CS 217- Object Oriented Programming

Form number	COURSEWARE OUTLINE/ DOCUMENT (Tentative)				
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DEGREE INFORMATION	Program	Batch	Section(s)	Semester	Spring
	BS(CS) BS(SE)	2019	A,B,C,D,E,F, SE-A,SE-B	Year	2020

COURSE INFORMATION	Course Category C- Core/ E-Elective		Code	Title	Credit hours
	C		CS 217	Computer Programming	3+1
	Prerequisite(s)		CS 118	Programming Fundamentals	3+1
	TA Required (Yes/ No)	No. of TA(s)	Brief Justification		
	Yes	7	For assignments, tutorials, and improvised coordination		

TEXT BOOK(s) INFORMATION	Title of Book		Object-Oriented Programming in C++ (Robert Lafore) C++ How to program (Deitel & Deitel)
Reference Book (s)	1.	Title of Book	C++ Programming: From Problem Analysis to Program Design (D.S. Malik)
	3.	Title of Book	The C++ Programming Language (Bjarne Stroustrup)
	Support Material(s)	a.	
		b.	

Course Objectives (CO):	
1.	This is an advanced course on programming where the emphasis would be on programming skills so that students would be able to write a program of reasonable size and complexity and handle more complex computational applications and more importantly get introduced to the basic concepts of object-oriented programming.
2.	Critical Analysis: The course aims to provide students the ability to analyze the given requirements for solving simple problems that can be implemented on the computer system.
3.	Solution finding: The computer-programming course attempts to teach students the art of designing algorithm-based solutions to solve problems in different domains.

Learning Outcome (LO):	
a.	On the successful completion of this course, students should be able to analyze computing problems for a given domain.
b.	The students should be able to devise algorithmic solution to solving problems in a particular domain.
c.	On the course completion, students should have ability to implement algorithmic solutions using a programming language.
d.	The students should be able to apply standards for writing programs.
e.	The students should have ability to collaborate and communicate efficiently in groups.

Courseware Structure: (Mark X where applies)

Lecture (Lect)	*Multimedia (MM)*	*Exercise (s) (Exer)*	*Labs (Lab)*	*Case Studies (CAS)*	*Assignment (s) (Assign)*	*Group Tasks*	*Any other Medium*
X	X	X	X		X	X	

Weeks	Contents/Topics	Course Activity
Week-01	• Course Introduction Revision of Basic C++ Concepts	
Week-02	• Pointers in C++ Pointer Variable Declarations and Initialization • Referencing/Dereferencing, Pointer Arithmetic Pointers & Functions	Quiz1
Week-03	• Dynamic Memory Allocation Dynamic Variables Dynamic Multi-dimensional Arrays Shallow Copy vs. Deep Copy	Quiz2
	• Structures in C++ Language Member Variables & Member Functions • Arrays vs. Structures and Arrays of Structures Structs and Pointer Variables	Assignment#1 (M.Haris)
Week-05	• Recursion • Object Oriented Programing (OOP) & Procedural Programming Object-Oriented Design (OOD) and OOP • Intro to Classes & Objects • Member Functions: Access Functions (Accessors and Mutators) Utility Functions Separating interface from implementation (3 File structures)	Quiz3
Week-6	• Mid Exam -1	
Week-07	• Static members and functions • Constant members and this pointer	Quiz4
Week-08	• Constructor, Destructor Data Abstraction, Classes, and Abstract Data Types, & A struct Versus a class • Classes and Pointer Variables Copy Constructor, Overloading Constructors Shallow Copy & Deep Copy (w.r.t. Objects) • Inheritance	Assignment#2 (Dr. Irfan-ul-Haq) Quiz5
Week-09	• Function Overriding/Redefining • Inheritance – Multiple inheritance – Ambiguity errors with detailed examples. • Types of inheritance (Public, Private & Protected)	Assignment#3 (M. Ali)
Week-10	• Composition: Association & Aggregation	

	• Friend Functions and classes	
Week-11	**Second Mid Term Exam** **Project Statement**	
Week -12	• Operator overloading – overview • Operator overloading - overloading basic operators with detailed examples. • Operator overloading and Friend functions.	Quiz6
Week-13	• Polymorphism – Introduction (Virtual functions) Polymorphism Abstract and concrete classes • Abstract Classes & pure Virtual Functions (Interface vs. Implementation)	Assignment # 4 (No Teacher assigned)
Week 14	• C++Templates – Introduction and usage with detailed examples	Quiz 7/8
Week-15	• Exceptions handling - Introduction • Exceptions handling -Built-in exception classes and creating your own exception classes.	Assignment # 5 (Zain Iqbal)
Week-16	• Advance Topics *(STL , MVC) (Optional)* • Reserved for revision	
Week-17	• Final Exam	

Grading Criteria			
	Absolute	X	RELATIVE Grading

Tentative Marks Distribution:

Particulars	% Marks	*Weight Ranges
1. Assignments	10	10 ~ 20
2. Quizzes	10	10 ~ 20
3. Mid Term 1	15	10 ~ 15
4. Mid Term 2	15	10 ~ 15
5.Project + Class Participation	10	10~20
6. Final Exam	40	40 ~ 60
Total:-	**100**	**100**

Planned Courseware Events:

Particulars	Planned Items	Remarks
1. Quizzes	**>= 5**	Announced quizzes
2. Assignments	**>= 5**	Individual assignments

QUALIFYING ATTENDANCE	You must attend every class for your own personal benefit. Please refer to university policy of minimum attendance requirement. Failing to confirm qualifying attendance threshold, the student will stand debarred from sitting in the examination and assigned with "F" Grade.
Academic and Moral Integrity:	1. All assignments should be your own work (or your group's when approved). PLAGIARISM will be awarded with "F" grade and/or reported to the University for academic and moral misconduct. 2. Missed quizzes/assignments will not be rescheduled. 3. Copied assignments shall not be accepted and will result in deduction of marks already scored.

Instructions / Suggestions for STUDENTS for satisfactory progress in this course:

- ✓ On average, most students find at least three hours outside of class for each class hour necessary for satisfactory learning.
- ✓ The homework assigned is a minimum. You should always work extra hours on your own.
- ✓ Use the few minutes you usually have before the start of each class to review the prior meetings' notes and homework. This will save us valuable in-class time to work on new material.
- ✓ Develop a learning habit rather than memorizing; work in groups, whenever appropriate.
- ✓ Apply the learned principles and gained knowledge; be creative in thinking.
- ✓ **Assignments/ Activities:** They are not meant simply for grades, but to reinforce your learning. Assignments are due on time. Each day late will lower your assignment grade by 30%. You can submit assignment till three days later after submission date.