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| CS209: Software Engineering | L | T | P | NIL |
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Course Objective: To introduce fundamentals of software engineering including requirement specifications, software design, testing and maintenance

| S. No | Course Outcomes (CO) |
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| CO1 | A general understanding of software process models such as the waterfall and evolutionary models. |
| CO2 | To be able to decompose the given project in various phases of a lifecycle. |
| CO3 | Understanding of software requirements and the SRS documents. |
| CO4 | To perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance |
| CO4 | To apply the knowledge, techniques, and skills in the development of a software product. |

| S. No | Contents | Contact Hours |
|---------------|--|----------------------|
| UNIT 1 | Introduction: Introduction to software Engineering, Software characteristics, Software components, Software applications, Software Engineering Principles, Software metrics and measurement, monitoring and control. Software development life-cycle, Water fall model, prototyping model, Incremental model, Iterative enhancement Model, Spiral model, Agile Model. | 8 |
| UNIT 2 | Software Requirement Specification: Requirements Elicitation Techniques, Requirements analysis, Models for Requirements analysis, Requirements specification, and requirements validation. | 8 |
| UNIT 3 | System Design: Design Principles: Problem partitioning, abstraction. Top down and bottom up – design, structured approach. Functional versus object oriented approach of design, design specification, Cohesiveness and Coupling. Overview of SA/SD Methodology, structured analysis, data flow diagrams, extending DFD to structure chart, Entity-Relationship diagram, Use case diagrams. | 8 |
| UNIT 4 | Software project Management: Project planning and Project scheduling and Resource Management including Gantt charts and critical path method (CPM). Software Metrics: Size Metrics like LOC, Token Count, and Function Count. Cost estimation using models like COCOMO. Risk Management activities. Software Reliability and Quality Assurance: Reliability issues, Reliability metrics, reliability models, Software quality, ISO 9000 certification for software industry, SEI capability maturity model, Agile Project Management | 10 |
| UNIT 5 | Testing: Verification and validation, code inspection, test plan, test case specification. Level of testing: Unit, Integration Testing, Top down and bottom up integration testing, Alpha and Beta testing, System testing and debugging. functional testing, structural testing, Software testing strategies. | 8 |
| UNIT 6 | Software Maintenance: Structured Vs unstructured maintenance, Maintenance Models, Configuration Management, Reverse Engineering, Software Re-engineering. | 6 |
| | Total | 48 |