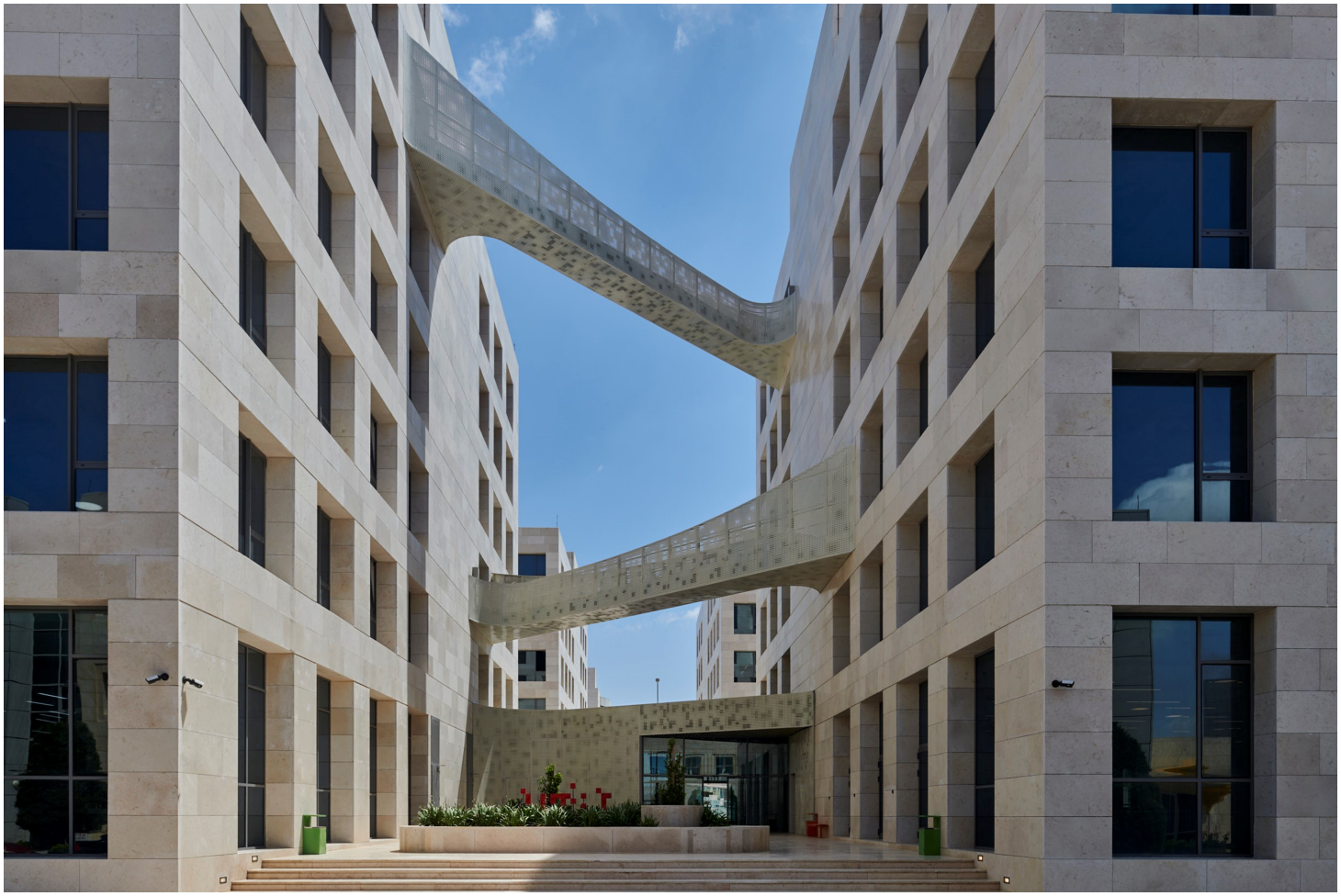
جامعة الحسين التقنية
Al Hussein Technical University

ASSIGNMENT BRIEF

HTU Course No: 00201471	**HTU Course Name:** Special Topics in Computer Science 1
BTEC Unit Code:	**BTEC UNIT Name:**



Student Name/ID Number/Section	
HTU Course Number and Title	00201471 Special Topics in Computer Science 1
BTEC Unit Code and Title	
Academic Year	2025-2026 1
Assignment Author	Razan Alquran
Course Tutor	Razan Alquran
Assignment Title	Designing and Developing a Full-Stack Web Application
Assignment Ref No	1
Issue Date	16/11/2025
Formative Assessment dates	From 17/11/2025 to 15/01/2026
Submission Date	22/01/2026
IV Name & Date	Reem Shtaiwi 15/11/2025

Submission Format

The submission for this assignment is divided into 4 deliverables:

1. Individual written Report. (**word document**)
2. Fully functional and responsive web application (Front-end and Back-end sides) .
   - GitHub repository links for both the front-end and back-end applications (repositories should be public, or if private, ensure you add your instructor as a collaborator).
   - Compressed (ZIP) files of the front-end, back-end applications (excluding the *node_modules* folder), and the *schema.sql* file of your database, containing real data inserted into the tables (for SQL databases) or documents (for NoSQL databases).
3. Declaration form.
4. **Oral Discussion:** You will be called to discuss your assignment with your instructor, and you must be ready to answer any questions the instructor has (**Tracing and writing code, explaining terminologies, and answering any questions related to the course**) and explain the answers you submitted for your assignment. The oral discussion is considered part of the assessment, and failing to answer questions during the oral discussion will result in failing the assessment related to that oral discussion. Please note that in order to fulfill the criterion, it must be correctly implemented in your report or in the web application if it's related to the app part, and you must be able to clearly explain it during the oral exam. Failure to meet either of these requirements will result in the loss of this criterion.

The report should be submitted as **word document softcopy** to the university's eLearning system within the deadline specified above on the link: https://elearning.htu.edu.jo. In your report, you should make use of headings, paragraphs, and subsections as
appropriate, should be written in a formal business style using single spacing and font size 12, of times roman, and must be well-researched and properly referenced using the Harvard referencing system.

Unit Learning Outcomes

LO1 Explain and Detect server technologies, version control techniques, and tools associated with building and managing full-stack web applications

LO2 Produce full-stack web development prototype design, and ER Diagram to create scalable web applications

LO3 Utilize full-stack development technologies, tools, and design principles to create a complete web application

Assignment Brief and Guidance

You are an **Apprentice Web Developer** participating in a **university apprenticeship program** at **TechStar Solutions**, a digital agency specializing in webapp development. This apprenticeship is a three-month placement designed to help you apply theoretical knowledge in a real-world environment and gain hands-on experience in client-server based web projects.

As part of your role, you have been assigned in a project to design, develop, and deploy a responsive, fully functional webapp for a **client organization**. You may choose an organization type that aligns with your interests, such as a small business, community organization, non-profit, or government agency. This project will help you demonstrate your skills in both front-end and back-end web development.

You are asked to submit a **report document**, then **design and develop a responsive fully functional web app (front-end and back-end parts using Reactjs, Expressjs, and Mongodb or PostgreSQL) based on the specified requirements and wireframe in your report.**

The web app should cover the following requirements:

- Users accounts management.
- The web app should contain dynamic components.
    - **Read** data from the database.
    - **Insert** data to the database.
    - **Update** and **delete** data in the database

Based on your work, please be sure to complete all the items **in the following two parts**.

Part 1 (Report):

1. **Identify** and **explain** the purpose and components of the Web Request-Response Cycle (WRRC), including how client-server communication is structured. (Drawing and deep discussion are required)
2. **Compare** the advantages of using front-end frameworks such as React.js over traditional approaches (HTML, CSS, and JavaScript).
3. **Identify** your app's idea and a comprehensive set of user and system requirements for your full-stack web application after getting the approval from your team lead on the idea.
4. **Create** a prototype for a full-stack web application, supported with low or medium-fidelity wireframes using a design tool. (Add screenshot, and URL).
5. **Design** an Entity Relationship Diagram (ERD) to model the database schema for the application, ensuring proper relationships and constraints are established. (Add screenshots).
6. Add your GitHub repository links and deployed application URLs.
7. Add your References using the Harvard referencing system.

Part 2 (Web App):

1. **Discuss** the importance of documenting API endpoints, and **Create** strong project documentation using Markdown for both frontend and backend in your README.md files to enhance maintainability and collaboration.

2. Use the designed prototype with appropriate development principles and coding standards to **Develop** a scalable, full-stack web application supported by realistic content and API integrations.
3. **Analyze** the impact of integrating third-party APIs and version control tools (GitHub) on the functionality, scalability, and efficiency by **Using** them in a full-stack web application.
4. **Analyze** the deployment process of the full-stack web application, including **Selecting** deployment platforms and **Configuring** production environments.
5. **Use** a UI framework (e.g., Bootstrap, Material-UI) in improving the design and responsiveness of a full-stack web application.
6. **Manage** the authentication process for your frontend and backend applications.
7. **Evaluate** the quality, innovation by choosing an innovative and helpful idea (authorization), and usability of the final project in real life, focusing on having creative design, functionality, and how well it meets all the client and user requirements in the report.
8. **Justify** the implementation of best practices, clean code principles, DRY principles, Separation of Concerns, Error Handling, Consistent Naming, and Github features including branch management used during the design and development of a high quality, well-structured, and innovative full-stack web application.

THE END

Learning Outcomes and Assessment Criteria			
Learning Outcome	**Pass**	**Merit**	**Distinction**
LO1 Explain and Detect server technologies, version control techniques, and tools associated with building and managing full-stack web applications	**P1** Identify and explain the purpose and components of the Web Request-Response Cycle (WRRC), including how client-server communication is structured. **P2** Compare the advantages of using front-end frameworks such as React.js over traditional approaches (HTML, CSS, and JavaScript). **P3** Identify a comprehensive set of user and system requirements for your full-stack web application.	**M1** Analyze the impact of integrating third-party APIs and version control tools (GitHub) on the functionality, scalability, and efficiency by using them in a full-stack web application.	**D1** Evaluate the quality, innovation (authorization feature), and usability of the final project, focusing on design, functionality, and how well it meets client and user requirements.
LO2 Produce full-stack web development prototype design, and ER Diagram to create scalable web applications	**P4** Create a prototype for a full-stack web application, supported with low or medium-fidelity wireframe using a design tool. **P5** Design an Entity Relationship Diagram (ERD) to model the database schema for the application, ensuring proper relationships and constraints are established.	**M2** Analyze the deployment process of the full-stack web application, including selecting deployment platforms and configuring production environments.	

LO3 Utilize full-stack development technologies, tools, and design principles to create a complete web application	**P6** Discuss the importance of documenting API endpoints, and create strong project documentation using Markdown for font end and backend to enhance maintainability and collaboration. **P7** Use the design document with appropriate development principles and coding standards to produce a scalable, full-stack web application supported by realistic content and API integrations.	**M3** Use a UI framework (e.g., Bootstrap, Material-UI) in improving the design and responsiveness of a full-stack web application. **M4** Manage the authentication system for your frontend and backend applications.	**D2** Justify the implementation of best practices, clean code principles, GitHub features including branch management, and collaboration used during the design and development of a high quality, well-structured, and innovative full-stack web application.