

Object-Oriented Programming

1. **Course number and name:** 020CPPES1 – Object Oriented Programming
2. **Credits and contact hours:** 3 credits, 2x1:15 course hours + 2:30 lab hours
3. **Instructor’s or course coordinator’s name:** Youssef EL-BAKOUNY
4. **Text book:**
Thinking in C++, 2nd Edition
 - a. **Other supplemental materials:**
Professor textbook and course material, E-learning support using Moodle, MOOC on coursera.org
5. **Specific course information**
 - a. **Catalog description:**
Program structure, types, literals and variables, operators, program control instructions (conditions and loops), functions, arrays, structures - Object-Oriented Programming: Objects and classes, attributes and methods, constructor and destructor, encapsulation, inheritance, virtual functions, abstract classes et polymorphism, method and operator overloading, exceptions, Input/Output, streams, generics and templates, Standard Templates Library (STL), Graphical User Interfaces with Qt.
 - b. **Prerequisites or co-requisites:**
 - c. **Required:** Required for EE program
6. **Specific goals for the course**
 - a. **Specific outcomes of instruction:**
 - Write complex programs in C++
 - Maintain existing C++ programs
 - b. **KPI:**

KPI	c1	i2	k1	k2	k3
Covered	x	x	x	x	x
Assessed			x	x	x

7. Brief list of topics to be covered

#Lectures	Topic	Lecture	Lab
1	Introduction, Compiled vs Interpreted languages	1	
2	C++ program structure, expressions and instructions, data types, declarations and operators	2	

2	Lab 1. Introduction to the Integrated Development Environment (IDE). Visual studio		2
1	Program Flow control: Conditional instructions, loops, break, continue	1	
2	Lab 2. Using the debugger to locate program bugs		2
2	Functions, passing arguments, return values	2	
1	Advanced data types: long, signed and unsigned modifiers, arrays (1D, 2D...), structures types	1	
2	Lab 3. Arrays, loops and conditions		2
2	Pointers	2	
2	Lab 4. Functions & pointers		2
2	Objects: Abstraction, classes, attributes, methods, encapsulation	2	
2	Lab 5. Objects (encapsulation)		2
1	constructors: Constructors, default constructor, conversion constructor, copy constructor.... Destructors	1	
2	Lab 6. Object construction, destruction		2
2	Inheritance, static attributes, static methods	2	
2	Lab 7. Inheritance		2
3	Polymorphism: virtual methods, pure virtual methods, static vs dynamic name resolution, abstract classes	3	
2	Lab 8. Polymorphism		2
2	Operator overloading	2	
2	Lab 9. Operators		2
1	Exceptions	1	
2	Lab 10. Exceptions		2
3	Input/output	3	
2	Lab 11. Read and writing to files		2
1	Type casting, namespaces and templates	1	
2	Lab 12.		2
4	GUI with Qt	4	
2	Lab 13.		2
2	Lab 14.		2