|  |  |  |
| --- | --- | --- |
| المملكة العربية السعودية  وزارة التعليم العالي  **جامعة أم القرى**  الكلية الجامعية بالجموم – قسم الحاسب الآلي |  | Kingdom of Saudi Arabia  Ministry of Higher Education  **Umm Al-Qura University**  University College in Al-Jamoum  Computer Dept. |

Course Specification

1. **Course number and name:** (2316327-3) File Organization and Processing
2. **Credits and contact hours:** 3 Credits

(Lecture: 3/week – Practical Session: Non)

1. **Instructor’s or course coordinator’s name:** Dr. Abdel-Rahman Hedar
2. **Text books**
3. **Main Text book:** Michael J. Folk, Bill Zoellick and Greg Riccardi, File Structures: An Object-Oriented Approach with C++, Addison Wesley, 2nd Edition, 1998.
4. **Reference:** Daniel Grosshons, File Systems design and implementation, Prentice Hall, 2000.
5. **Specific course information**
6. **brief description of the content of the course (Catalog Description):**
7. This course aims to introduce the topic of file structures design and discuss a number of advanced data structure concepts that are necessary for achieving high efficiency in file operations. In addition, students should develop important programming skills in an object-oriented language such as C++.
8. **prerequisites or co-requisites:** Data Structures & Algorithms (2316318-4)
9. **indicate whether a required, elective, or selected elective course in the program:** required
10. **Specific goals for the course**

The student will be able to:

1. Describe how data is saved on secondary storages for achieving high efficiency in File Operations.
2. Understand how file organization allows applications to read, write and modify data.
3. Identify cost-based query optimization to find needed data that match some search criteria quickly.
4. Show practical programming skills to develop file processing and organizing applications.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Course*  *Goals* | *Program Outcomes* | | | | | | | | | | |
| SOa | SOb | SOc | SOd | SOe | SOf | SOg | SOh | SOi | SOj | SOk |
| 1 | ✓ |  |  |  |  |  |  |  |  |  |  |
| 2 | ✓ | ✓ |  |  |  |  |  |  |  |  |  |
| 3 | ✓ | ✓ |  |  |  |  |  |  |  | ✓ |  |
| 4 |  |  | ✓ |  |  |  |  |  |  | ✓ |  |

|  |  |
| --- | --- |
| **Relationship of Course Goals to the Program Student Outcomes** | |
| **SOa** | An ability to apply knowledge of computing and mathematics appropriate to the discipline   * *Students will develop an understanding of how to represent different algorithm resource requirements as mathematical functions on the size of the input.* |
| **SOb** | An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.   * *Students can analyze the time and space requirements of a particular problem by performing asymptotic analysis.* |
| **SOc** | An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.   * *Students are asked to modify algorithms to produce different outputs or combine algorithms and data structures to offer new solutions.* |
| **SOj** | An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.   * *Students are able to compare various algorithms for specific problems and the optimal choice of data structures.* |

1. **Brief list of topics to be covered**

* Introduction to file structures
* Fundamental file processing operations
* Secondary storage and system software
* Organizing files for performance
* File Compression
* Indexing
* Multi-level indexing and B-Trees
* Hashing