1. **Course Handout (Student & Faculty)**

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| **Institute/School/College Name** | Chitkara University Institute of Engineering & Technology | | |
| **Department/Centre Name** | Department of Computer Applications | | |
| **Programme Name** | BCA | | |
| **Course Name** | Software Testing | **Session** | Aug- Dec 2020 |
| **Course Code** | CA127 | **Semester/Batch** | 5th/2018 |
| **Lecture/Tutorial (Per Week)** | 4/0 | **Course Credit** | 4 |
| **Course Coordinator Name** | Mr. Jaswinder Singh | | |

1. **Scope & Objective of the Course:**

In Software Industry testing is an important activity and plays an integral part. Software seems to be there in almost every device that we use in our daily lives. Thedesigning of the course is done in such a manner that it enables a student to have a clear understanding and knowledge of the foundations, frameworks, techniques, processes and tools in the area of software testing and its practice in the industry. The course will prepare students to be leaders in software testing. Whether you are a developer or a tester, you must test software. This course is a unique opportunity to learn strengths and weaknesses of a variety of software testingtechniques.

**The main objectives of the course are:**

* To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
* To learn how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.
* To gain software testing experience by applying software testing knowledge and methods to practice-oriented software testing projects.
* To learn how to write software testing documents, and communicate with engineers in various forms.
* To learn various testing techniques and its applications.

1. **Course Learning Outcome:**

**On the successful completion of the course a student will be able to**

* **CLO01:**Apply software testing knowledge and engineering methods.
* **CLO02:**Design and conduct a software test process for a software testing project.
* **CLO03:** Identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
* **CLO04:**Use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects.
* **CLO05:** Apply various testing techniques on real life projects
* **CLO06:** Differentiate static testing methods with Dynamic testing.
* **CLO07:** Write test case and report the bugs at various levels.

1. **Recommended Books (Reference Books/Text Books):**
   1. **B01:**Software Testing Principles and Practices, Naresh Chauhan, Second Edition, OXFORD University Press
   2. **B02:**Software Testing and Quality Assurance Theory and Practive, Kshirasagar Naik, Student Edition, Wiley Publications
   3. **B03:**ISTQB Certified Tester Foundation Level Syllabus
2. **Other readings & relevant websites:**

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| **S.No.** | **Link of Journals, Magazines, websites and Research Papers** |
|  | <https://www.istqb.org/downloads/syllabi/foundation-level-syllabus.html> |
|  | https://www.softwaretestingclass.com/start-testing-before-testing-starts/ |
|  | <https://www.guru99.com/software-testing.html> |

1. **Course Plan:**
   1. **Lecture Plan**

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| **Lecture No.** | **Topic(s)** |
| 1-5 | **A perspective of Testing** : Basic Testing Vocabulary, Basic definitions, Test cases, Insights from a Venn diagram, Identifying test cases, Error and fault taxonomies, Levels of testing, Examples. |
| 6 | Generalized pseudo code, The triangle problem |
| 7 | Defects and identification of defects |
| 8-10 | The Multiple Roles of the Software Tester (People Relationships), Scope of Testing, Testing Constraints, The “V” Concept of Testing. |
| 11-15 | **Test Administration and Test Plan**: Test Planning, Customization of the Test Process, Prerequisites to test planning, understand the Characteristics of the Software Being Developed, Build the Test Plan, Write the Test Plan. |
| 16-18 | **Testing Techniques**: Structural versus Functional Technique Categories, Verification versus Validation, Static versus Dynamic Testing. |
| 19-22 | Path Testing, Data Flow Testing, Boundary value analysis, Robustness testing, Worst-case testing, Special value testing, Examples |
| 23-26 | Random testing, Equivalence classes, Equivalence test cases for the triangle problem, System Testing. |
| 27-30 | **Test Cases**: Test case Design, Building test cases, Test data mining, Test execution, Test Reporting, Defect Management, Test Coverage – Traceability matrix. |
| 31-34 | **Test reporting**: Guidelines for writing test reports, Test Tools used to Build Test Reports. Bug reporting using Excel Sheets. |
| 35-40 | **Automation Testing Basics**: Basics of automation testing, Factors for choosing a particular tool, An overview for the major functional testing tools, Overview of Test management and bug tracking tools. |

1. **Evaluation Scheme & Components:**

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| **Evaluation Component** | **Type of Component** | **No. of Assessments** | **Weight age of Component** | **Mode of Assessment** |
| Component 2 | Subjective Test/Sessional Tests (STs) | 03\* | 40% | Offline |
| Component 3 | End Term Examinations | 01 | 60% | Offline |
| **Total** | | **100%** | | |

\*Out of 03 STs, the ERP system automatically picks the best 02 STs 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 02 | ST 01 | Upto 40% | As defined in Academic Calendar | 40% |
| ST 02 | 41% - 80% | As defined in Academic Calendar |
| ST 03 | 100% | As defined in Academic Calendar |
| Component 03 | 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.

1. **Syllabus of the Course:**

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| **Subject: Software Testing** | **Subject Code: CAL4212** |

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| **Lecture No.** | **Topic(s)** |
| 1-5 | **A perspective of Testing** : Basic Testing Vocabulary, Basic definitions, Test cases, Insights from a Venn diagram, Identifying test cases, Error and fault taxonomies, Levels of testing, Examples. |
| 6 | Generalized pseudo code, The triangle problem |
| 7 | Defects and identification of defects |
| 8-10 | The Multiple Roles of the Software Tester (People Relationships), Scope of Testing, Testing Constraints, The “V” Concept of Testing. |
| 11-15 | **Test Administration and Test Plan**: Test Planning, Customization of the Test Process, Prerequisites to test planning, understand the Characteristics of the Software Being Developed, Build the Test Plan, Write the Test Plan. |
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| **S.No.** | **Topic (s)** | **No. of Lectures** | **Weightage %** |
| 1. | **A perspective of Testing** : Basic Testing Vocabulary, Basic definitions, Test cases, Insights from a Venn diagram, Identifying test cases, Error and fault taxonomies, Levels of testing, Examples. | 1-5 | 5% |
| 2. | Generalized pseudo code, The triangle problem | 6 | 5% |
| 3. | Defects and identification of defects | 7 | 5% |
| 4. | The Multiple Roles of the Software Tester (People Relationships), Scope of Testing, Testing Constraints, The “V” Concept of Testing. | 8-10 | 10% |
| 5. | **Test Administration and Test Plan**: Test Planning, Customization of the Test Process, Prerequisites to test planning, understand the Characteristics of the Software Being Developed, Build the Test Plan, Write the Test Plan. | 11-15 | 10% |
| 6. | **Testing Techniques**: Structural versus Functional Technique Categories, Verification versus Validation, Static versus Dynamic Testing. | 16-18 | 5% |
| 7. | Path Testing, Data Flow Testing, Boundary value analysis, Robustness testing, Worst-case testing, Special value testing, Examples | 19-22 | 15% |
| 8. | Random testing, Equivalence classes, Equivalence test cases for the triangle problem, System Testing. | 23-26 | 10% |
| 9. | **Test Cases**: Test case Design, Building test cases, Test data mining, Test execution, Test Reporting, Defect Management, Test Coverage – Traceability matrix. | 27-30 | 10% |
| 10. | **Test reporting**: Guidelines for writing test reports, Test Tools used to Build Test Reports. Bug reporting using Excel Sheets. | 31-34 | 10% |
| 11. | **Automation Testing Basics**: Basics of automation testing, Factors for choosing a particular tool, An overview for the major functional testing tools, Overview of Test management and bug tracking tools. | 35-40 | 15% |

**This Document is approved by:**

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| **Designation** | **Name** | **Signature** |
| **Course Coordinator** | **Jaswinder Singh** |  |
| **Programme In-charge/**  **Asst. Dean/Associate Dean** | **Preetinder Singh Brar** |  |
| **Dy. Dean/Dean** | **Dr. Jaiteg Singh** |  |
| **Date (DD/MM/YYYY)** |  | |

1. **Course Execution Plan (Faculty)**

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| **Lecture No.** | **Topics** | **Date of delivery** | **Remarks (if any)** |
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**Signature with Name Counter Signed by**

**Faculty In-charge Programme In-charge/Dy. Dean/Dean**