Description of Course CSE 214

PART A: General Information

1	**Course Title**	: Software Engineering Sessional
2	**Type of Course**	: SESSIONAL
3	**Offered to**	: DEPARTMENT OF CSE
4	**Pre-requisite Course(s)**	: None

PART B: Course Details

1. Course Content (As approved by the Academic Council)

Sessional based on CSE 213 (Software Engineering).

2. Course Objectives

The students are expected to

i. Design software applying requirement analysis and design techniques.
ii. Apply software design patterns in appropriate scenarios.
iii. Apply software testing techniques and tools.

3. Knowledge required

Technical

- Databases and Object-Oriented Programming.

Analytical

4. Course Outcomes (COs)

CO No.	CO Statement After undergoing this course, students should be able to:	Corresponding PO(s)*	Domains and Taxonomy level(s)**	Delivery Method(s) and Activity(-ies)	Assessment Tool(s)
CO 1	**Design** software applying requirement analysis and design techniques	PO1, PO2, PO3	C3	Lecture and demonstration	Assignment, Quiz
CO 2	**Apply** software design patterns in appropriate scenarios	PO1, PO2, PO3	C3	Lecture and demonstration	Assignment, Quiz
CO 3	**Apply** software testing techniques and tools	PO1, PO5	C3	Lecture and demonstration	Assignment, Quiz

***Program Outcomes (POs)**

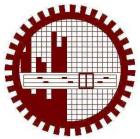
PO1: Engineering knowledge; PO2: Problem analysis; PO3: Design/development of solutions; PO4: Investigation; PO5: Modern tool usage; PO6: The engineer and society; PO7: Environment and sustainability; PO8: Ethics; PO9: Individual work and teamwork; PO10: Communication; PO11: Project management and finance; PO12: Life-long learning.

****Domains**

C-Cognitive: C1: Knowledge; C2: Comprehension; C3: Application; C4: Analysis; C5: Synthesis; C6: Evaluation
A-Affective: A1: Receiving; A2: Responding; A3: Valuing; A4: Organizing; A5: Characterizing
P-Psychomotor: P1: Perception; P2: Set; P3: Guided Response; P4: Mechanism; P5: Complex Overt Response; P6: Adaptation; P7: Organization

5. Mapping of Knowledge Profile, Complex Engineering Problem Solving and Complex Engineering Activities TODO

COs	K1	K2	K3	K4	K5	K6	K7	K8	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5
CO1		√		√	√	√			√	√				√		√				√
CO2		√		√	√	√			√		√	√			√					√
CO3		√		√	√	√			√		√	√	√		√					√



K-Knowledge Profile:

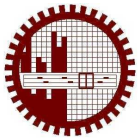
K1: A systematic, theory-based understanding of the natural sciences applicable to the discipline; **K2:** Conceptually based mathematics, numerical analysis, statistics and the formal aspects of computer and information science to support analysis and modeling applicable to the discipline; **K3:** A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline; **K4:** Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline; **K5:** Knowledge that supports engineering design in a practice area; **K6:** Knowledge of engineering practice (technology) in the practice areas in the engineering discipline; **K7:** Comprehension of the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the engineer's professional responsibility to public safety; the impacts of engineering activity; economic, social, cultural, environmental and sustainability; **K8:** Engagement with selected knowledge in the research literature of the discipline

P-Range of Complex Engineering Problem Solving:

P1: Cannot be resolved without in-depth engineering knowledge at the level of one or more of K3, K4, K5, K6 or K8 which allows a fundamentals-based, first principles analytical approach; **P2:** Involve wide-ranging or conflicting technical, engineering and other issues; **P3:** Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models; **P4:** Involve infrequently encountered issues; **P5:** Are outside problems encompassed by standards and codes of practice for professional engineering; **P6:** Involve diverse groups of stakeholders with widely varying needs; **P7:** Are high level problems including many component parts or sub-problems

A-Range of Complex Engineering Activities:

A1: Involve the use of diverse resources (and for this purpose resources include people, money, equipment, materials, information and technologies); **A2:** Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues; **A3:** Involve creative use of engineering principles and research-based knowledge in novel ways; **A4:** Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation; **A5:** Can extend beyond previous experiences by applying principles-based approaches

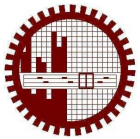


6. **Lecture/ Activity Plan (Tentative)**

Week	Topic	Course Outcomes
1	Introduction	
2	Declaration of Assignment 1 on Creational Design Pattern	CO1
3	Demonstration of Version Control System (Git)	CO3
4	Assignment 1 Evaluation + Online 1 (A1/B1/C1) & Declaration of Assignment 2 on Structural Design Pattern.	CO2
5	Assignment 1 Evaluation + Online 1 (A2/B2/C2)	CO1
	Mid Break	
6	Assignment 2 Evaluation + Online 2 (A2/B2/C2)	CO2
7	Assignment 2 Evaluation + Online 2 (A1/B1/C1) & Declaration of Assignment 3 on Behavioral Design Pattern.	CO2
8	Lecture on Coding Conventions and Code Refactoring	CO2
9	Assignment 3 Evaluation + Online 3 (A1/B1/C1)	CO2
10	Assignment 3 Evaluation + Online 3 (A2/B2/C2)	CO2
11	Lecture on Unit Testing & Load Testing	CO3
12	Online 4 on Unit Testing (A1/B1/C1)	CO3
13	Online 4 on Unit Testing (A2/B2/C2)	CO3
	Quiz	CO1+ CO2 + CO3

7. **Assessment Strategy**

- Class Attendance: Class attendance will be recorded in every class.
- Assignments and Projects: There will be assignments and a project.
- Quiz Exam: A comprehensive quiz exam will be held at the end of the semester.



8. Distribution of Marks

Attendance:	5 %
Assignments/Projects:	70%
Final Quiz:	25%
Total:	100%

9. Textbook/ Reference

a. Software Engineering at Google: Lessons Learned from Programming Over Time by Titus Winters, Tom Manshreck, Hyrum Wright
b. Engineering Software as a Service: An Agile Approach Using Cloud Computing by Armando Fox, David Patterson
c. Software Engineering: A Practitioner's Approach by Roger S. Pressman, Bruce Maxim
d. Software Engineering by Ian Sommerville
e. The Unified Modeling Language User Guide by Booch, Rumbaugh, and Jacobson
f. Design Patterns: Elements of Reusable Object-Oriented Software by Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides