

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

Course Specifications

CMP 110: Program Design and Computer Languages

A- Affiliation

Relevant program:	Computer Engineering and Information Technology BSc Program Electronic Engineering and Communication Technology BSc Program Manufacturing Engineering and Production Technology BSc Program Architectural Engineering and Building Technology BSc Program
Department offering the program:	Architecture Engineering and Building Technology Department. Electronic Engineering and Communications Technology Department Computer Engineering and Information Technology Department Manufacturing Engineering and Production Technology Department
Department offering the course:	Computer Engineering and Information Technology Department
Date of specifications approval:	September 2015

B - Basic information

Title: Program Design and Computer Languages	Code: CMP110	Year/level: Freshman - Fall, Spring and Summer Semesters
Credit Hours: 4	Lectures: 2	Tutorial: 3
	Prerequisite: None	Practical: 2

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the concepts of programming, the steps of solving problems using flowcharts or using the C++ programming language. They should be able to develop and enhance programming using the Microsoft Visual C++ software (embedded in the Microsoft Visual Studio software package).

2 - Intended Learning Outcomes (ILOS)

a – Knowledge and understanding:

By the end of this course the student should have the following Knowledge:

- a1- Steps for solving programs by computer programs and flowcharts (A1, A2, A4, A15).
- a2- Program structure in C++ (A4, A15, A18).
- a3- Data types, Data declaration (Variables and Constants) in C++ (A16, A18).
- a4- Different Categories of Operators and their precedence in C++ (A1, A13).
- a5- Control Structures in C++ (Decision and Loop Constructs) (A4, A5).
- a6- Arrays, Pointers, References, and dynamic allocation (A16, A18).
- a7- Functions and types of calling (by value, by reference) in C++ (A4, A16, A18).
- a8- Structures, Unions, Enumeration, User-defined data types and ADT (Abstract Data Types) (A4, A15, A16).
- a9- Object-Oriented Programming (OOP) concepts and terminologies (A5, A8, A16, A18).
- a10- Input and Output Files (File I/O s), I/O stream, strings and recursion(A5, A16, A18).

b – Intellectual Skills:

- On successful completion of the course, the student should be able to.
- b1-Investigate on a Visual C++ program in a similar way to other computer programming tools (B1, B13, B14).
 - b2-Manipulate different data types (B4, B18, B19).
 - b3- Analyze the problem required to be solved and design the appropriate C++ program to solve this problem (B1, B2, B3, B13)
 - b4-Manipulate the different control structures; investigate decisions and loops suitable for solving the problem (B2, B7).
 - b5- Manipulate different C++ structures (Arrays, Structures, Unions and Classes) for different problems (B3, B7, B18).
 - b6-Investigate the new programming interface and develop to the Object- Oriented Programming concepts (B17, B18).
 - b7-Manipulate input and output files (for reading from and writing into these files respectively) (B4, B19).

c - Professional and practical skills:

- On successful completion of the course, the student should be able to.
- c1- Install and use the Visual C++ 2010 (or 2012) software (C6, C14).
 - c2- Develop and Produce a solution to the problem through flowcharts and C++ programs (C1, C4).
 - c3-Solve different engineering problems related to the artificial intelligent systems, microcontroller systems, operating systems and their basic elements (C1, C5, C6, C15).
 - c4- Design and implement C++different structures (C2, C3, C4, C13).
 - c5- Apply the concepts of Object –Oriented Programming for solving different engineering problems (C2,C3,C4,C5).

d - General and transferable skills:

- On successful completion of the course, the student should be able to:
- d1- Work in a team and involve in group discussion and seminars (D1, D2, D3).
 - d2- Communicate effectively and present data and results orally and in written form (D3, D4).
 - d3- Use ICT facilities in presentations, and manage resources efficiently (D4, D5).
 - d4- Search for information's in references, journals and in internet (D7).
 - d5- Practice self-learning (D7, D9).

Co Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A4, A5, A8, A13, A15, A16, A18
B	Professional and practical skills	B1, B2, B3, B4, B7, B13, B14,B17,B18, B19
C	Intellectual skills	C1, C2,C3,C4,C5, C6, C13, C14,C15
D	General and transferable skills	D1, D2, D3, D4, D5,D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Steps for solving programs by computer programs	2	3	2
➤ Program documentation and flow charts	2	3	2
➤ Program structure in C++	1	2	1
➤ Data types and declaration in C++	2	2	2
➤ Input/output in C++ and I/O stream class	1	2	1
➤ I/O manipulation	1	2	1
➤ Operators and precedence in C++	2	3	2

➤ Decision (Selection) Constructs in C++	2	3	2
➤ Loops (Iterations) in C++	2	3	2
➤ Arrays, Pointers, References, and dynamic allocation	2	3	2
➤ Functions in C++, calling functions (by value, by reference)	2	3	2
➤ Structures, Unions, Enumeration, and user-defined data types	2	3	2
➤ Abstract data types (ADT)	1	2	1
➤ Concepts and Terminologies of Object-Oriented Programming (OOP)	2	2	2
➤ Classes and objects	2	2	2
➤ Constructors, destructors, friend functions	1	2	1
➤ Polymorphism, encapsulation, inheritance	1	2	1
➤ File I/O, I/O stream, strings, recursion	2	3	2
Total hours	30	45	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation		Written Exam	Practical Exam	Quizzes	Term papers	Assignments		
Knowledge & Understanding	a1	1	1	1		1						1			1		1	1	1		
	a2	1	1		1										1		1	1	1		
	a3	1	1		1		1					1			1		1	1	1		
	a4	1	1		1		1					1			1	1	1	1	1		
	a5	1	1		1		1					1	1		1	1	1	1	1		
	a6	1	1	1	1		1					1			1	1	1	1	1		
	a7	1	1	1	1		1					1	1		1	1	1	1	1		
	a8	1	1		1		1					1			1	1	1	1	1		
	a9	1	1	1	1		1					1	1		1	1	1	1	1		
	a10	1	1		1		1					1			1	1	1	1	1		
Intellectual Skills	b1		1	1			1						1			1	1	1	1		
	b2	1	1		1		1								1		1	1	1		
	b3	1	1	1	1	1						1			1		1	1	1		
	b4	1	1		1	1	1					1			1	1	1	1	1		
	b5	1	1	1	1		1					1	1		1	1	1	1	1		
	b6	1	1	1	1		1					1	1		1	1	1	1	1		
	b7	1	1		1		1					1			1		1	1	1		
Applied Professional Skills	c1						1									1					
	c2						1									1					
	c3						1									1					
	c4						1									1					
	c5						1									1					

Course ILO's		Teaching Methods										Learning Methods			Assessment Method						
		Lecture	Presentations	Discussions	and seminars	Tutorials	Problem solving	Laboratory & Experiments				Researches and Reports	Modeling and Simulation		Written Exam	Practical Exam	Quizzes	Term papers	Assignments		
General and Transferable Skills	d1																1		1		
	d2																1		1		
	d3																1		1		
	d4																1		1		
	d5																1		1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes, assignments and reports	Bi-Weekly	10
Mid-Term Exam	6 th Week	10
Practical Exam	14 th , 15 th weeks	20
Written Exam	Sixteenth week	60
Total		100

6- List of references

6-1 Course notes:

- Lecture notes and handouts

6-2 Required books:

- Walter Savitch, Problem Solving With C++, Pearson Education Inc., 2006.
- Deitel & Deitel, C++ How To program, Prentice Hall, 2001.
- Al Stevens, C++ Programming Bible, IDG, 2000.

6-3 Recommended books:

- C++ Essentials, Sharam Hekmat, PragSoft Corporation, www.pragsoft.com, 2005

6-4 Periodicals, Web sites, etc.:

- <http://www.cplusplus.com/>.

7- Facilities required for teaching and learning:

- Computer Lab.

Course coordinator:

Dr. Ehab ElShimy

Head of the Department:

Prof. Dr. Said Gawish

Date:

September 2015