Daffodil International University

Department of Computer Science and Engineering (CSE)

Course Outline

Course Code:	CSE333		
Course Title:	Software Engineering		
Program:	B.Sc. in CSE		
Faculty:	Faculty of Science and Information Technology (FSIT)		
Semester:	Summer 2020	**Year:**	2020
Credit:	3.0	**Contact Hour:**	3.0
Course Level:	Level 3 Term 3	**Prerequisite:**	No
Course Category:	Core Engineering		
Instructor Name:	Saiful Islam		
Designation:	Senior Lecturer		
Email:	saiful.cse@diu.edu.bd		
Office Address:	Room 404, CSE Building, Department of CSE		

Class Hours:	**Section**	**Class Day**	**Class Hours**	**Classroom**

Google Classroom Code:	

1. Course Rationale

Software Engineering is designed helping students to grow up and understanding of how to develop a software system development process and giving them the fundamental principles of system development with object oriented technology using Use Case Model, Object Oriented Model. The course will initiate students to the different software process models, project management, software requirements and design as a problem solving activity, key elements of analysis and design, and the place of the of the analysis and design phases within the system development life cycle.

1.1. Course Objective

This course aims at introducing to the students about the product that is to be engineered and the process that provides a framework for the engineering technology. The course facilitates the students to analyze risk in software design and quality and to plan, design, develop and validate the software project.

1.2.Course Outcomes (CO's)

On the successful completion of the course, students will be able to,

CO1: Explain a process model for a software project Development	Understand
CO2: Prepare the SRS (Software Requirements Specification), Design document, Project plan of a given software system.	Analyze
CO3: Apply Project Management and Requirement analysis, Principles to S/W project development.	Apply
CO4: Generate test cases using the techniques involved in selecting: (a) White Box testing (b) Block Box testing.	Analyze
CO5: Analyze the cost estimate and problem complexity using various estimation techniques.	Analyze
CO6: Understand how reviews and inspections are used as a mechanism for software quality assurance and management.	Understand

1.3.Program Outcomes (PO's):

Program Outcomes are reported in Appendix-I.

1.4.CO-PO Mapping:

	CO1	CO2	CO3	CO4	CO5	CO6
PO1: Engineering knowledge	3	3	2	1	2	-
PO2: Problem analysis	2	2	-	-	3	3
PO3: Design/development of solutions	-	-	2	1	-	-
PO4: Investigation	-	-	2	-	3	2
PO5: Modern tool usage	-	-	-	3	1	1
PO6: The engineer and society	-	-	-	-	-	-
PO7: Environment and sustainability	1	-	3	-	-	2
PO8: Ethics	-	-	3	1	-	3
PO9: Individual work and teamwork	-	-	-	-	-	-
PO10: Communication	-	-	-	-	-	-
PO11: Project management and finance	-	-	-	-	-	-
PO12: Life-long learning	-	-	-	-	-	-

3-Strong; 2-Medium; 1-Low

1.5. CO Assessment Scheme

Assessment Task	CO's						Mark (Total=100)
	CO1	CO2	CO3	CO4	CO5	CO6	
Attendance	--	--	--	--	--	-	7
Class Test (CT1, CT2, CT3)	--	--	--	--	--	-	15

Assignment	--	--	--	--	--	-	5
Presentation	--	--	--	--	--	-	8
Midterm Examination	10.0	10.0	5.0	-	--	-	25
Semester Final Examination	-	-	16.0	8.0	8.0	8.0	40
Total Mark	10.0	10.0	21.0	8.0	8.0	8.0	100

2. Strategies and approaches to learning

2.1. Teaching and Learning Activities (TLA)

TLA1	Lectures twice a week using multimedia of different topics.
TLA2	Active discussion in class regarding efficient solving of the logical and mathematical problems.
TLA3	Group discussion and presentation regarding diverse problems and corresponding lectures.
TLA4	Evaluation of class performances to reach each student in a class for every topic.

3. Course Schedule and Structure

3.1.Textbook

1. Software Engineering A Practitioner's Approach, Roger S. Pressman

3.2.Reference Books

1. Software Engineering, Ian Sommerville, 10th edition
2. Software Engineering, Ivan Marsic
3. A Concise Introduction to Software Engineering, Pankaj Jalote, Springer,2008

3.3.Course Plan/Lesson Plan

Week	Lesson	Topic	Teaching and Learning Activities (TLAi)	Textbook & Video Reference	Related CO's
1	Les. 1	Introduction and importance of Software Engineering, Applications	TLA1	Pressman: Ch. 1	CO1
	Les. 2	Basic concepts of Software Engineering and System Roadmap to Software Engineering	TLA1	(Pressman: Ch. 1)	CO1
2	Les. 3	Software Process, Framework activities, Generic process Model, Identifying the task for small, medium and large project, process pattern	TLA1	(Pressman: Ch. 2)	CO1
	Les. 4	Software Development Life-Cycle Models: Waterfall, V-shape, Incremental Model, Spiral Model, Concurrent Model, The Unified Process Model	TLA1, TLA2	(Pressman: Ch. 2)	CO1
3	Les. 5	Software Development Life-Cycle: Agile, Extreme Programming (XP), ASD, DSDM, Scrum Models, Problem analysis of different models from real life problem.	TLA1	(Pressman: Ch. 3), (Sommerville: Ch. 3)	CO1
	Les. 6	Comparative Analysis of Software Engineering Models from Traditional to Modern Methodologies	TLA1, TLA2	(Online Materials: Research Paper)	CO1, CO2
(Class Test – 1)					
4	Les. 7	Understanding the Requirements, Functional Requirements, Non-Functional Requirements, Use Case, Use Case description	TLA1	(Pressman: Ch. 5), (Sommerville: Ch. 4)	CO2, CO3
	Les. 8	Building requirements model, Negotiating requirements, negotiating requirements, Project Discussion and execution plan.	TLA2, TLA3	(Pressman: Ch. 5), (Sommerville: Ch. 4)	CO2, CO3
5	Les. 9	Software Modelling: Overview of UML; Use Case Modelling; Object Modelling, Dynamic modelling, State diagram	TLA1	(Pressman : Ch 6)	CO1, CO2
	Les. 10	Activity Diagram, Sequence Diagram and Swimlane diagram.	TLA1	(Pressman : Ch 6)	CO1, CO2
(Class Test – 2, Assignment – 1)					
6	Les. 11	Object-Oriented design, UI Design	TLA1	(Pressman Ch 11, 22)	CO1, CO3
	Les. 12	Design Case Study and GUI design from user activity. Review discussion	TLA3, TLA4	(Pressman : Ch15)	CO3
(MID–TERM EXAM)					

Week	Lesson	Topic	Teaching and Learning Activities (TLAi)	Textbook & Video Reference	Related CO's
7	Les. 13	Object Oriented design concept, Modeling, UML diagram types, Class diagram, Object diagram, component level design elements	TLA1	(Pressman : Ch 8), (Sommerville : Ch. 5)	CO3
	Les. 14	Practicing exercise on object model diagram from case study	TLA3	(Pressman : Ch 8), (Sommerville: Ch 5)	CO3
8	Les. 15	Business process modeling(BMP), Notation defining workflows, Some rules for creating BPN, BPM example and practicing, uses of BMP.	TLA2, TLA3	(Sommerville: Ch.19)	CO3
	Les. 16	Integrating Requirements and Business Process Models in BPM Projects, Extracting Business Logic from Business Process Models	TLA2, TLA3	(Online Materials)	CO3
9	Les. 17	Software Testing: Testing strategies, Test coverage, developing and recording test cases.	TLA1	(Sommerville :Ch 8)	CO4
	Les. 18	Black box, white box, stress & load Testing.	TLA3	(Pressman: Ch 18)	CO4
(Class Test-3, Assignment – 2)					
10	Les. 19	Software Maintenance Model, Forward Engineering, Reverse Engineering	TLA1	(Sommerville: Ch 24)	CO4, CO5
	Les. 20	Software Engineering vs Reengineering Estimation of approximate maintenance cost	TLA1	(Sommerville: Ch 26), (Pressman:Ch 30)	CO4, CO5
11	Les. 21	Estimation for software projects, Estimation of development time, Project resources, Estimation of development time.	TLA1	(Pressman: Ch. 26), (Sommerville:Ch.23)	CO5
	Les. 22	Boehm's Definition of Software Project Types COCOMO, Basic, Intermediate and Complete COCOMO, Three classes of software: Organic, Semi-detach and Embedded	TLA1	(Pressman: Ch. 26), (Sommerville:Ch.23)	CO5
12	Les. 23	Software quality assurance, Software quality goals, attributes, and metrics, SQA, SQP, SQC, and SQM.	TLA3	(Pressman: Ch. 16)	CO6
	Les. 24	Software Quality Management, Reviews and Inspections, Inspection checklist	TLA2, TLA4	(Sommerville Ch: 24)	CO6
(FINAL EXAM)					

4. Assessment Methods

4.1. Grading System

Numerical Grade	Letter Grade	Grade Point
80-100	A+	4.00
75-79	A	3.75

70-74	A-	3.50
65-69	B+	3.25
60-64	B	3.00
55-59	B-	2.75
50-54	C+	2.50
45-49	C	2.25
40-44	D	2.00
Less than 40	F	0.00

5. Additional Support for Students

- Student Portal:
  http://studentportal.diu.edu.bd/
- Academic Guidelines
  https://daffodilvarsity.edu.bd/article/academic-guidelines
- Rules and Regulations of DIU
  https://daffodilvarsity.edu.bd/article/rules-and-regulation
- Career Development Center:
  https://cdc.daffodilvarsity.edu.bd/
- For general queries:
  http://daffodilvarsity.edu.bd/

Program Outcomes and Assessment

Program Outcomes (POs) are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills and attitudes that students acquire while progressing through the program. The program must demonstrate that by the time of graduation, students have attained a certain set of knowledge, skills and behavioral traits to some acceptable minimum level. The BAETE specifically requires that students acquire the following graduate attributes.

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

(PO2: Problem analysis: Identify, formulate, research the literature and analyze complex engineering problems and reach substantiated conclusions using first principles of mathematics, the natural sciences and the engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety as well as cultural, societal and environmental concerns.

PO4: Investigation: Conduct investigations of complex problems, considering design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

PO5: Modern tool usage: Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO7: Environment and sustainability: Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics, responsibilities and the norms of the engineering practice.

PO9: Individual work and teamwork: Function effectively as an individual and as a member or leader of diverse teams as well as in multidisciplinary settings.

PO10: Communication: Communicate effectively about complex engineering activities with the engineering community and with society at large. Be able to comprehend and write effective reports, design documentation, make effective presentations and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work as a member or a leader of a team to manage projects in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for and have the preparation and ability to engage in independent, life-long learning in the broadest context of technological change.