**University of Asia Pacific (UAP)**

**Department of Computer Science and Engineering (CSE)**

**Course Outline**

**Program:** Computer Science and Engineering (CSE)

**Course Title:** Software Engineering Lab

**Course Code:** CSE 322

**Semester:** Fall-2020

**Level:** 6th Semester

**Credit Hour: .75**

**Name & Designation of Teacher:** Fahad Ahmed, Lecturer.

**Office/Room:** 7th Floor

**Class Hours: Section B:** Sunday (02.00– 04.50) **Section A:** Monday (12.30-03.20)

**Consultation Hours:** Lab hours

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**Rationale:** This course gives an idea about the practical implementation of the later stages of the System Development Life Cycle. Required course for completion of the 6th semester, which results in finishing Bachelor,’s in CSE consequently.

**Pre-requisite** (if any)**: CSE 306**

**Course Synopsis:** Continued from CSE 306, the course focuses on the principles of System development, implementation and maintenance. Therefore, this lab emphasizes on the SystemTesting and Design pattern, architecture, which the students will be learning lab by lab.

**Course Objectives:** The objectives of this course are to:

1. **Develop d**istributed and collaborative software development, maintenance and appraise project operating cost , financial analysis for complex software-intensive systems
2. **Ensure** industrial state of the practice methods of verifying and validating high-assurance software-intensive system**.**
3. **Provide** the knowledge to design and implement of different software process models in different systems and ensure good quality software.
4. **An Ability** to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global.

**Course Outcomes (CO) and their mapping with Program outcomes (PO) and Teaching-Learning Assessment methods:**

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| --- | --- | --- | --- | --- | --- |
| **CO**  **No.** | **CO Statements:**  Upon successful completion of the course, students should be able to: | **Corresponding**  **POs**  **(Appendix-1)** | **Bloom’s taxonomy domain/level**  **(Appendix-2)** | **Delivery methods and activities** | **Assessment**  **Tools** |
| CO1 | **Explain** key issues and solutions of managing and operating large and complex software-intensive systems | 3,12 | 1/ Apply |  | Project demonstration, Viva |
| CO2 | **Use** industrial state of the practice methods of verifying and validating high-assurance software-intensive system | 4 | 1/Analyze |  | Project Presentation , Report, Viva |
| CO3 | **Use** a modern/popular IDEto test complex software-intensive systems. | 5 | 2/Manipulation |  | Project Presentation |
| CO4 | **Understand** concept of professional ethics, confidentiality, industrial standards, risk benefit analysis and explain the impact of engineering solutions in public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. | 6,7,8 | 3/ Valuing |  | Report, Viva |
| CO5 | **Maintain** distributed and collaborative software development, maintenance and appraise project operating cost , financial analysis for complex software-intensive systems | 9,10,11 | 1/ Apply |  | Version Control System , Report, Viva |

**Weighting COs with Assessment methods:**

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| --- | --- | --- | --- | --- | --- | --- |
| **Assessment Type** | **% weight** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| Lab Tasks | 30% | 5 | 20 | 5 |  |  |
| Project demonstration , Presentation, Report, viva | 70% | 30 | 10 | 5 | 15 | 10 |
| Total | 100% | 35 | 30 | 10 | 15 | 10 |

**Course Content Outline and mapping with COs**

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| --- | --- | --- | --- | --- |
| **Weeks** | **Topics / Content** | **Course Outcome** | **Delivery methods and activities** | **Reading Materials** |
| **1** | Introduction to the course, Basic concept of complex engineering problem, characteristic and activities, Complex | CO1 | Online Lectures, Individual Tasks | **PPT Slides,**  **Reference links** |
| **2** | Introduction to Testing, how to write test case, Manual testing | CO2, CO3 | Online Lectures, Individual Tasks | **PPT Slides,**  **Reference links** |
| 3 | Introduction to automated Testing, Selenium platform, Installing Selenium and Eclipse, Synching Github repository of individual student  **Test #1** | CO2,CO3, CO4 | Online Lectures, Individual Tasks | **PPT Slides,**  **Reference links** |
| 4 | Setting up Selenium for different web browsers, WebDriver installation; Demonstrating WebDriver Commands with Java and Selenium, | CO2,CO3, CO4 | Lecture, Online Demonstration, Individual Tasks | **Reference links** |
| 5 | WebDriver Explicit & Implicit Wait, WebDriver Input Box and Test Box.; Working with Radio Buttons, Check Boxes, Drop Down list, Links etc. Scrolling Web Pages, Working with Links  **Test #2** | CO2,CO3, CO4 | Lecture, Online Demonstration, Individual Tasks | Lecture video, YouTube links, |
| 6 | Concept of Unit testing , Integration Testing; Unit Testing Framework and Methods with Selenium,Assertions, Creating and Running Test Suites Running Multiple Tests, Generating Log/Report File from multiple tests  **Project report** | CO2,CO3, CO4 | Lecture, Online Demonstration, Individual Tasks | Lecture video, YouTube links, |
| 7 | Final Project Demonstration, Report & Viva | CO1,CO2,CO3, CO4, CO5 |  |  |

**Minimum attendance:** 70% class attendance is mandatory for a student in order to appear at the final examination.

**Textbook: No textbook Required**

# **Required References: Will be provided during lectures**

**Grading System:** As per the approved grading scale of University of Asia Pacific (Appendix-3).

**Special Instructions: Assignment**: **Unfinished** work should be submitted as assignment. **Additional** assignments may be given as needed. Late submission will result a 50% deduction in score.

**Student’s responsibilities:** Students must attend the class prepared for the course material covered in the previous class (es). They must submit their assignments on time.

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| **Prepared by**  **(**Course Teacher**)** | **Checked by**  **(**Chairman, PSAC committee**)** | **Approved by**  **(**Head of the Department**)** |
| Fahad Ahmed (FMD) |  |  |

**Appendix-1:**

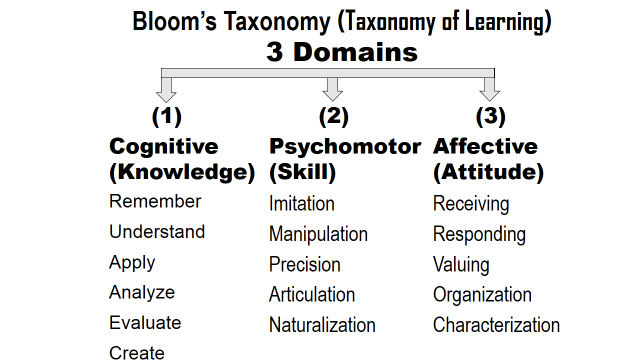
**Washington Accord Program Outcomes (PO) for engineering programs:**

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| --- | --- | --- |
| **No.** | **PO** | **Differentiating Characteristic** |
| 1 | Engineering Knowledge | Breadth and depth of education and type of knowledge, both theoretical and practical |
| 2 | Problem Analysis | Complexity of analysis |
| 3 | Design/ development of solutions | Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified |
| 4 | Investigation | Breadth and depth of investigation and experimentation |
| 5 | Modern Tool Usage | Level of understanding of the appropriateness of the tool |
| 6 | The Engineer and Society | Level of knowledge and responsibility |
| 7 | Environment and Sustainability | Type of solutions. |
| 8 | Ethics | Understanding and level of practice |
| 9 | Individual and Team work | Role in and diversity of team |
| 10 | Communication | Level of communication according to type of activities performed |
| 11 | Project Management and Finance | Level of management required  for differing types of activity |
| 12 | Lifelong learning | Preparation for and depth of Continuing learning. |

**Generic Skills (Detailed):**

1. **Engineering Knowledge (T)** -Apply knowledge of mathematics, sciences, engineering fundamentals and manufacturing engineering to the solution of complex engineering problems;
2. **Problem Analysis (T)** – Identify, formulate, research relevant literature and analyze complex engineering problems, and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences;
3. **Design/Development of Solutions (A)** –Design solutions, exhibiting innovativeness, for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, economical, ethical, environmental and sustainability issues.
4. **Investigation (D)** Conduct investigation into complex problems, displaying creativeness, using research-based knowledge, and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions;
5. **Modern Tool Usage (A & D)** -Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations;
6. **The Engineer and Society (ESSE)** -Apply reasoning based on contextual knowledge to assess societal, health, safety, legal, cultural, contemporary issues, and the consequent responsibilities relevant to professional engineering practices.
7. **Environment and Sustainability (ESSE)** -Understand the impact of professional engineering solutions in societal, global, and environmental contexts and demonstrate knowledge of and need for sustainable development;
8. **Ethics (ESSE)** –Apply professional ethics with Islamic values and commit to responsibilities and norms of professional engineering code of practices.
9. **Communication (S)** -Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;
10. **Individual and Team Work (S)** -Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
11. **Life Long Learning (S)** -Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
12. **Project Management and Finance (S)** -Demonstrate knowledge and understanding of engineering management and financial principles and apply these to one’s own work, as a member and/or leader in a team, to manage projects in multidisciplinary settings, and identify opportunities of entrepreneurship.

**Appendix-2**



**Appendix-3**

**UAP Grading Policy:**

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| **Numeric Grade** | **Letter Grade** | **Grade Point** |
| 80% and above | A+ | 4.00 |
| 75% to less than 80% | A | 3.75 |
| 70% to less than 75% | A- | 3.50 |
| 65% to less than 70% | B+ | 3.25 |
| 60% to less than 65% | B | 3.00 |
| 55% to less than 60% | B- | 2.75 |
| 50% to less than 55% | C+ | 2.50 |
| 45% to less than 50% | C | 2.25 |
| 40% to less than 45% | D | 2.00 |
| Less than 40% | F | 0.00 |