KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

Programming Concepts & Algorithms Course Syllabus			
Course Title	**Programming Concepts & Algorithms + lab**		
Course Code	**CPE 2405C**	**No. of Credits**	**(4 CHs)**
Computer Department	**Computer Department**	**Collage**	**Engineering**
Pre-requisites Course Code	**Introduction to Computer (CMP 1200)**	**Co-requisite Course Code**	**None**
Course Instructor	**Adnan H. M. Al-Helali , PhD**		
Email	**Adnan.hadi@komar.edu.iq**	**Office No. 208**	**IP No. 148**
Course Other Teacher(s) /Tutor(s)	**None**		
Teaching Hours	**Monday and Wednesday from 8:00 to 9:50 AM**		
Contact Hours	**Tuesday from 11:00 to 12:00** **Or by appointment, also you can send an email at any time.**		
Course Type	❒ **CPE Requirement**		
Offer in Academic Year	☐ **Spring Semester 2015/2016**		

COURSE DESCRIPTION:

This course affords students a basic understanding to problem solving techniques and operations on data using the fundamental components of a programming language. Fundamental components of a programming language including simple and structured data representation; mathematical and logical operations; input/ output, control and loop structures; functions. This course also provides students with the knowledge and skills in complexity analysis and design of computer algorithms.

COURSE OBJECTIVES:

As part of this course, students

1. Will be introduced to Java programming IDE techniques.
2. Will be introduced to Java language syntax.
3. Will learn variables declarations, control statements, loops, functions, and arrays.
4. Will write programs for wide variety problems in math, science, financials, and games.
5. Will understand standard set of important algorithms from different areas of computing and analyze their efficiency.

COURSE LEARNING OUTCOMES (CLO):

Upon successful completion of this course, students will be able to:

1. Explain how to use a Java IDE to develop programs [ABET Program Outcome K].
2. Distinguish between variables data types and constants and use them in calculations [ABET Program Outcome I, K].
3. Evaluate decisions and conditions using control structures selection statements and loops [ABET Program Outcome I, K].

4. Use array and Java functions in programming [ABET Program Outcome I, K].
5. Create new programs to solve a variety of problems in math, science, business, and games [ABET Program Outcome A].
6. Understand the strategies for algorithms to solving basic programming problems [ABET Program Outcome E].

COURSE CONTENT:

Course topics include:

1. Introduction
2. Data and Expressions
3. Using Classes and Objects
4. Conditionals and Loops
5. Arrays
6. Analysis of Algorithms
7. Searching and Sorting Algorithms

GRADING POLICY

Grades	Letter	GPA	Grades	Letter	GPA
95-100%	**A**	4.0	70-74%	**C**	2.0
94-90%	**A-**	3.7	**65-69%**	**C-**	1.7
87-89%	**B+**	3.3	60-64%	**D+**	1.3
83-86%	**B**	3.0	55-59%	**D**	1.0
80-82%	**B-**	2.7	50-54%	**D-**	0.7
75-79%	**C+**	2.3	0-49%	**F**	0.0
Withdrawal	**W**	-	Incomplete	**I**	-

Note: Passing Grade is 65% and above

COURSE TEACHING AND LEARNING ACTIVITIES

1. **Lectures**: The lectures provide a broad introduction to each topic and emphasis key concepts.
2. **Case Studies:** the numerous Case Studies are an important learning tool, integrated closely with the theoretical materials presented in each chapter.
3. **Chapter Labs**: Every chapter ends with Lab.
4. **Quick Quizzes**: There are some announced quizzes.
5. **Feedback**: Feedback on student progress will be given throughout the course.
6. **Examinations**: Examinations (mid-term and final) are all comprehensive in nature.

COURSE ASSESSMENT Tools

Assessment Tool	Description	Weight
Homework and Assignments	Homework must be turned in at the specified due date prior to the beginning of class. No late homework assignments will be accepted.	**15%**
Quizzes	There are Four quizzes, which the students are supposed to appear in (one is optional).	**15%**
Mid-Term Exam	One mid-term exam will be conducted (20% theoretical and 10% practical).	**30%.**
Final Exam	The final examination will be comprehensive of all the course materials. This exam will be conducted (25% theoretical and 15% practical).	**40%.**

ESSENTIAL READINGS: (textbooks, website addresses etc.)

Textbook	**Java™ Foundations "Introduction to Program Design & Data Structures"** by John Lewis, Peter DePasquale, and Joseph Chase. 2nd edition, Addison-Wesley, 2011.
Additional Resource	i. Starting Out with Java; from Control Structures through Objects 4th ed. by Tont Gaddis, Addison Wesley, New York, N.Y., 2009. ii. Paul Deitel, Harvey Deitel, "Java How to program" , Prentice Hall,2014 iii. Herbert Schildt, "Java: The Complete Reference", Ninth Edition, 2014

COURSE POLICY *(including plagiarism, academic honesty, attendance etc)*

Attendance Policy	KUST Academic Policy http://sar.komar.edu.iq/files/Student%20hand%20Book%202013.pdf Attendance: ❖ Students are expected to **attend all lectures** and must **attend all examinations, quizzes, and practical exercises.** ❖ Faculty **need not** give substitute assignments or examination to students who miss classes **without official permission.** ❖ Student must arrange with the faculty to **make-up** the missed class. ❖ Students are subject to the regulation and policies mentioned in the **KUST Student Handbook**. ❖ KUST guidelines for **l**ateness are as follows: **Three occasions of lateness count as one absence**. (you can be considered in lateness from the 10th minute).

GUIDELINES FOR SUCCESS

The following points may help the students to success:

i. Attend all lectures, pay attention, participate during the classes, and keep asking questions.
ii. Be preparing for the classes, quizzes, and examinations ahead of time schedule.
iii. Need not to memorize everything, instead of that try to understand and enhance your knowledge.
iv. Ask for help from your teacher or classmates and don't feel shy for acquire of knowledge and understanding of subject matter.
v. Take note during the lecture.

NOTE: students are required to bring their notebooks, pens and not to engage themselves with cell-phones.

REVISION TO THE SYLLABUS

This syllabus is subject to change, it is the responsibility of the instructor to let the students be informed and aware of such change, if, happened, in a timely fashion after the approval of Quality Assurance Office (QAO).

Course calendar: Please check the academic calendar for 2015/2016 (Subject to Change)

Week	Beg/End Dates	Topics (Chapters)	CLO	Course Requirements
1	Feb 28- Mar 3 2016	**1- Introduction** **1.1 The Java Programming Language** • A Java Program • Comments • Identifiers and Reserved Words • White Space **1.2 Program Development** • Programming Language Levels • Editors, Compilers, and Interpreters • Development Environments • Syntax and Semantics • Errors	1	
2	Mar 6- Mar 10 2016	**2 - Data and Expressions** **2.1 Character Strings** • The print and println Methods • String Concatenation • Escape Sequences **2.2 Variables and Assignment** • Variables • The Assignment Statement • Constants **2.3 Primitive Data Types** • Integers and Floating Points • Characters • Booleans	1, 2	**Assignment #1**
3	Mar 13- Mar 17 2016	**2.4 Expressions** • Arithmetic Operators • Operator Precedence • Increment and Decrement Operators • Assignment Operators **2.5 Data Conversion** • Conversion Techniques **2.6 Reading Input Data** • The Scanner Class	2	**Quiz #1**
4	Mar 27- Mar 31 2016	**3 - Using Classes and Objects** **3.1 Creating Objects** • Aliases	2	**Assignment #2**

		3.2 The String Class **3.3 Packages** • The import Declaration **3.4 The Random Class**		
5	Apr 4- Apr 7 2016	**3.5 The Math Class** **3.6 Formatting Output** • The NumberFormat Class • The DecimalFormat Class • The printf Method **3.7 Enumerated Types** **3.8 Wrapper Classes** • Autoboxing	**2**	
6	Apr 10- Apr 14 2016	**4- Conditionals and Loops** **4.1 Boolean Expressions** • Equality and Relational Operators • Logical Operators **4.2 The if Statement** • The if-else Statement • Using Block Statements • The Conditional Operator • Nested if Statements	**3**	**Assignment #3**
7	Apr 17- Apr 21 2016	**4.4 The switch Statement** **4.5 The while Statement** • Infinite Loops • Nested Loops • Other Loop Controls	**3**	**Quiz #2**
	Apr 22 – Apr 28 2016	**Midterm Exam**		
8	May 2- May 5 2016	**4.6 Iterators** • Reading Text Files **4.7 The do Statement** **4.8 The for Statement** • Iterators and for Loops • Comparing Loops	**3**	
9	May 8- May 12 2016	**7- Arrays** **7.1 Array Elements** **7.2 Declaring and Using Arrays** • Bounds Checking • Alternate Array Syntax • Initializer Lists • Arrays as Parameters	**4**	**Assignment #4**

10	May 15- May 19 2016	**7.3 Arrays of Objects** **7.4 Command-Line Arguments** **7.5 Variable-Length Parameter Lists** **7.6 Two-Dimensional Arrays** • Multidimensional Arrays	**4**	
11	May 22- May 26 2016	• **Write programs to solve a variety of problems**	**5**	**Quiz #3**
12	May 29- June 2 2016	**12 – Design & Analysis of Algorithms** **12.1 Algorithm Efficiency** **12.2 Growth Functions and Big-Oh Notation** •	**5,6**	**Assignment #5**
13	June 5-June 9 2016	**13- Searching and Sorting Algorithms** **13.1 Searching** **13.2 Sorting**	**6**	
14	June 12-June 16 2016	**13.3 Analyzing Searching and Sorting Algorithms** • Comparing Search Algorithms • Comparing Sort Algorithms	**6**	**Quiz #4**
15	June 19-June23 2016	**review**		
16	June 24- June 30 2016	**Final Exam**		

Signature:

Adnan Hadi Mahdi Al-Helali (PhD)

Course Instructor