### COURSE BASICS

Course Title**: INTRODUCTION TO SOFTWARE ENGINEERING**

Course Code**: SEN-210**

Credit Hours**: 3 + 0**

Prerequisite**: None**

Class & Section: **BSE- 2 (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 | 20th Feb – 24th 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 | 27th Feb – 3rd Mar | **lecture 2- sOFTWARE Development**   * A Generic Process Model * A types of information system * sdlc * Process Patterns * stakeholders * Process Assessment and Improvement * Summary |
| 3 | 6th Mar – 10th Mar | **lecture 3- pROcess model**   * Waterfall Model * V- MoDEL * Incremental Model * Prototype Model |
| 4 | 13th Mar – 17th Mar | * Spiral Model * Other process model **QUIZ # 1**   **lecture 4- an agile view of process agile**   * RAPID APPLICATION DEVELOPMENT * PLAN DRIVEN & AGILE DEVELOPMENT |
| 5 | 20th Mar – 24th Mar | * Agile principles * agile development techniques * Extreme programming * scrum   **lecture 5- Work breakdown structure**   * overview * design * levels * benefits * levels of wbs * Example |
| 6 | 27th Mar – 31st Mar | **lECTURE 6- REQUIREMENT ENGINEERING**   * FUNCTIONAL & NON FUNCTIONAL REQUIREMENTS * sOFTWARE REQUIREMENT DOCUMENT * REQUIREMENT SPECIFICATION |
| 7 | 3rd April – 7th April | * 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 | 10th April – 14th April | * mid term exams |
|  | **17th April – 21st April** | eid holidays |
| 9 | 24th April – 28th April | * usecase diagram * sequence diagram * class diagram * state diagram * context diagram   **QUIZ # 2** |
| 10 | 1sr May – 5th May | **LECTURE 8- sOFTWARE QUALITY**   * QUALITY * SOFTWARE QUALITY ASSURANCE * STANDARD (IEEE & ISO) * CMM |
| 11 | 8th May – 12th May | **LECTURE 9- ARCHITECTURAL DESIGN**   * ARCHITECTURE * ARCHITECTURAL DESCRIPTION * ARCHITECTURAL STYLES * dATA CENTERED ARCHITEURE * data flow architecture |
| 12 | 15th May – 19th May | * call & return architecture * layered architecture * architectural description language * factoring |
| 13 | 22nd May – 26th May | **lecture 10- project management & planning**   * project * 4 p’s * software teams * project management * pm activties * earned value analysis |
| 14 | 29th May – 2nd June | **Lecture 11 -** **project management & estimation**   * software scope * resources * metrics * software metrics * estimation techniques * size estimation * loc * cocomo * function point   **QUIZ # 3** |
| 15 | 5th June – 9th June | **lecture 12- SOFTWARE TESTING**   * importance of testing * testing principles * test cases * level of specification * level of testing * types of test cases |
| 16 | 12th June – 16th June | **QUIZ # 4**  **Presentations** |
| 17 | 19th June – 23rd June | REVISION |
| 18 | 3th July – 11th July | **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. Mobeen Nazar

Designation: Senior Lectuer

Office: Iqbal block, 2nd Floor, Faculty Room 7

Email: mobeennazar.bukc@bahria.edu.pk

**Counseling Hours: Thursday & Friday (2:30-4:30 PM)**

**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