



Course Specifications

Course Title:	Continuum Mechanics
Course Code:	42041314
Program:	B. Sc in Mathematics
Department:	Department of Mathematics
College:	Faculty of Science and Arts in Qilawah
Institution:	AlBaha University



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A. Course Identification

1. Credit hours: 3
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: Level 6 / Third year
4. Pre-requisites for this course (if any): - Vector Analysis 42041319
5. Co-requisites for this course (if any): Analytical Mechanics

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	Blended	0	0%
3	E-learning	0	0%
4	Correspondence	45	100%
5	Other	0	0%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	45
2	Laboratory/Studio	0
3	Tutorial	0
4	Others (specify)	0
	Total	45
Other Learning Hours*		
1	Study	0
2	Assignments	0
3	Library	0
4	Projects/Research Essays/Theses	0
5	Others (specify)	0
	Total	0

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

The students in this course is studying basic concepts of continuum mechanics that related to, for example, tensors, stress and strain, and the relationship between them by Hook's law, and to identify the concept of isotropic bodies and finding equilibrium equations and stress compounds in terms of strain compounds and the concept of general deviator and the presence of strain compounds by displacement compounds.

2. Course Main Objective

Studying the properties of Tensors and Deformation Body

- ❖ After studying this course, the student is expected to be able to
- ❖ Known the calculus of Tensor.
- ❖ Analysis the stress and strain
- ❖ Solve problems related to stress and strain
- ❖ learn deformation and solve problems related to it
- ❖ Known the relation between components of stress and components of strain by Hook's law
- ❖ Know Isotropic bodies and solve related problems
- ❖ Different models of continuous medium (ideal fluid – viscous fluid)

3. Course Learning Outcomes

CLOs		Aligned-PLOs
1	Knowledge:	
1.1	Students should be able to define concepts of continuum mechanics (stress, strain, fluid, ideal fluid, viscous fluid, ...)	K1
1.2	Students should be able to state basic theorems in continuum mechanics (stress theorem, strain theorem and general Hook's law)	K2
2	Skills :	
2.1	Students should be able to apply continuum mechanics concepts, axioms and theorems in solving mathematical problems.	S1
2.2	Students should be able to solve elastic problems by using analytical methods.	S3
3	Competence:	
3.1	Students should be able to use information and communication technologies to collect reports about continuum mechanics.	C1
3.2	Students should be able to take responsibility for their own learning related to deformation bodies and fluids.	C3

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Tensors Calculus	6
2	Stress analysis	9
3	Strain analysis	9
4	The relationship between stress and strain	6
5	Study Isotropic bodies	9
6	Basic concepts to fluid	6
Total		45

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Students should be	❖ The main lectures	❖ Discussion in

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	able to define concepts of continuum mechanics (stress, strain, fluid, ideal fluid, viscous fluid, ...)	<ul style="list-style-type: none"> ❖ Scientific discussion. ❖ Open discussion. ❖ Intensifying the issues to be resolved collectively or individually. ❖ Provide a short research collective or individual. 	<ul style="list-style-type: none"> lectures ❖ Follow-up in the practical lessons and correct test ❖ Achievement tests. (Periodic tests – Midterm tests - final exams).
1.2	Students should be able to state basic theorems in continuum mechanics (stress theorem, strain theorem and general Hook's law)	<ul style="list-style-type: none"> ❖ The main lectures ❖ Scientific discussion. ❖ Open discussion. ❖ Intensifying the issues to be resolved collectively or individually. ❖ Provide a short research collective or individual. 	<ul style="list-style-type: none"> ❖ Discussion in lectures ❖ Follow-up in the practical lessons and correct test ❖ Achievement tests. (Periodic tests – Midterm tests - final exams).
2.0	Skills		
2.1	Students should be able to apply continuum mechanics concepts, axioms and theorems in solving mathematical problems.	<ul style="list-style-type: none"> ❖ The main lectures ❖ Mutual discussion and sharing the students in making cognitive skills. ❖ Educate students on selected models in the presentation 	<ul style="list-style-type: none"> ❖ Continuous evaluation through scientific meetings and other activities. ❖ Continuous discussion and questions ❖ Regular testing ❖ Discuss the duties ❖ Self-evaluation by the student (questionnaires)
2.2	Students should be able to solve elastic problems by using analytical methods.	<ul style="list-style-type: none"> ❖ The main lectures ❖ Mutual discussion and sharing the students in making cognitive skills. ❖ Educate students on selected models in the presentation 	<ul style="list-style-type: none"> ❖ Continuous evaluation through scientific meetings and other activities. ❖ Continuous discussion and questions ❖ Regular testing ❖ Discuss the duties ❖ Self-evaluation by the student (questionnaires)
3.0	Competence		
3.1	Students should be able to use information and communication technologies to collect reports about	<ul style="list-style-type: none"> ❖ Discussion collectively and then individually for the development of thinking skills with the group and constructive cooperation to solve problems. ❖ Making work groups of students 	<ul style="list-style-type: none"> ❖ Place some degrees as part of encouragement ❖ Periodic examinations ❖ Practical exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	continuum mechanics.	<ul style="list-style-type: none"> ❖ cooperate in joint research ❖ Encouraging competition among students and groups 	<ul style="list-style-type: none"> ❖ Oral discussion.
3.2	Students should be able to take responsibility for their own learning related to deformation bodies and fluids.	<ul style="list-style-type: none"> ❖ Discussion collectively and then individually for the development of thinking skills with the group and constructive cooperation to solve problems. ❖ Making work groups of students cooperate in joint research ❖ Encouraging competition among students and groups 	<ul style="list-style-type: none"> ❖ Place some degrees as part of encouragement ❖ Periodic examinations ❖ Practical exam ❖ Oral discussion.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	5	10%
2	Mid-term Exam	9	20%
3		13	10%
4	Home works	Every two weeks	10%
5	Final theoretical exam	16	50%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- ❖ Follow-up by the head of the department.
- ❖ Define 8 office hours per week for each member of the faculty who resides in his office.
- ❖ Define 2 hours weekly as Academic guidance for each faculty member for guiding a group of students academically.
- ❖ Give guidance so encouraging in assessing the performance of a teacher.
- ❖ Creating the means to make the teacher benefit of his time during his stay in office.
- ❖ Non-scientific services to assist the teacher to attend office hours.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ul style="list-style-type: none"> ❖ Course notes ❖ Chapters from different text books
Essential References Materials	<ul style="list-style-type: none"> ❖ Continuum Mechanics, By R. R. Huilgol, John wiley and Sons. ❖ Schaum's outline of Continuum Mechanics, By: Mase, Mc Grew-Hill.
Electronic Materials	<ul style="list-style-type: none"> ❖ http://www.google.com. ❖ https://bu.edu.sa/web/deanship-of-libraries-affairs ❖ https://sdl.edu.sa/SDLPortal/Publishers.aspx

Other Learning Materials	
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2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Teaching classes equipped with white board and display screen for (20) student
Technology Resources (AV, data show, Smart Board, software, etc.)	Provision of computers for students training to be used in research on scientific topics that serve the course
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Program Leaders and, Peer Reviewer	Test progress form
Extent of achievement of course learning outcome	The lecturer	Assessment of course learning outcomes program
Quality of learning resources	Students, Entities	Questionnaires

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Dr. Ibrahim Elshamy Dr. Dr.	Prepared References References
Reference No.		
Date	24-6-1441 H 18-2-2020	



Course Specifications

Course Title:	Complex Analysis
Course Code:	42041316
Program:	B. Sc in Mathematics
Department:	Department of Mathematics
College:	Faculty of Science and Arts in Qilawah
Institution:	AlBaha University



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A. Course Identification

1. Credit hours:	3 hours per week.
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered:	Level Six / Third Year
4. Pre-requisites for this course (if any):	
	➤ Real Analysis (1) (42041216)
	Note: For the most part, student only needs to be familiar with basic concepts in real analysis (especially topics related to convergence of sequences, series, and integrals). Student also should learn calculus better and learn some basic multivariable calculus. The idea of a contour integral is a little weird at first but once student make the connection to line integrals twill be fairly intuitive. It is suggested to you learn a little bit of topology since it shows up a bit in complex analysis. Knowing real analysis to a decent extent is necessary if student want to know complex analysis rigorously.
5. Co-requisites for this course (if any):	None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	3*15=45
2	Laboratory/Studio	None
3	Tutorial	None
4	Others (specify)	None
	Total	45 Hours
Other Learning Hours*		
1	Study	45 Hours
2	Assignments	None
3	Library	None
4	Projects/Research Essays/Theses	None
5	Others (specify)	None
	Total	45 Hours

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Complex analysis is a classical mathematical subject, in which functions of a complex variable is studied. Many surprising and deep results occur when such a function is holomorphic, i.e. is differentiable with respect to the complex variable instead of just being a differentiable function of a real variable. Complex analysis has applications to all other branches of mathematics.

The objectives of the course are to impart to the participants knowledge of the basic theory of Homomorphic functions and of important results as Cauchy's integral formula and the residue theorem.

Topics covered include the algebra of complex numbers, analytic functions, complex integration, Cauchy's Integral Formula, singularities, residues, Taylor and Laurent series.

2. Course Main Objective

By the end of the course the student will be able to:

- Understand the fundamental concepts of complex variable theory.
- Understand the proof of Cauchy's Theorem and Cauchy's Integral Formula, and use them to obtain further results in complex analysis.
- Calculate Taylor and Laurent series
- Use complex analysis Technique such as the residue Theorem to evaluate real integrals.

3. Course Learning Outcomes

CLOs		Aligned-PLOs
1	Knowledge:	
1.1	Recognize basic mathematical operations (Arithmetics, roots...) with complex numbers in Cartesian and polar forms.	K1
1.2	Outline the continuity, differentiability of a complex valued function at a point; establish the necessity of the Cauchy-Riemann equations to describe the analyticity of complex functions.	K2
1.3	Recall complex integral on a path, Cauchy theorem and Cauchy integral formula name zeros and singularities of a complex function and the residue theorem.	K3
2	Skills :	
2.1	Explain the fundamental concepts of complex analysis and their role in modern mathematics and applied contexts.	S1
2.2	Prove basic results in complex analysis and demonstrate accurate and efficient use of complex analysis techniques.	S2
2.3	Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concepts from complex analysis.	S3
2.4	Use the main results to treat further problems in complex analysis and its applications.	S4
3	Competence:	

CLOs		Aligned-PLOs
3.1	Demonstrate the ability to work effectively in groups and exercise leadership when appropriate.	C4
3.2	Demonstrate skills in communicating mathematics orally and writing.	C2
3.3	Demonstrate the ability to use information and communication-technology and use basic mathematical.	C1

C. Course Content

No	List of Topics	Contact Hours
1	Complex numbers: <ul style="list-style-type: none"> - Basic algebraic and geometric properties - Modulus - Exponential and Polar Form, complex roots 	9
2	Complex Functions: <ul style="list-style-type: none"> - Basic notions - Limits, Continuity and Differentiation - Cauchy- Riemann equations - Analytic functions - Harmonic functions 	9
3	Complex integral: <ul style="list-style-type: none"> - Definition and Basic Properties - Antiderivatives - Cauchy's Theorem - Cauchy's Integral Formula 	9
4	Series: <ul style="list-style-type: none"> - Convergence of sequences and series - Taylor and Laurent Series 	9
5	Isolated Singularities and the Residue Theorem: <ul style="list-style-type: none"> - Classification of singularities - Residue calculus: evaluation of integrals 	9
Total		45

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Recognize basic mathematical operations (Arithmetics, roots...) with complex numbers in Cartesian and polar forms.	<ul style="list-style-type: none"> ➤ Lectures ➤ Assignments ➤ Group discussion 	<ul style="list-style-type: none"> ➤ Quizzes ➤ Midterm ➤ Homework ➤ Assignments ➤ Final exam
1.2	Outline the continuity, differentiability of a complex valued function at a point; establish the necessity of the Cauchy-Riemann equations to describe the analyticity of complex functions.		
1.3	Recall Complex integral on a path, Cauchy theorem and Cauchy integral formula name zeros and singularities of a complex function and the residue theorem.		
2.0	Skills		
2.1	Explain the fundamental concepts of complex analysis and their role in modern mathematics and applied contexts.	<ul style="list-style-type: none"> ➤ Lecture Notes. ➤ Training students to Discussion. ➤ Team work ➤ Assignments 	<ul style="list-style-type: none"> ➤ Questions in Lectures. ➤ Short Quizzes ➤ Exams. ➤ Participation through Classwork and Homework.
2.2	Prove basic results in complex analysis and demonstrate accurate and efficient use of complex analysis techniques.		
2.3	Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concepts from complex analysis.		
2.4	Use the main results to treat further problems in complex analysis and its applications.		
3.0	Competence		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.1	Demonstrate the ability to work effectively in groups and exercise leadership when appropriate.	<ul style="list-style-type: none"> ➤ Classroom discussion and group work. ➤ Library and internet search. 	<ul style="list-style-type: none"> ➤ Assessment of group and individual assignments ➤ Direct assessment of basic skills including communication skills in English Language and use of IT. ➤ Class Activities. ➤ Giving marks for Participation in the class.
3.2	Demonstrate skills in communicating mathematics orally and writing.		
3.3	Demonstrate the ability to use information and communication-technology and use basic mathematical.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework and Assignments	During the semester	10%
2	Quiz 1	The 5 th week	10%
3	Mid-Term Exam	The 9 th week	20%
4	Quiz 2	The 13 th week	10%
5	Final Exam	The 16 th week	50%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- In addition to class lectures time, faculty members assign **6 hours per week** for student consultations and academic advice.
- During the registration period, faculty members also spend time for review and approving students' registration form. Each faculty member is assigned a group of students for advising.
- Students are able to get individual consultation and academic advice appointment with teaching staff via **e-mail** or **phone calls** or **messengers**.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ol style="list-style-type: none"> 1. John H. Mathews Complex Analysis for Mathematics and Engineering, Third Edition California State University Fullerton Russell W. Howell Westmont College. 2. By Y.K. Kwok “Applied Complex Variables for Scientists and Engineers,” Cambridge University Press (2002). 3. J. B. Conway, Functions of One Complex Variable, Second Edition, Graduate Texts in Mathematics 11, Springer-Verlag, New York, 1978. 4. Brown, J.W. and Churchill, R.V., Complex Variables and Applications McGraw-Hill 9th ed. 2013 ISBN: 9780073383170
Essential References Materials	<ol style="list-style-type: none"> 1. Ravi P. Agarwal, Kanishka Perera, Sandra Pinelas, An Introduction to Complex Analysis, Springer Science + Business Media, LLC 2011 DOI 10.1007/978- 1-4614-0195-7. 2. Juan Carlos Ponce Campuzano, Complex Analysis Problems with solutions Copyrightc 2016 Juan Carlos Ponce Campuzano PUBLISHED BY JUAN CARLOS PONCE CAMPUZANO. 3. Complex variables and it applications (Eighth Edition) BY James Ward Brown and Ruel V. Churchill.
Electronic Materials	<p>http://www.maths.tcd.ie/~richardt/414</p> <p>https://en.wikipedia.org/wiki/Category:Complex_analysis</p> <p>http://www.freebookcentre.net/Mathematics/Complex-Analysis-Books.html</p> <p>http://en.wikipedia.org/wiki/Complex_analysis</p>
Other Learning Materials	-----

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> ➤ Classrooms: The number of student does not exceed on 20 per lecture. ➤ Library
Technology Resources (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> ➤ Smart Board ➤ Provide overhead projectors and related items
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	-----

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	-Students. -Department head.	Indirect.
Extent of achievement of course learning outcomes.	-Faculty. -Department head.	Direct.
Quality of learning resources.	-Students. -Department head.	Indirect.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	



Course Specifications

Course Title:	Mathematical Methods
Course Code:	42041318
Program:	B. Sc in Mathematics
Department:	Department of Mathematics
College:	Faculty of Science and Arts in Qilawah
Institution:	AlBaha University



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F. Learning Resources and Facilities	7
1. Learning Resources	7
2. Facilities Required.....	7
G. Course Quality Evaluation	8
H. Specification Approval Data	8

A. Course Identification

1. Credit hours: 3 Hours
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: Sixth Level / Third Year.
4. Pre-requisites for this course (if any): Partial Differential Equations(42041317)
5. Co-requisites for this course (if any): N/A

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	Blended	0	0%
3	E-learning	0	0%
4	Correspondence	0	0%
5	Other	0	0%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	45
2	Laboratory/Studio	0
3	Tutorial	0
4	Others (specify)	0
	Total	45
Other Learning Hours*		
1	Study	0
2	Assignments	0
3	Library	0
4	Projects/Research Essays/Theses	0
5	Others (specify)	0
	Total	0

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces the theory and application of mathematical methods to solutions of problems that arise in science and engineering. Topics include Special functions (Gamma function, Beta function and relation between Gamma and Beta functions), Laplace Transforms, Inverse of Laplace Transforms and its applications, Power series Solution of linear differential equations, Bessel equation, Legendre equation, Fourier series, Fourier transform and its applications, Analytical solution for Boundary Value Problems in One dimensional (wave equation- Heat equation- Laplace equation in plane).

2. Course Main Objective

-To teach students the concepts of mathematical methods or techniques for solving mathematical problems.

- Fourier series and transforms; Fourier coefficient, complex form of Fourier series, Fourier transforms, Laplace transforms. Special functions, Beta Function, Error Function. Series Solution of differential Equations; Legendre, Associated Legendre, Bessel. Partial Differential Equations ; Laplace equation, steady state temperature in a rectangular plate, the diffusion or heat flow equation, the wave function.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Define basic concept of special functions (Gamma – Beta and relation between them) , Laplace transforms , Fourier series and Fourier transforms , Legendre's and Bessel's functions	K1
1.2	State the various mathematical methods to solve Ordinary Differential Equations.	K2
1.3	Framing the Physical problems and given conditions by mathematical method	K3
2	Skills :	
2.1	Explain and interpret the Concept of mathematical method	S1
2.2	Derive the recurrence relation of Legendre's and Bessel's functions	S2
2.3	Classify different types of polynomials.	S3
2.4	Frame of physical equations using special functions.	S4
3	Competence:	
3.1	Communicates effectively in oral and written form in educational situations related to the subjects of the course	C1
3.2	Take responsibility for own learning and professional development	C2
3.3	Work effectively in groups and exercise leadership when appropriate.	C3

C. Course Content

No	List of Topics	Contact Hours
1	Special functions (Gamma function, Beta function and relation between Gamma and Beta functions).	9
2	Laplace Transforms, Inverse of Laplace Transforms and its applications.	9
3	Power series Solution of linear differential equations, Bessel equation, Legendre equation.	9
4	Fourier series, Fourier transform and its applications.	9
5	Analytical solution for Boundary Value Problems in One dimensional (wave equation- Heat equation- Laplace equation in plane).	9
Total		45

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Define the fundamentals of Special Functions	Beginning each chapter by giving general idea and benefits of it. Demonstrate course information and objectives with lectures.	- Homework Assignments. - Written Mid-Term Examinations. - Written Final Examination.
1.2	Students should be able to use the Laplace transformation and Fourier transformation for solving differential equations and use Power series for solving linear differential equations.	- Lectures. - Laboratory.	- Homework Assignments. - Written Mid-Term Examinations. - Written Final Examination.
1.3	Students should be able to use Analytical solution for Boundary Value Problems in One dimensional (wave equation- Heat equation- Laplace equation in plane).	- Lectures. - Laboratory.	- Homework Assignments. - Written Mid-Term Examinations. - Written Final Examination.
2.0	Skills		
2.1	The students are able to explain and interpret the Concept of Special Functions	- Lectures.	- Homework Assignments. - Written Mid-Term Examinations. - Written Final Examination.
2.2	Enable the students to analyze the mathematical problems	- Lectures. - Laboratory.	- Homework Assignments. - Written Mid-Term Examinations. - Written Final Examination.
2.3	Students should be able to apply the Laplace transformation and Fourier transformation for solving differential equations.	- Lectures. - Laboratory.	- Homework Assignments. - Written Mid-Term Examinations. - Written Final Examination.
2.4	Apply series methods for solving ODE's.	- Lectures.	- Homework Assignments. - Written Mid-Term Examinations.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		- Laboratory.	- Written Final Examination.
3.0	Competence		
3.1	Students should be able to use information and communication technologies to gather, interpret and communicate information and ideas.	Teaching students how to use ICT.	- Homework Assignments.
3.2	Students should be able to develop their self-learning skills.	Encouraging students to develop their self-learning skills from different learning resources such as printed book, eBook, online courses, websites, educational applications, etc.	- Homework Assignments.
3.3	Students should be able to demonstrate the work either independently or being a part of a team.	- Inspiring students to believe in themselves. - Encouraging students to use cooperative learning as an educational approach.	- Homework Assignments. - Group discussion in the classroom.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework Assignments	During the Semester	10%
2	Quiz 1	The 5 th Week	10%
3	Mid-Term Exam	The 9 th Week	20%
4	Quiz 2	The 13 th Week	10%
5	The Final Examination (Written Test)	The 16 th Week	50%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

In addition to lectures, there are two ways to reach the faculty members:

- 1- **Office hours:** faculty members assign minimum 6 office hours per week for student consultations and academic advice. The consultation time is mentioned in the faculty members' timetable and is display on the faculty member's office door.
- 2- **Email:** Students may also reach the faculty members through emails, which should be written in the syllabus of the course.

Each faculty member is assigned to a group of students as an academic advisor in order to:

- 1- Review and approve his/her students' registration forms during the registration week.
- 2- Follow-up his/her students' academic progress.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ul style="list-style-type: none"> • Special functions, an introduction to the classical functions of mathematical physics; John Wiley & sons. Inc. (1999). • Fourier Analysis and its Applications , GERALD B. F. FOURIER FOLLAND , Pacific Grove , 1992 • Mathematical Methods for Physics and Engineering , K. F. RILEY, M. P. HOBSON and S. J. BENICE, Cambridge University Press, 2008 • 1431 الدوال الخاصة وبعض تطبيقاتها جامعة القصيم محمد فالح الدوسري، محمد عبده <ul style="list-style-type: none"> • محمد القويز : الطرائق الرياضية في تحليل فوريير ، فهرسة مكتبة الملك فهد الوطنية، الطبعة الأخيرة.
Essential References Materials	None
Electronic Materials	Special functions for Scientists and Engineers, W.W. Bell, Princeton, New Jersey, Toronto, London.
Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	- Classroom. - Laboratory.
Technology Resources (AV, data show, Smart Board, software, etc.)	- Data show. - Smart or regular board.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	-Students. -Department head.	Indirect.
Extent of achievement of course learning outcomes.	-Faculty. -Department head.	Direct.
Quality of learning resources.	-Students. -Department head.	Indirect.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	



Course Specifications

Course Title:	Real Analysis(2)
Course Code:	42041312
Program:	B. Sc in Mathematics
Department:	Department of Mathematics
College:	Faculty of Science and Arts in Qilawah
Institution:	AlBaha University



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A. Course Identification

1. Credit hours: 3			
2. Course type			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>
			Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	
3. Level/year at which this course is offered: 7 Fourth Year			
4. Pre-requisites for this course (if any): Real Analysis(1) (42041216)			
5. Co-requisites for this course (if any): NA			

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	75
2	Blended	√	10
3	E-learning	√	15
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	45
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	45
Other Learning Hours*		
1	Study	90
2	Assignments	45
3	Library	45
4	Projects/Research Essays/Theses	----
5	Others(specify)	
	Total	180

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description: To learn the students to the basic concepts methods, theorems and results in mathematical methods (Riemann Integral, Riemann sums, fundamental theorem. Uniform convergence of sequences and series of functions, power series. Lebesgue Measure: Borel and sigma-algebra, outer measure, Lebesgue measurable sets, Lebesgue measure and its properties, measurable functions, relation between Lebesgue and Riemann integrals.)

2. Course Main Objective: Study the concepts of Riemann and Lebesgue Theory.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Define Riemann integral, Riemann Sums, Improper integrals	K1
1.2	State fundamental theorem of derivative and integral calculus, the concepts of measure and measurable functions	K2
1.3	Describe sequences and series of functions, uniform convergence, Sigma-algebra and simple measurable functions and applications. Identify the properties of Riemann and Lebesgue integrals	K3
2	Skills :	
2.1	Solve the problems by using the main theorems of Riemann integral, improper integrals and sequence and series of functions. Solve the problems using the concepts of measure and measurable functions	S1
2.2	Study the important properties of Lebesgue integral	S3
2.3	Prove some important theorems related to Riemann and Lebesgue integrals.	S2
2.4	Comparison between Riemann and Lebesgue integrals.	S4
3	Competence:	
3.1	To participate in the discussion.	C1
3.2	Study, learn and work independently.	C2
3.3	Work effectively in teams.	C3
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Definition of Riemann Integration and its Properties with examples.	6
2	Definition, Darboux theorem, Riemann sums, the fundamental theorem of derivative and integral. Improper integrals	9
3	Sequences and series of functions: uniform and pointwise convergence of sequences and series of functions. Weierstrass M-Test and some theorem	9
4	Power series. Cauchy-Hadamard Theorem, and some theorem.	3
5	Lebesgue measure: Borel σ -algebra, outer measure, Lebesgue measurable sets, properties of Lebesgue measure. Lebesgue integral: simple functions, measurable functions	9
6	Definition of Lebesgue integral. Monotone convergence theorem, bounded convergence theorem, the relation between Lebesgue and Riemann integrals	9
Total		45

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Define Riemann integral, Riemann Sums, Improper integrals	Lectures PowerPoint presentation Debate and discussion. Assignments (Co-operative & Individual assignments). Cooperative Learning Working in small groups Individual & group research	Continuous evaluation through interaction, and presentation of research projects. Evaluation of assignments. Quiz1 & Quiz2. Midterm exam. Final written exams.
1.2	State fundamental theorem of derivative and integral calculus, the concepts of measure and measurable functions	Lectures PowerPoint presentation Debate and discussion. Assignments (Co-operative & Individual assignments). Cooperative Learning Working in small groups Individual & group research	Continuous evaluation through interaction, and presentation of summaries and reports during lectures. Evaluation of assignments. Quiz1 & Quiz2. Midterm exam. Final written exams.
1.3	Describe sequences and series of functions, uniform convergence, Sigma-algebra and simple measurable functions and applications. Identify the properties of Riemann and Lebesgue integrals	Lectures PowerPoint presentation Debate and discussion. Assignments (Co-operative & Individual assignments). Cooperative Learning Working in small groups Individual & group research.	Continuous evaluation through interaction, and presentation of summaries and reports during lectures. Evaluation of assignments. Quiz1 & Quiz2. Midterm exam. Final written exams.
2.0	Skills		
2.1	Solve the problems by using the main theorems of Riemann integral, improper integrals and sequence and series of functions. Solve the problems using the concepts of measure and measurable functions	• Lectures PowerPoint presentation Debate and discussion. Assignments (Co-operative & Individual assignments). Cooperative Learning Working in small groups Individual & group research	Continuous evaluation through interaction, and presentation of summaries and reports during lectures. Evaluation of assignments. Quiz1 & Quiz2.
2.2	Study the important properties of Lebesgue integral	Lectures PowerPoint presentation Debate and discussion. Assignments (Co-operative & Individual assignments). Cooperative Learning	Continuous evaluation through interaction, and presentation of summaries and reports during lectures. Evaluation of assignments.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		Working in small groups Individual & group research	Quiz1 & Quiz2. Midterm exam. Final written exams
2.3	Prove some important theorems related to Riemann and Lebesgue integrals.	Lectures-PowerPoint presentation -Debate and discussion.-Assignments (Co-operative & Individual assignments). Cooperative Learning Working in small groups Individual & group research	Continuous evaluation through interaction, and presentation of summaries and reports during lectures. Evaluation of assignments. Quiz1 & Quiz2. Midterm exam. Final written exams
2.4	Comparison between Riemann and Lebesgue integrals.		
3.	Competence		
3.1	To participate in the discussion.	Team work- Assignments- student presentation- reporting- Scientific media Co-operative & Individual assignments. Cooperative Learning.	Evaluation of individual & group works. Observation Card
3.2	Study, learn and work independently.	Working in small groups- Group research	Evaluation of individual & group works.
3.3	Work effectively in teams.	Team work small groups and the distribution of roles. PowerPoint - presentation. Writing reports	Oral discussion Report evaluation

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	5	10
2	Midterm Written Theoretical Exam	9	20
3	Quiz 2	13	10
4	Assignments, Activities & Attendance	During Semester	10
5	Final Practical Exam	-	-
6	Lab Reports	-	-
7	Final Written Theoretical Exam	17	50
8			

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- The presence of faculty members to provide advice, academic advice and academic guidance to the student in need within the six hours a week available to all students.
- Arrange extra hours gifted students or Program for students who default in scholastic achievement

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ul style="list-style-type: none"> - Course notes - Chapters from different text books
Essential References Materials	1-K. a. Ross, Elementary Analysis (The Theory of Calculus) Springer vrlage, 1980. 2 - Method of Real Analysis. R. Goledberg, Willy, 1974. 3-Principle of Math. Analysis, W. Ruden . 3 edd. Magzo Hall, 1976
Electronic Materials	Web Sites http://www.google.com
Other Learning Materials	----

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms equipped with smart board and display screen for (40) students
Technology Resources (AV, data show, Smart Board, software, etc.)	Provision of computers for students training to be used in research on scientific topics that serve the course.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	-----

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Extent of achievement of course learning outcomes	The teacher using an excel program that measure CLO's	Direct
Quality of learning resources	Students and Program Leaders	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

رؤية
VISION
2030



المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA
هيئة تقويم التعليم
Education Evaluation Commission

المركز الوطني للتقويم والاعتماد الأكاديمي
National Center for Academic Accreditation and Evaluation

توصيف المقرر الدراسي

طبقاً لهيئة تقويم التعليم

اسم المقرر: مهارات كتابة البحث والمقال

رمز المقرر: ١١٠١٠١١٢



نموذج توصيف مقرر دراسي

إسم المؤسسة التعليمية: جامعة الباحة	تاريخ التوصيف: ١٤٣٩/٤/١٦ هـ
الكلية / القسم: كلية العلوم والآداب بقلوة / قسم الرياضيات	

أ- التعريف بالمقرر الدراسي ومعلومات عامة عنه

١. اسم المقرر الدراسي ورمزه: مهارات كتابة البحث والمقال (١١٠١٠١٢)
٢. عدد الساعات المعتمدة: ٢ ساعة (٢ نظري)
٣. البرنامج (أو البرامج) الذي يقدم ضمنه المقرر الدراسي: بكالوريوس العلوم في الرياضيات (في حال وجود مقرر عام في عدة برامج، يبين هذا بدلاً من إعداد قائمة بكل هذه البرامج)
٤. السنة أو المستوى الدراسي الذي يعطى فيه المقرر الدراسي: السنة الثالثة (المستوى السادس)
٥. المتطلبات السابقة لهذا المقرر (إن وجدت): لا يوجد
٦. المتطلبات المتزامنة مع هذا المقرر (إن وجدت): لا يوجد
٧. موقع تقديم المقرر، إن لم يكن في المقر الرئيس للمؤسسة التعليمية: كلية العلوم
٨. نمط الدراسة المتبع (اختر كل ما ينطبق):

أ. قاعات المحاضرات التقليدية	<input checked="" type="checkbox"/>	النسبة: ٨٠%
ب. التعليم الإلكتروني	<input checked="" type="checkbox"/>	النسبة: ١٠%
ج. تعليم مدمج (تقليدي وعن طريق الإنترنت)	<input checked="" type="checkbox"/>	النسبة: ١٠%
د. بالمراسلة	<input type="checkbox"/>	النسبة: <input type="text"/>
هـ. أخرى	<input type="checkbox"/>	النسبة: <input type="text"/>

ب- الأهداف

<p>١- ما هدف المقرر الرئيس؟ يتوقع من الطالب بعد دراسة هذا المقرر أن يكون قادراً على اكتساب المعرفة اللازمة بمفهوم البحث وأنواعه المختلفة، وكيفية التخطيط له، وأسس اختيار موضوع البحث، ومراحله المختلفة، والوقوف على مفهوم المقال وأنواعه، والتعرف على المصادر والمراجع.</p> <p>نواتج التعلم لهذا المقرر: من المتوقع بعد دراسة هذا المقرر أن يكون الطالب قادراً على:</p> <ul style="list-style-type: none"> ● تحديد مفهوم البحث والمقال. ● معرفة كيفية اختيار موضوع البحث. ● الإلمام بالخطوات التي يمر بها البحث حتى يتم انجازه. ● التعرف على مفهوم المقال وأنواعه. ● اكتساب معرفة الفرق بين المصادر والمراجع.
<p>٢- اذكر بإيجاز أي خطط - يتم تنفيذها - لتطوير وتحسين المقرر الدراسي. (مثل الاستخدام المتزايد لتقنية المعلومات أو مراجع الإنترنت، والتغييرات في المحتوى كنتيجة للأبحاث الجديدة في مجال الدراسة).</p> <ul style="list-style-type: none"> ● التحديث المستمر في محتوى الموضوعات طبقاً لنتائج الأبحاث الجديدة في مجال الدراسة. ● تحديث مراجع المقرر طبقاً للمراجع الحديثة في مجال المقرر سواء مطبوعة أو رقمية.

- استخدام البلاك بورد في عمل الواجبات والاختبارات والتدريب على الاختبارات.
- يطلب من الطلاب تقديم عرض تقديمي لأحد موضوعات المقرر.

ج. وصف المقرر الدراسي (ملاحظة: المطلوب هنا وصف عام بالطريقة نفسها المستخدمة في النشرة التعريفية أو دليل البرنامج).

٢- وصف عام للمقرر: يتناول هذا المقرر معنى البحث وكيفية اختيار موضوعه وتوافر ادواته ومقومات نجاحه , كما يتطرق إلى التعرف على مفهوم المقال والخطوات المتبعة في كتابته , كما يتناول المقرر مفهوم الاقتباس وتوظيفه في البحث , كما يستعرض كيفية توثيق المعلومات والتعرف على المصادر والمراجع الأساسية والثانوية وكيفية كتابة المراجع , كما يتناول المقرر الأخلاقيات التي ينبغي أن يتحلى بها الباحث بما يحفظ حقوق الملكية الفكرية للآخرين.

١. الموضوعات التي ينبغي تناولها:

ساعات التدريس	عدد الأسابيع	قائمة الموضوعات
٢	١	مفهوم البحث وأدواته
٢	١	اخلاقيات الباحث
٢	١	أسس اختيار موضوع البحث
٢	١	مراحل البحث وخطواته
٢	١	مفهوم الاقتباس وكيفية توظيفه في البحث
٢	١	توثيق المعلومات
٢	١	ترتيب الهوامش والمصادر
٢	١	المصادر والمراجع وأنواعها
٢	١	أدوات كتابة البحث
٢	١	خطوات كتابة البحث
٢	١	مفهوم المقال وأنواعه
٢	١	خطوات كتابة المقال
٢	١	دراسة فنية لنماذج من المقال
٢	١	المراجع وكيفية كتابتها

٢. إجمالي عدد ساعات المقرر وتوزيعها:

المجموع	أخرى	تطبيق	معامل أو استديو	دروس إضافية	محاضرات	
٣٠					٣٠	ساعات التدريس الفعلية
٣٠					٣٠	الساعات المعتمدة

٣. عدد ساعات الدراسة / التعلم الفردي (الإضافي) التي يقوم بها الطالب خلال أسبوعياً:
 ساعة أسبوعية للقراءة الحرة وساعة أسبوعية لعمل الواجبات ويمكن تخصيص ساعة لإجادة المهارات من خلال تطبيقات عملية على نماذج بحثية ومقالية مختلفة.

٤. مخرجات التعلم للمقرر وفقاً لمجالات الإطار الوطني للمؤهلات واتساقها مع طرق قياسها واستراتيجيات تدريسها

يحدد الجدول التالي مجالات مخرجات التعلم الخمسة الواردة في الإطار الوطني للمؤهلات

- **أولاً:** قم بملء الجدول بمخرجات تعلم المقرر، بحيث تكون قابلة للقياس حسب المطلوب في مجالات التعلم المناسبة.

- **ثانياً:** ضع استراتيجيات التدريس التي تناسب طرق التقييم و تتسق معها ومع مخرجات التعلم المستهدفة.

- **ثالثاً:** ضع طرق التقييم المناسبة التي تساعد على قياس وتقويم مخرجات التعلم بدقة، ويجب أن تتسق مخرجات تعلم المقرر المستهدفة وطرق تقييمها واستراتيجيات تدريسها لتشكل معاً عملية تعلم وتعليم متكاملة، مع ملاحظة أنه لا يلزم أن يتضمن كل مقرر مخرجات تعلم في كل مجال من مجالات التعلم.

جدول مخرجات التعلم للمقرر

م	مخرجات التعلم للمقرر وفقاً لمجالات الإطار الوطني للمؤهلات	استراتيجيات التدريس للمقرر	طرق التقويم
١			المعرفة
١-١	يحدد مفهوم البحث العلمي وأدواته.	<ul style="list-style-type: none"> المحاضرات استخدام العروض التقديمية power point. المناقشة والحوار. 	<ul style="list-style-type: none"> الاختبارات (الاختبارات الدورية-منتصف الفصل-الاختبار النهائي). تقييم الواجبات. المشاركات أثناء المحاضرات.
٢-١	التعرف على أبرز مراحل كتابة البحث	الحوارات والنقاشات	الاسئلة والتحليلات
٣-١	مقارنة بين البحث والمقال.	بعض التطبيقات	الانشطة المتنوعة
٤-١	مقارنة المصادر والمراجع	نماذج وانشطة متنوعة	اختبارات شفوية
٢			المهارات المعرفية
١-٢	بناء فرضيات اختيار موضوع البحث والمقال	<ul style="list-style-type: none"> المحاضرات استخدام العروض التقديمية power point. المناقشة والحوار. 	<ul style="list-style-type: none"> الاختبارات (الاختبارات الدورية-منتصف الفصل-الاختبار النهائي). تقييم الواجبات. المشاركات أثناء المحاضرات.
٢-٢	اكتساب الطالب قدرة على فهم البحث وأهدافه.	قراءات وحلقات نقاش	المشاركة في قاعة الدرس
٣-٢	القدرة على الإلمام بخطوات كتابة البحث.	تدريبات وأنشطة	تقديم الواجبات و الانشطة المنزلية
٣-٢	القدرة على الإحاطة بمفاهيم الاقتباس والتوثيق.	زيارة المواقع الإلكترونية	اختبارات فصلية ونهاية
٣			مهارات العلاقات الشخصية وتحمل المسؤولية
١-٣	تنمية قدرة الطالب على التعلم الذاتي، واجراء حلقات نقاشية وورش العمل.	<ul style="list-style-type: none"> التعلم التعاوني . العمل في مجموعات صغيرة. المشاركة في الأنشطة الجماعية الصفية وغير الصفية 	<ul style="list-style-type: none"> بطاقة ملاحظة لتقييم تعامل الطلبة في مواقف مختلفة. تقييم الأعمال الفردية والجماعية.

	التعلم الذاتي.		
٢-٣	تطوير قدرة الطالب على الحوار والمناقشة	تكليف الطالب ببعض الأنشطة والواجبات المنزلية	المشاركة الفاعلة في قاعة الدرس
٣-٣	التحلي بالأمانة العلمية والالتزام بالأخلاقيات والنزاهة	حسن إدارة وقت المحاضرة	التزام الطالب بالموعد المقرر للمحاضرة، وتسليم البحوث والأنشطة
٤	مهارات الاتصال ومهارات تقنية المعلومات والمهارات العددية		
١-٤	تنمية قدرة الطالب على التعامل مع وسائل التقنية الحديثة	<ul style="list-style-type: none"> البحث والاستقصاء البحوث الفردية والجماعية الحوار والنقاش 	<ul style="list-style-type: none"> تقييم الواجبات تقييم البحوث في موعدها
٢-٤	تطوير التعامل مع الشبكة العنكبوتية.	إدارة الحوار والمناقشة عبر الشبكة العنكبوتية.	المشاركة الفاعلة في إدارة الحوار
٣-٤	تنمية التعامل مع الوسائط المتعددة.	التواصل بين الطلاب و أعضاء هيئة التدريس إلكترونياً	الملاحظة والمتابعة
٥	المهارات النفسية الحركية (إن وجدت)		
١-٥	تنمية قدرة الطالب على المحاوراة والكتابة الصحيحة، والتعبير بلغة الجسد عن موضوع معين	المحاضرات، الندوات العلمية، المنتديات والحفلات	مدى المشاركات الفاعلة والقدرة على التعبير.
٢-٥			

٥. جدول مهام تقويم الطلبة خلال الفصل الدراسي:			
م	مهام التقويم المطلوبة (مثال: اختبار، مشروع جماعي، كتابة مقال، خطابة، تقديم شفهي، ملاحظة..... الخ)	الأسبوع المحدد لتسليمه	نسبته من التقويم النهائي
١	اختبار دوري أول	٥	١٠
٢	اختبار منتصف الفصل نظري	٩	٢٠
٣	اختبار دوري ثاني	١٤	١٠
٤	واجبات ومشاركات	على مدار الفصل	١٠
٥	اختبار نظري نهائي	١٦	٥٠

د. الإرشاد الأكاديمي للطلاب ودعمهم

- ترتيبات إتاحة أعضاء هيئة التدريس والهيئة التعليمية للاستشارات والإرشاد الأكاديمي الخاص لكل طالب (مع ذكر مقدار الوقت الذي يتوقع أن يتواجد خلاله أعضاء هيئة التدريس لهذا الغرض في كل أسبوع).
- وجود أعضاء هيئة التدريس لتقديم المشورة والنصح والإرشاد الأكاديمي للطلاب المحتاج لذلك وهي في حدود ست ساعات أسبوعية متاحة لجميع الطلاب.
 - تحديد مواعيد إضافية مع الطلاب الذين يحتاجون لذلك خارج نطاق الساعات المكتتبية المتفوقين دراسياً أو المتعثرين لإعداد برامج خاصة بهم.

هـ. مصادر التعلم

- أدرج - في قائمة - الكتب المقررة المطلوبة:
- المالكي، عبيد، عبد الكريم، أحمد وسعيد جمال (٢٠١٥): مقدمة في مهارات كتابة البحث والمقال، دار الأوراق الثقافية، جامعة الملك عبد العزيز، جدة، المملكة العربية السعودية.

- حسنين, حسين محمد (١٩٩٦): طرق وأدوات جمع المعلومات والبيانات في المجتمع المحلي. دار مجد للنشر والتوزيع, عمان , الأردن.
- عبد الرحمن عبيد مصيقر, (٢٠١٢): الدليل المختصر في كتابة البحث العلمي, الطبعة الأولى, المركز العربي للتغذية, مملكة البحرين .
- عويس, خير الدين علي (١٩٩٧): دليل البحث العلمي, دار الفكر العربي, القاهرة, جمهورية مصر العربية.

المراجع الأجنبية

- Hofmann A.H. (2009) : Scientific Writing and Communication. Oxford Press, UK.
- Day R.A.&Gastel B. (2006): How to Write and Publish a Scintific Paper. Greenwood Press,London.
- Cargi M. & Cannor P.(2009):Writing of Scientific Research Articles,Wiley-Blackwell,UK.
- Day A. and Gastel B. (2012): How to Write and Publish a Scientific Paper: Seventh Edition Robert Cambridge University Press, UK.

٢. أدرج – في قائمة - المواد المرجعية الأساسية (المجلات العلمية والتقارير وغيرها):

٣. أدرج المواد الإلكترونية ومواقع الإنترنت ومواقع التواصل الاجتماعي وغيرها:

- <http://www.al-warak.net/index>
- <http://www.alarabiyah.ws>
- <http://www.alukah.net>
- <http://www.iwan.fajjal.com>
- <http://www.imamu.edu.sa/arabiyah>

٤. أدرج أي مواد تعليمية أخرى مثل البرامج الحاسوبية، البرمجيات، والأسطوانات المدمجة:

و. المرافق المطلوبة

بيّن متطلبات المقرر الدراسي من المرافق بما في ذلك حجم القاعات الدراسية والمختبرات (أي عدد المقاعد داخل القاعات الدراسية والمختبرات، وعدد أجهزة الحاسب الآلي المتاحة، وغيرها):

١. المباني (قاعات المحاضرات، والمختبرات، وقاعات العرض، والمعامل، وغيرها):
 - قاعات دراسية حديثة مزودة بالتقنيات الحديثة للتعليم وأجهزة العرض المختلفة.
 - عدد المقاعد في القاعات يكفي لجميع الطلبة.

٢. مصادر تقنية (أدوات عرض البيانات، واللوحات الذكية، والبرمجيات وغيرها):
 - جهاز كمبيوتر واحد والسبورة الذكية.
 - برمجيات

٣. مصادر أخرى (حدها: مثلاً إذا كان هناك حاجة إلى تجهيزات مخبرية خاصة، فاذكرها، أو أرفق قائمة بها):

ز. تقويم المقرر الدراسي وإجراءات تطويره

١. استراتيجيات الحصول على التغذية الراجعة من الطلاب بخصوص فعالية التدريس:

- توزيع استبانة تقويم طالب على الطلبة في نهاية كل فصل دراسي للحصول على تقويم المقرر.
- استخدام حلقات نقاش مع عدد محدود من الطلاب.
- تحليل درجات الطلبة في الاختبارات إحصائياً وتفسيرها.
- عدد مشاركات الطلبة أثناء الشرح يعد مؤشراً لفاعلية التدريس.

٢. استراتيجيات أخرى لتقويم عملية التدريس من قبل الأستاذ أو القسم:

- التشاور وتبادل الخبرات بين من يقومون بتدريس المقرر.

- التعرف على آراء الطلاب في المقرر وماشاب العملية التعليمية من أخطاء.
- التوصيات المستقلة بشأن مهام الواجبات وتقييمها.
- أخذ عينة عشوائية وإعادة تقييمها.
- قيام مشرفين بملاحظة قاعات الدراسة والتأكد من جهوزيتها.

٣. إجراءات تطوير التدريس:

- دورات تدريبية لأعضاء هيئة التدريس في طرق واستراتيجيات التعليم.
- تكليف الطلاب بالواجبات واختبارات تجريبية على برنامج البلاك بورد.
- تنظيم ورش عمل لتبادل الخبرات والآراء بين أعضاء هيئة التدريس.
- عقد لقاءات منتظمة في بداية كل فصل دراسي لمناقشة مشكلات التدريس في الفصل السابق وطرح الحلول .
- تشجيع أعضاء هيئة التدريس على حضور المؤتمرات الهادفة إلى تطوير الأداء.

٤. إجراءات التحقق من معايير إنجاز الطالب (مثل: تدقيق تصحيح عينة من أعمال الطلبة بواسطة

- أعضاء هيئة تدريس مستقلين، والتبادل بصورة دورية لتصحيح الاختبارات أو عينة من الواجبات مع أعضاء هيئة تدريس من مؤسسة أخرى):
- الإختبارات التحريرية الدورية.
 - الإختبارات الشفوية المبنية على خطة واضحة.
 - القيام بواجبات أساسية أو إضافية
 - مراجعة تصحيح أوراق الإجابة .
 - تسجيل نقاط القوة والضعف.

٥. صف إجراءات التخطيط للمراجعة الدورية لمدى فعالية المقرر الدراسي والتخطيط لتطويره:

- استطلاع آراء هيئة التدريس الذين يدرسون المقرر وعقد حلقة نقاشية بينهم لمعرفة مرنيتهم واقتراحاتهم لتطويره.
- لقاءات دورية مع المميزين من الطلاب لمعرفة نقاط القوة ونقاط الضعف في المقرر.
- عقد مقارنة بين هذا المقرر ونظيره في جامعات أخرى.
- استضافة أساتذة زائرين لتقويم المقرر.
- عقد لقاءات نصف سنوية لمناقشة سبل التطوير.
- عقد ورش عمل لأساتذة المقرر.
- مناقشات بيت أعضاء هيئة التدريس لمعرفة طرائق كل منهم لصعوبات تدريس المقرر.
- الاطلاع المستمر على المواقع الإلكترونية الخاصة بالمقرر.
- تطوير الخطط الدراسية في ضوء التوجهات المعاصرة وحاجات المجتمع.
- تقويم المقرر الدراسي.
- اعداد تقرير المقرر بصفة دورية.
- مراجعة الخطط الدراسية.

اسم منسق البرنامج:

التاريخ

التوقيع:



Course Specifications

Course Title:	Number Theory
Course Code:	42041320
Program:	B. Sc in Mathematics
Department:	Department of Mathematics
College:	Faculty of Science and Arts in Qilawah
Institution:	AlBaha University



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A. Course Identification

1. Credit hours: 3
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: Level 6, Third Year.
4. Pre-requisites for this course (if any): Foundations of mathematics (42041221)
5. Co-requisites for this course (if any): Non

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	75%
2	Blended	√	10%
3	E-learning	√	15%
4	Correspondence		
5	Other		-----

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	45
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	45
Other Learning Hours*		
1	Study	90
2	Assignments	45
3	Library	45
4	Projects/Research Essays/Theses	-----
5	Others (specify)	
	Total	180

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course is designed to give a broad overview of Number Theory, with respect to Divisibility and Factorization, Euclid's Theorem, The fundamental Theorem of Arithmetic, Congruences, the prime number Theorem, Simultaneous linear congruences, Chines remainder Theorem, Wilson's Theorem, Fermat's Theorem, Euler's Theorem, Quadratic residues and non-residues, Euler's Criterion, Gauss's Lemma, Primitive roots and Applications to cryptography.

2. Course Main Objective

The objectives of this course are to:

- introduce students to the basic concepts of number theory;
- expose students to the knowledge of host-parasite relationship;
- give students a broad perception of pure mathematics and applications of number theory in many branches of mathematics.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Define the concepts of Divisibility and Factorization, division algorithm, Euclid's algorithm, prime numbers, Fermat primes, Mersenne primes, congruence relation and residue classes, Primitive roots, Quadratic residues and nonresidues, and Euler function.	
1.2	State Euclid's Theorem, the Fundamental Theorem of Arithmetic, prime number Theorem, basic properties of congruence relation, Chinese Remainder Theorem, Euler's Theorem, Fermat's Theorem, Wilson's Theorem Euler's Criterion and Gauss's Lemma, the law of quadratic reciprocity, Primitive roots Theorem.	
2	Skills :	
2.1	Derive the proofs of main theorems and key results of number theory.	
2.2	Compute the quotient and the remainder when divide an integer by another, the prime factors of an integer, the greatest common divisor of two or more integers with or without Euclid's algorithm, least common multiple, Euler function of an integer, primitive roots, and Quadratic residues and nonresidues.	
2.3	Apply main theorems and key results of number theory to the set of integers, the concepts of number theory to cryptography, The RSA algorithm and The Diffie-Helman key agreement protocol.	
2.4	Solve complete residue systems, Linear congruences in one variable, Simultaneous linear congruences,	
3	Competence:	
3.1	Present information clearly in both written and oral form	
3.2	Take responsibility for own learning and professional development	
3.3	Work effectively in groups and exercise leadership when appropriate	
3.4	Communicates effectively in oral and written form in educational situations related to the subjects of the course.	

C. Course Content

No	List of Topics	Contact Hours
1	Divisibility and Factorization: definition and properties, division algorithm (The Euclidean algorithm), Definition of prime numbers, Euclid's Theorem, Prime Number Theorem, Fermat primes, Mersenne primes, The Fundamental Theorem of Arithmetic.	9
2	Congruences: Definitions and basic properties, residue classes, complete residue systems, reduced residue systems, Linear congruences in one variable, Simultaneous linear congruences, Chinese Remainder Theorem,	9

	Wilson's Theorem, Fermat's Theorem, pseudoprimes and Carmichael numbers, Euler's Theorem	
3	Quadratic residues: Quadratic residues and nonresidues, The Jacob and Legendre symbols: Definition and basic properties, Euler's Criterion, Gauss' Lemma, The law of quadratic reciprocity	9
4	Primitive roots: The order of an integer, Primitive roots: Definition and properties, The Primitive Root Theorem: Characterization of integers for which a primitive root exists	9
5	Applications to cryptography: The RSA algorithm, The Deffie-Helman key agreement protocol...etc.	9
...		
Total		

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Define the concepts of Divisibility and Factorization, division algorithm, Euclid's algorithm, prime numbers, Fermat primes, Mersenne primes, congruence relation and residue classes, Primitive roots, Quadratic residues and nonresidues, and Euler function.	The main lectures Scientific discussion. Open discussion. Intensifying the issues to be resolved collectively or individually. Provide a short research collective or individual. Research	Discussion in lectures Achievement tests. (Periodic tests – Midterm tests - final exams).
1.2	State Euclid's Theorem, the Fundamental Theorem of Arithmetic, prime number Theorem, basic properties of congruence relation, Chines Remainder Theorem, Euler's Theorem, Fermat's Theorem, Wilson's Theorem Euler's Criterion and Gauss's Lemma, the law of quadratic reciprocity, Primitive roots Theorem.	-Presentation (traditional lecture). -Electronic media. -Mutual discussion and sharing the students in making cognitive skills. -Educate students on selected models in the presentation	Discussion in lectures Achievement tests. (Periodic tests – Midterm tests - final exams).
2.0	Skills		
2.1	Derive the proofs of main theorems and key results of number theory.	<ul style="list-style-type: none"> • Lectures • Debate and discussion. • Assignments (Co-operative & Individual assignments). • Cooperative 	Discussion in lectures Achievement tests. (Periodic tests – Midterm tests - final exams).

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		Learning <ul style="list-style-type: none"> Working in small groups Individual & group research	
2.2	Compute the quotient and the remainder when divide an integer by another, the prime factors of an integer, the greatest common divisor of two or more integers with or without Euclid's algorithm, least common multiple, Euler function of an integer, primitive roots, and Quadratic residues and nonresidues.	<ul style="list-style-type: none"> Lectures Debate and discussion. Assignments (Co-operative & Individual assignments). Cooperative Learning Working in small groups Individual & group research	Midterm exam. Homework. Final written exams. Quiz Oral discussions
2.3	Apply main theorems and key results of number theory to the set of integers, the concepts of number theory to cryptography, The RSA algorithm and The Deffie-Helman key agreement protocol.	<ul style="list-style-type: none"> Lectures Debate and discussion. Assignments (Co-operative & Individual assignments). Cooperative Learning Working in small groups Individual & group research	Discussion in lectures Achievement tests. (Periodic tests – Midterm tests - final exams).
2.4	Solve complete residue systems, Linear congruences in one variable, Simultaneous linear congruences,	<ul style="list-style-type: none"> Lectures Debate and discussion. Assignments (Co-operative & Individual assignments). Cooperative Learning Working in small groups Individual & group	Discussion in lectures Achievement tests. (Periodic tests – Midterm tests - final exams).

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		research	
3.0	Competence		
3.1	Present information clearly in both written and oral form	Discussion collectively and then individually for the development of thinking skills with the group and constructive cooperation to solve problems.	Place some degrees as part of encouragement Periodic examinations Practical exam Oral discussion
3.2	Take responsibility for own learning and professional development	Encouraging competition among students and groups	Place some degrees as part of encouragement Periodic examinations Practical exam Oral discussion
3.3	Work effectively in groups and exercise leadership when appropriate	Making work groups of students cooperate in joint research	
3.4	Communicates effectively in oral and written form in educational situations related to the subjects of the course.	Discussion collectively and then individually for the development of thinking skills with the group and constructive cooperation to solve problems.	Place some degrees as part of encouragement Periodic examinations Practical exam Oral discussion

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	5	10
2	Midterm Written Theoretical Exam	9	20
3	Quiz2	13	10
4	Assignments, Activities & Attendance	During Semester	10
5	Final Practical Exam	-	-
6	Lab Reports	-	-
7	Final Written Theoretical Exam	17	50

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- The presence of faculty members to provide advice, academic advice and academic guidance to the student in need within the six hours a week available to all students.
- Arrange extra hours gifted students or Program for students who default in scholastic achievement

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- I. Niven, H. Zuckerman, H. Montgomery, An Introduction to the Theory of Numbers, 5th Edition, Wiley, ISBN 0471625469. - Kenneth Rosen, Elementary Number Theory and its Applications, 5th Edition, McGraw Hill, ISBN 0-201-87073-8.
Essential References Materials	Kenneth Rosen, Elementary Number Theory and its Applications, 5th Edition, McGraw Hill, ISBN 0-201-87073-8.
Electronic Materials	https://www.youtube.com/ https://en.wikipedia.org/wiki/Number_theory
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms equipped with smart board and display screen for (40) students
Technology Resources (AV, data show, Smart Board, software, etc.)	Provision of computers for students training to be used in research on scientific topics that serve the course.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	-----

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Extent of achievement of course learning outcomes	The teacher using an excel program that measure CLO's	Direct
Quality of learning resources	Students and Program Leaders	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	1- Dr/ Ahmed Ageeb Sayed Ahmed Elok1 2- Dr/ 3- Dr/
Reference No.	
Date	