



**The University of Jordan**

**Accreditation & Quality Assurance Center**

**Course Syllabus**

**Course Name:**  
**Algebraic Graph Theory**

1	Course title	Algebraic Graph Theory
2	Course number	0301943
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/requisites	--
5	Program title	PhD. In Mathematics
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Science
9	Department	Mathematics
10	Level of course	Elective specialization requirement
11	Year of study and semester(s)	2 <sup>nd</sup> year (1 <sup>st</sup> or 2 <sup>nd</sup> semester)
12	Final Qualification	PhD. In Mathematics
13	Other department(s) involved in teaching the course	--
14	Language of Instruction	English
15	Date of production/revision	22/10/2020

**16. Course Coordinator:**

Prof. Omar AbuGhneim  
 Math 329  
 Tel: 22021  
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**17. Other instructors:****18. Course Description:**

As stated in the approved study plan.

Introduction to graphs and famous types of graphs and their properties. Studying Eulerian, Hamiltonian, Planar graphs, zero-divisor graphs and divisor graphs. Investigating clique number, independence number, characteristic polynomial, spectrum and chromatic number of graphs. Studying the automorphism group of various types of graphs. Studying strongly regular graphs.

**19. Course aims and outcomes:****A- Aims:**

1. Studying various types of graphs and finding their clique number, chromatic number, characteristic polynomial, spectrum and independence number. Also finding their automorphism groups.
2. Studying divisor, zero-divisor and strongly regular graphs.

**B- Intended Learning Outcomes (ILOs):** Upon successful completion of this course students will be able to...B1.

To know various types of graphs and their properties

B2. To determine if a given graph is Eulerian, Hamiltonian or Planar

B3. To find clique number, chromatic number and independence number for various types of graphs.

B4. To find characteristic polynomial and spectrum for various types of graphs.

B5. To characterize the zero-divisor graphs for different types of rings

B6. To decide if a given graph is a divisor graph or not.

B7. To describe the automorphism group of different types of graphs.

B8. To learn different ways of constructing strongly regular graphs

**20. Topic Outline and Schedule:**

Topic	Week	Achieved ILOs	Evaluation Methods	Reference	
Introduction to graphs and famous types of graphs	1	B 1	First Exam Final Exam	Text Book	
Eulerian, Hamiltonian and Planar graphs	2-4	B 2	First Exam Final Exam	Text Book	
clique number, independence number and chromatic number	5-6	B 3	First Exam Final Exam	Text Book	
characteristic polynomials and spectrum of graphs	7-8	B 4	Second Exam Final Exam	Text Book	
zero-divisor graphs and divisor graphs	9-10	B5 and B6	Second Exam Final Exam	Text Book	
Automorphism group of different types of graphs	11-12	B 7	Second Exam Final Exam	Text Book	
Strongly regular graphs	13-14	B 8	Final Exam	Text Book	

**21. Teaching Methods and Assignments:**

Development of ILOs is promoted through the following teaching and learning methods:

In order to succeed in this course, each student needs to be an active participant in learning – both in class and out of class.

- Class time will be spent on lecture as well as discussion of suggested problems and some group work.
- Suggested problems will be assigned at the end of each topic. Students will be asked to present their solutions for some of these problems.
- You are encouraged to work together with other students and to ask questions and seek help from the professor, both in and out of class.

**22. Evaluation Methods and Course Requirements:**

**Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:**

Evaluation Activity	Mark	Topic(s)	Period (Week)
First Exam	30		6
Second Exam	30		12
Final Exam	40		

**23. Course Policies:**

1. The student is not allowed to take the course and its pre-requisite in the same time.
2. Attendance is absolutely essential to succeed in this course. You are expected to attend every class; please notify your instructor if you know you are going to be absent. All exams must be taken at the scheduled time. Exceptions will be made only in extreme circumstances, by prior arrangement with the instructor.
3. If a student is absent for more than 10% of lectures without an excuse of sickness or due to other insurmountable difficulty, then he/she shall be barred from the final examination also he/she will get a failing grade in this course.
4. Medical certificates shall be given to the University Physician to be authorized by him. They should be presented to the Dean of the Faculty within two weeks of the student's ceasing to attend classes.
5. Test papers shall be returned to students after correction. His/her mark is considered final after a lapse of one week following their return.
7. Cheating is prohibited. The University of Jordan regulations on cheating will be applied to any student who cheats in exams or on homeworks.

**24. Required equipment:**

**25. References:**

Text Book: L. Gillman and M. Jerison: Rings of Continuous Functions, Graduate Texts in Mathematics 43, Springer-Verlag, USA, 1960.

**26. Additional information:**

Name of Course Coordinator : Prof. Omar Abu Ghneim      Signature :----- Date : 22/10/2020

Head of curriculum committee/Department : ----- Signature : -----

Head of Department : Dr. Morad Ahmad      Signature : -----

Head of curriculum committee/Faculty : ----- Signature : -----

Dean : Prof. Mahmoud Al Jaghoub      Signature : -----

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Head of Department  
Assistant Dean for Quality Assurance  
Course File