuit (10 degrees Presence , 5 degrees duty my house, 5 degrees Exam daily, 20 degrees Exam Monthly 60 total degree Exam ultimate100)</li> <li>▪ on road questions Direct during lecture</li> <li>▪ on road Exams Monthly</li> <li>▪ on road performance Duties</li> <li>▪ on road Exams Final</li> <li>▪ on road Discipline And commitment By regulations And the laws</li> </ul>
<p><b>C- Objectives Sentimentality And value</b>          - thinking critic ( a question And Answer)          2- Skill Organization          3- Skill Interaction          4- Skill the job</p>
<p><b>Methods education And learning</b></p>
<p>Discussion, Lectures</p>
<p><b>Methods Evaluation</b></p>
<p>1. Discussion          2. the exams Editorial</p>



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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

<b>10.structure The decision</b>					
<b>road Evaluation</b>	<b>road education</b>	<b>name Unit / Course or the topic</b>	<b>Outputs Learning required</b>	<b>hour s</b>	<b>the week</b>
the audience And the questions Motivation al	a lecture Video with a lecture Textual with broadcast direct	Computer basics	fundamentals of computer	4	the first
the audience And the questions Motivation al	a lecture Video with a lecture Textual with broadcast direct	Definition of computer	Definition of Computer	4	the second
the audience And the questions Motivation al	a lecture Video with a lecture Textual with broadcast direct	computer components	Components of Computer	4	the third
the audience And the questions Motivation al	a lecture Video with a lecture Textual with broadcast direct	Material components	Hardware	4	the fourth
the audience And the questions Motivation al	a lecture Video with a lecture Textual with broadcast direct	Software components	Software	4	Fifth
the audience And the	a lecture Video with a lecture Textual with	Learn about numerical systems	Numerical systems	4	VI



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questions Motivational	broadcast direct				
the audience And the questions Motivational	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 Motivational	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 Motivational	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 Motivational	a lecture Video with a lecture Textual with broadcast direct	Algorithm	Algorithms	4	atheistic ten
the audience And the questions Motivational	a lecture Video with a lecture Textual with broadcast direct	Its types	Types of Algorithms	4	the second ten
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	a lecture Video with a lecture Textual with broadcast direct with Questions	Win-7	IntroductionWindows	4	the fourth ten



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Class	Editorial immanence				
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"> <li>➤ <b>Computer principles</b></li> <li>➤ <b>Course of the Ministry of Higher Education for computer principles</b></li> </ul>	<p>Readings required :</p> <ul style="list-style-type: none"> <li>➤ books The decision</li> <li>➤ Other</li> </ul>
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



## 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]
<b>College of Education for Pure Sciences/Department of Mathematics</b>	University [2] department/center
Numerical analysis 1	Course name/code [3]
	The programs in which he [4] participates
Electronically	Available forms of [5] attendance
<b>First semester/third academic year</b>	Semester/year [6]
60	Number of study hours [7] ((total
<b>2021-2022</b>	Date this description was [8] prepared
:Course objectives [9]	
<ul style="list-style-type: none"> <li>• The need of most researchers in various branches of knowledge, especially those who deal with approximate measurements and calculations in their .research</li> </ul>	
<ul style="list-style-type: none"> <li>• The importance of approximation is extremely important, as many topics</li> </ul>	



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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

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

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

2- Research

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
<ul style="list-style-type: none"> <li>-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</li> <li>-Assigning the student to some group activities and duties.</li> <li>-Allocate a percentage of the grade to daily assignments and tests .</li> </ul>
Evaluation methods
<ul style="list-style-type: none"> <li>-Active participation in the classroom is evidence of the student's commitment and responsibility</li> <li>-Commitment to the specified deadline for submitting assignments and research</li> <li>-Semester and final tests express commitment and cognitive and skill achievement</li> </ul> <p>Applications, exercises and daily assignments</p>
<p>D - General and transferable skills (other skills related to employability (and personal development.</p> <ol style="list-style-type: none"> <li>1-Developing the student's ability to deal with technical means</li> <li>2-Developing the student's ability to deal with the Internet</li> <li>3-Developing the student's ability to deal with multimedia</li> <li>4-Developing the student's ability to dialogue and discuss</li> </ol>

10-Course structure



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<b>Evaluation method</b>	<b>Teaching method</b>	<b>Name of the unit/course or subject</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>The Week</b>
General questions and discussion	Theoretical + practical	Elementary numerical analysis	The concept of0 Numerical analysis	theoretical + 2 2 practical	the first
General questions and discussion	Theoretical + practical	The numerical error types	Absalute error, Relative errors + operation of error	theoretical + 2 2 practical	the second
General questions and discussion	Theoretical + practical	Numerical solution of Nonlinear equation	Half interval method	theoretical + 2 2 practical	the third
General questions and discussion	Theoretical + practical	Numerical solution of Nonlinear equation	False position method	theoretical + 2 2 practical	the fourth
General questions and discussion	Theoretical + practical	Numerical solution of Nonlinear equation	secant mrthod	theoretical + 2 2 practical	Fifth
General questions and discussion	Theoretical + practical	Numerical solution of Nonlinear equation	Newton_raphson method	theoretical + 2 2 practical	Seventh
General questions and discussion	Theoretical + practical	Numerical solution of Nonlinear equation	Fixed point method	theoretical + 2 2 practical	eighth
			first Test		Ninth
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	The concept of system linear equation	theoretical + 2 2 practical	The tenth
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	Gaussian Elimination method	theoretical + 2 2 practical	eleventh
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	Gauss-Jordan Reduced Method	theoretical + 2 2 practical	twelveth
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	Jacobi Method	theoretical + 2 2 practical	Thirteenth
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	Gauss-Seidel Method	theoretical + 2 2 practical	fourteenth
General questions and discussion	Theoretical + practical	Numerical Solution of System of Linear equations	Eigenvalue : The Power Method	theoretical + 2 2 practical	Fifteenth
	Theoretical + practical		Second test		sixteen



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10- Infrastructure .	
<b>Introduction to numerical analysis</b> <b>S . Baskar 2010</b> <b>Introduction To Numerical Analysis</b> <b>.Froberg C. E 1969</b>	: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



## 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]
<b>College of Education for Pure Sciences/Department of Mathematics</b>	University [11] department/center
Numerical analysis 2	Course name/code [12]
	The programs in which he participates [13]
Electronically	Available forms of attendance [14]
<b>Second semester/third academic year</b>	Semester/year [15]
60	Number of study hours [16] ((total
<b>2021-2022</b>	Date this description was prepared [17]
	:Course objectives [18]
<ul style="list-style-type: none"> <li>• The need of most researchers in various branches of knowledge, especially those who deal with approximate measurements and calculations in their .research</li> <li>• The importance of approximation is extremely important, as many topics</li> </ul>	



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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

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

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

2- Research

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
<ul style="list-style-type: none"> <li>-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</li> <li>-Assigning the student to some group activities and duties.</li> <li>-Allocate a percentage of the grade to daily assignments and tests .</li> </ul>
Evaluation methods
<ul style="list-style-type: none"> <li>-Active participation in the classroom is evidence of the student's commitment and responsibility</li> <li>-Commitment to the specified deadline for submitting assignments and research</li> <li>-Semester and final tests express commitment and cognitive and skill achievement</li> <li>.Applications, exercises and daily assignments</li> </ul>
<p>D - General and transferable skills (other skills related to employability (and personal development.</p> <ol style="list-style-type: none"> <li>1-Developing the student's ability to deal with technical means</li> <li>2-Developing the student's ability to deal with the Internet</li> <li>3-Developing the student's ability to deal with multimedia</li> <li>4-Developing the student's ability to dialogue and discuss</li> </ol>



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







10- Infrastructure .	
<b>Introduction to numerical analysis</b> <b>S . Baskar 2010</b> <b>Introduction To Numerical Analysis</b> <b>.Froberg C. E 1969</b>	: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

**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	<b>[19] Educational institution</b>
Mathematics	<b>[20] University department/center</b>
<b>(MAT210 Computers 2)</b>	<b>[21] Course name/code</b>
Electronically	<b>[22] Available forms of attendance</b>
Second course / 2020-2022	<b>[23] Semester/year</b>
60hours	<b>[24] Number of study hours (total)</b>
<b>2022/3/17</b>	<b>[25] The date this description was prepared</b>
<b>[26] Course objectives: A course concerned with teaching the student the art of programming using the C++ language in addition to MATLAB</b>	

<b>[27] Course outcomes and teaching, learning and evaluation methods</b>
<p>A- Cognitive objectives</p> <p>.1Learn how to solve problems using a calculator.          .2Issue analysis. .3Practical examples</p>
<p>B - The skills objectives of the course.</p> <p>The student participates in intellectual problems and finds the solution to these problems, including the derivative and integration.</p>



<b>Teaching and learning methods</b>
<ol style="list-style-type: none"> <li>1- Electronically on some e-learning programs such as Google Form and other forms</li> <li>2- Various means, including displaying the minutes on a display screen and using a calculator</li> </ol>
<b>Evaluation methods</b>
<ol style="list-style-type: none"> <li>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)</li> <li>2. Through direct questions during the lecture</li> <li>3. Through monthly examinations</li> <li>4. By performing duties. 5. Through final exams.</li> <li>6. Through discipline and adherence to regulations and laws</li> </ol>
<p>C- Emotional and value goals</p> <ul style="list-style-type: none"> <li>- Critical thinking (question and answer)</li> <li>-2Organization skill. -3Interaction skill</li> <li>4- Work skill</li> </ul>
<b>Teaching and learning methods</b>
Discussion, lectures
<b>Evaluation methods</b>
<ol style="list-style-type: none"> <li>1. Discussion. Written tests</li> </ol>
<p>D - Transferable general and qualifying skills (other skills related to employability and personal development).</p> <ul style="list-style-type: none"> <li>-The student participates in intellectual problems and finds the solution to these problems, including the derivative and integration.</li> <li>- Assignments in addition to questions during the lecture</li> </ul>



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[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 <sup>rd</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Characteristics of the algorithms used	Algorithm properties	4	4 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Learn about simple examples of algorithms	Simple flow charts	4	5 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Get to know flowchart	Branching flowchart	4	6 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast	discussion	Simple rotation flowchart	4	7 <sup>th</sup>
Degree	Test-1			4	8 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Various examples	Various examples of algorithms	4	9 <sup>th</sup>
Attendance and	Video lecture with text	Various examples	Sequence	4	10 <sup>th</sup>



motivational questions	lecture with live broadcast		algorithms		
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Various examples	Array algorithms	4	11 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Various examples	One dimensional Array	4	12 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast	Various examples	two dimensional Array	4	13 <sup>th</sup>
Degree	Test-2			4	14 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast	review	exercises	4	15 <sup>th</sup>
[29] Infrastructure					





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<ul style="list-style-type: none"> <li>▪ <b>Principles of algorithms</b></li> <li>▪ <b>Analyzing problems using computers</b></li> </ul>	<p style="text-align: center;">Required readings:</p> <ul style="list-style-type: none"> <li>• Written the course</li> <li>• Other</li> </ul>
<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 style="text-align: center;">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>



[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 <sup>rd</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Characteristics of the algorithms used	Algorithm properties	4	4 <sup>th</sup>
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 <sup>th</sup>



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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 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	discussion	Simple rotation flowchart	4	7 <sup>th</sup>
Degree	Test-1			4	8 <sup>th</sup>
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 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Various examples	Sequence algorithms	4	10 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Various examples	Array algorithms	4	11 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Various examples	One dimensiona l Array	4	12 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	Various examples	two dimensiona l Array	4	13 <sup>th</sup>





Degree	Test-2			4	14 <sup>th</sup>
Attendance and motivational questions	Video lecture with text lecture with live broadcast and Attendance inside the hall	review	exercises	4	15 <sup>th</sup>

### 11. Course development plan

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.

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



## 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**

<b>1- Educational institution</b>	<b>Anbar University - College of Education for Pure Sciences</b>
<b>University department/center</b>	<b>College of Education for Pure Sciences/Department of Mathematics</b>
<b>Course name/code</b>	<b>Mathematical Statistics -1\MAT403</b>
<b>Programs in which it is included</b>	<b>Bachelor of Mathematics</b>
<b>Available attendance forms</b>	<b>Daily</b>
<b>Semester/year</b>	<b>Quarterly</b>
<b>Number of study hours (total)</b>	<b>64</b>
<b>Date this description was prepared</b>	<b>2021-2022</b>

**Course objectives:**

- 1- For students to become familiar with the types of Mathematical Statistics.
- 2- Transferring from the description stage to the decision-making stage and logical interpretation of the results.
- 3- The course is concerned with studying an introduction to estimation theory (by point or by period) and how to obtain it.
- 4- The concept of hypothesis testing, some probability distributions, sampling distribution theory, finding the critical region, optimal test power, and the Neyman-Pearson theorem.



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



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
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	A video lecture with a	Review the subject and conduct a monthly exam	The student learns how to do a comprehensive	16	4



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motivational questions with grade	text lecture with a live broadcast		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.		
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
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



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

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



## 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**

<b>1- Educational institution</b>	<b>Anbar University - College of Education for Pure Sciences</b>
<b>University department/center</b>	<b>College of Education for Pure Sciences/Department of Mathematics</b>
<b>Course name/code</b>	<b>Mathematical Statistics -2\MAT403</b>
<b>Programs in which it is included</b>	<b>Bachelor of Mathematics</b>
<b>Available attendance forms</b>	<b>Daily</b>
<b>Semester/year</b>	<b>Quarterly</b>
<b>Number of study hours (total)</b>	<b>64</b>
<b>Date this description was prepared</b>	<b>2021-2022</b>

**Course objectives:**

- 1- For students to become familiar with the types of Mathematical Statistics.
- 2- Transferring from the description stage to the decision-making stage and logical interpretation of the results.
- 3- The course is concerned with studying an introduction to estimation theory (by point or by period) and how to obtain it.
- 4- The concept of hypothesis testing, some probability distributions, sampling distribution theory, finding the critical region, optimal test power, and the Neyman-Pearson theorem.





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



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
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	16	4



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			taking the first month's exam.		
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 exam	16	4
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



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

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



## 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**

<b>1- Educational institution</b>	<b>Anbar University - College of Education for Pure Sciences</b>
<b>University department/center</b>	<b>College of Education for Pure Sciences/Department of Mathematics</b>
<b>Course name/code</b>	<b>General Topology -1\MAT402</b>
<b>Programs in which it is included</b>	<b>Bachelor of Mathematics</b>
<b>Available attendance forms</b>	<b>daily</b>
<b>Semester/year</b>	<b>quarterly</b>
<b>Number of study hours (total)</b>	<b>64</b>
<b>Date this description was prepared</b>	<b>2021-2022</b>
<b>Course objectives:</b>	
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**



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



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<b>Course structure</b>					
<b>Evaluation method</b>	<b>Teaching method</b>	<b>Name of the unit/course or subject</b>	<b>Required learning outcomes</b>	<b>hours</b>	<b>The week</b>
<b>Exams and daily activities</b>		1-Definition (Examples) of a Topological Space. 2- Types (Examples) of Topological Spaces.	<b>Understand the prescribed material correctly and know its applications</b>	16	4
<b>Exams and daily activities</b>		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.	<b>Understand the prescribed material correctly and know its applications</b>	16	4
<b>Exams and daily activities</b>		1-Closure of a Set: Definition – Examples - Properties of closure of a set.	<b>Understand the prescribed material correctly and know its applications</b>	16	4
<b>Exams and daily activities</b>		1-Interior of a Set: Definition – Examples – Theorems.	<b>Understand the prescribed material correctly and know its applications</b>	16	4





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 قسم الاعتماد الدولي

Infrastructure	
<ul style="list-style-type: none"> <li>➤ General topology, by: J.L., Kelley's.</li> <li>➤ General topology, by: Bourbaki's.</li> <li>➤ General topology, by: R. S. Aggarwal. A Text Book On Topology.</li> </ul>	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



## 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**

<b>1- Educational institution</b>	<b>Anbar University - College of Education for Pure Sciences</b>
<b>University department/center</b>	<b>College of Education for Pure Sciences/Department of Mathematics</b>
<b>Course name/code</b>	<b>General Topology -1\MAT402</b>
<b>Programs in which it is included</b>	<b>Bachelor of Mathematics</b>
<b>Available attendance forms</b>	<b>daily</b>
<b>Semester/year</b>	<b>quarterly</b>
<b>Number of study hours (total)</b>	<b>64</b>
<b>Date this description was prepared</b>	<b>2021-2022</b>
<b>Course objectives:</b>	
<b>1- Emphasizing the importance of the topic of topological spaces in relation to other .sciences.</b>	
<b>2- For students to become familiar with the types of topological spaces</b>	
<b>3-Informing students about topological spaces, the axioms of separation, and compact .spaces</b>	
<b>4-To show students the most important applications of topological spaces</b>	

**Learning outcomes, teaching, learning and assessment methods**



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



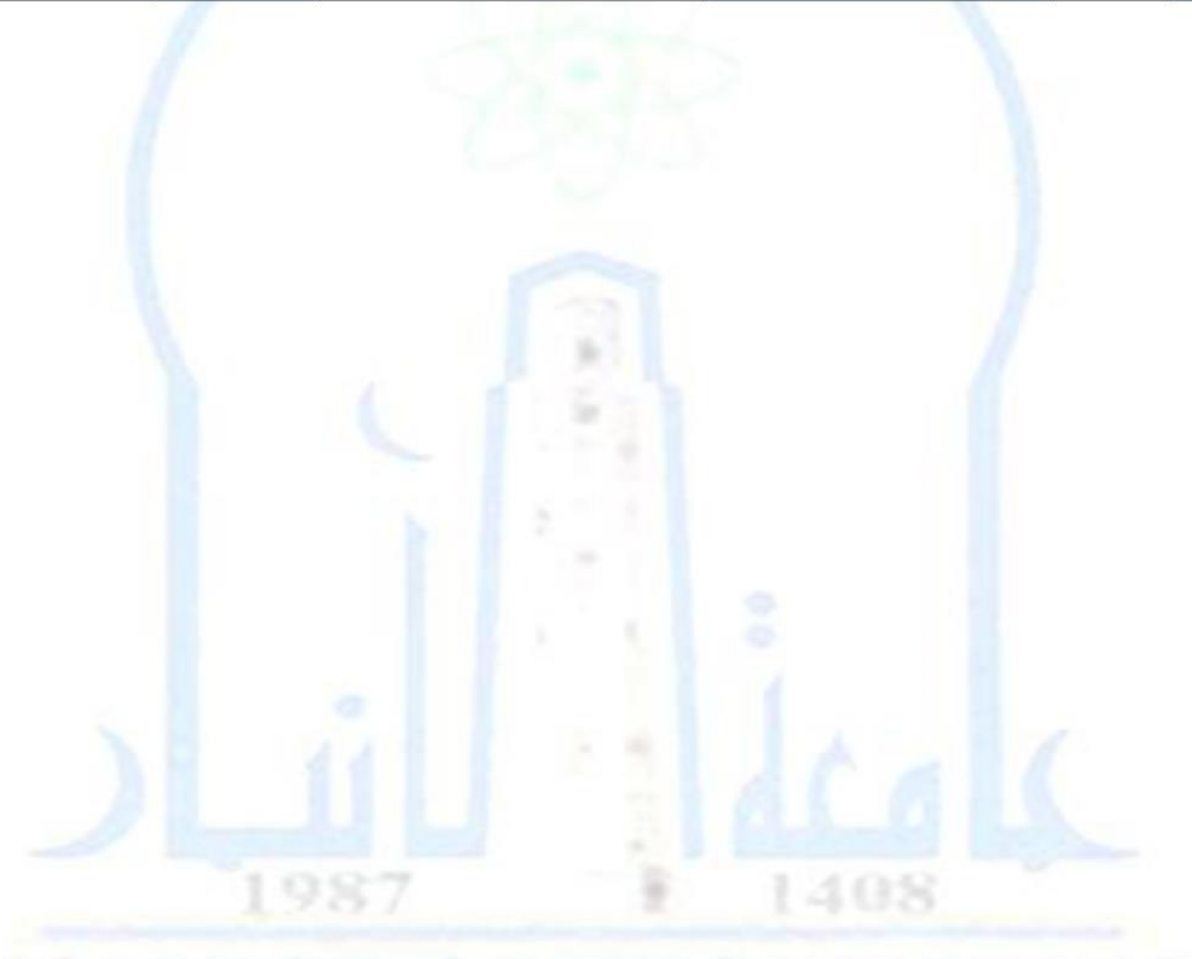
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**International Accreditation Department**

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



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		<b>2-Definition of a compact space – Examples - Properties of compactness.</b> <b>3-Connected Spaces: Separated sets – Properties of separated sets – Connected spaces- Definitions, examples and properties about connected spaces.</b> <b>4-Theorems and properties about connected spaces.</b>			
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 دائرة ضمان الجودة والاعتماد الأكاديمي  
 قسم الاعتماد الدولي

Infrastructure	
<ul style="list-style-type: none"> <li>➤ General topology, by: J.L., Kelley's.</li> <li>➤ General topology, by: Bourbaki's.</li> <li>➤ General topology, by: R. S. Aggarwal. A Text Book On Topology.</li> </ul>	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



## 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

<b>1- Educational institution</b>	<b>Anbar University - College of Education for Pure Sciences</b>
<b>University department/center</b>	<b>College of Education for Pure Sciences/Department of Mathematics</b>
<b>Course name/code</b>	<b>General Topology - 1\MAT402</b>
<b>Programs in which it is included</b>	<b>Bachelor of Mathematics</b>
<b>Available attendance forms</b>	<b>daily</b>
<b>Semester/year</b>	<b>quarterly</b>
<b>Number of study hours (total)</b>	<b>64</b>
<b>Date this description was prepared</b>	<b>2021-2022</b>
<b>Course objectives:</b>	
<b>1-Identify real numbers and their mathematical properties</b>	
<b>2-Identify applications of real numbers in different fields -</b>	
<b>3-To learn about sequences and some of their different types</b>	
<b>4-Identify real sequences and calculate their limits</b>	
<b>5-To verify the convergence of a convergent sequence</b>	
<b>6-To recognize the convergence of series and their different periods of convergence</b>	





**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**

**External tests 2- Various and interconnected questions to test the -1 student's skills**



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**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**

**Teaching and learning methods**

**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**

**Assigning the student to some group activities and duties**

**Allocate a percentage of the grade to daily assignments and tests**

**Manage the lecture in a way that makes time feel important**

**Evaluation methods**

**Active participation in class is evidence of the student's commitment and responsibility**

**Commitment to the deadline for submitting assignments and research Semester and final exams express commitment and cognitive and skill achievement .**

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

**Developing the student's ability to recognize types of groups**

**Developing the student's ability to deal with the Internet**

**Developing the student's ability to find solutions and evidence**

**Developing the student's ability to dialogue and discuss**

**Developing the student's ability to recognize types of functions**



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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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 presence	Its definition, examples, and some special infinite series, harmonic-geometric-alternating	Infinite series and convergence	4	Eleventh



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





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

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



## 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**

<b>1- Educational institution</b>	<b>Anbar University - College of Education for Pure Sciences</b>
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<b>Course name/code</b>	<b>General Topology - 1\MAT402</b>
<b>Programs in which it is included</b>	<b>Bachelor of Mathematics</b>
<b>Available attendance forms</b>	<b>daily</b>
<b>Semester/year</b>	<b>quarterly</b>
<b>Number of study hours (total)</b>	<b>64</b>
<b>Date this description was prepared</b>	<b>2021-2022</b>
<b>Course objectives:</b>	
<b>1-Identify the basic concepts of the derivative and how to find them using the definition and its applications</b>	
<b>2-Learn about the Riemann integral of functions and how to find them using the definition and its properties</b>	
<b>3-Identify function sequences, their dotted and regular convergence, and</b>	





<b>how to replace limits with integration</b>
<b>4-The identifier for measuring subsets of the set of real numbers</b>
<b>5-Identify measurable functions and their properties</b>
<b>6-Identify the Riemann-Esteljets integral and compare it with the Riemann integral</b>
<b>7-Identify the Riemann integral and its most important properties and .compare it with the Riemann integral</b>

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



**C- Thinking skills**

**External tests 2- Various and interconnected questions to test the -1 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**

**Teaching and learning methods**

**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**

**Assigning the student to some group activities and duties**

**Allocate a percentage of the grade to daily assignments and tests**

**Manage the lecture in a way that makes time feel important**

**Evaluation methods**

**Active participation in class is evidence of the student's commitment and responsibility**

**Commitment to the deadline for submitting assignments and research Semester and final exams express commitment and cognitive and skill achievement .**

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

**Developing the student's ability to recognize types of groups**

**Developing the student's ability to deal with the Internet**

**Developing the student's ability to find solutions and evidence**

**Developing the student's ability to dialogue and discuss**

**Developing the student's ability to recognize types of functions**



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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



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 presence	Its definition, examples, and some special infinite series, harmonic-geometric-alternating	Integration of Libik	4	Eleventh



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		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



<b>Infrastructure [36]</b>	
<p>Adel Ghassan Naoum, "Introduction to 1 Mathematical Analysis," University of Baghdad, Iraq, 1986, first edition</p> <p>Anwar Badraneh and others: Introduction to -2 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><b>:Required readings</b></p> <p><input type="checkbox"/> Course books</p> <p><input type="checkbox"/> Other   ▪</p>
<b>Nothing</b>	<b>Special requirements</b>
<b>Graduation research projects</b>	<b>Social services (including, for example, guest lectures, vocational (training, and field studies</b>

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



## 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**

<b>1- Educational institution</b>	<b>Anbar University - College of Education for Pure Sciences</b>
<b>University department/center</b>	<b>College of Education for Pure Sciences/Department of Mathematics</b>
<b>Course name/code</b>	<b>Partial Differential Equations 1\MAT302</b>
<b>Programs in which it is included</b>	<b>Bachelor of Mathematics</b>
<b>Available attendance forms</b>	<b>daily</b>
<b>Semester/year</b>	<b>quarterly</b>
<b>Number of study hours (total)</b>	<b>60</b>
<b>Date this description was prepared</b>	<b>2021-2022</b>
<b>1-Course objectives</b> <b>1-That the student is familiar with the definition and concept of partial</b> <b>2-differential equations and how to form them</b>	





- 3-For the student to become familiar with the classification of partial differential equations in terms of degree and rank  
 4-Identify methods for solving partial differential equations  
 Identify the applications of partial differential equations in various fields

<b>Learning outcomes, teaching, learning and assessment methods</b>
<p style="text-align: center;">A - Teaching and learning methods</p> <p style="text-align: right;">.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</p>
<p style="text-align: center;">B - Evaluation methods</p> <p style="text-align: right;">.1 Participation in the classroom            .2 Daily, semester and final written tests            .3 Oral exams in class            .4 Research activities</p>
<p style="text-align: center;">C- Thinking skills</p> <p style="text-align: right;">-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</p>
<p style="text-align: center;">D - General and transferable skills (other skills related to employability (and personal development</p> <p style="text-align: right;">-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</p>



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<b>Course structure .1</b>					
Evaluation method	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 equations I	4	the first
General questions and discussion	Lecture and discussion	How to get the equation	Partial differential equations I	4	the second
General questions and discussion	Lecture and discussion	Methods for solving first-order and first-order equations	Partial differential equations I	4	the third
General questions and discussion	Lecture and discussion	Nonlinear partial differential equations of the first order	Partial differential equations I	4	the fourth
General questions and discussion	Lecture and discussion	Review and test	Partial differential equations I	4	Fifth
General questions and discussion	Lecture and discussion	Using some transformations to solve first-order partial differential equations	Partial differential equations I	4	sixth
General questions and discussion	Lecture and discussion	Garbit method	Partial differential equations I	4	Seventh



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discussio on					
General ques tions and discussio on	Lecture and discussion	Adjustable equations method	Partial differential equations I	4	eighth
General ques tions and discussio on	Lecture and discussion	Features method	Partial differential equations I	4	Ninth
General ques tions and discussio on	Lecture and discussion	Review and test		4	The tenth
General ques tions and discussio on	Lecture and discussion	Direct integration method	Partial differential equations I	4	eleventh
General ques tions and discussio on	Lecture and discussion	Linear partial differential equations with homogeneous terms and constant higher-order coefficients	Partial differential equations I	4	twelveth
General ques tions and discussio on	Lecture and discussion	Linear partial differential equations with homogeneous terms and non-homogeneous constant coefficients of higher order	Partial differential equations I	4	The thirteenth
General ques tions and discussio on	Lecture and discussion	Linear partial differential equations with homogeneous terms and non-homogeneous constant coefficients of higher order	Partial differential equations I	4	fourteenth
Conduc ting theoreti cal tests	Lecture and discussion	Review and test	Partial differential equations I	4	Fifteenth



Infrastructure	
<b>Ordinary differential equations - - 1</b> .written by Atallah Thamer Al-Ani <b>Theory of Differential Equations -2</b> written by Amjad Ibrahim <b>Differential Equations - Part Two, -3</b> written by Hussein Mustafa Al-Awadhi	:Required readings <input type="checkbox"/> Course books <input type="checkbox"/> Other
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



## 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**

<b>1- Educational institution</b>	<b>Anbar University - College of Education for Pure Sciences</b>
<b>University department/center</b>	<b>College of Education for Pure Sciences/Department of Mathematics</b>
<b>Course name/code</b>	<b>Partial Differential Equations 2\MAT302</b>
<b>Programs in which it is included</b>	<b>Bachelor of Mathematics</b>
<b>Available attendance forms</b>	<b>daily</b>
<b>Semester/year</b>	<b>quarterly</b>
<b>Number of study hours (total)</b>	<b>60</b>
<b>Date this description was prepared</b>	<b>2021-2022</b>

**1-Course objectives**

- 1-That the student is familiar with the definition and concept of partial differential equations and how to form them
  - 2-differential equations and how to form them
  - 3-For the student to become familiar with the classification of partial differential equations in terms of degree and rank
  - 4-Identify methods for solving partial differential equations
- Identify the applications of partial differential equations in various fields



<b>Learning outcomes, teaching, learning and assessment methods</b>
<p style="text-align: center;">A - Teaching and learning methods</p> <p style="text-align: right;">.Lectures .1            .Classroom discussion from a scientific perspective .2            .Directing students to some websites to benefit from them .3            .Mini-discussions .4            .Training students on how to prepare scientific research .5</p>
<p style="text-align: center;">B - Evaluation methods</p> <p style="text-align: right;">.Participation in the classroom .1            .Daily, semester and final written tests .2            .Oral exams in class .3            .Research activities .4</p>
<p style="text-align: center;">C- Thinking skills</p> <p style="text-align: right;">Developing the student's ability to work on performing assignments and -1            .submitting them on the scheduled date            .The ability to think scientifically -2            .The ability to participate effectively in quarterly activities -3            Skill in carrying out research activities and using useful sources to -4            .support the main idea required</p>
<p style="text-align: center;">D - General and transferable skills (other skills related to employability            .(and personal development</p> <p style="text-align: right;">.Learn how to form partial differential equations -1            .Employing several methods to solve partial differential equations -2            The student acquires general skills to solve partial differential equations -3            that carry scientific meanings</p>



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**Course structure .1**

<b>Evaluation method</b>	<b>Teaching method</b>	<b>Name of the unit/course or subject</b>	<b>Required learning outcomes</b>	<b>hours</b>	<b>The week</b>
General questions and discussion	Lecture and discussion	Partial differential equations with non-homogeneous terms and constant coefficients	Partial differential equations I	4	the first
General questions and discussion	Lecture and discussion	Irreducible partial differential equations	Partial differential equations I	4	the second
General questions and discussion	Lecture and discussion	Second-order linear partial differential equations with variable coefficients	Partial differential equations I	4	the third
General questions and discussion	Lecture and discussion	Cauchy's linear partial differential equation	Partial differential equations I	4	the fourth
General questions and discussion	Lecture and discussion	Review and test	Partial differential equations I	4	Fifth
General questions and discussion	Lecture and discussion	Separation of variables	Partial differential equations I	4	sixth
General questions and discussion	Lecture and discussion	Garbit method	Partial differential equations I	4	Seventh





discuss ion					
General questio ns and discuss ion	Lecture and discussion	Fourier series	Partial differential equations I	4	eighth
General questio ns and discuss ion	Lecture and discussion	Fourier series	Partial differential equations I	4	Ninth
General questio ns and discuss ion	Lecture and discussion	Review and test		4	The tenth
General questio ns and discuss ion	Lecture and discussion	Heat conduction equation	Partial differential equations I	4	eleventh
General questio ns and discuss ion	Lecture and discussion	One dimensional wave equation	Partial differential equations I	4	twelfth
General questio ns and discuss ion	Lecture and discussion	Laplace equation	Partial differential equations I	4	The thirteenth
General questio ns and discuss ion	Lecture and discussion	Solving partial differential equations using Laplace transforms	Partial differential equations I	4	fourteenth
Conduc ting theoreti cal tests	Lecture and discussion	Review and test	Partial differential equations I	4	Fifteenth





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Infrastructure	
<b>Ordinary differential equations - - 1</b> <b>.written by Atallah Thamer Al-Ani</b> <b>Theory of Differential Equations -2</b> <b>written by Amjad Ibrahim</b> <b>Differential Equations - Part Two, -3</b> <b>written by Hussein Mustafa Al-Awadhi</b>	:Required readings <input type="checkbox"/> Course books <input type="checkbox"/> Other   ▪
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



## description form Course

### **education higher Reviewing the performance of ( ( program review academic ) ) 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 ,s functional analysi ,nodal analysis ,theory Measurement dynamic ,topology Differential equations ,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 ,e natural extension of calculusIt is th .of mathematics As for analysis .concerned with answering questions of the “how” type . The athlete takes care of answering “why” type questions

College of Education for /Anbar University cesPure Scien	Educational institution [38]
mathematics	University [39] center/department
<b>MAT301</b> /2Mathematical Analysis	code/Course name [40]
D No	Programs in which it is [41] included
Electronic lectures	Available attendance [42] forms
third academic year/Second semester	year/Semester [43]
hour 60	sNumber of study hour [44] (total)
<b>2021-2022</b>	Date this description was [45] prepared
	: Course objectives [46]



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

learning and assessment methods ,teaching ,Learning outcomes [47]
<p style="text-align: right;">Understanding Knowledge and-A .</p> the derivatives of to find Knowing the derivatives of functions and how- - .its applications and some of the definition functions using ts most importantKnowing the Riemannian integral of functions and i - derivative and By continuity relationships and properties . real numbers group of the set of the measure of a partial Knowing - importance in clarifying its ,Knowing and understanding the Libeck integral - . with the Rheiman integral it and comparing ,other sciences .The athlete analysis Gain experience and knowledge in - With each topics and their relationships Different mathematics to bin Binding - . complementary to the other is considered position each ,other
<p style="text-align: right;">           llsspecific ski-Subject -B            Scientific Reports -            Graduation research-            Teaching and learning methods         </p>



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. seminars ,learning-self ,Readings - . Activities in the classroom - . benefit from them to Directing students to some websites - thinking e student's Giving examples and questions that stimulate th - . tests and activities Semester and final -
<b>Evaluation methods</b>
Participation in electronic classes - Provide activities - Semester and final exams -
<b>Thinking skills -C</b>
and Developing the student's ability to work on performing assignments - . 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 . y to dialogue and discuss Developing the student's abilit -
<b>Teaching and learning methods</b>
Managing the lecture in an applied manner linked to the reality of daily -



<p>life to attract the student to the topic of the lesson without straying from  is flexible and amenable to the core of the topic so that the material  . understanding and analysis</p> <ul style="list-style-type: none"> <li>. Assigning the student to some group activities and duties -</li> <li>. tests Allocating a percentage of the grade to daily assignments and -</li> <li>. Manage the lecture in a way that makes time feel important -</li> </ul>
<p>uation methodsEval</p>
<p>in the electronic class is evidence of the student's commitment and participation  . responsibility</p> <p>Commitment to the specified deadline for submitting assignments and research -</p> <p>and skill Semester and final exams express commitment and cognitive  . achievement</p>
<p>other skills related to employability and )General and transferable skills -D  .(personal development</p> <ul style="list-style-type: none"> <li>. Developing the student's ability to recognize types of groups -</li> <li>. Developing the student's ability to deal with the Internet -</li> <li>. Finding solutions and evidence s ability to'evolving the studentD -</li> <li>. Developing the student's ability to dialogue and discuss -</li> <li>. Developing the student's ability to recognize types of functions -</li> </ul>



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Course structure [48]

<b>Evaluation method</b>	<b>Teaching method</b>	<b>Name of the course or /unit subject</b>	<b>Required learning outcomes</b>	<b>hours</b>	<b>the week</b>
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 and of continuity -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	calculate to How derivatives of functions using and recognition study of the properties of	derivative A	4	the third



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



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



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



Infrastructure [49]	
<p>1- Adel Ghassan Naoum -1986, "Introduction to Real Analysis", Riyadh-Al-Balad, first edition, 1986, Baghdad.</p> <p>2- Badrana Anwar -2004, "Introduction to Real Analysis and Distribution", Al-Farabi Publishing, Amman, 1992, Jordan.</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- W. Rudin, "Principles 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
<p>. Graduation research projects</p>	<p>for (including) Social services, guest lectures, example and field, vocational training (studies)</p>



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

## description form Course

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

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

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



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

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



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Understanding Knowledge and understanding -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 . Theories proof and axioms in Data using Gain experience and knowledge in -4
specific skills-Subject -B Graduation research -
Teaching and learning methods
. seminars ,learning-self ,Readings - . Activities in the classroom - . to gain interest The Internet use Instruct students to - . thinking that stimulate the student's Giving examples and questions -
Evaluation methods
electronic classes Participation in - activities Provide - Semester and final exams -
Thinking skills -C
the student's ability to work on performing assignments and Developing - . the scheduled date submitting them on . solutions to problems finding in and mathematical thinking Logical - and find solutions using the ,solve it mathematically ,Analyze the problem -





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



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Course structure [61]

<b>Evaluation method</b>	<b>Teaching method</b>	<b>Name of the unit or subject</b>	<b>Required learning outcomes</b>	<b>hours</b>	<b>the week</b>
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



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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



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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







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

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



## description form Course

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

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

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





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

learning and assessment methods ,teaching ,Learning outcomes [73]	
	Knowledge and understanding -A
rience and knowledge in dealing with groupsGaining expe - A	
Gain experience and knowledge in dealing with types of functions -2	
. Gain experience and knowledge in dealing with groups -3	
. Theories proof and axioms in Data using Gain experience and knowledge in -4	
	specific skills-jectSub -B
	Graduation research -
Teaching and learning methods	



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. seminars ,learning-self ,Readings -
. Activities in the classroom -
. to gain interest The Internet use Instruct students to -
. thinking sGiving examples and questions that stimulate the student’ -
<b>Evaluation methods</b>
electronic classes Participation in -
activities Provide -
Semester and final exams -
<b>Thinking skills -C</b>
the student’s ability to work on performing assignments and Developing - . submitting them on the scheduled date
. solutions to problems finding in and mathematical thinking calLogi -
and find solutions using the ,solve it mathematically ,Analyze the problem - . available information and theorems
. the student’s ability to dialogue and discuss Developing -
<b>ing methodsTeaching and learn</b>
Managing the lecture in an applied manner linked to the reality of daily - from straying Without life to attract the student to the topic of the lesson the material will be flexible and capable of being ,the core of the topic . ysedunderstood and anal
. activities and duties Assigning the student to some group -
and electives Allocate a percentage of the grade to daily assignments -



. Manage the lecture in a way that makes time feel important -
Evaluation methods
<p>           class is a guide to the student's onicThe electr Active participation in -            . commitment and responsibility            to the specified deadline for submitting assignments and research Commitment -            .            and skill and cognitive commitment express tests Semester and final -            . achievement         </p>
<p>           other skills related to employability and )ansferable skills General and tr -D            .(personal development         </p>
<p>           . Developing the student's ability to recognize types of groups -            . the Internet Developing the student's ability to deal with -            . lutions and evidenceFinding so s ability to'Developing the student -            . Developing the student's ability to dialogue and discuss -            . functions Developing the student's ability to recognize types of -         </p>

Course structure .11
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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 theorems, relationship with $T_0$ -space and $T_1$ -space, hereditary	$T_2$ -space, sequence in topological space and convergent sequences.	4	VI



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		and topological property.			
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 discussion and discussion	theoretical	Some properties, examples and theorems such as hereditary and topological property	Basic theorems of connected and disconnected spaces	4	eleventh



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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	urteenthfo
Comprehensi mve exa		Quiz	-----	4	Fifteenth



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Infrastructure [74]	
<p>1-JN . Sharma , Topology , Krishna Prakashan Media, 2003.            2- N. Bourbaki , General topology, part1, Addison Wesley, Reading, Mass, 1996.            3- R. Englking , Outline of general topology, Amsterdam, 1989.            4-C. Kuratowski, Topologies, Warsaw, 1952.            5-S. Willard, General topology, AddisonWesley Publishing Company, Inc , USA, 1970.            6- S. Michael, Elementary topology Second edition, Gemidnami , 1972.            translated by Atallah ,William Pervin -7 ,General Topology .Basics ,iAn-Thamer Al . 1986 ,Iraq -University of Baghdad ,Aslim Muhammad Abd Rabh -8 1999 ,Palestine ,topology of jurisprudence</p>	<p>:Required readings            Course books   ▪                              Other       ▪</p>
Nothing	requirements Special
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

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

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

College of Education for Pure Sciences/Anbar University	Educational .1 institution
mathematics	University .2 center/department
m class ro	Name of the .3 academic program
s degree' Bachelor	e final Name of th .4 certificate
quarterly	School system .5
Electronic lectures	Accredited .6 accreditation program
Nothing	Other external .7 influences
<b>2021-2022</b>	Date the description .8 was prepared
Objectives of the academic program .9	
mathematical properties And its numbers real Do not know the -	
. numbers in different fields the applications of real Identify -	
types about sequences and some of their different learn To -	





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learning and assessment methods ,Required learning outcomes and teaching .10
<p><b>nd understanding Knowledge a 1 -1</b></p> <p>The athlete analysis Gaining experience and knowledge in - 1A          With topics and their relationships Different mathematics to Bin Linking -2A          . complementary to the other is considered position each ,each other          to master the skills acquired over time and to have the student Teaching -3A          extent sound intuitive perception to a reasonable</p>
<p>skill objectives s' the program following are The -B          Scientific Reports - 1B          Graduation research - 2B          _ Duties - 3B</p>
Teaching and learning methods
<p>. seminars ,learning-self ,Readings -          . Activities in the classroom -          . benefit from them to Directing students to some websites -          . The student thought Give examples and questions that provoke -</p>
Evaluation methods
<p>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 ,hematicallysolving it mat ,Analyzing the problem -3C -</p>



<ul style="list-style-type: none"> <li>. for it using the available information and theorems</li> <li>. Developing the student's ability to dialogue and discuss -4 C</li> </ul>
Teaching and learning methods
<ul style="list-style-type: none"> <li>ly life to Managing the lecture in an applied manner linked to the reality of dai -</li> <li>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</li> <li>. Assigning the student to some group activities and duties -</li> <li>. tests centage of the grade to daily assignments andAllocating a per -</li> <li>. Manage the lecture in a way that makes time feel important -</li> </ul>
Evaluation methods
<ul style="list-style-type: none"> <li>in the electronic class is evidence of the student's commitment and participation . responsibility</li> <li>. e specified deadline for submitting assignments and researchCommitment to th -</li> <li>. Semester and final exams express commitment and cognitive and skill achievement</li> </ul>
<ul style="list-style-type: none"> <li>other skills related to ) transferable skills qualifying and General - D</li> <li>. (mentpersonal develop employability and</li> <li>Developing the student's ability to recognize types of groups -1D</li> <li>. Developing the student's ability to deal with the Internet -2D</li> <li>.Finding solutions and evidence Developing the student's ability to -3D</li> </ul>



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<p>Developing the student's ability to dial -4D</p>	
<b>Teaching and learning methods</b>	
<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 and amenable to understanding and the topic so that the material is flexible . analysis</p> <p>. Assigning the student to some group activities and duties -</p> <p>tests Allocating a percentage of the grade to daily assignments and -</p> <p>Manage the lecture in a way that makes time feel important</p>	<p>-</p> <p>-</p> <p>-</p>
<b>Evaluation methods</b>	
<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>. Achievement Semester and final exams express commitment and cognitive and skill</p>	<p>-</p> <p>-</p> <p>-</p>



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Certificates and credit hours	Program structure.11				
	units Hours and credit		Name of the course or course	Course or course code	year/Level
	practical	theoretical			
hour 60	urho 60	1	Mathematical analysis	<b>MAT301</b>	First t/semester hird academic year

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



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**Course description form**

**Course description**

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

College of Education for /Anbar University Pure Sciences	Educational institution [76]
mathematics	University [77] center/department
<b>MAT301 /1</b> Mathematical analysis	code/rse nameCou [78]
Electronic lectures	Available attendance [79] forms
third academic year/First semester	year/Semester [80]
hours 60	Number of study hours [81] (total)
<b>2021-2022</b>	Date this description was [82] prepared
: Course objectives [83]	
mathematical properties And its numbers real not know the Do -	
. numbers in different fields applications of real Identify -	
types about sequences and some of their different learn To -	



Identify - and calculate their limits real sequences
To learn - some of their differenta types bout sequences

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



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Participation in electronic classes - Provide activities - Semester and final exams -
Emotional and value goals -C Forming assignments and Developing the student's ability to work on perf -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 - Developing the student's . eoremsfor it using the available information and th ability to dialogue and discuss
Teaching and learning methods
Managing the lecture in an applied manner linked to the reality of daily life to - re of attract the student to the topic of the lesson without straying from the co the topic so that the material is flexible and amenable to understanding and . analysis . Assigning the student to some group activities and duties - tests Allocating a percentage of the grade to daily assignments and - . akes time feel importantManage the lecture in a way that m -
Evaluation methods
Active participation in the electronic class is evidence of the student's commitment . and responsibility . Commitment to the specified deadline for submitting assignments and research - . xams express commitment and cognitive and skill achievementSemester and final e
other skills related to employability )transferable skills qualifying General and -D .(and personal development . Developing the student's ability to dialogue and discuss -1D - .Finding solutions and evidence ...the student's ability to Developing -2D - . Developing the student's ability to deal with the Internet -3D -



Course structure [85]

<b>Evaluation method</b>	<b>Teaching method</b>	<b>Name of the course or /unit subject</b>	<b>Required learning outcomes</b>	<b>hours</b>	<b>the week</b>
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





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ic discuss on					
Exam	electronic	-----	Exam	4	Fifth
General questio ns and electron ic discuss on	Theoretica electroni/l c	Examples tariff dusty -are semi - spaces Euclidean spaces equivalent - metric spaces	spaces cMetri	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 on	Theoretica electroni/l c	basic Some in principles topology and its relationship to ,metric space with examples .and theories	Metric and biological space	4	VIII
General questio ns and electron ic discuss on	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 - plesexam important in theorems	Lined spaces	4	The tenth



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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 root -test p - -comparison test root -ratio test definition -test -of number theorems basic about the e number	-Series test e number	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



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preCom hensive exam	electronic	-----	Review exam	4	Fifteenth

Infrastructure .11	
Analysis Adel Ghassan Naoum “Introduction to - first ,1986Iraq - dadhgaB fo ytisrevinU ” Riyadh-Al . edition Introduction to :Badrana And others Anwar - for Publishing Awal-lA raD ” Haqiqi-Al analysis Jordan , and 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
Ring2 - <b>MAT308</b>	Name academic/ .17 program
Bachelor	Name of the final certificate
Season	School system .18
Daily	Approved preparation .19 program
Community	Other external influences .20
<b>17-6-2022</b>	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	

Learning and learning outputs and evaluation -9



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



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



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

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



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	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 <b>6-17-2022</b>	<b>3. The date this description [88] was prepared is 6-17-2021</b>
	4. Course objectives [89]
<p>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</p>	

Course outcomes and teaching, learning and evaluation methods- 5





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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



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. 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

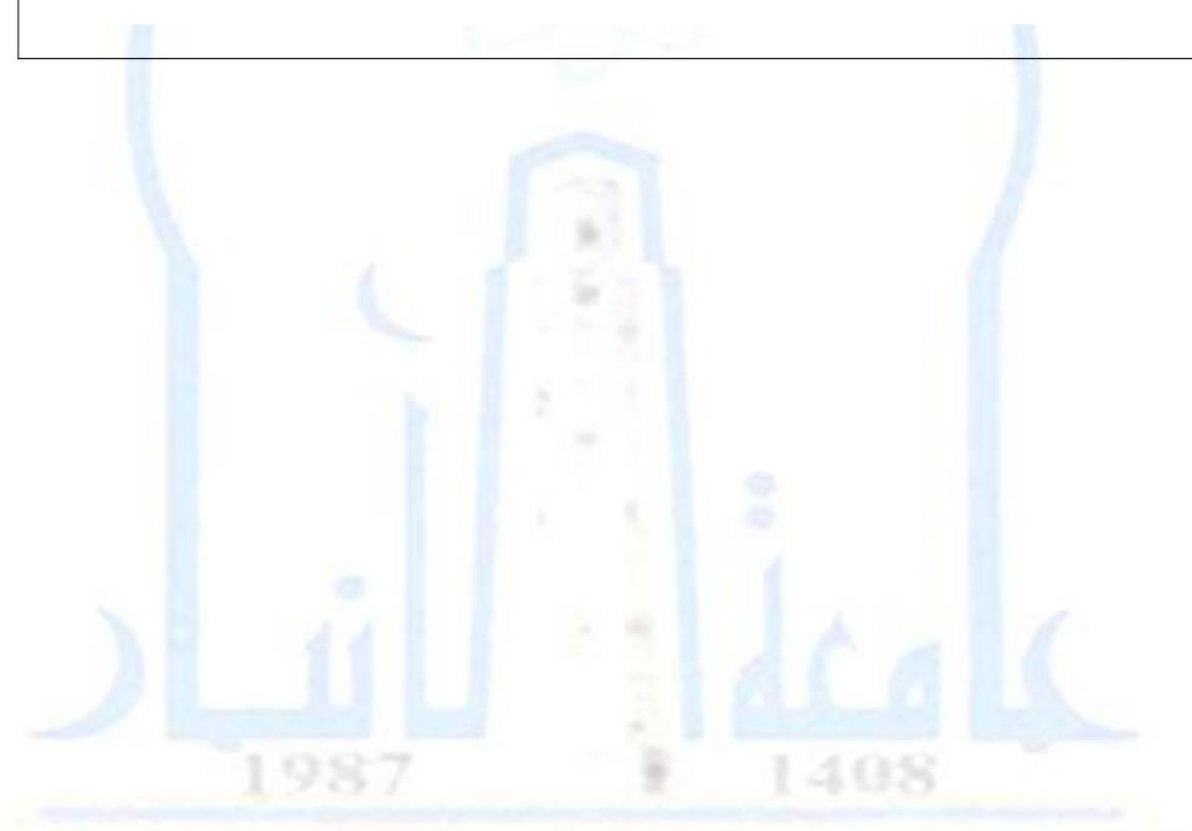
1. Infrastructure	
1- Required textbooks 3. A First Course in Abstract Algebra By J.B.F.raleigh.	1- Required textbooks 3. A First Course in Abstract Algebra By J.B.F.raleigh.



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<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>Course development plan .10</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
Ring 1 - <b>MAT203</b>	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
<b>17-5-2022</b>	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	



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



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Questions with quick exams -1 Monthly exams-2				
General and qualifying transferable skills (other skills related to employability and personal development) Tests are as off-topic as possible -1 Diverse and interconnected questions-2				
Teaching and learning methods				
Using the board - using the pen				
Evaluation methods				
Daily tests Monthly tests				
Certificates and .11 credit hours	Program structure .10			
	Hours and credit units	Name of the	Course or	Level/year



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	practical	theoretical	course or course	course code	
4	<b>4</b>		<b>Ring 1</b>	<b>- MAT203</b>	<b>quarterly</b>

Planning for personal development .10
Planning to acquire skills in learning, communicating with society, and applying vocabulary
Admission standard (setting regulations related to admission to the college or .11 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.**

	Educational institution 1
	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 (total) [91]
<b>3. The date this description was prepared is 5-17-2022</b>	<b>3. The date this description was prepared is 6-17-2021 [92]</b>
	4. Course objectives [93]
<p>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</p>	

Course outcomes and teaching, learning and evaluation methods- 5





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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 -3-D2- Training the student to accept difficult issues



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. 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>B - Electronic references, ...Internet sites</b>

Course development plan .10
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 differentiation 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)	$5 * 15 = 75$ hours, where 5 hours per week
8. Date this description was prepared	<b>2022-10-6</b>
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	



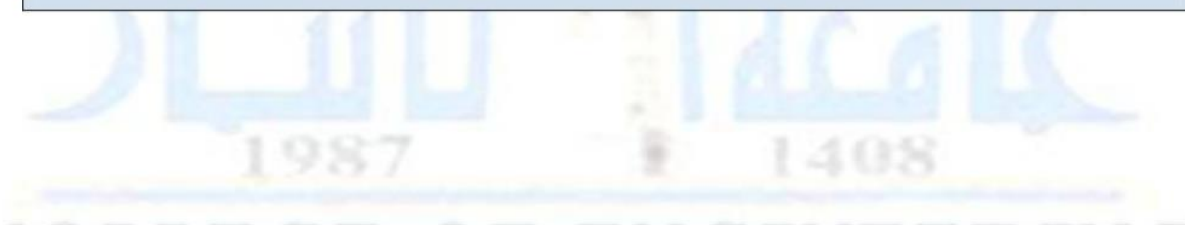
<b>.Taylor</b> most famous

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 style="text-align: center;">Teaching and learning methods</p> <ul style="list-style-type: none"> <li>-Lecture method.</li> <li>-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.</li> <li>Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics.</li> <li>Giving students homework</li> </ul>
Lecture and conclusion
Evaluation methods
By giving assignments and questions during lectures and monthly exams



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C- Thinking skills Through external questions
Teaching and learning methods
Evaluation methods
<ul style="list-style-type: none"> <li>- Questions during lecture and daily assignments.</li> <li>- Daily Quizzes.</li> <li>- Discussions during the lecture.</li> <li>- Monthly exam</li> </ul>
D - General and transferable skills (other skills related to employability and personal development.(
<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>





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[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



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12. Infrastructure	
<p><b>: Required readings</b></p> <p><input type="checkbox"/> <i>Course books</i></p> <p style="padding-left: 20px;"><input type="checkbox"/> <i>Other</i></p>	<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>
	<p>متطلبات خاصة</p>





## Course description form

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**((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 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	<b>2022-1-12</b>
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.
<p style="text-align: center;">Teaching and learning methods</p> <ul style="list-style-type: none"> <li>-Lecture method.</li> <li>-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.</li> <li>Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics.</li> <li>Giving students homework</li> </ul>
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"><li>- Questions during lecture and daily assignments.</li><li>- Daily Quizes.</li><li>- Discussions during the lecture.</li><li>- Monthly exam</li></ul>
D - General and transferable 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.



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[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 limits for functions of three variables	theory	Daily questions with assignments
Ninth	5	Partial derivatives	Calculate the partial derivatives of functions with two or more variables	theory	Daily questions with assignments



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			using the definition		
The tenth	5	Partial derivatives	Calculating partial derivatives for functions 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
twelfth	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



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12. Infrastructure	
<p><b>: Required readings</b></p> <p><input type="checkbox"/> <i>Course books</i></p> <p style="padding-left: 20px;"><input type="checkbox"/> <i>Other</i></p>	<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 .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	<b>2022-10-7</b>
9:Course objectives 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	



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"><li>- Questions during lecture and daily assignments.</li><li>- Daily Quizzes.</li><li>- Discussions during the lecture.</li><li>- Monthly exam</li></ul>
D - General and transferable 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.





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[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 discussions	theory	Daily questions with assignments
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





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12. Infrastructure	
<p><b>: Required readings</b></p> <p><input type="checkbox"/> <i>Course books</i></p> <p style="padding-left: 20px;"><input type="checkbox"/> <i>Other</i></p>	<p>-Introduction to functional analysis and its applications</p> <p>-Introductory of functional analysis with applications</p> <p>-Topics in functional analysis</p> <p style="text-align: center;">Functional Analysis Problems with Solutions</p> <p>-Papers of functional analysis with applications</p>





## 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	<b>2022-10-7</b>
9:Course objectives 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	



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"> <li>- Questions during lecture and daily assignments.</li> <li>- Daily Quizzes.</li> <li>- Discussions during the lecture.</li> <li>- Monthly exam</li> </ul>
<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>



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[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
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	
<p><b>: Required readings</b></p> <p><input type="checkbox"/> <i>Course books</i></p> <p><input type="checkbox"/> <i>Other</i></p>	<p>-Introduction to functional analysis and its applications</p> <p>-Introductory of functional analysis with applications</p> <p>-Topics in functional analysis</p> <p>Functional Analysis Problems with Solutions</p> <p>-Papers of functional analysis with applications</p>





## 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
<b>First semester / 2021-2022</b>	[103] Semester/year
60 theory for the first semester.	[104] Number of study hours (total)
2021/10/1	[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"> <li>- Lecture method.</li> <li>-Using modern illustrative methods such as Google Meet, audio recording of the lecture, and .pdf files.</li> </ul> <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"> <li>-Giving students homework.</li> </ul>
Evaluation methods
<ul style="list-style-type: none"> <li>--Questions during lecture and daily assignments.</li> <li>-Daily Quizes. -Discussions during the lecture.</li> <li>-Monthly exams.</li> </ul>
<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"> <li>-Lecture method.</li> <li>-Using modern illustrative methods such as Google Meet, audio recording of the lecture, and .pdf files.</li> </ul> <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"> <li>-Giving students homework.</li> </ul>
Evaluation methods
<ul style="list-style-type: none"> <li>-Questions during lecture and daily assignments.</li> <li>-Daily Quizes. -Discussions during the lecture.</li> <li>-Monthly exams.</li> </ul>



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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 <b>Separable type</b>	✓ Solve the ordinary differential equation. Of <b>Separable type</b>	4	4
Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of <b>Homogeneous type</b>	✓ Solve the ordinary differential equation. Of <b>Homogeneous type</b>	4	5
Daily assignments and exams	Lecture	✓ Solve the ordinary differential equation. Of <b>Exact type</b>	✓ Solve the ordinary differential equation. Of <b>Exact type</b>	4	6



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





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

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

<b>[110] Course development plan</b>
- <b>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.</b>





وزارة التعليم العالي والبحث العلمي  
جهاز الإشراف والتقويم العلمي  
دائرة ضمان الجودة والاعتماد الأكاديمي  
قسم الاعتماد الدولي

## 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

<b>1- Educational institution</b>	<b>Anbar University - College of Education for Pure Sciences</b>
<b>University department/center</b>	<b>College of Education for Pure Sciences/Department of Mathematics</b>
<b>Course name/code</b>	<b>Complex Analysis 1</b>
<b>Programs in which it is included</b>	<b>Bachelor of Mathematics</b>
<b>Available attendance forms</b>	<b>Daily</b>
<b>Semester/year</b>	<b>Quarterly</b>
<b>Number of study hours (total)</b>	<b>64</b>
<b>Date this description was prepared</b>	<b>2021-2022</b>
<b>Course objectives:</b>	
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><b>A- Knowledge and understanding</b></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><b>Teaching and learning methods</b></p>
<p><b>Blackboard + pen + data show</b></p>
<p><b>B- Subject-specific skills</b></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><b>C- Thinking skills</b></p> <p>External tests 2- Various and interconnected questions to test the student's skills</p>
<p><b>Teaching and learning methods</b></p>
<p><b>Blackboard + pen + data show</b></p>
<p><b>Evaluation methods</b></p>
<p><b>Daily and monthly examinations</b></p>
<p><b>General and transferable skills (other skills related to employability (and personal development</b></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



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

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