### COURSE BASICS

Course Title**: INTRODUCTION TO SOFTWARE ENGINEERING**

Course Code**: SEN-210**

Credit Hours**: 3 + 0**

Prerequisite**: None**

Class & Section: **BSE- 2 (A, B, C)**

**Course Objectives and Description:**

Software engineering is the branch of computer science that creates practical, cost-effective solutions to computing and information processing problems, preferentially by applying scientific knowledge, developing software systems. This course covers the fundamentals of software engineering, an understanding of different software processes and how to choose between them, study of Requirements Engineering and an overview of various modeling techniques applicable to requirements and specifications including UML and formal modeling.

**Course Learning Outcomes (CLO):**

|  |  |  |
| --- | --- | --- |
| **CLO #** | **CLO Statement** | **Bloom’s Taxonomy** |
| CLO 1: | Define Various software Engineering concepts and practices. | C1 |
| CLO 2: | Explain basic concept of Software Engineering approaches & techniques. | C2 |
| CLO 3: | Analyze scenarios to apply different software engineering techniques. | C3 |
| CLO 4: | Present any software product used for software process like collaboration, Testing etc. | A2 |

**Weekly Breakdown:**

|  |  |  |
| --- | --- | --- |
| Week | **Date** | **Topics** |
| 1 | 13th Feb – 16th Feb | **Lecture 1- Introduction to software engineering**   * An Introduction to SE * Software Engineering as defined by IEEE * Attributes of a good software * Participants & Roles * Software Applications * Software Myths * Software – New Categories * Software Tools * CAse tools |
| 2 | 20th Feb – 23rd Mar | **lecture 2- sOFTWARE Development**   * A Generic Process Model * A types of information system * sdlc * Process Patterns * stakeholders * Process Assessment and Improvement * Summary |
| 3 | 27th Feb – 1th Mar | **lecture 3- pROcess model**   * Waterfall Model * V- MoDEL * Incremental Model * Prototype Model |
| 4 | 05th Mar – 08th Mar | * Spiral Model * Other process model   **lecture 4- an agile view of process agile**   * RAPID APPLICATION DEVELOPMENT * PLAN DRIVEN & AGILE DEVELOPMENT |
| 5 | 12th Mar – 15th Mar | * Agile principles * agile development techniques * Extreme programming * scrum   **lecture 5- Work breakdown structure**   * overview * design * levels * benefits * levels of wbs * Example |
| 6 | 19th Mar – 22nd Mar | **lECTURE 6- REQUIREMENT ENGINEERING**   * FUNCTIONAL & NON FUNCTIONAL REQUIREMENTS * sOFTWARE REQUIREMENT DOCUMENT * REQUIREMENT SPECIFICATION |
| 7 | 26th Mar – 29th Mar | * requirement ENGINEERING PROCESS * REQUIREMENT ELICITATION & aNALYSIS * REQUIREMENT VALIDATION * REQUIREMENT MANAGEMENT   **Lecture 7- system modeling**   * System modeling * Existing & planned system models * syste, prespectives * uml diagram types * activity diagram |
| 8 | 1st April – 6th April | * mid term exams |
|  | **8th April – 12th April** | eid holidays |
| 9 | 23rd April – 26th April | * usecase diagram * sequence diagram * class diagram * state diagram * context diagram |
| 10 | 30th April – 4th May | **LECTURE 8- sOFTWARE QUALITY**   * QUALITY * SOFTWARE QUALITY ASSURANCE * STANDARD (IEEE & ISO) * CMM |
| 11 | 7th May – 10th May | **LECTURE 9- ARCHITECTURAL DESIGN**   * ARCHITECTURE * ARCHITECTURAL DESCRIPTION * ARCHITECTURAL STYLES * dATA CENTERED ARCHITEURE * data flow architecture |
| 12 | 14th May – 17th May | * call & return architecture * layered architecture * architectural description language * factoring |
| 13 | 21st May – 24th May | **lecture 10- project management & planning**   * project * 4 p’s * software teams * project management * pm activties * earned value analysis |
| 14 | 28th May – 31st May | **Lecture 11 -** **project management & estimation**   * software scope * resources * metrics * software metrics * estimation techniques * size estimation * loc * cocomo * function point |
| 15 | 4th June – 7th June | **lecture 12- SOFTWARE TESTING**   * importance of testing * testing principles * test cases * level of specification * level of testing * types of test cases |
| 16 | 11th June – 14th June | **Presentations** |
| 17 | 18th June – 21st June | REVISION |
| 18 | 24th June – | **FINAL TERM EXAMINATIONS** |

***NOTE:***

1. *This schedule is subject to revisions as conditions may warrant.*
2. *Topics will be covered in sequence no matter if city observes any planned or unplanned holidays.*
3. *The information in this course outline is subject to revision as conditions may warrant.*

**Course Assessment Method**

**Method of Evaluation and Structure:**

A student’s grade will be based on multiple measures of performance as mentioned below:

|  |  |
| --- | --- |
| **Evaluation Instruments (EI)** | **Marks** |
| Quizzes (4 Quizzes of 10 Marks) | 10 |
| Assignments (3 Assignments) | 20 |
| Mid Term Examination | 20 |
| Final Examination | 50 |
| **Total** | **100** |

**Mapping of CLOs to PLOs (Program Learning Outcomes)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PLO’s** | **CLO’s** | | | |
| **CLO 1** | **CLO 2** | **CLO 3** | **CLO 4** |
| PLO:1 (Engineering Knowledge) | X | X |  |  |
| PLO:2 (Engineering Problem Analysis) |  |  | X |  |
| PLO:3 (Designing and Development) |  |  |  | X |
| PLO:4 (Investigation) |  |  |  |  |
| PLO:5 (Modern tool usage) |  |  |  |  |
| PLO:6 (Engineer and Society) |  |  |  |  |
| PLO:7 (Environment and Sustainability) |  |  |  |  |
| PLO:8 (Professionalism and Ethics) |  |  |  |  |
| PLO:9 (Individual and Team Work) |  |  |  |  |
| PLO:10 (Communication) |  |  |  |  |
| PLO:11 (Project Management) |  |  |  |  |
| PLO:12 (Lifelong Learning) |  |  |  |  |

**Mapping of CLOs to Course Evaluation Instruments (EI)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EI** | **CLO’s** | | | |
| **CLO 1** | **CLO 2** | **CLO 3** | **CLO 4** |
| Assignments | X | X |  |  |
| Quizzes | X | X |  |  |
| Projects |  |  |  | X |
| Midterm Exam | X | X | X | X |
| Final Exam | X | X | X | X |

**Grading System:**

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | 4.0 | ≥ 85 | - |
| **A-** | 3.67 | ≥ 80 | < 85 |
| **B+** | 3.33 | ≥ 75 | < 80 |
| **B** | 3.00 | ≥ 71 | < 75 |
| **B-** | 2.67 | ≥ 68 | < 71 |
| **C+** | 2.33 | ≥ 64 | < 68 |
| **C** | 2.00 | ≥ 60 | < 64 |
| **C-** | 1.67 | ≥ 57 | < 60 |
| **D+** | 1.33 | ≥ 54 | < 57 |
| **D** | 1.00 | ≥ 50 | < 53 |
| **F** | 0.00 | - | < 50 |

**COURSE RESOURCES**

**Instructor:**

Name: Engr. Rahemeen Khan

Designation: Senior Lecturer

Email: rahemeen.bukc@bahria.edu.pk

**Counseling Hours:**

**Text Book:**

1. Software Engineering 10th Edition, 2015 by Sommerville

**Reference Books:**

1. Software Engineering: A Practitioner's Approach Roger S. Pressman, Bruce R. Maxim McGraw-Hill Education, 2015

**Online References:**

1. http://www.tutorialspoint.com/java/index.htm - TUTORIALSPOINT
2. https://www.coursera.org/stanford - COURSERA
3. http://www.slideshare.net - SLIDESHARE
4. https://www.youtube.com - YOUTUBE and many more