پوهنتون کاردان
KARDAN UNIVERSITY

Faculty of Engineering andTechnolgy
Deparment of Computer Science

Course Title:	Principles of Software Engineering
Code:	CS-106
Coordinating Faculty/ Department:	Faculty of Engineering and Technology department of Computer Science
Credits:	04
Pre-requisites :	NIL
Lecturer Name and Contact:	Mashal Rokhan +93782220771 m.rokhan@kardan.edu.af

GENERAL COURSE INFORMATION

Due to the organizational trends to computerize their businesses and other advancements in the society in computer science industry it has been recognized that real world systems should be computerized in order to improve their performance. It has been strongly recommended that the students should be familiarized with knowledge of basic SW engineering methods and practices, and their appropriate application; Students should know different kinds of projects/systems and should be able to understand its requirements and hence to prepare the Software Requirement Specification (SRS) document. The student should understand how to model the requirements as per the organizational needs and hence should be able to design those modeled requirements for the proposed system.

COURSE OBJECTIVES

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. The course is inteded to introduce the concepts and methods required for the construction of large software intensive systems. It aims to develop a broad understanding of the discipline of software engineering. It seeks to complement this with a detailed knowledge of techniques for the analysis and design of complex software intensive systems. It aims to set these techniques in an appropriate engineering and management context. It provides a brief account of associated professional and legal issues.

COURSE LEARNING OUTCOMES

After successful completion of this course, students will be able to:

1. Understand the different categories of software
2. Acquire Analytical skills and Compare software engineering, system engineering, and computer science
3. Leadership skills Critique the different process models used in software project development
4. Acquire collaboration and communication skills and also Analyze the various process models used in software project development

5. Learn & Understand working in team various categories of Requirements
6. Get technical skills and Apply feasibility study report for software project development
7. Amass creativity skills and interpersonal skills also to Create SRS Document
8. Procure self-management and self-appraisal also to Design the software project of elicited requirements
9. Achieve technical skills and to Design the requirement using class and object diagram
10. Procure Creativity and to How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
11. Acquire goals-oriented skills and to Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle
12. Obtain technical skills and to Demonstrate an ability to use the techniques and tools necessary for engineering practice

LEARNING REFERENCES

Following resources will be used as references during teaching this course:

1. Roger Pressman, Software Engineering: A pracatitioner's approach Latest Edition
2. Ian Sumerville, Software Engineering: Latest Edition
3. Various Websites

TEACHING METHODS

Following teaching methods will be adopted for the taught course:
1. Leacture:
2. Presentation:
3. Small talk
4. Group discussions

CLASSROOM ETIQUETTE:

Class room courtesy is expected of all students all the time. Following is general guideline for the class room conduct:

1. Refrain from chatting with fellow students.
2. Arrive on time. If you come late please be courteous to other students
3. Do not get up and walk out halfway through class.
4. Do not cut the instructor off at the class.
5. All cell phones must be turned off during class and examination.
6. Eating is not permitted.
7. Above all please be cognizant of the learning process and purpose of you being in the
8. Class room and extend same respect to other students.

POLICIES / GUIDLINES

Guidelines for Format of Assignments: (General Recommendations)
1. Assignments must be submitted online using Kardan LMS
2. No Assignment will be accepted after the deadline
3. Hard copies of the assignment won't be accepted

4. Assignments via e-mail won't be accepted
5. Assignments need to be written by hands also students are obliged to upload the screen shots of the assignments
6. Copied assignments will lead to the cancellations of the assignments of the respective students
7. Proper references relevant to the assignment must be included in the last page of the assignment
8. Students are also advised to include the table of contents in assignment

Note: All assignments and any work related to this work submitted will be subjected to plagiarism verification by software.

COURSE SCHEDULE / CONTENTS

Week No.	Topics for Discussion	Book Chapter #	Suggested Activity	Topic Outcomes (List the topic outcome in alignment with course outcome)
1	Introduction FAQs about software engineering Software Types of Software Generic software Be-spoken software Engineering Software Engineering Software Engineering vs computer Science Software Engineering vs system engineering Software Engineering Layers Professional and ethical responsibilities of software engineers Software Crises Attributes of quality software	Software engineering by IanSummerville chapter no 1 Software engineering: A practitoner's approach chapter 1	Lecture, group discussion The muddiest point	**Understand** & **clarify** **Ethical and professional Responsibilities**
2	The Process Software Development Life Cycle Software Engineering: The Layered Technology Process, Methods and tools A generic view of software engineering The Software Process Common Process framework Framework Activities Umbrella Activities	Softwaare Engineering: A practitioner's approach chapter # 2	Lecture, group discussion One sentence summeries	**Understand**, **Explain** and **analyze Analytical skills**
3	Software Development Life Cycle Different Phases of SDLC Selecting SDLC for a project Process Models Selection criteria of process model for a project The Build and Fix Process Model	oftwaare Engineering: A practitioner's approach chapter # 2 Software Engineering: IanSummerville chapter # 4	Lecture, group discussion, simulations,	**Understand**, **Learn** and **Team-working**

Week No.	Topics for Discussion	Book Chapter #	Suggested Activity	Topic Outcomes (List the topic outcome in alignment with course outcome)
	Advantages and disadvantages of build and fix model When to use build and fix model		The muddiest point	
4	The Linear Sequential Process Model Advantages of Linear Sequential Model Disadvantages of Linear Sequential Model When to use Linear Sequential Model The V-shaped Process Model Advantages of V Model Disadvantages of V Model When to use V Model	Softwaare Engineering: A practitioner's approach chapter # 2 Software Engineering: IanSummerville chapter # 4	Lecture, group discussion, simulations, The muddiest point	**Understand**, **Learn** and **Team-working**
5	Process Models Prototyping Process Model Types of Prototyping process model Advantages of prototyping Model Disadvantages of prototyping Model When to use prototyping Model Incremental build Model Advantages of Incremental Build Model Disadvantages of Incremental Build Model When to use Incremental Build Model	Softwaare Engineering: A practitioner's approach chapter # 2 Software Engineering: IanSummerville chapter # 4	Lecture, group discussion, simulations, One minute paper	**Understand**, **Explain** and **analyze** **Analytical** and **collaborative skills**
6	Process Models Spiral Process Model Advantages of Spiral Model Disadvantages of Spiral Model When to use Spiral Model	Softwaare Engineering: A practitioner's approach chapter # 2 Software Engineering: IanSummerville chapter # 4		**Understand**, and **Analyze** **Self-organization**
7	Process Models Agile Process Model Advantages of Agile Model Disadvantages of Agile Model When to use Agile Model RAD Process model Advantages of RAD model Disadvantages of RAD model When to use RAD model	Softwaare Engineering: A practitioner's approach chapter # 2 Software Engineering: IanSummerville chapter # 4	Lecture, group discussion, Brain storming	**Understand** and **analysis** **self-appraisal**

Week No.	Topics for Discussion	Book Chapter #	Suggested Activity	Topic Outcomes (List the topic outcome in alignment with course outcome)
	Assignment 1			
8	Component based software engineering Who and what in software Engineering Quize 1	Softwaare Engineering: A practitioner's approach chapter # 2 Software Engineering: IanSummerville chapter # 4	Lecture, group discussion, simulations, Opening question	**Understand**, **Explain** and analyze **Analytical skills**
9	Software Requirements Functional and Non-Functional Requirements User Requirements System Requirements User Interface Requirements Domain Requirements	Software Engineering: IanSummerville chapter # 6	Lecture, group discussion, audiovisual, One minute paper	**Understand** and **Learn** **Goal-oriented**
10	Requirement Engineering Process Feasibility study Requirement Elicitation and Analysis Requirement Validation Requirement change management	Software Engineering: IanSummerville chapter # 7	Lecture, group discussion Application cards	**Explain** and **apply** **Leadership skills**
11	Requirement Engineering Process Requirements gathering process Activities Requirement discovery Fact Find Techniques Assignment 2	Software Engineering: IanSummerville chapter # 7	Lecture, group discussion, audiovisual The muddiest point	**Understand**, and **apply** **Creativity**
12	Requirement Classification and Analysis Prioritization and negotiation Requirement documentation Creating SRS Document	Software Engineering: IanSummerville chapter # 7	Lecture, group discussion, audiovisual The muddiest point	**Understand**, and **apply** **Creativity**
13	The Analysis Modeling Data Modelling Functional Modeling Behavior modeling Data Dictionary Quiz 2	Softwaare Engineering: A practitioner's approach chapter # 12	Lecture, group discussion, audiovisual One minute paper	**Design , create** and **application** **Technical Skills**

Week No.	Topics for Discussion	Book Chapter #	Suggested Activity	Topic Outcomes (List the topic outcome in alignment with course outcome)
14	Modelling DFD(Data Flow Diagram) Purpose of DFD Elements of DFD Guidelines for developing DFD Context Diagram Different Levels in DFD Example Assignment 3	Softwaare Engineering: A practitioner's approach chapter # 12	Lecture, group discussion, One-sentence summary	**Design** and **apply** **Interpersonal skills**
15	Behavior Modelling State Transition Diagram(STD) Elements of State Transition Diagram Example Use case Diagram Components of use case diagram Example Quiz 3	Softwaare Engineering: A practitioner's approach chapter # 12	Lecture, group discussion, Pre and post test	**Explain, Design** and **apply** **Team-working skills**
16	Object Oriented Analysis and Design Class diagram Components of class diagram Object diagram Object oriented Analysis an example Object oriented design an example	Softwaare Engineering: A practitioner's approach chapter # 20 and 21	Lecture, group discussion, One-minute paper	**Clarify Design**, **create** and **apply** **Technical Skills**

COURSE ASSESSMENT

TYPE	PERCENTAGE	RATIONALE
Internal Assessment Assignments: 10% Quizzes: 10% Attendance: 5%	25 %	Equal weightage is assignments and quizzes and at the same time emphasizing on the importance of class participation.
External Assessment Midterm: 25% Terminal: 50%	75%	Students develop an examination sense through midterm examination hence 25% weightage is appropriate. Midterm duly followed by terminal examination providing 50% weightage which is an opportunity to improve scores appropriately.

GRADING

MARK RANGE	GRADE POINT	GRADE	EXPECTED RESULT
90 and above	4.0	A	At least 25% expected to secure A grade
80 – 89	3.0	B	At least 35% expected to secure B grade
70 – 79	2.0	C	At least 30% expected to secure C grade
60 – 69	1.0	D	At least 7% expected to secure D grade
59 and below	0.0	F	At least 3% expected to secure F grade

KARDAN UNIVERSITY POLICY ON PLAGIARISM:

All examinations and quizzes will be "closed book" unless otherwise instructed. At the time of examination all students are requested to clear their desks and are not allowed exchanging any notes or electronic (text) messages to other students. All cellular phones should be in silent mode and student will not be allowed to use it during the examination other than medical/family/work emergency. All students are expected to adhere to these policies and procedures.

CONDUCT AND IMPORTANT POLCIES:

Any student found guilty of a breach of ethics will be referred to Disciplinary Committee of the University.
a) Breach of ethics includes, but is not limited to plagiarism (the copying of other's ideas and passing them off as one's own); copying or other forms of cheating on examinations, papers, and reports; the sale, purchase, or distribution of term papers It is within an instructor's discretion to impose a lesser penalty, e.g., "zero" grade on a given assignment.
b) Course registration is charged by the management. Please approach the management for any queries about course enrolment. In no circumstances should you approach the lecturers who have no control on this.
c) Make-up exam for midterm and terminal exam is available only for those individuals, who are not able to attend their regural exams. Provision of supported documents are mandatory for grant of approval to participate in make-up exams. Those students who miss their regular exam without a genuin reason, will be entitled for 80% of total makeup marks.
Usually make-up exam starts a week after the regular exam finishes.

d) There is no make-up session for the oral presentations and quizzes. If you are absent from the oral presentation/ quiz without eligible reasons/documents, you will not earn any marks.

e) All examinations and quizzes will be "closed book" unless otherwise instructed. At the time of examination all students are requested to clear their desks and are not allowed exchanging any notes or electronic (text) messages to other students. All cellular phones should be in silent mode and student will not be allowed to use it during the examination other than medical/family/work emergency. All students are expected to adhere to these policies and procedures.

f) There is no supplementary exam for any failed course. Individuals, who fail the course, must retake the module.

ATTENDENCE:

Your regular and punctual attendance at lectures and seminars is expected in this course.
University regulations indicate that if students attend less than 65% of scheduled classes they may be refused final assessment.

This course policy has been approved in the Curriculum Development Committee meeting FCS/CDC-2025-01.

Head of Committee: .....

Dean, Faculty of Computer Science .....