



## CS 173 - ADVANCED PROGRAMMING

College/Institute	College of Business Studies
Scientific Department	Computer and Information Systems
Course Title	Advanced Programming / برمجة متقدمة
Course Number	CS 173
Language of Instruction	English
Prerequisites	CS 103
Credits	4
Hours	5
Theoretical Hours per week	3
Practical Hours per Week	2
Category	Major Core

### COURSE DESCRIPTION

This course is a continuation of CS103 programming fundamentals, using the same programming language; the course will extend the object-oriented programming principles to a moderate technical level of details. Apart from creating and manipulating members, objects, and classes, using an up-to-date Integrated Development Environment (IDE), the course will start by recapping the previous programming course arrays manipulation section, adding the applications of arrays as well (Sorting and Searching), Emphasis is placed on abstraction, encapsulation, inheritance, and polymorphism as the major four concepts of Object Oriented Principles. The course will introduce File Input/output, Exception handling, and advance data structures manipulation using Collection Framework and Generics. Upon completion, students should be able to understand, code, test, and debug a class diagram of more than five classes.

### COURSE OBJECTIVES

1. Automate arrays sorting and searching algorithms
2. Understand class diagram of at least five classes
3. Understand Object Oriented Core Principles
  - a. Abstraction
  - b. Encapsulation - Information hiding
  - c. Inheritance
  - d. Polymorphism
4. Professionally manipulate binary and text files
5. Develop exception aware programs
6. Use predefined data structures bundled with Collection Framework
7. Read API documentation and implement solutions based on knowledge obtained directly from that documentation
8. Generate API documentation for student-written classes



## OUTLINE OF TOPICS AND SEQUENCE

Sequence	Topics	Week	Theo. Hours	Practical Hours
1	Java Arrays	1 , 2 , 3	9	6
2	Arrays Applications (Sorting and Searching)	4 , 5	6	4
3	Object Oriented Concepts (Abstraction, Encapsulation, Inheritance, and Polymorphism)	6 , 7 , 8	9	6
4	Exception Handling	9	3	2
5	File input / output	10 , 11, 12	9	6
6	Using Collections	13	3	2
<b>Total Theoretical and Practical Hours</b>			<b>39</b>	<b>26</b>

Note: Week 14 left for project discussions and examination

## DELIVERY METHODS

- ◆ Lectures: 3 hours per week ( i.e. 3 credit)
- ◆ Laboratories: 2 hours per week ( i.e. 1 credit)

## RECOMMENDED TEXT / OTHER LEARNING MATERIALS / AND REFERENCES

[Text] Java Programming Guided Learning with Early Objects [Author] D.S Malik & Robert P. Burton  
[Publisher] Course Technology Incorporated [ISBN13] 978-1-4239-0162-4 [ISBN10] 1-4239-0162-2

## EVALUATION METHODS

Students will be evaluated as follows:

Evaluation Method	Percentage
Lab Work	10%
Homework or Quizzes	10%
Midterm Exam ( 2 Exams “ Theoretical or Practical “ )	30%
Final Examination ( Theoretical or Practical )	50%
<b>Total</b>	<b>100%</b>