

COURSE DESCRIPTION FORM

FAST-NUCES

INSTITUTION _____

PROGRAM (S) TO BE BS (CS)

EVALUATED _____

A. Course Description

Course Code	CS3009										
Course Title	Software Engineering										
Credit Hours	3+0										
Prerequisites by Course(s) and Topics	Software Analysis and Design										
Assessment Instruments with Weights (homework, quizzes, midterms, final, programming assignments, lab work, etc.)	<table> <tr> <td>Midterm examinations</td><td>30%</td></tr> <tr> <td>Final term examination</td><td>50%</td></tr> <tr> <td>Assignments(2)</td><td>04%</td></tr> <tr> <td>Project</td><td>10%</td></tr> <tr> <td>Quiz(3)</td><td>06%</td></tr> </table>	Midterm examinations	30%	Final term examination	50%	Assignments(2)	04%	Project	10%	Quiz(3)	06%
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Course Coordinator	Hajra Ahmed										
URL (if any)											
Current Catalog Description	Introduction to engineering concepts, software engineering concepts including requirements engineering, software process models, UI design, process improvement, design engineering, software architecture, software project planning, cost estimation, software testing, quality assurance, risk management										
Textbook (or Laboratory Manual for Laboratory Courses)	Ian Sommerville, Software Engineering 10th Edition Pressman, R S Software Engineering: A Practitioners Approach (7 th Edition, European Adaptation), McGraw Hill, 1994										
Reference Material	Roger S. Pressman_ Bruce R. Maxin - Software Engineering_ A Practitioner's Approach- McGraw-Hill Education (2014)										

Course Goals	A. Course Learning Outcomes (CLOs)			
	No	CLO	Domain	Taxonomy level
	1	Apply suitable process models and activities for medium size software systems	C	3 (Applying)
	2	Analyze software requirements and how to produce software design and architecture	C	4 (Analyzing)
	3	Apply software quality assurance, verification and validation to medium size software systems	C	4 (Analyzing)
4	Understand key principles and common methods for software project management such as scheduling, size estimation, cost estimation and risk analysis	C	2 (Understanding)	
	B. Program Learning Outcomes			
	For each attribute below, indicate whether this attribute is covered in this course or not. Leave the cell blank if the enablement is little or non-existent.			
PLO1	Computing Knowledge	Apply knowledge of mathematics, natural sciences, computing fundamentals, and a computing specialization to the solution of complex computing problems.	✓	
PLO2	Problem Analysis	Identify, formulate, research literature, and analyse complex computing problems, reaching substantiated conclusions using first principles of mathematics, natural sciences, and computing sciences.	✓	
PLO3	Design/Develop Solutions	Design solutions for complex computing problems and design systems, components, and processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	✓	
PLO4	Investigation & Experimentation	Conduct investigation of complex computing problems using research based knowledge and research based methods		
PLO5	Modern Tool Usage	Create, select, and apply appropriate techniques, resources and modern computing tools, including prediction and modelling for complex computing problems.		
PLO6	Society Responsibility	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal, and cultural issues relevant to context of complex computing problems..		
PLO7	Environment and Sustainability	Understand and evaluate sustainability and impact of professional computing work in the solution of complex computing problems		
PLO8	Ethics	Apply ethical principles and commit to professional		

			ethics and responsibilities and norms of computing practice.																																																																																
	PLO9	Individual and Team Work	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.																																																																																
	PLO10	Communication	Communicate effectively on complex computing activities with the computing community and with society at large.																																																																																
	PLO11	Project Mgmt and Finance	Demonstrate knowledge and understanding of management principles and economic decision making and apply these to one's own work as a member or a team.	✓																																																																															
	PLO12	Life Learning	Long Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes.																																																																																
<p>C. Relation between CLOs and PLOs (CLO: Course Learning Outcome, PLOs: Program Learning Outcomes)</p> <table border="1"> <thead> <tr> <th colspan="2" rowspan="2"></th> <th colspan="12">PLOs</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> <th>11</th> <th>12</th> </tr> </thead> <tbody> <tr> <td rowspan="4">CLOs</td> <td>1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>✓</td> <td></td> </tr> </tbody> </table>							PLOs												1	2	3	4	5	6	7	8	9	10	11	12	CLOs	1	✓												2		✓											3			✓										4											✓	
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Topics Covered in the Course, with Number of Lectures on Each Topic (assume 15-week instruction and one-hour lectures)	Weeks	Topics	CLO	Tools																																																																															
	1	Introduction, History of Software Engineering, Importance and Need of SE. Software Engineering Ethics, Case Studies	1,4	Prj, M																																																																															
	2	Software Process, Process Activities, Process Models, Waterfall, Incremental, Prototyping, Coping with Change, Software Process Improvement	1	A, Prj, M																																																																															
	3	Agile Methods, Extreme Programming, Scrum, Scaling Agile	1	A, Prj, M																																																																															
	4	Requirement Engineering, Functional and Non-functional	1	P, Prj, M																																																																															

		Requirements, Requirements Engineering Process, Requirements Elicitation, Specification, Validation, and Change			
	5	WBS, Wideband Delphi estimation method	1,4	M,A, Prj,	
	6	Mid Term 1			
	7	Architectural Design, Design Decision, Views, Patterns	2	M	
	8	UI Design: Golden rules of design, UI design, analysis and evaluation. WebApp design concepts	2,3	M, Prj	
	9	Software Testing: Development, Release and Acceptance testing, types of testing, testing strategies	3	A, Prj, M	
	10	Human Resource: Managing people, teamwork	1	Prj	
	11	Mid Term 2			
	12	Quality Management: Standards, quality in Agile, Measurements	3	F	
	13	Estimation for software projects: Size oriented, Functional Points	4	F	
	14	Project Scheduling and Risk management: PERT chart, Gantt chart, Network diagram, Risk mitigation, monitoring and management	4	F	
	15	Projects and Reviews		Prj	
	16	Final exam			
	<p><i>A = Assignment, Q = Quiz, M = Midterm, F=Final, P=Presentation, W=Written Report, Prj=Project</i></p>				
Laboratory Projects/Experiments Done in the Course	There will be class activities carried out after covering course topics in the form of case study evaluation and other class activities to help better learn the concepts.				
Programming Assignments Done in the Course	N/A				
Class Time Spent on (in credit hours)	Theory	Problem Analysis	Solution Design	Social and Ethical Issues	
	1	1	0.8	0.2	
Oral and Written Communications	Every student is required to submit at least 2 written reports of typically 5 pages and to make 1oral presentations of typically 20 minute's duration. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy.				



Instructor Name: Noureen Fatima

Instructor Signature Noureen Fatima

Date: 11-Jan-2023