

City University
Department of Computer Science and Engineering
Faculty of Science and Engineering

Course Outline

Course Code and Title, SE – 415: Software Engineering

Credit Hours: 3

Prerequisites:

Program: B. Sc. in Computer Science & Engineering (CSE),

Semester: Summer 2019

Total Weeks: 13

Hours/Week: 3

Total Hours: 39⁺

Instructor: Supta Richard Philip

Designation: Senior Lecturer

Office: Room 403

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Office Hrs: By appointment

Course Details

Rationale:

With the integration of new technology, framework the current software industries are changing in a great speed day by day. New tools and approaches are announced almost every day. To meet upcoming challenges of software industry all concerns should be adapted with different phases of software development like maintainability, reusability, portability, security, and integrity and user friendliness. Programming knowledge is not only enough for software development but different ideas and thoughts on different activities are also essential. So every student must have been acquired knowledge on software engineering.

Course Objectives:

The program will assist our students to develop their knowledge in the field of software engineering.

- Be employed in industry, government, or entrepreneurial endeavors to demonstrate professional advancement through significant technical achievements and expanded leadership responsibility.
- Utilize and exhibit strong communication and interpersonal skills, as well as professional and ethical principles when functioning as members and leaders of multi-disciplinary teams
- Apply their foundations in software engineering to adapt to readily changing environments using the appropriate theory, principles and processes

Intended learning outcomes (ILOs) of the Course:

Knowledge	LO1: Acquire knowledge of basic SE engineering methods and practices, and their appropriate application
	LO2: Ability to design and build practices for easy to use, maintainable SW developed using modern multi
	LO3: Apply software engineering techniques including object oriented design approaches, classical software construction projects including planning, scheduling, and risk assessment/management., use of documentation, and avoidance of excessive branching standing a functional hierarchical software development process organization.
Skills	Will develop skills on understanding the problems
	Will gain skills on analysis the problem and selecting the solutions for the problem.
	Will help in achieving communication, demonstrate and presentation skill.
Attitude	Will develop attitude to group dynamics and team work.
	Will create attitude to tackle challenges related to computer and basic software.
	Will create positive attitude to listen ideas of classmates.

Mapping of Course ILO and PLO:

Learning Outcome (LO) of the Course	Program Learning Outcome (PLO)											
	1	2	3	4	5	6	7	8	9	10	11	
LO1	MJ	MJ	MJ	MJ	MJ			MN		MJ	MN	
LO2	MJ	MJ	MJ	MJ						MJ	MN	
LO3	MJ	MJ	MJ	MN	MN					MJ	MN	
LO4	MJ	MJ	MN		MN					MJ	MN	

Course Contents:

Sl. NO	ILO	Topic	Teaching Strategy	Assessment Strategy	No. of Sessions
1	1	The Product: The evolving role of software and its characteristics, Applications The Process: Software Process Model, Linear Sequential model, prototyping model, The RAD model, Evolutionary Software Process model,	Lecture, Exercise	Q/A, Test	3
2	1,2	Project management concepts, the management spectrum, people, the product, the process. Software process and project metrics: Measures, Metrics and Indicators, software measurement, metrics for software quality, metrics for software quality, Integrating metrics within the software engineering process.	Lecture, Exercise	Q/A, Test, Assignment	3
3	2	Software project planning: project planning objectives, software scope, resources, software project estimation, decomposing techniques, empirical estimation models. Risk analysis and management: Software risks, risk identification, risk projection, risk refinement, risk mitigation, monitoring and management, safety risks and hazards	Lecture, Exercise	Q/A, Test, Assignment	4
4	2,3	Project Scheduling and tracking: The relationship between people and effort, defining a task set for the software project, selecting software engineering tasks, refinement of major tasks, scheduling: timeline charts, tracking the schedule, earned value analysis, error tracking, and the project plan.	Lecture, Exercise	Q/A, Test, Assignment	4
5	1,2	Software quality assurance: quality concepts, software reviews, formal technical reviews, software reliability. Software configuration management: the SCM process, identification of objects in the software configuration, version control, change control, status reporting, SCM standard	Lecture, Exercise	Q/A, Test, Assignment	3
6	2,3	The system engineering hierarchy, requirements engineering, system modeling Analysis concepts and principles: Requirement analysis, requirement elicitation for software, analysis principles, software prototyping, software specification,	Lecture, Exercise	Q/A, Test, Assignment	4
7	3	Design concepts and principles: the design process, design and software quality, design concepts, effective modular design, design model	Lecture, Exercise	Q/A, Test, Assignment	3

Teaching Learning Methods:

Analyze and solve knowledge-based problems for practical situation
Group discussion
Lecture slides, presentations, audio and video
Analytical and critical thinking approach to understand real life system and models

Assessment Schedule:

Assessment 1	Quizzes	Week 4, Week 10
Assessment 2	Assignments	Week 5, Week 11
Assessment 3	Presentation	Week 5, Week 11
Assessment 4	Mid-Term Exam	Week 6
Assessment 5	Final Exam	Week 12

Weights of Assessments:

Assessments	%
Mid-Term Exam	30
Final Exam	40
Quizzes	10
Assignments	10
Presentation	10
Total	100

Grading Policy:

Policy	Letter Grade	Grade Point	Assessments
80% and above	A+	4.00	Outstanding
75% to below 80%	A	3.75	Superlative
70% to below 75%	A-	3.50	Excellent
65% to below 70%	B+	3.25	Very Good
60% to below 65%	B	3.00	Good
55% to below 60%	B-	2.75	Average
50% to below 55%	C+	2.50	Below Average
45% to below 50%	C	2.25	Passing
40% to below 45%	D	2.00	Probationary
Below 40%	F	-----	Fail

List of References:

Course Notes: Follow Lecture notes

Essential Books (Text Books):

1. Roger S Pressman, "Software Engineering: A Practitioner's Approach", McGraw-Hill, 7th edition, 2004.

Recommended Reference Books:

1. Ian Sommerville, "Software Engineering", Addison Wesley, 6th edition, 2000.

Online Recourses: Use Internet to get documents on specific topics

Facilities Required for Teaching and Learning:

Projector, Whiteboard, Internet access from classroom computer, Audio/Visual equipment.

Course Policies and Procedures:

1. **Class attendance:** Regular attendances of classes are mandatory and students will be assigned F automatically if he/she misses 6 consecutive classes.
2. **Late submission of work:** Late submission will be followed by penalty, please maintain deadlines.
3. **Unfair means /plagiarism:** Plagiarism will be dealt with severe penalty. Original work is encouraged as they will carry value marks.

Appendix-1: Program Learning Outcome (PLO)

PLO No.	PLO
1.	Engineering Knowledge
2.	Problem Analysis
3.	Design/Development of Solutions
4.	Investigation
5.	Modern Tool Usage
6.	The Engineer and Society
7.	Environment and Sustainability
8.	Ethics
9.	Communication
10.	Individual and Team Work
11.	Life Long Learning
12.	Project Management and Finance

Professional/Generic Skills (Detailed):

- 1. Engineering Knowledge (T)** -Apply knowledge of mathematics, sciences, engineering fundamentals and manufacturing engineering to the solution of complex engineering problems;
- 2. Problem Analysis (T)** – Identify, formulate, research relevant literature and analyze complex engineering problems, and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences;
- 3. Design/Development of Solutions (A)** –Design solutions, exhibiting innovativeness, for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, economical, ethical, environmental and sustainability issues.
- 4. Investigation (D)** Conduct investigation into complex problems, displaying creativeness, using research-based knowledge, and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions;
- 5. Modern Tool Usage (A & D)** -Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations;
- 6. The Engineer and Society (ESSE)** -Apply reasoning based on contextual knowledge to assess societal, health, safety, legal, cultural, contemporary issues, and the consequent responsibilities relevant to professional engineering practices.
- 7. Environment and Sustainability (ESSE)** -Understand the impact of professional engineering solutions in societal, global, and environmental contexts and demonstrate knowledge of and need for sustainable development.
- 8. Ethics (ESSE)** –Apply professional ethics with moral values and commit to responsibilities and norms of professional engineering code of practices.
- 9. Communication (S)** -Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 10. Individual and Team Work (S)** -Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
- 11. Life Long Learning (S)** -Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
- 12. Project Management and Finance (S)** -Demonstrate knowledge and understanding of engineering management and financial principles and apply these to one's own work, as a member and/or leader in a team, to manage projects in multidisciplinary settings, and identify opportunities of entrepreneurship.

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Course Coordinator/ Teacher

Date:

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Head of the Department

Date: