**Course Handout**

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| **Institute/School/College Name** | Chitkara School of Engineering & Technology | | |
| **Department/Centre Name** | Department of Computer Science & Engineering | | |
| **Programme Name** | Bachelor of Engineering (B.E.)-Computer Science & Engineering | | |
| **Course Name** | Software Engineering | **Session** | 2018-19 |
| **Course Code** | CSL3307 | **Semester/Batch** | 4th / 2017 |
| **Lecture/Tutorial (Per Week)** | 3-0-0 | **Course Credit** | 3 |
| **Course Coordinator Name** | Er. Parul Datta | | |

1. **Scope & Objective 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.
* 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 Outcome:**

* **CLO01:** Acquire strong fundamental knowledge in science, mathematics, fundamentals of computer science, software engineering and multidisciplinary engineering to begin in practice as a software engineer.
* **CLO02:** Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.
* **CLO03:** Deliver quality software products by possessing the leadership skills as an individual or contributing to the team development and demonstrating effective and modern working strategies by applying both communication and negotiation management skill.
* **CLO04:** Apply new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects and evolving into their continuous professional development.

1. **Recommended Books (Reference Books/Text Books):**
   1. **B01:** Software Engineering, A practitioner’s Approach by Roger S. Pressman, 7th Edition, McGraw-Hill International Edition.
   2. **B01 (a):** Software Engineering, A practitioner’s Approach by Roger S. Pressman, 6th Edition, McGraw-Hill International Edition.
   3. **B02:** Software Engineering by Ian Sommerville, Sixth Edition, Adison-Wesley Pub. Co.
   4. **B03:** An Integrated Approach toSoftware Engineering by Pankaj Jalote, Third Edition.
2. **Other readings & relevant websites:**

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| **S.No.** | **Link of Journals, Magazines, websites 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:**
   1. **Lecture 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 | B01 | 3-8  12-16 |
| **3-4** | **The Software Process:** Software Engineering–Layered Technology, Process Models: The Waterfall Model | B01  B02 | 38-45 |
| **5-6** | Evolutionary Process Models, Incremental Models, Spiral Model | B01 | 45-47 |
| **7-9** | **An Agile View of Process:** what is agility, what is an agile process, Agile Process Models: extreme programming (XP), ASD, Scrum | B01 | 67-83 |
| **10-12** | **Requirements Engineering:** Requirements Engineering Tasks: Initiating Requirement, Engineering Process, Eliciting Requirements | B01  B03 | 120-140 |
| **13-15** | **Building Analysis Model:** Requirement Analysis, Data modeling Concepts, Flow Oriented Modeling | B01 | 149-153  164-165  187-192 |
| **16-17** | **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 | B01 | 222-232  249-255  282-290  313-320 |
| **18-19** | **Software Testing Strategies and Tactics:** A strategic approach for Software Testing, Software Testing Strategies: Unit Testing | B01 | 450-466 |
| **20** | Integration Testing, Validation Testing , System Testing | B01 | 467-472 |
| **ST-I (Syllabus covered from 1-20 lectures)** | | | |
| **21-22** | **White-Box Testing Techniques:** Basis Path Testing, Control Structure Testing: condition and loop testing | B01 | 485-493 |
| **23-24** | **Black-Box Testing Techniques:** Equivalence Partitioning and Boundary Value Analysis | B01  B02 | 495-498 |
| **25-27** | **Project Management & Metrics:** The management spectrum, Metrics for process & project, Metrics for Software Quality, Estimation | B01 | 647-648  667-670  679-681  692 |
| **28-30** | **Software Project Planning:** Objective, Software Scope and Resources, Software Project Estimation and Decomposition Techniques (LOC, FP) | B01  B03 | 693-707 |
| **31-32** | **Empirical Estimation Models:** COCOMO Model, COCOMO Model II | B01 | 708-711 |
| **33-34** | **Project Scheduling:** Basic concepts of scheduling, Project Scheduling, Earned Value Analysis | B01 | 722-740 |
| **ST-II (Syllabus covered from 21-34 lectures)** | | | |
| **35** | **Risk Management:** Software Risks & Risk Strategies | B01 | 745 |
| **36** | Risk Identification, Risk Projection, Risk Mitigation, Monitoring and Management (RMMM) plan | B01 | 747-757 |
| **37-38** | **Overview of Quality Management:** Quality Management | B01 (a) | 745-766 |
| **39** | **Change Management** | B01 (a) | 772-788 |
| **ST-III (Syllabus covered from 1-39 lectures)** | | | |

1. **Evaluation Scheme & Components:**

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| **Evaluation Component** | **Type of Component** | **No. of Assessments** | **Weightage of Component** | **Mode of Assessment** |
| **Component 1** | Formative Assessment | 01 | 10% | Offline |
| **Component 2** | Sessional Tests (STs) | 03\* | 30% | Offline |
| **Component 3** | End Term Examination | 01 | 60% | Offline |
| **Total** | | **100%** | | |

\*Out of 3 STs, the ERP system automatically picks the best 2 ST marks for evaluation of the STs as final marks.

**Details of Evaluation Components:**

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| --- | --- | --- | --- | --- |
| **Evaluation Component** | **Description** | **Syllabus Covered (%)** | **Timeline of Examination** | **Weightage (%)** |
| **Component 1** | Formative Assessment | 100% | 12th/ 13th week | 10% |
| **Component 2** | ST 1 | Upto 40% | As defined in Academic Calendar | 30% |
| ST 2 | 41% - 80% | As defined in Academic Calendar |
| ST 3 | 100% | As defined in Academic Calendar |
| **Component 3** | End Term Examination\* | 100% | At the end of the semester | 60% |
| **Total** | | | **100%** | |

\*As per Academic Guidelines minimum 75% attendance is required to become eligible for appearing in the End Semester Examination.

**7. Syllabus of the Course:**

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| **Subject: Software Engineering** | **Subject Code: CSL3307** |

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| **S. No.** | **Topic (s)** | **No. of Lectures** | **Weightage (%)** |
| **1** | **Introduction to Software Engineering:** The Evolving Role of Software, Changing nature of software | 2 | 15% |
| **2** | **The Software Process:** Software Engineering –Layered Technology, Process Models: The Waterfall Model | 2 | 5% |
| **3** | Evolutionary Process Models, Incremental Models, Spiral Model | 2 | 5% |
| **4** | **An Agile View of Process:** what is agility, what is an agile process, Agile Process Models: extreme programming (XP), ASD, Scrum | 3 | 5% |
| **5** | **Requirements Engineering:** Requirements Engineering Tasks: Initiating Requirement, Engineering Process, Eliciting Requirements | 3 | 5% |
| **6** | **Building Analysis Model:** Requirement Analysis, Data modeling Concepts, Flow Oriented Modeling | 3 | 4% |
| **7** | **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 | 2 | 1% |
| **8** | **Software Testing Strategies and Tactics:** A strategic approach for Software Testing, Software Testing Strategies: Unit Testing | 3 | 5% |
| **9** | Integration Testing, Validation Testing , System Testing | 1 | 5% |
| **10** | **White-Box Testing Techniques:** Basis Path Testing, Control Structure Testing | 3 | 5% |
| **11** | **Black-Box Testing Techniques:** Equivalence Partitioning and Boundary Value Analysis | 2 | 5% |
| **12** | **Project Management & Metrics:** The management spectrum, Metrics for process & project, Metrics for Software Quality, Estimation | 3 | 5% |
| **13** | **Software Project Planning:** Objective, Software Scope and Resources, Software Project Estimation and Decomposition Techniques (LOC, FP) | 3 | 5% |
| **14** | **Empirical Estimation Models:** COCOMO Model, COCOMO Model II | 2 | 5% |
| **15** | **Project Scheduling:** Basic concepts of scheduling, Project Scheduling, Earned Value Analysis | 2 | 5% |
| **16** | **Risk Management:** Software Risks & Risk Strategies | 1 | 8% |
| **17** | Risk Identification, Risk Projection, Risk Mitigation, Monitoring and Management (RMMM) plan | 1 | 6% |
| **18** | **Overview of Quality Management:** Quality Management, **Change Management** | 1 | 6% |

**This Document is approved by:**

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| **Designation** | **Name** | **Signature** |
| **Course Coordinator** | Er. Jyoti Snehi |  |
| **Dy. Dean** | Dr. Meenu khurana |  |
| **Date (DD/MM/YYYY)** | 07/01/2019 | |