

١ - بيانات المقرر		
المستوى: الرابع	اسم المقرر: Design and Analysis of Algorithms	كود المادة : Math 444
عدد الوحدات الدراسية: ٢ ساعة معتمدة نظري ٢ : تمارين: ٠ عملي: ٢		التخصص : الإحصاء وعلوم الحاسب

<p><b>For students undertaking this course, the aims are to:</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate of the knowledge and understanding of the essentials and theories of mathematics and basic sciences, in general, relevant to CS.</li> <li>2. Define the requirements of the algorithms.</li> <li>3. Apply computational and mathematical skills in building efficient algorithms and programs.</li> <li>4. Understand the theories and methods applied for making a program in any programming language.</li> <li>5. Understand the heapsort and quick sort algorithms.</li> </ol>	٢ - هدف المقرر:
٣ - المستهدف من التدريس المقرر:	
<p><b>a- Knowledge and Understanding :</b>  <b>On completing this course, students will be able to:</b>  a1- Describe the principle of algorithms to produce a well program.  a2- Recognize the elements used in algorithms.  a3- Identify the different type of algorithms.  a4- Identify the role of each of them.</p>	أ-المعلومات والمفاهيم:
<p><b>b- Intellectual Skills:</b>  <b>On completing this course, students will be able to:</b>  b1- Select the suitable algorithm for solving problems.  b2- Study an algorithm that judges validity of mathematical arguments as sorting algorithms.</p>	ب-المهارات الذهنية
<p><b>c-Professional and Practical Skills:</b>  <b>On completing this course, students will be able to:</b>  c1- Solve problems using a range of formats and approaches.  c2- Design, write and debug computer programs in appropriate languages along with using appropriate algorithms.</p>	ج- المهارات المهنية الخاصة بالمقرر:
<p><b>d-General and Transferable Skills:</b>  <b>On completing this course, students will be able to:</b>  d1- Consider community linked problems, ethics and traditions.  d2-Utilize and apply suitable strategies to accomplish well algorithm for program.  d3- Prove that this algorithm is the best for this program.</p>	د- المهارات العامة :
<p>The Role of Algorithms in Computing, Getting Started.  Algorithms complexity, Growth of Functions.  Recurrences, Probabilistic Analysis and Randomized Algorithms.  Heapsort, Maintaining the heap property, The heapsort algorithm.  Quicksort</p>	٤ - محتوى المقرر:
1- Lectures.	٥ - اساليب التعليم

2- Tutorial.	والتعلم:
The same as normal students, only skeletal disabilities are allowed in the Faculty of Science.	٦- أساليب التعليم والتعلم للطلاب ذوي القدرات المحدودة:
	٧- تقويم الطلاب :
1- Oral Exam. to assess 2- Final Exam to assess 3- Mid-Term Exam to assess 4- Practical Exam to assess	أ- الأساليب المستخدمة :
1- Oral Exam week 16 2- Final Exam week 16 3- Mid-Term Exam week 6 4- Practical Exam week 14	ب- التوقيت :
- Mid-Term Examination 10 - Final-Term Examination 60 - Oral Examination 10 - Practical Examination 20 Total 100%	ج- توزيع الدرجات :
	٨- قائمة الكتب الدراسية والمراجع :
	أ- مذكرات:
Introduction to Algorithms (2 <sup>nd</sup> Ed.) by Thomas Cormen, Charles Leieron, Ronald Rivest, and Clifford Stein; McGraw-Hill, 2001, ISBN 0-07013151-1. Sara Base, Allen Van Gelder, Computer Algorithms Introduction to Design & Analysis, Third Edition, Addison Wesley Longman 2000. Steven Skiena, The Algorithm Design Manual, Springer-Verlag New York, Inc., 1998.	ب- كتب ملزمة
	ج- كتب مقترحة :
	د- دوريات علمية أو نشرات..

#### مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسي

المحتويات للمقرر	أسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
The Role of Algorithms in Computing, Getting Started.	1-2	a1-a4			d1
Algorithms complexity, Growth of Functions.	3	a3			
Recurrences, Probabilistic Analysis and Randomized Algorithms.	4-6		b2	c2	d3
Heapsort, Maintaining the heap property, The heapsort algorithm.	7-10	a4	b1,b2	c1,c2	d3
Quicksort.	11-13	a4			d1,d2

أستاذ المادة : د/ محمد فتحي حامد الرحماوى

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