جامعة : المنصورة

كـــلية : العلـــوم

قسم / الرياضيات

١- بيانات المقرر		
كود المادة : Math 412	اسم المقرر : Graph Theory	المستوى: الرابع
التخصص : رياضيات	عدد الوحدات الدراسية: ٢ ساعة معتمدة نظرى ٢: تمارين: ١ عملى: ٠	

٢- هدف المقرر:	**For students undertaking this course, the aims are to:** - Outline the basic information of advanced courses related with graph theory. - Introduce the principles and basic concepts of the different types of graphs. - Use graphs to translate the problems in the other topics to a graph. - Enable the students to use the properties of graphs to find a solution for their problems.
٣- المستهدف من التدريس المقرر:	
أ-المعلومات والمفاهيم:	**a- Knowledge and Understanding :** **On completing this course, students will be able to:** a1- Historical acknowledgement about graph theory. a2- Understand all different types of graphs, and digraphs. . a3- Recognize different kinds of graphs and its important properties.
ب-المهارات الذهنية	**b- Intellectual Skills:** **On completing this course, students will be able to:** b1- Distinguish and to analyze the properties of each type of graphs. b2- Apply the main theorems of each type of graphs.
ج- المهارات المهنية الخاصة بالمقرر:	**c-Professional and Practical Skills:** **On completing this course, students will be able to:** c1- Learn how to use the properties of graphs to differentiate and compare between the required graphs. c2- Learn how to choose the suitable graph for the required topic.

d-General and Transferable Skills: **On completing this course, students will be able to:** d1- Use graphs to solve some problems and to present the data in graphical form. d2- Transfers some natural problems to a certain type of graphs and solve it .	**د- المهارات العامة :**
1- Introduction to graph theory. 2- Simple, Multi, general, regural, bipartite graphs and other kinds of graphs. 3- Basic concepts: adjacent, incident, degree of vertices. 4- Subgraphs: spanning, induced subgraphs. 5- Walks, trails, paths, cycles, circuts. 6- Grith, Circumference, geodesics, distances and diameters of graphs. 7- Operations on graphs: deleting and adding vertices and edges. 8- Relation between graphs: isomorphisms. 9- Connected and disconnected graphs. 10- Planar and plane graphs.11- Trees: binary trees and n-ary trees. 12- Directed graphs and concepts in dericted graphs: indegree and outdegree and directed walks. 13- Roted trees and its applications. 14- Relation between matrices and graphs.	**٤- محتوى المقرر:**
1- Lectures 2- Tutorial.	**٥- اساليب التعليم والتعلم:**
The same as normal students, only skeletal disabilities are allowed in the Faculty of Science.	**٦- أساليب التعليم والتعلم للطلاب ذوى القدرات المحدودة:**
	٧- تقويم الطلاب :
1- Oral Exam. to assess a1-a2,b1-b2,d1-d2 2- Final Exam to assess a1-a2,b1-b2,c1-c2 3- Mid-Term Exam to assess a1-a2,b1-b2,c1-c2	**أ- الأساليب المستخدمة :**

1- Oral Exam week 16 2- Final Exam week 16 3- Mid-Term Exam week 7	**ب- التوقيت :**
- Mid-Term Examination 10 - Final-Term Examination 80 - Oral Examination 10 - Practical Examination 0 Total 100%	**ج- توزيع الدرجات :**
٨- قائمة الكتب الدراسية والمراجع :	
Lecture Notes.	**أ- مذكرات:**
1- Frank Harary, Graph Theory, addison-Wesly publishing company, USA, Canada, 1972.. 2- G. Chartraud & L. Lesniak, Graphs & Digraphs, 2nd Edition, Wadsworth & Books/Cole, Math. Series, Pacific Grove, California.	**ب- كتب ملزمة**
1- Graph Theory, Coding theory and Block Designs by P.J. Comeron & J.H. Van lint.-2- Graph Theory with Applications to Engineering and Computer Science by Narsingh Deo. 3- Mathematics with applications by Gareth Williams.	**ج- كتب مقترحة :**
- http://www.utm.edu/departments/math/graph.	**د- دوريات علمية أو نشرات..**

مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

المحتويات للمقرر	أسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
1- Introduction to graph theory.	**1**	a1			
2- Simple, Multi, general, regural, bipartite graphs and other kinds of graphs.	2	a2	b1		d1&d2
3- Basic concepts: adjacent, incident, degree of vertices.	3	a2	b1		d1&d2
4- Subgraphs: spanning, induced subgraphs.	4	a2	b2	c1	d1
5- Walks, trails, paths, cycles, circuts.	5	a2	b2	c1	d1
6- Grith, Circumference, geodesics, distances and	6	a2	b2	c1	d1

diameters of graphs.					
7- Operations on graphs: deleting and adding vertices and edges.	7	a2& a3	b1, b2	c1& c2	d1
8- Relation between graphs: isomorphisms.	8	a2& a3	b1, b2	c2	d1
9- Connected and disconnected graphs.	9	a2& a3	b1	c1	d1
10- Planar and plane graphs.	10	a2	b1	c1	d1,d2
11- Trees: binary trees and n-ary trees.	11	a2& a3	b1	c1, c2	d1,d2
12- Directed graphs and concepts in dericted graphs: indegree and outdegree and directed walks.	12	a2& a3	b2	c1, c2	d1&d2
13- Roted trees and its applications.	13	a2& a3	b2	c1, c2	d1&d2
14- Relation between matrices and graphs.	14	a3	b1,b2	c2	d1&d2

أستاذ المادة : ا.د/ مجدى حكيم

رئيس مجلس القسم العلمي : ا.د. مجدى الياس فارس