Year:2020
Semester:IVth

1. Name of the Faculty: Arjun Arora — Course Code: **CSEG2008**
2. Course :SEPM — L: **36 (F2F: 24, Online: 12)**
3. Program : BTECH CSE MAD — T:NA
4. Target : 40% — P:NA
   C:NA

COURSE PLAN

Target	50% (marks)
Level-1	40% (population)
Level-2	50% (population)
Level-3	60% (population)

1. Method of Evaluation

UG	PG
Quizzes/Tests, Assignments (30%)	Quizzes/Tests, Assignments, seminar (50%)
Mid Examination (20%)	End semester (50%)
End examination (50%)	

2. Passing Criteria

Scale	PG	UG
Out of 10 point scale	SGPA – "6.00" in each semester CGPA – "6.00" Min. Individual Course Grade – "C" Course Grade Point – "4.0"	SGPA – "5.0" in each semester CGPA – "5.0" Min. Individual Course Grade – "C" Course Grade Point – "4.0"

*for PG, passing marks are 40/100 in a paper
*for UG, passing marks are 35/100 in a paper

3. Pedagogy
   1. Presentations
   2. Flipped Classroom sessions
   3. Think-Pair-Share Activities
   4. Video Lectures
   5. Class Test
   6. Quiz
   7. Assignments
   8. Digital and analog Presentations
   9. Concept diary (needs to be maintained by students-short and concise notes which include course concepts that he/she has understood.)

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4. References:

Text Books	Web resources	Journals	Reference books
1. Software Engineering, New Age International Third Edition, Aggarwal, K. K. & Singh, Yogesh 2. Software Project Management, Tata Mcgraw Hill, New Delhi, Fifth Edition, Bob Hughes And Mike Cotterell			1. Fundamentals of Software Engineering by Rajib Mall 2. Software Engineering by Ian Sommerville, Pearson Education, New Delhi 3. Software Engineering Principles and Practices, OXFORD, New Delhi by Deepak Jain 4. Software Project Management – A Concise Study by S.A. Kelkar.

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GUIDELINES TO STUDY THE SUBJECT

Instructions to Students:

1. Go through the 'Syllabus' in the Black Board section of the web-site(https://learn.upes.ac.in) in order to find out the Reading List.
2. Get your schedule and try to pace your studies as close to the timeline as possible.
3. Get your on-line lecture notes (Content, videos) at Lecture Notes section. These are our lecture notes. Make sure you use them during this course.
4. Check your blackboard regularly
5. Go through study material
6. Check mails and announcements on blackboard
7. Keep updated with the posts, assignments and examinations which shall be conducted on the blackboard
8. Be regular, so that you do not suffer in any way
9. **Cell Phones and other Electronic Communication Devices:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) are not permitted in classes during Tests or the Mid/Final Examination. Such devices MUST be turned off in the class room.
10. **E-Mail and online learning tool:** Each student in the class should have an e-mail id and a pass word to access the LMS system regularly. Regularly, important information – Date of conducting class tests, guest lectures, via online learning tool. The best way to arrange meetings with us or ask specific questions is by email and prior appointment. All the assignments preferably should be uploaded on online learning tool. Various research papers/reference material will be mailed/uploaded on online learning platform time to time.
11. **Attendance:** Students are required to have minimum attendance of 75% in each subject. Students with less than said percentage shall NOT be allowed to appear in the end semester examination.

This much should be enough to get you organized and on your way to having a great semester! If you need us for anything, send your feedback through e-mail to your concerned faculty. Please use an appropriate subject line to indicate your message details.

There will no doubt be many more activities in the coming weeks. So, to keep up to date with all the latest developments, please keep visiting this website regularly.

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RELATED OUTCOMES

1. The expected outcomes of the Program are:

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, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and 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 the public health and safety, and the cultural, societal, and environmental considerations.
PO4	*Conduct investigations of complex problems:* Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the 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 the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	*Environment and sustainability:*Understand the impact of the 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 and responsibilities and norms of the engineering practice.

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PO9	*Individual and team-work:* Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	*Communication:* 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.
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 and leader in a team, to manage projects and in multidisciplinary environments.
PO12	*Life-long learning:* 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.

2. The expected outcomes of the Specific Program are: (upto3)

PSO1	Perform system and application programming using computer system concepts, concepts of Data Structures, algorithm development, problem solving and optimizing techniques.
PSO2	Apply software development and project management methodologies using concepts of front-end and back-end development and emerging technologies and platforms.
PSO3	AS PER PROGRAME SPECIALIZATION .

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3. The expected outcomes of the Course are: (minimum 3 and maximum 6)

CO 1	Understand various software process models such as waterfall, Spiral and evolutionary models.
CO 2	Demonstrate effective teamwork and strong working knowledge of ethics and professional responsibility for managing the software projects.
CO 3	Demonstrate effective project execution, quality control and risk management techniques that result in successful projects.
CO 4	Conduct project planning activities that accurately forecast project costs, timelines and quality.
CO 5	Conduct standard tests and measurements for validation of projects; to conduct, analyze, and interpret results; and to apply results to improve processes.

4. Co-Relationship Matrix

Indicate the relationships by1- Slight (low) 2- Moderate (Medium) 3-Substantial (high)

Program Outcomes / Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1		1	2	2									1	3	2
CO 2								2	2				2	3	
CO 3										2			2	3	
CO 4					2								2	2	
CO 5													2	2	
Etc.															
Average															

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5. Course outcomes assessment plan:

components / Course Outcomes	Assignment/Project	Test/Quiz	Mid Semester	End Semester	Any other
CO 1	☐	☐	☐	☐	☐
CO 2	☐	☐	☐	☐	☐
CO 3	☐	☐	☐	☐	☐
CO 4	☐	☐	☐	☐	☐
CO 5	☐	☐	☐	☐	☐

BROAD PLAN OF COURSE COVERAGE

Course Activities:

S. No.	Description	Planned			Remarks
		From	To	No. of Sessions	
1.	**UNIT- 1: Introduction to Software Engineering**			05	
2.	**UNIT- 2: Requirement Analysis and Specifications**			06	
3.	**UNIT- 3: Software Project Planning**			05	

UPES

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4.	**UNIT -4: Software Metrics**			04	
5.	**UNIT- 5: Software Testing**			08	
6.	**UNIT-6: Project Quality and Risk Management**			04	
7	**UNIT 7: Project Integration and Scope Management**			04	

Sessions: Total No. of Instructional periods available for the course

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SESSION PLAN

UNIT-I

Introduction to Software Engineering

Lecture No.	Topics to be Covered	CO Mapped
L1	Software Engineering definition; S/W characteristics, applications	CO1
L2	Life Cycle Models – Waterfall (classical and iterative)	CO1
L3	Spiral Model with quadrants and its scope	CO1
L4	Prototyping, RAD Models	CO1
L5	Comparison of above models and their applications	CO1

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SESSION PLAN

UNIT-II

Requirements Analysis and Specifications

Lecture No.	Topics to be Covered	CO Mapped
L6	Requirements Engineering-Crucial steps; types of requirements	CO2
L7	Requirements documentation – Nature of SRS, characteristics of a good SRS	CO2
L8	Use case approach with guidelines	CO2
L9	Problems on Use Case diagram	CO2
L10	DFD (Level 0, 1, 2 and 3)	CO2
L11	Organization of the SRS	CO2

UPES

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SESSION PLAN

UNIT-III

Software Project Planning

Lecture No.	Topics to be Covered	CO Mapped
L12	Size Estimation – LOC and Function Count, Albrecht FPA	CO4
L13	Cost estimation– Static, Single variable and Multivariable Models (SEL, Watson Felix model)	CO4
L14	The Constructive Cost model: basic, intermediate model	CO4
L15	Cost-benefit evaluation techniques (Net Profit, Payback period, ROI, NPV computation)	CO4
L16	Problems(numerical) on above methods	CO4

UPES

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4. Target : 40%

Course Code: **CSEG2008**
L: **36 (F2F: 24, Online: 12)**
T:NA
P:NA
C:NA

SESSION PLAN

UNIT-IV

Software Metrics

Lecture No.	Topics to be Covered	CO Mapped
L17	Understanding metrics: definition, process metrics, product and project metrics, areas of applications	CO3
L18	Product metrics – Metrics for source code; metrics for testing(Halstead metrics);	CO3
L19	Numericals based on above metrices	CO3
L20	Metrics for maintenance and numericals	CO3

UPES

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L: **36 (F2F: 24, Online: 12)**
T:NA
P:NA
C:NA

SESSION PLAN

UNIT-V

Software Testing

Lecture No.	Topics to be Covered	CO Mapped
L21	Understanding software testing, its need and objectives; Error, mistake, bug, fault and failure	CO5
L22	Test, test case and test suite; Verification & Validation; Alpha, Beta and Acceptance Testing	CO5
L23	Functional (BBT) Testing –characteristics, pros & cons	CO5
L24	Boundary Value Analysis with numerical problems	CO5
L25	Equivalence Class testing with numerical problems	CO5
L26	Structural Testing (WBT) – concept; characteristics, its pros and cons; Comparison with BBT	CO5
L27	Path Testing(Flow graph) with problems	CO5
L28	Cyclomatic complexity with numericals	CO5

UPES

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L: **36 (F2F: 24, Online: 12)**
T:NA
P:NA
C:NA

SESSION PLAN

UNIT-VI

Project Quality and Risk Management

Lecture No.	Topics to be Covered	CO Mapped
L29	Understanding Software Quality attributes, McCall Model.	CO3
L30	ISO 9126 and CMM Model	CO3
L31	Software Risk Management : Types of Risks involved	CO3
L32	Phases of Risk Management	CO3
L29	Understanding Software Quality attributes, McCall Model.	CO3
L30	ISO 9126 and CMM Model	CO3
L31	Software Risk Management : Types of Risks involved	CO3

UPES

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Course Code: **CSEG2008**
L: **36 (F2F: 24, Online: 12)**
T:NA
P:NA
C:NA

SESSION PLAN

UNIT-VII

Project Integration and Scope Management

Lecture No.	Topics to be Covered	CO Mapped
L33	Project Selection and its methods; Understanding Project Scope	CO4
L34	Role and responsibilities of Project manager and project stakeholders	CO2
L35	Issues in project staff acquisition ; Team formation and development	CO2
L36	Project Life Cycle phases and its deliverables	CO3