|  |  |  |  |
| --- | --- | --- | --- |
| COMP-453 : Full Stack Development | | | |
| Course Code: | COMP-453 | **Semester:** | 5th |
| Credit Hours: | 3 | **Prerequisite Codes:** |  |
| Instructor: | Dr. Musadaq Mansoor | **Class:** | BS-SE / BS-AI |
| Office: |  | **VOIP:** |  |
| Lecture Days: | Wed, Friday | **E-mail:** |  |
| Classroom: | See Timetable | **Consulting Hours:** | By Appointment |
| Lab Engineer: | NA | **Lab Engineer Email:** | NA |
| Knowledge Group: | Computing | **Updates on LMS:** | MS Team |
| Course Description: | | | |
| This course is designed to serve as a pathway to building blocks of web development starting with introduction to basics of Web and the corresponding technologies involved in design, development, and management of a modern Web Application. Following the basics, the course then focuses on building blocks of web application development i.e. An introduction to HTML, CSS, and JavaScript. Having a grip on fundamentals the course moves to advance concepts of JavaScript like prototyping, asynchronous program execution, ES6 standard. The course then discusses Bootstrap Framework that is essential to building responsive web applications. Owing to the market trend the course shall discuss the latest approaches and trends in the field of web development and shall also introduce the students to modern web communication strategies (such as REST, GraphQL) and service-oriented architecture. And finally, the course dives into Full Stack Web Development consisting of a detailed view into a frontend framework, backend framework, and a NoSQL Database. | | | |
| Course Objectives: | | | |
| This course aims to provide students with a comprehensive understanding of web development, starting with the basics of web technologies, HTML, CSS, and JavaScript. It covers advanced JavaScript concepts like prototyping, asynchronous execution, and ES6, along with responsive design using Bootstrap. The course also introduces modern web communication strategies such as REST , and concludes with full-stack web development, integrating frontend and backend frameworks with a SQL/NoSQL database. | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| Course Learning Outcomes (CLOs): | |  |  |
| At the end of the course the students will be able to: | | **PLO** | **BT Level\*** |
| 1 | Apply & Use JavaScript Code in accordance with ES6 standard | 9 | C-3 |
| 2 | Develop Responsive User Interface (Frontend) in terms of smaller and reusable components, and create Applications using modern frontend frameworks | 3 | C-5 |
| 3 | Develop Server-Side (Backend) layers such as controllers, and data access layer using Services based Architecture | 3 | C-6 |
|  |  | | |
|  | \* BT= Bloom’s Taxonomy, C=Cognitive domain, P=Psychomotor domain, A= Affective domain | | |
| Mapping of CLOs to Program Learning Outcomes | | | |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **PLOs/CLOs** | **CLO1** | **CLO2** | **CLO3** | **Emphasis Level** | | PLO 1 (Computing Knowledge) |  |  |  |  | | PLO 2 (Problem and Requirement Analysis) |  |  |  |  | | PLO 3 (Design, Implementation and Evaluation of Solutions) |  | x | x |  | | PLO 4 (Individual and Teamwork) |  |  |  |  | | PLO 5 (Professional and ethical Responsibility) |  |  |  |  | | PLO 6 (Communication) |  |  |  |  | | PLO 7 (Local and Global Computing Impact Analysis) |  |  |  |  | | PLO 8 (Lifelong Learning) |  |  |  |  | | PLO 9 (Modern tool usage) | x |  |  |  | | PLO 10 (Design Choices and Tradeoffs Analysis) |  |  |  |  | | PLO 11 (Adherence to Design and Development Principles) |  |  |  |  | | | | |
| Mapping of CLOs to Program Learning Outcomes | | | |

|  |  |
| --- | --- |
| Mapping of CLOs to Assessment Modules and Weightages | |
| To be filled in at the end of the course.   |  |  |  |  | | --- | --- | --- | --- | | **Assessments/CLOs** | **CLO1** | **CLO2** | **CLO3** | | **Theory: 75%** |  |  |  | | Quizzes: 15% |  |  |  | | Assignments/Semester Project: 10% |  |  |  | | Mid-term: 25% |  |  |  | | End Semester Exam: 50% |  |  |  | | Total: 100 % |  |  |  | | |
| Books: | |
| Textbook: | 1. Textbook: JavaScript: The Definitive Guide: Master the World's Most-Used Programming Language 7th Edition, June 23, 2020, ISBN: 978-1491952023 2. Textbook: Learn JavaScript VISUALLY with Interactive Exercises: The Beautiful New Way to Learn a Programming Language (Learn Visually) 3. Textbook: The Road to React: Your journey to master React.js in JavaScript (2021 Edition) 4. Textbook: Learning PHP, MySQL & JavaScript, 4th Edition With jQuery, CSS & HTML5 By Robin Nixon |
| Reference Books: | 1. Reference book: Getting MEAN with Mongo, Express, Angular, and Node 2nd Edition 2. Reference book: Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node 2nd ed. Edition |

|  |  |
| --- | --- |
|  | Topic |
| Week 1 | Lecture-1: Course Introduction  Lecture-2: Introduction to HTML  Lecture-3: HTML5 basics |
| Week 2 | Lecture-4: HTML5 Advance  Lecture-5: HTML Forms  Lecture-6: Introduction to CSS3 |
| Week 3 | Lecture-7: CSS3 Basics  Lecture-8: CSS3 Advance  Lecture-9: CSS3 Advance |
| Week 4 | Lecture-10: Designing Menus  Lecture-11: Designing Dropdown Menus  Lecture-12: Introduction to Bootstrap |
| Week 5 | Lecture-13: Introduction to Javascript  Lecture-14: Javascript Basics  Lecture-15: Javascript Advance |
| Week 6 | Lecture-16: Designing Slider  Lecture-17: Designing Gallery  Lecture-18: Jquery |
| Week 7 | Lecture-19: Coding in Front End Framework-I  Lecture-20: Coding in Front End Framework-II  Lecture-21: Coding in Front End Framework-III |
| Week 8 | Lecture-22: Coding in Front End Framework-IV  Lecture-23: Coding in Front End Framework-V  Lecture-24: Coding in Front End Framework-VI |
| Week 9 | Mid Semester Exam (MSE) |
| Week 10 | Lecture-25: Introduction to PHP  Lecture-26: PHP Basics  Lecture-27: PHP Basics |
| Week 11 | Lecture-28: File Handling in PHP  Lecture-29: Form Handling in PHP  Lecture-30: Error Handling in PHP |
| Week 12 | Lecture-28: Introduction to MySQL  Lecture-29: MySQL with PHP-I  Lecture-30: MySQL with PHP-II |
| Week 13 | Lecture-34: Cookies  Lecture-35: Session  Lecture-36: Exceptions |
| Week 14 | Lecture-37: Connecting NoSQL with PHP-I  Lecture-38: Connecting NoSQL with PHP-II  Lecture-39: Coding in Back End Framework-I |
| Week 15 | Lecture-40: Coding in Back End Framework-II  Lecture-41: Coding in Back End Framework-III  Lecture-42: Coding in Back End Framework-IV |
| Week 16 | Lecture-43: Testing in Web Applications-I  Lecture-44: Testing in Web Applications-II  Lecture-45: Web Application Deployment |
| Week 17 | Lecture-46: Web Project Demos  Lecture-47: Web Project Demos  Lecture-48: Web Project Demos |
| Week 18 | End Semester Exam |

|  |  |
| --- | --- |
| Tools / Software Requirement: | |
|  | Xampp, Wamp, Lamp, Apache, MySQL, PHP, React, Node, Laravel |

|  |  |
| --- | --- |
| Policy & Procedures | |
| Attendance Policy: | Every student must attend 75% of the lectures delivered in this course. The students falling short of required percentage of attendance of lectures/seminars/practical/laboratory work, etc., shall not be allowed to appear in the terminal examination of this course and shall be treated as having failed this course. |
| Quiz Policy: | The quizzes may be unannounced and normally last for ten minutes. The question framed is to test the concepts involved in the last few lectures. |
| Assignment Policy: | The course website/MSTeams will be the primary source for announcements and submitting assignments. Submission may also be done in printed form, as per the given instructions. |
| Lab Conduct: | Assignments as part of the course will be announced to conduct the requirement elicitation, and other analysis in field. |
| Plagiarism: | The course website will be the primary source for announcements and submitting assignments.  Plagiarism: Collaboration and group wok is encouraged but each student is required to submit his/her own contribution(s). Your writings must be your own thoughts. You must cite and acknowledge all sources of information in your assignments. Cheating and plagiarism will not be tolerated and will lead to strict penalties including zero marks in assignments as well as referral to the Chairman/Dean for appropriate action(s). |
| Missing Exam: | No makeup exam will be given for final exam under any circumstance. When a student misses Mid-term for a legitimate reason (such as medical emergencies), his grade for this exam will be determined based on the academic rules. Further, the student must provide an official excuse within one week of the missed exam. |
| Academic Integrity: | All PAF-IAST policies regarding ethics apply to this course. The students are advised to discuss their grievances/problems with their advisors or course instructors in a respectful manner. |