نموذج وصف المقرر

وصف المقرر

> يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة
> من الطالب تحقيقها مبرهناً عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم
> المتاحة. ولابد من الربط بينها وبين وصف البرنامج.

1. المؤسسة التعليمية	Shatt AL-Arab University
2. القسم العلمي / المركز	Computer Science – College of Science
3. اسم / رمز المقرر	Data Structures and Algorithms 2 – CS207
4. أشكال الحضور المتاحة	In person and Supported online meetings
5. الفصل / السنة	2025-2024 \ Second semester
6. عدد الساعات الدراسية (الكلي)	6 per week
7. تاريخ إعداد هذا الوصف	2025-8-1

8. أهداف المقرر

1. Master sorting and searching algorithms.
2. Understand tree structures and traversal.
3. Explore graph data structures and traversals.
4. Learn efficient data storage and retrieval.
5. Utilize versatile data structures.
6. Study heap data structures and priority queues.
7. Learn string matching algorithms.
8. Analyze time and space complexity

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9.مخرجات المقرر وطرائق التعليم والتعلم والتقييم
أ-الاهداف المعرفية
8. Apply sorting and searching algorithms effectively. 9. Utilize tree structures and perform traversals. 10. Analyze and solve problems using graph data structures and traversals. 11. Implement efficient data storage and retrieval with hash tables. 12. Employ maps, sets, multisets, and multimaps for various problem-solving scenarios. 13. Utilize heaps and priority queues for efficient data organization. 14. Apply string matching algorithms for text processing tasks. 15. Analyze algorithm complexity in terms of time and space -
ب-الاهداف المهاراتية الخاصة بالمقرر 1- 2- 3- 4-
طرائق التعليم والتعلم
1. Lectures and interactive discussions 2. Practical laboratory sessions 3. Problem-solving exercises and tutorials 4. Simulation tools and software 5. Assessments (exams, projects) with feedback
طرائق التقييم
Quizzes Assignments Projects / Lab. Exam Final Lab Final Exam
ج- الاهداف الوجدانية والقيمية 1- 2- 3- 4-
طرائق التعليم والتعلم

	طرائق التقييم

د ـ المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي) .
 	
 1. **Problem-Solving Skills:**
    o Develop logical and analytical thinking.
    o Analyze complex problems and design efficient solutions using appropriate data structures.
 2. **Teamwork and Collaboration:**
    o Work effectively in group projects to design and implement algorithms.
    o Collaborate with peers to solve programming challenges in a structured way.
 3. **Effective Communication:**
    o Communicate technical ideas clearly using appropriate terminology, diagrams, and documentation.
    o Write reports that explain algorithm design, implementation, and testing.
 4. **Time Management:**
    o Meet deadlines for assignments and projects.
    o Balance theoretical study with practical coding efficiently.
 5. **Self-Learning and Continuous Development:**
    o Explore concepts beyond the textbook through online resources and research.
    o Engage in independent study to understand advanced topics and enhance learning.
 6. **Use of Modern Tools and Technologies:**
    o Utilize integrated development environments (IDEs) and debugging tools.
    o Apply software tools for data visualization and performance analysis.
 7. **Employability Readiness:**
    o Acquire programming and algorithmic skills relevant to industry needs.
    o Understand how data structures are applied to solve real-world problems in software development.	

	10.بنية المقرر

الاسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة/او الموضوع	طريقة التعلم	
2 + 1	12		Sorting and Searching: Bubble Sort, Quick Sort, Merge Sort, Sequential Search, Interval Search	Theory+ LAB	
4 + 3	12		Trees: General trees, Binary trees, Tree traversal, Balanced Trees	Theory+ LAB	
6 + 5	12		Graphs: Data Structures for Graphs, Graph Traversals, Shortest Paths	Theory+ LAB	
7	6		Hash Tables	Theory+ LAB	
8	6		Maps, Sets, Multisets, and Multimaps	Theory+ LAB	
9	6		Exam I	Theory+ LAB	
11 + 10	12		Heaps: The Heap Data Structure, Implementing a Priority Queue, with a Heap, Analysis of a Heap-	Theory+ LAB	

		Based Priority Queue, Bottom-Up Heap Construction			
	Theory+ LAB	Text Processing: String Matching algorithms		12	13 + 12
	Theory+ LAB	Algorithm Analysis: Time Complexity, Space Complexity		12	15 + 14
		Preparatory week before the final Exam		6	16

	11.البنية التحتية
Data Structures and Algorithms in Java. Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser. 6th Edition. 2014 John Wiley & Sons, Inc.	1-الكتب المقررة المطلوبة
Data Structures and Abstractions with Java™. Frank M. Carrano and Timothy M. Henry. Fifth Edition 2019 Pearson Education, Inc.	2-المراجع الرئيسية(المصادر)
Data Structures and Abstractions with Java™. Frank M. Carrano and Timothy M. Henry. Fifth Edition 2019 Pearson Education, Inc.	أ)الكتب والمراجع التي يوصى بها(المجلات العلمية,التقارير,.......)
https://www.javatpoint.com/data-structure-tutorial	ب)المراجع الاكترونية,مواقع الانترنيت,.....

	12.خطة تطوير المقرر الدراسي