2023
TP-153

Course Specification
(Bachelor)

Course Title:	Software Engineering
Course Code:	COMP 371-3
Program:	Bachelor in Computer Science
Department:	Computer Science
College:	College of Engineering Computer Science
Institution:	Jazan University
Version:	V2
Last Revision Date:	20-10-2023.

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (9)					
4. Course general Description:					
Software engineering is a major branch of computing science that deals with the development of software systems as practical and cost-effective solutions for individuals and society. This course covers the fundamentals of software engineering like software life cycle, requirements engineering system development paradigm, and system modeling using UML. It also covers software verification & validation, important implementation issues, open-source development, and concepts of software re-engineering. The course has a strong technical relation with graduation project providing the opportunity to practice software engineering knowledge, skills, and practices in a realistic development setting with a real client.					
5. Pre-requirements for this course (if any)**:**					
None					
6. Pre-requirements for this course (if any)**:**					
None					
7. Course Main Objective(s):					
• To relate the theoretical concepts with software development industry. • To understand the importance software development life cycle (SDLC) as roadmap. • To classify the project categories and requirement gathering techniques. • To draw the UML diagrams as graphical representation of the system. • To test the software using different V&V techniques. • To follow the Re-Engineering rules and techniques.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	28
2.	Laboratory/Studio	28
3.	Field	
4.	Tutorial	
5.	Others (specify)	4
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Define** the concepts of software engineering and its importance in software industry.	K1	Visual & Verbal [Lectures / Presentations]	Mid Term, Final Exam
1.2	**Outline** the advantages of software evolution to support software re-engineering.	K1	Visual & Verbal [Lectures / Presentations]	Final Exam Assign-II
...				
2.0	**Skills**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	**Analyze** the software requirements to select effective software engineering process based on requirements classification.	S1	Visual & Verbal [Lectures / Group Activity]	Assig-I, Midterm, Lab Exam, Final Exam
2.2	**Design** the computer-based systems to meet desired needs.	S3	Visual & Verbal [Lectures / Group Activity] [Lab Session]	Assig-II, Lab Exam, Final Exam
2.3	**Critique** the quality of product using Verification and Validation techniques.	S2	Visual & Verbal [Lectures / Group Activity]	Assig-II, Final Exam
2.4	**Communicate** effectively through presentation to support the work in both verbal and writing.	S5	[Lectures / Group Activity]	Assig-II (Group Assignment)
3.0	**Values, autonomy, and responsibility**			
3.1	**Justify** their ability to function as an effective team player to achieve a common goal.	V2	Small group discussion/Brain storming/class discussion to train students to think independently.	Assig-II (Group Assignment)
3.2	**Appraise** the correctness of software artifacts by analyzing & designing them in UML.	V3	Demonstrating real time example	Lab Exam, Assig-II (Group Assignment)
...				

C. Course Content

No	List of Topics	Contact Hours
1.	**Chapter 1: Introduction and Software processes** • Basic Definitions • Role of Management in Software Development Software Products • Essential attributes of good software • Importance of Software Engineering practices	6T + 6P

	• Challenges for Software Engineering Practices • Software Engineering diversity • Software life Cycle • Software Process Model & Its Types • Waterfall Model • Incremental Development Process Model • Boehm's Spiral Model • Reuse Oriented Software Engineering Model • Agile Modeling	
2.	**Chapter 2 : Requirement Engineering** • Crucial process steps of Requirement Engineering • Types of Requirements • User and System Requirement • Categories of Metric • SRS Document • Requirements Gathering Techniques	4T + 4P
3	**Chapter 3: System Modeling and Architectural Design** • System Modeling • Context Models • UML Diagram Types • Interaction Models • Structural Models • Architectural Design • Architectural Views	6T + 6P
4	**Chapter 4: Design and Implementation** • An Object-Oriented Design Process • Context And Interaction Models • Implementation Issues • Open Source Development	4T + 4P
5	**Chapter 5: Software Testing and Maintenance** • Software Verification and Validation • Objectives of Software Testing • Stages of Testing • Black Box Testing • White Box Testing • Problems during Maintenance • Types of Maintenance • The Software Maintenance Process • Maintenance Cost • Software Re-Engineering	6T + 6P

	• Maintenance prediction	
Total		**26T + 26P**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	7^{th}-8^{th} week	15%
2.	Assignment I	5^{th} week	10%
3.	Assignment II (Group assignment)	10^{th} week	15%
4.	Lab Exam + Lab Assignment	As per schedule	20%
5.	Final Theory Exam	As per schedule	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Software Engineering, 10th Edition, 2016, Ian Sommerville, Pearson Education. ISBN-10: 0-13-703515-2
Supportive References	R. S. Pressman, Software Engineering: A Practitioners Approach, 9th edition, 2020, McGraw HillInternational publication.
Electronic Materials	http://www.softwareengineering-9.com/ http://www.pearsonhighered.com/sommerville/ http://www.softwareengineering-9.com/Web/History/
Other Learning Materials	Online tutorial

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom equipped with projector, whiteboard, and sufficient seating arrangements. Lab with software installed and individual computer terminal for each student.
Technology equipment (projector, smart board, software)	Whiteboards and projectors for classroom and labs computer Lab equipped with 30 PCs having Rational Rose, ArgoUml, MS-VISIO

Items	Resources
	An active internet connection.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect (Course evaluation survey form)
Effectiveness of Students assessment	CRC / QAU / HoD	Direct (Course reports / result analysis)
Quality of learning resources	Track leaders / CRC	Indirect (Review, meetings and star rating with suggestions for further modification and improvements)
The extent to which CLOs have been achieved	CRC / QAU	Direct(CLO assessment template further verified at course coordinator, Track leader and QAU level)
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**DEPARTMENT COUNCIL**
REFERENCE NO.	
DATE	**15/10/2022**