# LOK JAGRUTI KENDRAUNIVERSITY

Syllabus for **Master of Computer Applications (Integrated)**

Semester- I

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| **Course Code** | **050120502** | | | |
| **Category** | **Core Subject** | | | |
| **Course Title** | **Software Engineering and Quality Assurance** | | | |
| **Scheme and Credits** | **Theory** | **Tutorial** | **Lab** | **Credits** |
| | **4** | 0 | **2** | 6 |
| **Pre-requisites (if any)** | **1. Basic knowledge of software development**<br>**2. Programming knowledge like Java, JavaScript Python** | | | |

## 1. Course Objectives:

| Sr. | Course Outcome (Learner will be able to) |
|---|---|
| 1. | To understand Requirement Analysis, System Design, Quality Assurance, and Implementation. |
| 2. | To understand various Software Development Life Cycle (SDLC) models and criteria to select appropriate model. |
| 3. | To understand Software Quality Assurance (SQA) architecture and the details of its Components. |
| 4. | To understand of how the SQA components can be integrated into the project life cycle. |
| 5. | To understand how to Analyze, Design, Build and Test software. |

## 2. Course contents:

| Module | Content | Weightage |
|---|---|---|
| **Unit I** | **Introduction to Software Engineering & Process Models**<br>Software Engineering, Software Process<br>Process Models – Waterfall, Incremental, Evolutionary Process Model – Prototype, Spiral and concurrent Development Model<br><br>Preliminary Introduction of Agile Process; Extreme Programming (XP); Brief Overview of Other Agile Process Models: Adaptive Software Development, Scrum | 20% |
| **Unit II** | **Requirement Engineering**<br>Requirements Engineering; Groundwork for Understanding of Software Requirements; Overview of Eliciting Requirements, Developing Use Cases, Building the Requirements Model; Negotiating Requirements; Validating Requirements; | 15% |

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| **Unit III** | **Introduction to software Quality and Assurance**<br>**What is software quality**- definition, what is software quality assurance-definition, what are software quality factors – Product operation factors, product revision factors, product transition factors, Alternative models of software quality factors, Software Project Life Cycle Components, Contract Review: Objectives, Process, and its stages, who performs contract review<br>**Development and quality plans:** objectives and elements<br>**Quality activities in project life cycle:** Verification, Validation and Qualification<br>**Reviews:** Formal design reviews – Objectives, Participants, Preparations, DR Sessions, Post review activities<br>**Infrastructure components** for error prevention and improvements, SQA Human Components | 20% |
| **Unit IV** | **Software Testing & Implementation**<br>Software testing definition, objectives, software testing strategies: big bang, incremental, top down, bottom up<br>**Software test classification:** White box testing – Correctness test line and path coverage, Black box testing – Equivalence Classes<br>The Testing Process, Testing Life Cycle, Test Case Design,<br>**Automated testing**: Process of automated testing, Brief about types of automated testing, Advantages, and disadvantages of automated testing, Alpha, and beta testing | 20% |
| **Unit V** | **Automation Testing Tool (Selenium)**<br>1. Download and install the Java Software Development Kit (JDK) http://www.oracle.com/technetwork/java/javase/downloads/index.html<br>2. Download "Eclipse IDE for Java Developers" http://www.eclipse.org/downloads/<br>3. Download the Selenium Java Client Driver http://seleniumhq.org/download/<br>4. Configure Eclipse IDE with WebDriver<br>**Learn Selenium Web Driver:**<br>Selenium Test Environment Setup, Inspect Web/HTML Elements, Locating Elements in Selenium (Using Element Locators), Performing Actions on Elements (Using Selenium WebDriver Methods), Selenium Page Object Model (Creating Object Repositories), Writing Selenium Test Cases | 25% |

**3. Desirable:**

**4. Main Text Books:**

1. Roger S. Pressman, “Software Engineering – A Practitioner’s Approach”, 7th Edition, McGraw Hill Publications
2. Daniel Galin, “Software Quality Assurance”, Pearson Publication, 2009.

**5. Accomplishment of the student after completing the course**:

| **L J University Exam Evaluation Scheme** | | | |
|---|---|---|---|
| Internal Marks Component | | **CEC** | **Total Marks** |
| | Unit Test 1 | 10 | **50** |
| | Unit Test 2 | 20 | |
| | Attendance | 10 | |
| | Presentation/ One Day Activity | 10 | |
| | Passing Marks | 20 | |
| **University Theory Exam** | | | **50** |
| | | **Total Marks** | **100** |