



Banha University



Faculty of Computers &
Informatics

File Organization Course Specifications

Faculty: Computer and Informatics

Department: Scientific Computing

Program(s) on which the course is given: Bachelor in Computer and Information Sciences

Major or Minor element of programs : All majors

Department offering the program : Scientific Computing

Department offering the course : Computer Science

Academic year / Level : 2nd year / B.Sc.

Date of specification approval : 23/2/2010

A. Basic Information

Title: File Organization

Code: DBA 271

Lectures: 3 hrs/week

Tutorial:

Practical: --- 2 hrs/week

Credit Hours: ---

Total: 5 hrs/week

B. Professional Information

1. Overall Aims of Course:

By the end of the course, a successful student should be able to:



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1. Design internal file structures and formats.
2. Use modern keyed access methods, indexes & hashing.
3. Build the structure; retrieve selected data, update and maintain the Structure.
4. Understand the storage data in memory & media storage.
5. Reduce the access time as much as possible.

1. Intended Learning Outcomes of Course (ILOs):

a. Knowledge and Understanding:

- a1- Name File organization methods.
- a2- Give an account of Data Types.

b. Intellectual Skills:

At the end of the course the student is :

- b1- able to interpret conceptual models and apply them in different contexts
- b2- able to analyze specifications appropriate to specific problems and plan strategies for their solution.

c. Professional and Practical Skills:

At the end of the course, the student will be able to:

- c1- Analyze, design write, and test computer software applications and systems.
- c2- Appreciate the features of complex computing hardware and software and operate them effectively.

d. General and Transferable Skills:

- d1- Retrieve information from a variety of sources such as libraries, printed or electronic sources.
- d2- Choose and formulate suitable strategies to accomplish well-defined goals.

e. Attitude:

- e1. A knowledge and respect of ethics and ethical standards in relation to a major area of study.
- e2. Illustrate the use of example, analogy, and counter-analogy in ethical argument.
- e3. Demonstrate an ethical behavior toward software copyrights



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2. Contents:

Topic	No. of hours	Lecture	Tutorial
Fundamental of file processing: <ul style="list-style-type: none"> • Introduction • Physical & Logical Files. • File Opening, Reading and Writing. • Seeking 	5	3	2
Secondary Storage and System Software: <ul style="list-style-type: none"> • Disks. • Magnetic Tape. • Disk versus Tape. • Physical Organization of CD-ROM 	5	3	2
Fundamental File Structure Concepts: <ul style="list-style-type: none"> • Field and Record Organization. • Using Classes to Manipulate Buffers. • Managing Fixed-Length Buffers. • An Object-Oriented Class for Record Files 	5	3	2
Managing Files of Records: <ul style="list-style-type: none"> • Record Access. • More about Record Structures. • File Access and File Organization. • Beyond Record Structures • Portability and Standardization. 	5	3	2
Organizing Files for Performance: <ul style="list-style-type: none"> • Introduction • Reclaiming Space in Files • Internal Sorting and Binary Searching. • Key Sorting. 	5	3	2
Indexing: <ul style="list-style-type: none"> • Introduction • A Simple Index for Entry-Sequential Files • Large Indexes to Hold in Memory 	5	3	2



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<ul style="list-style-type: none"> • Indexes Access by Multiple Keys • Improving The Secondary Index Structure • Selective Indexes • Binding 			
<p>Consequential Processing & the Sorting:</p> <ul style="list-style-type: none"> • Implementing Consequential Process. • Extension the Model by Multi-way Merging. • A Second Look at Sorting in Memory. • Merging for Sorting Large Files on Disk. 	10	6	4
<p>Multilevel Indexing, B-Trees and B+ Trees:</p> <ul style="list-style-type: none"> • Introduction. • Statement of the Problems. • Indexing with Binary Search Trees. • Multilevel Indexing. • B-Trees and B+ Trees. • B-Trees and B+ Trees Methods Search. 	10	6	4
<p>Hashing:</p> <ul style="list-style-type: none"> • Introduction. • A simple Hashing Algorithm. • Hashing Functions and Record Distributions. • Collision Resolution • Buckets • Making Deletions 	10	6	4