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| **Institute Name** | Chitkara University, H.P | |
| **Program Name**  **Semester**  **Batch** | B.E CSE  V  2016 | |
| **Course Code** | CSL3306 | |
| **Course Name** | Software Engineering | |
| **Lecture / Tutorial (per week)** | 3 -0 -0 | **Course Credits**  3.0 |
| **Course Coordinator Name** | Ms. Praveshika Sinval | |

1. **Scope of the Course**

In this course, students will gain a broad understanding of the discipline of software engineering and its application to the development and management of software systems.

1. **Objectives of the Course**

* To acquire knowledge of basic software engineering methods and practices, and their appropriate application.
* To understand the role of project management including planning, scheduling, risk management, etc.
* To impart knowledge of software requirements, software testing approaches (such as unit testing and integration testing) and quality control and ensuring good quality software using latest tools.

1. **Course Learning Outcomes**

CLO1: Be employed in industry, government, or entrepreneurial endeavors to demonstrate professional advancement through significant technical achievements and expanded leadership responsibility.

CLO2:Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment.

CLO3:An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

CLO4: An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes.

CLO5:Regularly engage in exploring, learning and applying state-of-the-art hardware and software technologies to the solution of computer systems problems.

1. **Textbooks**

**TB1:** ‘Software Engineering, A practitioner’s Approach’ by Roger S. Pressman, 6th Edition, McGraw- Hill International Edition.

1. **Reference Books**

**RB1:** Software Engineering by Ian Sommerville, sixth Edition, Adison- Wesley Pub. Co.

**RB2:** An Integrated Approach toSoftware Engineering by Pankaj Jalota, third edition

1. **Other readings and relevant websites**

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| S.No. | **Link of Journals, Magazines, websites, MOOC Course and Research Papers** |
|  | <http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Soft%20Engg/New_index1.html> |
|  | http://www.csse.monash.edu.au/courseware/cse3308/cse3308\_2005/html/lectures.html |
|  | http://engineeringppt.blogspot.in/2011/12/software-engineering-pressman-ppt.html |
|  | MOOC course: https://www.udacity.com/course/software-development-process--ud805 |

1. **Course Plan**

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| **Lecture Number** | Topics | **Text Book / Reference Book / Other reading material** | **Page numbers of Text Book(s)** |
| 1-2 | **Introduction to Software Engineering:** The Evolving Role of Software, Changing nature of software, | TB1 | 33-42 |
| 3-5 | **The Software Process:** SDLC, Software Engineering –Layered Technology, **Process Models:** The Waterfall Model, Evolutionary Process Models – Incremental Models, Spiral Model | TB1  RB1  RB2 | 52-63  80-90  78-80  42-63  32-33 |
| 6-9 | **An Agile View of Process:** what is agility, what is an agile process, agile process models: extreme programming(XP), ASD, Scrum | TB1 | 103-107  109-118 |
|  | **Assignment-1** |  |  |
| 10-12 | **Requirements Engineering:** SRS, Requirements Engineering Tasks: Initiating Requirement, engineering Process, Eliciting Requirements | TB1  RB1 | 175-190  97-115  121-139 |
|  | **ST-I (Syllabus covered from 1-12 lectures)** |  |  |
| 13-16 | **Building Analysis Model:** Requirement Analysis, Data modeling Concepts, Flow Oriented Modeling, | TB1 | 226-229 |
| 17-20 | **Design Engineering-** Design Concepts and model, Data design, Architectural design. Designing class based Components .User Interface Analysis and design, Interface analysis and Interface design steps. | TB1 | 265-270  289-291  335-338 |
| 21-24 | **Software Testing Strategies and Tactics:** A strategic approach for Software Testing, **Software Testing Strategies:** Unit Testing, | TB1  RB2 | 387-406  405-407 |
| 25-27 | Integration Testing, Validation Testing ,System Testing, | TB1  RB1 | 406-408  452-457 |
|  | **Assignment-2** |  |  |
| 28-29 | **White-Box Testing Techniques:** Basis Path Testing, Control Structure Testing: condition and loop testing | TB1  RB2 | 421-428,  425-428 |
| 30-31 | **Black -Box Testing Techniques:** Equivalence Partitioning and Boundary Value Analysis | TB1  RB2 | 427-438  411-414 |
|  | **ST-II (Syllabus covered from 13-31 lectures)** |  |  |
| 32-33 | **Project Management & Metrics:** The management spectrum, Metrics for process & project, Metrics for Software Quality, Estimation. | TB1  RB1 | 629-630  649-650  661-663  71-89 |
|  | **Assignment-3** |  |  |
| 34-35 | **Software Project Planning:** Objective , Software Scope and Resources, Software Project Estimation and Decomposition Techniques(LOC,FP), | TB1  RB1 | 680-686  180-184 |
| 36 | **Empirical Estimation Models:** COCOMO Model, COCOMO Model II | TB1  RB2 | 691-699  185-188 |
|  | **Assignment-4** |  |  |
| 37-38 | **Project Scheduling:** basic concepts of scheduling, Project Scheduling, Earned Value Analysis. | TB1 | 708-711  716-722 |
| 39-40 | **Risk Management:** Software Risks & Risk Strategies, Risk Identification, Risk Projection, Risk Mitigation, Monitoring and Management (RMMM) plan | TB1  TB1  RB2 | 726-728  729-740  199-206 |
| 41-42 | **Quality Management** :Overview of Quality Management, | RB1  TB1 | 535-554  745-753  762-766 |
| 43-45 | **Change Management** | TB1  RB1 | 771-796  641-656 |
|  | **Assignment-5** |  |  |
| **ST-III (Syllabus covered from 32-45 lectures)** | | | |

1. **Evaluation Scheme:**

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| Component 1 | Formative Assessment | 20 |
| Component 2\* | Sessional Tests (STs)\* | 30 |
| Component 3\*\* | End Term Examination\*\* | 50 |
|  | **Total** | **100** |

**\*** There are three Sessional Tests (STs) for all theory papers. The average of best two will be considered.

**\*\*** The End Term Comprehensive examination will be held at the end of semester. The mandatory requirement of 75% attendance in all theory classes is to be met for being eligible to appear in this component.

1. **Guest Faculty likely to invited :** Dr. Naveen Hemarjan, HOD (Computer Science Department), JECRC University, Jaipur.

**SYLLABUS**

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| **Contents** | **Lectures** | **Weightage(%age)** |
| **Introduction to Software Engineering:** The Evolving Role of Software, Changing nature of software, | 2 | 15% |
| **The Software Process:** Software Engineering –Layered Technology,SDLC **Process Models:** The Waterfall Model, Evolutionary Process Models – Incremental Models, Spiral Model | 5 |
| **An Agile View of Process:** what is agility, what is an agile process, agile process models: extreme programming(XP), ASD, Scrum | 4 | 15% |
| **Requirements Engineering:** SRS, Requirements Engineering Tasks: Initiating Requirement, engineering Process, Eliciting Requirements | 3 |
| **Building Analysis Model:** Requirement Analysis, Data modeling Concepts, Flow Oriented Modeling, | 4 | 30% |
| **Design Engineering-** Design Concepts and model, Data design, Architectural design. Designing class based Components .User Interface Analysis and design, Interface analysis and Interface design steps. | 4 |
| **Software Testing Strategies and Tactics:** A strategic approach for Software Testing, **Software Testing Strategies:** Unit Testing, Integration Testing, Validation Testing ,System Testing, | 5 |
| **White-Box Testing Techniques:** Basis Path Testing, Control Structure Testing, | 2 |
| **Black -Box Testing Techniques:** Equivalence Partitioning and Boundary Value Analysis | 2 |
| **Project Management & Metrics:** The management spectrum, Metrics for process & project, Metrics for Software Quality, Estimation. | 2 | 15% |
| **Software Project Planning:** Objective , Software Scope and Resources, Software Project Estimation and Decomposition Techniques(LOC,FP), | 2 |
| **Empirical Estimation Models:** COCOMO Model, COCOMO model II | 1 | 10% |
| **Project Scheduling:** basic concepts of scheduling, Project Scheduling, Earned Value Analysis, | 2 |
| **Risk Management:** Software Risks & Risk Strategies, Risk Identification, Risk Projection, Risk Mitigation, Monitoring and Management (RMMM) plan | 2 | 8% |
| Overview of Quality Management,  Quality Management | 2 | 12% |
| Change Management | 3 |

**This Document is approved by:**

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| **Designation** | **Name** | **Signature** |
| Course Coordinator | Ms Praveshika Sinval |  |
| Deputy Dean | Dr. Shaily Jain |  |
| Date | 10th july, 2018 |  |