

Title (Units): **COMP7980 Dynamic Web and Mobile Programming (3,2,1)**

Course Aims: This course aims to cover key concepts, technologies and skills in web and mobile programming, including HTML, CSS, JavaScript, server-side scripting language, database connectivity and web protocols. Upon completion of this course, students will master the information and communication technology skills to develop web and mobile applications with dynamic and interactive contents

Prerequisite: Basic knowledge on database and computer programming

Course Intended Learning Outcomes (CILOs):

Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
	Knowledge
1	Explain the knowledge of web standards including markup languages, stylesheets and scripts
2	Explain the knowledge of web protocols and options in data transaction over networks
3	Explain the knowledge of software architectures and components of web and mobile applications
	Professional Skill
4	Design and implement a web application for presenting and managing a data-driven system
5	Design and implement a mobile application for presenting and managing a data-driven system

Calendar Description: This course aims to cover key concepts, technologies and skills in web and mobile programming, including HTML, CSS, JavaScript, server-side scripting language, database connectivity and web protocols. After the completion of this course, students will be able to develop web and mobile applications with dynamic and interactive contents.

Teaching and Learning Activities (TLAs):

CILOs	Type of TLA
1-3	Lectures are conducted to teach concepts, programming techniques, and database techniques for web and mobile application development. They provide theoretical knowledge and foundational understanding of the subject matter.
4-5	Laboratory sessions are hands-on practical sessions conducted in computer labs. Students can apply their knowledge and skills acquired from lectures and tutorials to work on exercises, experiments, and projects related to web and mobile application development.

Assessment:

No.	Assessment Methods	Weighting	CILOs to be addressed	Description of Assessment Tasks
1	Assignments and quizzes	40%	1-5	The assignments and in-class quizzes aim to assess students' understanding of concepts, programming techniques, and database skills required for developing web and mobile applications. The assignments will provide students with practical tasks to demonstrate their knowledge and application of these concepts.
2	Group Project	20%	1-5	The group project serves as an evaluation of students' acquisition of knowledge and software skills related to web and mobile application development. This project will require students to collaborate in teams to design and implement a web or mobile application, showcasing their ability to apply the learned concepts in a real-world context.
3	Examination	40%	1-5	The final examination is designed to assess the extent to which students have achieved their intended learning outcomes. The examination will

				primarily consist of analysis and skills-based questions, evaluating students' ability to apply their knowledge to web and mobile application development. The exam will test their understanding of the course material and their proficiency in practical application.
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Assessment Rubrics:

Criteria	Excellent (A)	Good (B)	Satisfactory (C)	Fail (F)
Demonstrate knowledge of and skill regarding the syntax and semantics of a web and mobile programming language, its control structures, and its basic data representations	Discuss rationale for choices made in selecting and organizing basic language instructions and data representations to accomplish a number of functionalities (commonly needed in most web and mobile applications).	Discuss rationale for choices made in selecting and organizing basic language instructions and data representations to accomplish a given straightforward task. Suggest alternative approaches and compare and contrast alternative approaches to the task.	Select and organize basic language instructions and data representations to accomplish a given straightforward task. Discuss generally how they work to accomplish the task.	Unable to correctly describe effects of execution of programming instructions (trace code) involving basic features of the web and mobile programming language used.
Demonstrate knowledge of and skill regarding the database connectivity and dynamic web pages	Establish database connectivity and make queries on databases based on the web scripting language used; Use a style sheet language for more sophisticated interface design	Establish database connectivity and make queries on databases based on the web scripting language used; Use a style sheet language for interface design;	Establish database connectivity and make queries on databases based on the web scripting language used; Use a style sheet language for simple interface design.	Unable to establish database connectivity based on the web scripting language used.
Describe the key concepts and methods for web and mobile application development with dynamic and interactive contents and interfaces.	Describe the features of various key concepts, methods and related standards for dynamic web and mobile application development and how they are deployed in the context of some selected applications commonly found on-line.	Describe the features of various key concepts, methods and related standards for dynamic web and mobile application development and explain their use via some concrete sample code.	Describe the features of various key concepts, methods and related standards for dynamic web and mobile application development.	Unable to clearly describe the key concepts, methods and related standards for dynamic web and mobile application development.

Course Content and CILOs Mapping:

Content	CILO No.
I Getting Started with Webpage Development	1, 4
II Web Application Development	1-4
III Mobile Application Development	2-5
IV Selected Topics in System Development	2-5

References:

- B. Frain, Responsive Web Design with HTML5 and CSS: Build future-proof responsive websites using the latest HTML5 and CSS techniques, 4th ed. Birmingham, England: Packt Publishing, 2022.
- E. Brown, Web development with node and express: Leveraging the JavaScript stack, 2nd ed. Sebastopol, CA: O’ Reilly Media, 2019.
- M. Shavin, R. Camden, C. Gurney, and H. Di Francesco, Frontend Development Projects with Vue.js 3: Learn the fundamentals of building scalable web applications and dynamic user interfaces with Vue.js, 2nd ed. Birmingham, England: Packt Publishing, 2023.
- J. Au-Yeung, Vue.js 3 By Example: Blueprints to learn Vue web development, full-stack development, and cross-platform development quickly. Birmingham, England: Packt Publishing, 2021.

Course Content:

Topic

- I. Getting Started with Webpage Development
 - A. HTML and CSS
 - B. Responsive web design
 - C. Document object model (DOM) and client-side JavaScript
- II. Web Application Development
 - A. Hypertext Transfer Protocol (HTTP)
 - B. Server-side programming
 - C. Document oriented database
 - D. AJAX techniques and Restful web services
- III. Mobile Application Development
 - A. Front-end JavaScript framework, such as Vue.js
 - B. Hybrid mobile application development
 - C. Software architecture patterns
- IV. Selected Topics in System Development
 - A. Version control system for software development
 - B. Basic data visualization for web and mobile platforms
 - C. Usage of pre-trained AI models on web and mobile applications