**BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI**

**WORK INTEGRATED LEARNING PROGRAMMES**

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| --- | --- |
| **Course Title** | Software Quality Management |
| **Course No(s)** | SS ZG661 |
| **Credit Units** | 4 |
| **Credit Model** | 1 + 1 + 2  (Class Hours + Assignment + Student preparation |
| **Course Author** | Viswanathan Hariharan |
| **Version No** | 1.0 |
| **Date** | Dec 22, 2015 |

**Course Objectives**

|  |  |
| --- | --- |
| **No** | **Course Objective** |
| **CO1** | Understand the framework for ensuring quality of software work in an organization |
| **CO2** | Enable software professionals to manage quality of software in an organization |

**Teaching methodology**

Lecture + Work Integrated Assignment + Case studies

**Text Book(s)**

|  |  |
| --- | --- |
| T1 | Humphrey, Watts S, Managing the Software Process, Pearson, 1999 |

**Reference Book(s) & other resources**

|  |  |
| --- | --- |
| R1 | Pressman, R.S. Software Engineering : A Practitioner’s Approach, Tata McGraw Hill |
| R2 | Hughes, B and Cotterel, M., Software Project Management, Tata McGraw Hill |
| R3 | Humphrey, Watts S, Winning with Software, Pearson, 2002 |

**Modular Content Structure**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Module** | **Topics** | **Reference** | **# of sessions** |
| 1 | Introduction | Why projects fail?  Why quality is important?  Software maturity framework  Basic principles of software process change  Misconceptions about software process | T1 – Ch 1, 2  R3 – Ch 2, 4 | 2 |
| 2 | Project management System | Why software organizations are chaotic  Project planning principles  Estimation  Productivity factors  Scheduling  Project tracking | T1 – Ch 4, 6 | 2 |
| 3 | Configuration management | Need for Configuration management  Configuration management functions  Baselines  Need for automated tools | T1 – Ch 7, 12 | 2 |
| 4 | Software Quality Assurance | Quality management  Role of SQA  Independent verification & validation | T1 – Ch 8 | 2 |
| 5 | Software inspections | Types of reviews  Inspection objectives  Inspection principles  Conduct of inspections  Reports & tracking | T1 – Ch 10 | 1 |
| 6 | Software testing | Software testing principles  Types of software tests  Test planning, development & execution  Test organization | T1 – Ch 11 | 1 |
| 7 | Improving quality using data & analysis | Principles of data gathering  Software measures  Data analysis  Setting Quality goals  Defining Quality plans | T1 – Ch 15 | 2 |
| 8 | Techniques for defect prevention | Principles of software defect prevention  Process changes for defect prevention | T1 – Ch 17 | 1 |
| 9 | Contracting for software | Principles of effective software contract management  Managing software contracts | T1 – Ch 19 | 1 |
| 10 | Assignment | Discussion on key findings by different students |  | 2 |

Note: Each session is of 2 hours

**Learning Outcomes:**

|  |  |
| --- | --- |
| **No** | **Learning Outcomes** |
| LO1 | Understand challenges in software projects |
| LO2 | Able to apply basic techniques to manage quality in software projects |
| LO3 | Able to apply basic techniques to improve quality in an organization |
| LO4 | Understand quantitative methods for quality improvement |
| LO5 | Understand techniques for defect prevention |

**Experiential learning components**

1. Case study: TBD
2. Work integrated activities:

Assess your project / projects in your organization and provide your observations on strengths and weaknesses of the software process followed in these projects, with respect to:

* Project management system
* Configuration management
* Software Quality Assurance
* Inspection
* Testing
* Data gathering & analysis

Provide your recommendations along with justification, to improve the quality management process.

**Additional documentation**

Nil

**Evaluation Scheme**:

Legend: EC = Evaluation Component; AN = After Noon Session; FN = Fore Noon Session

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Name | Type | Duration | Weight | Day, Date, Session, Time |
| EC-1 | Quiz-I | Online | - | 5% | February 1 to 10, 2016 |
|  | Quiz-II |  |  | 5% | March 1 to 10, 2016 |
|  | Assignment-I |  |  | 10% | March 25, 2016 |
| EC-2 | Mid-Semester Test | Closed Book | 2 hours | 30% | 27/02/2016 (FN) 10 AM – 12 NOON  OR  28/02/2016 (AN) 2 PM – 4 PM |
| EC-3 | Comprehensive Exam | Open Book | 3 hours | 50% | 09/04/2016 (FN) 9 AM – 12 NOON  OR  10/04/2016 (AN) 2 PM – 5 PM |

Syllabus for Mid-Semester Test (Closed Book): Topics in Module Nos. 1 to 4

Syllabus for Comprehensive Exam (Open Book): All topics given in Plan of study.

**Important links and information:**

Elearn portal: https://elearn.bits-pilani.ac.in

Students are expected to visit the Elearn portal on a regular basis and stay up to date with the latest announcements and deadlines.

Contact sessions: Students should attend the online lectures as per the schedule provided on the Elearn portal.

Evaluation Guidelines:

1. EC-1 consists of either two Assignments or three Quizzes. Students will attempt them through the course pages on the Elearn portal. Announcements will be made on the portal, in a timely manner.
2. For Closed Book tests: No books or reference material of any kind will be permitted.
3. For Open Book exams: Use of books and any printed / written reference material (filed or bound) is permitted. However, loose sheets of paper will not be allowed. Use of calculators is permitted in all exams. Laptops/Mobiles of any kind are not allowed. Exchange of any material is not allowed.
4. If a student is unable to appear for the Regular Test/Exam due to genuine exigencies, the student should follow the procedure to apply for the Make-Up Test/Exam which will be made available on the Elearn portal. The Make-Up Test/Exam will be conducted only at selected exam centres on the dates to be announced later.

It shall be the responsibility of the individual student to be regular in maintaining the self study schedule as given in the course handout, attend the online lectures, and take all the prescribed evaluation components such as Assignment/Quiz, Mid-Semester Test and Comprehensive Exam according to the evaluation scheme provided in the handout.