

**SCHOOL OF COMPUTER SCIENCES**

**SEMESTER I, ACADEMIC SESSION 2021/2022**

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| Course Code | CMT322/CMM323 | | |
| Course Title | Web Engineering and Technologies | | |
| Course Lecturer | Dr Anusha Achuthan  anusha@usm.my  Room 606 |  | |
| Course Units | 3 (3 hours x 14 weeks) | | |
| Student Learning Time | 120 hours | | |
| Breakdown of Assessments | Examinations | | 50% (2 hours) |
| Coursework | | 50% |
| Coursework Evaluation Basis | Report | | 10% |
| Simulation | | 15% |
| Teamwork and Leadership Evaluation | | 10% |
| Tests | | 15% (2 x 1 hour) |
| Type of Course | Elective/Minor | | |
| Prerequisites (if any) | - | | |

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| Objective | * To introduce the concepts, models, current technologies, and architectures involved in developing Web based applications. * To expose the implementation of web-based applications using current technologies. |
| Course Synopsis | This course introduces a structured software engineering methodology for developing web applications. The course covers the concepts, methods, and technologies in web applications development. Topics covered include requirements engineering, project management, modelling, design, architecture, technologies, testing and security for web application. This course also exposes latest trends in web applications.    *Malay version:*  *Kejuruteraan Web memperkenalkan metodologi berstruktur yang digunakan dalam kejuruteraan perisian kepada Kursus ini memperkenalkan metodologi kejuruteraan perisian berstruktur untuk membangunkan aplikasi-aplikasi web. Kursus ini menyentuh konsep, kaedah, dan teknologi-teknologi dalam pembangunan aplikasi web. Tajuk-tajuk yang diliputi adalah kejuruteraan keperluan,pengurusan projek, pemodelan, reka bentuk, seni bina, teknologi-teknologi, pengujian, dan keselamatan dalam aplikasi web. Kursus ini juga mendedahkan aliran terkini dalam pembangunan aplikasi web.* |
| Learning Outcomes | **At the end of this course the students will be able to:**   * Analyze concepts and current technologies related to Web-based application development including basic requirements, models, designs, architecture and testing (PO1, C3). * Construct Web-based applications using knowledge in Web engineering concepts and current technologies (PO2, P4, CTPS3). * Organize development of Web-based application in team effectively within a stipulated time (PO5, A3, TS3). * Demonstrate relevant leadership skill during development of Web-based application in team (PO9,A3, LS2). |
| CO-LO Mapping | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **CO** | **Descriptions** | **PO** | **LT** | **SS** | **Assessment Methods** | | 1. | Analyze concepts and current technologies related to Web-based application development including basic requirements, models, designs, architecture, and testing | PO1 | C3 |  | Peperiksaan Akhir (PA),  Ujian (13),  Laporan (37) | | 2. | Construct Web-based applications using knowledge in Web engineering concepts and current technologies. | PO2 | P4 | CTPS3 | Pembentangan (53),  Simulasi (27) | | 3. | Organize development of Web-based application in team effectively within a stipulated time. | PO5 | A3 | TS3 | Penglibatan Dalam Perancangan (41) | | 4. | Demonstrate relevant leadership skill during development of Web-based application in team. | PO9 | A3 | LS2 | Penglibatan Dalam Perancangan (41) | |
| *Constructive Alignment (Detailing Delivery and Assessment Methods)* | |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **CO** | **PO** | **Delivery Method** | **Final Exam**  **#Questions– Marks** | **Test**  **#Test – Marks** | **Assignment/Project etc. Type (Description) - Marks** | | | | | Analyze concepts and current technologies related to Web-based application development including basic requirements, models, designs, architecture, and testing | PO1 | Lectures & Other F2F | 4 Questions – 100 marks | Test1 – 50 marks  Test 2 – 50 marks | Project Report: - 100 marks |  |  |  | | Construct Web-based applications using knowledge in Web engineering concepts and current technologies. | PO2 | Lectures & Other F2F |  |  |  | Project Simulation – 100 marks |  |  | | Organize development of Web-based application in team effectively within a stipulated time. | PO5 | Project Based Learning |  |  |  |  | Peer Evaluation – 100 marks |  | | Demonstrate relevant leadership skill during development of Web-based application in team. | PO9 | Project Based Learning |  |  |  |  |  | Peer Evaluation – 100 marks | | *Total Marks* | | | *100* | *100* | *100* | *100* | *100* | *100* | | *Total Percentage (EW/CW)* | | | *100%* | *30%* | *20%* | *30%* | *10%* | *10%* | | *Overall Percentage* | | | *50%* | *50%* | | | | | |
| Main References | 1. Chopra R. (2016). Web Engineering. India: Prentice Hall. 2. Connolly R. and Hoar R. (2017). Fundamentals of Web Development 2nd Edition, Pearson. 3. Roger Pressman and David Lowe (2009). Web Engineering: A Practitioner's Approach. McGraw-Hill Education. |
| Additional References | 1. Kogent Learning Solutions Inc. (2014). Web Engineering and Technology. India: Wiley.  2. Morris T. F. (2014). Basics of Web Design: HTML5 & CSS3. Pearson. |

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| **Course Syllabus and Planner** | | | | | | |
| **No** | **Topics** | **Week** | **Lectures** | | **Labs/Tutorials /Test** | **Details** |
| 1 | **Course Overview**  **Introduction**   * 1. Introduction to Web Engineering   2. Skillset in Web Engineering   3. Categories and Characteristics of Web Applications | 1 | 2 | | 1  In Class Hands-on | * Formation of project groups (4 in a group).   *\*Mixed gender, race, programmes if theres minor students* |
| 2 | **Requirements Engineering for Web Applications**   * 1. Introduction and Fundamentals   2. Principles for Requirement Engineering of Web Applications   3. Adapting Requirement Engineering Methods to Web Application Development   4. Components of Web Engineering   5. Agility in Web Engineering | 2 | 2 | | 1  In Class Hands-on | * **Project Part A Start** |
| 3 | **Web Project Management**   1. Understanding Scope 2. Buiding a Web Team 3. Managing risks 4. Developing Schedule 5. Managing Quality 6. - Tracking the project | 3 | 2 | | 1  In Class Hands-on |  |
| 4 | **Modeling Web Applications**   * 1. Modeling Specifics in Web Engineering and Requirement   2. Modeling Framework and Languages   3. Analysis Modeling: Content, Interaction, Functional and Configuration Models | 4 | 2 | | 1  In class Hands-on |  |
| 5 | **Web Application Design**   * 1. Presentation, Interaction and Functional Design   2. Design of Conceptual Architecture   3. Design of Technical Architecture | 5-6 | 4 | | 2  In class Hands-on |  |
| 6 | **Web Application Architectures**   * 1. Specifics of Web Application Architectures   2. Components of a Web Application Architecture   3. Layered Architectures | 7 | 2 | | 1  Off Class Hands-on | * **Project Part A Due** * **Test 1 (Contents Week 1-6)** |
| 6 | **Technologies of Web Application I**   1. Basic Internet Protocols 2. HTTP 3. XHTML, DHTML, XML 4. CSS 5. Client-Side Technologies | 8 | | 2 | 1  In class Hands-on |  |
| **MID SEMESTER BREAK** | | | | | | |
| 7 | **Technologies of Web Application II**   1. Server-Side Technologies 2. Session & Cookies 3. Web Service 4. Session Tracking 5. Database Connectivity | 9-10 | | 3 | 3  Offline Activities (Prerecorded lecture, Quiz) | * **Project Part B Start** |
| 8 | **Testing Web Applications**   1. ”Dimension” of Quality 2. Testing Strategy And Process 3. Test Methods and Techniques. | 11 | | 2 | 1  In class Hands-on |  |
| 9 | **Security for Web Applications**   1. Aspects of Security 2. Secure Client/Server-Interaction 3. Client Security Issues 4. Service Provider Security Issues | 12 | | 2 | 1  In class Hands-on |  |
| 10 | **Latest trends in Web Technologies**   1. Web 2.0 2. Web 3.0 3. Fullstack | 13 | | 2 | 1  In class Hands-on | * **Project Part B Due** |
| 11 | **Industrial Talk - Web Applications** | 14 | | 2 | 1  Offline Hands-On | * **Project Simulation** * **Test 2 (Contents Week 8 - 13)** * **Online Peer Assessment** |
|  | **Total Contact Hours** |  | | **27** | **15** | **42** |

**JUMLAH JAM PEMBELAJARAN PELAJAR (JPP) BERDASARKAN KEGIATAN**

**PENGAJARAN-PEMBELAJARAN**

***(TOTAL STUDENT LEARNING TIME (SLT) BASED ON TEACHING-LEARNING ACTIVITIES)***

**KOD KURSUS/*COURSE CODE*: CMT322**

**TAJUK KURSUS/*COURSE TITLE*: WEB ENGINEERING AND TECHNOLOGIES**

**UNIT/*UNITS*: 3**

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| **BIL** | **KEGIATAN PENGAJARAN DAN PEMBELAJARAN** | **SLT** |
| 1 | Kuliah/Syarahan | 27 |
| 2 | Ulang kaji termasuk persediaan untuk kuliah/syarahan | 27 |
| 3 | Tutorial | 0 |
| 4 | Ulang kaji termasuk persediaan untuk tutorial | 0 |
| 5 | Amali/Makmal | 0 |
| 6 | Ulang kaji termasuk persediaan untuk amali/makmal | 0 |
| 7 | Pembelajaran Berpusatkan Pelajar yang lain (Bersemuka) (Pembelajaran Bersemuka lain seperti Pembelajaran Berasaskan Masalah (PBL), Kajian Kes, Perbincangan, Perundingan, Lawatan Sambil Belajar, Seminar, dsb) Nyatakan (Berserta pecahan jam):  *Project based Learning (In Class Hands-on) – 15 hours* | 15 |
| 8 | Ulang kaji termasuk persediaan untuk Pembelajaran Berpusatkan Pelajar yang lain (Bersemuka) | 15 |
| 9 | Pembelajaran Berpusatkan Pelajar yang Lain (Tak Bersemuka) (Pembelajaran Terarah Kendiri (SDL) seperti Manual, Projek, Tugasan, Modul, Kerja Kursus, dsb) Nyatakan (Berserta pecahan jam):  *Laporan = 19 hours*  *Simulasi = 2.5 hours*  *Penglibatan dalam kumpulan = 0.5 hours* | 22 |
| 10 | Penilaian berterusan (Ujian, Pembentangan, Persembahan dsb) Nyatakan (Berserta pecahan jam):  • *Ujian: 2 jam* | 2 |
| 11 | Persediaan penilaian berterusan | 4 |
| 12 | Penilaian (peperiksaan) akhir | 2 |
| 13 | Persediaan penilaian (peperiksaan) akhir | 6 |
|  | **JUMLAH SLT** | **120** |
|  | **UNIT (JUMLAH SLT/40)** | **3** |

**IMPORTANT CLASS RULES:**

1. All assignments must be submitted by the given due date. Late submissions should be avoided as it will be penalized in grades according to the reasons.
2. Tests will be conducted on the specified date, given prior by the lecturers. Replacement for tests is not allowed without a valid MC or exemptions letters for activities by recognized bodies.
3. PLAGIARISM is a serious offence and may face disciplinary actions by the university. Those student copies another person work, students allowing their work to be copied will be given grade F for the copied work, or the whole coursework components. Barring of final exam may also be possible depending on the case of plagiarism.