



Course Specifications

Course Title:	Mathematical logics
Course Code:	MTH 433
Program:	B.Sc. in Mathematics
Department:	Mathematics
College:	College of science
Institution:	Majmaah University

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A. Course Identification

1. Credit 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 type="checkbox"/> Elective <input checked="" type="checkbox"/>
3. Level/year at which this course is offered:
4. Pre-requisites for this course (if any): Basic Mathematics
5. Co-requisites for this course (if any):

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	40	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	45
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	45

B. Course Objectives and Learning Outcomes

1. Course Description

This course will cover:

Recognize Aristotelian logics, tautology, absurdity, contingency, propositional calculus-Prove the deduction theorem for propositional calculus - Completeness and consistency of propositional calculus.

Provide a link between logic and set theory and then provide some related questions with table.

State First-order theorems - Consistency of first order predicate calculus - Completeness theorem for predicate logic.

Describe the normal and canonical form of the propositions

2. Course Main Objective

To enable the students to understand the concepts of Mathematical Logic.

- The course aims at providing the student with the proper knowledge, cognitive skills, interpersonal skills, responsibility, communication skills, use of information technology skills and self – kinetics skills.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Recognize Aristotelian logics, tautology, absurdity, contingency, propositional calculus.	K1
1.2	Prove the deduction theorem for propositional calculus - Completeness and consistency of propositional calculus.	K4
1.3	Provide a link between logic and set theory and then provide some related questions with table.	K4
1...	Describe First-order theorems - Consistency of first order predicate calculus - Completeness theorem for predicate logic. The normal and canonical form of the propositions.	K4
2	Skills :	
2.1	The students will explain and interpret a general knowledge of mathematical logics.	S1
2.2	Enable students to analyses the mathematical problems.	S1
2.3	Ability to understand and analyze the mathematical problems	S1
2...	Ability to think analytically and critically;	S1
3	Values:	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Aristotelian logics, tautology, absurdity, contingency, propositional calculus.	٦
2	The deduction theorem for propositional calculus - Completeness and consistency of propositional calculus	٦
3	A link between logic and set theory and then provide some related questions with table	٨
4	First-order theorems - Consistency of firstorder predicate calculus	١٠
5	Completeness theorem for predicate logic.	١٠
...	The normal and canonical form of the propositions.	٥
Total		٤٥

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 and Understanding		
1.1	Aristotelian logics, tautology, contingency absurdity Completeness and consistency of propositional	Direct teaching: lectures and discussions Aimed teaching: Discovery and oral questions	<ul style="list-style-type: none"> • Homework • Quiz • Midterms • Final Exams • E-exam
1.2	Completeness theorem for predicate logic First-order theorems	Direct teaching: lectures and discussions Aimed teaching: Discovery and oral questions	<ul style="list-style-type: none"> • Homework • Quiz • Midterms • Final Exams • E-exam
...			
2.0	Skills		
2.1	The students will explain and interpret a general knowledge of mathematical logics	Direct teaching: lectures and discussions Aimed teaching: -Raise the spirit of dialogue and discussion among students. - Ask indirect questions interesting and varied and give incentive to those who based solution. Indirect teaching: Peer Learning	<ul style="list-style-type: none"> • Midterms • Final Exams E-exam
2.2	Enable students to analyses the mathematical problems. Ability to understand and analyze the mathematical problems	Direct teaching: lectures and discussions Indirect teaching: Peer Learning - Assigning students solve the exercises in each chapters	<ul style="list-style-type: none"> • Midterms • Final Exams E-exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
...			
3.0	Values		
3.1			
3.2			
...			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	During semester	0
2	Midterm 1	11	20
3	E-Exam	14	10
4	Midterm 2	12	20
5	Homework	During semester	0
6	Final exam	16	40
7			
8	Total		100

*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 :

- 1- 4-office hours per week in the lecturer schedule.
- 2- The contact with students by e-mail and website.
- 3- Activation office hour for availability of academic advice and meeting the students.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1. K.H. Rosen: Discrete Mathematics and its Applications, Sixth Edition, Published by McGraw-Hill, Inc., 2007. J. Rubín: Mathematical Logic, Theory and Applications
Essential References Materials	1. K.H. Rosen: Discrete Mathematics and its Applications, Sixth Edition, Published by McGraw-Hill, Inc., 2007. 2. J. Rubín: Mathematical Logic, Theory and Applications
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	
Technology Resources (AV, data show, Smart Board, software, etc.)	
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

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	Mathematics Department
Reference No.	27
Date	8/8/1442 H -21/3/2021 G

Head of Department

Dr. Muqrin Almuqrin


