# Luminus Technical University College - Assignment Brief (RQF)

## Higher National Diploma in computing

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| **Student Name** | | **Abdelrahman Saleh** | | | **Language of assessment** | | | **AR** | **EN** |
| **College ID:** | | | **22030961** | |
| **Pearson ID:** | | | **PG76228** | |
| **Unit Number and Title** | | **30** | **Application Development** | | | | | | |
| **Academic Year** | | **2022/2023** | | | | | | | |
| **Unit Tutor** | | Arar Al Tawil, Fadia Ala’eddin | | | | | | | |
| **Internal Verifier Name and Approval (Signature)** | | **Ghena Ibrahim Barakat** | | | | **Approve date :6/8/2023** | | | |
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| **Assignment number and Title** | | **1** | **Bus Trips Reserving System (BTRS)** | | | | | | |
| **Issue Date (1St Submission)** | | **6/8/2023** | | **Submission Date (1st Submission)** | | | **5/9/2023** | | |
| **Issue Date (2nd Submission)** | | **8/9/2023** | | **Completion Date (2nd Submission)** | | | **11/9/2023** | | |
| **Submission Format** | | | | | | | | | |
| **Format:**  **The submission is in the form of an individual written report. The submission is in the form of 5 documents, which are (Student submission and Declaration form that includes your solution, and technical documentation). In addition project files, database backups, and the PowerPoint presentation. You must use font Times New Roman size 12, Headings size 14, set number of the pages, and use multiple line spacing at 1.15. The reference follows the Harvard referencing system.**    **Submission:**  **Students are mandatory to submit the assignment on the due date and in a way requested by the Tutor. The form of submission will be a soft copy posted on the LMS (D2L).**    **Note:**  **The Assignment must be your own work, and not copied by, from another student, or from books etc. If you use ideas, quotes, or data (such as diagrams) from books, journals, or other sources, you must reference your sources, using the Harvard style. Make sure that you know how to reference properly, and that understand the guidelines on plagiarism. If you do not, you definitely will not pass.** | | | | | | | | | |
| **Unit Learning Outcomes** | | | | | | | | | |
| **LO1** | **Produce a Software Design Document by analysing a business-related problem, and deducing an appropriate solution including a set of initial requirements.** | | | | | | | | |
| **LO2** | **Use design and development methodologies with tools and techniques**  **associated with the creation of a business application.** | | | | | | | | |
| **LO3** | **Work individually and as part of a team to plan and produce a functional**  **business application with support documentation.** | | | | | | | | |
| **LO4** | **Evaluate the performance of a business application against its Software Design**  **Document and initial requirements.** | | | | | | | | |
| Transferable skills and competencies developed | | | | | | | | | |
| By analyzing a business-related problem and determining a solution, students will be able to create a Software Design Document that includes initial requirements. Using tools and techniques associated with the development of a business application, students will select and use design and development methodologies, work alone as well as in a team to plan, prepare and produce functional business applications with support documentation, and evaluate and plan improvements to a business application based on its Software Design Document and initial requirements by assessing and planning improvements. | | | | | | | | | |
| **Vocational scenario:** | | | | | | | | | |
| ABC Bus Travels, a leading and customer-centric bus-traveling company, envisions revolutionizing the way passengers experience travel by introducing an innovative and efficient online reservation system called the Bus Trips Reserving System (BTRS). With an unwavering commitment to providing top-notch travel services, ABC Bus Travels aspires to offer its clients a seamless, convenient, and technology-driven booking platform that will redefine their travel experience.  The idea for the Bus Trips Reserving System (BTRS) was born out of a visionary meeting orchestrated by the esteemed IT manager of ABC Bus Travels. Recognizing the growing demand for user-friendly and digital solutions in the travel industry, the IT manager collaborated with a prominent IT programming company renowned for its expertise in developing cutting-edge systems.  In pursuit of an enhanced travel experience for their valued passengers, ABC Bus Travels, a progressive and innovative bus-traveling company, is embarking on developing a cutting-edge web application. This visionary initiative stems from a strategic meeting between the bus company's IT manager and a reputed IT programming company. The web application aims to redefine the way passengers interact with bus travel by providing easy access to all available bus trips, enabling seamless reservations, and empowering travellers to make informed decisions. With a user-friendly interface, real-time updates from a robust SQL database, and advanced security measures for transactions, the web application aspires to set new industry benchmarks while showcasing ABC Bus Travels' commitment to excellence and customer satisfaction.  Suppose ABC Bus has reached out to you, and after engaging in discussions with them regarding the web application, you concur that the "Bus Trips Reserving System" (BTRS) should encompass the following key requirements:   * Timely Delivery: The application must be completed and ready for deployment within a month to ensure prompt access and convenience for ABC Bus's valued passengers. * User-Friendly Interface with Database Integration: To meet customer expectations, the BTRS should feature a user-friendly interface equipped with a navigation bar and footer, enhancing ease of use. Additionally, the application should integrate a robust SQL database to ensure efficient data management and seamless user interactions. * Account Creation For a personalized experience, visitors (passengers) must have the ability to create accounts and furnish essential information, including name, email address, mobile number, username, password, Language. * Viewing All Available Bus Trips: The BTRS should enable visitors to access a comprehensive listing of all available bus trips, each trip has ID , trip destination, start date , end date, bus number , availability, allowing passengers to explore various travel options based on their preferences and the passengers can booking many trips and each trip has many passengers . * Administrator Privileges: To ensure seamless management of bus trip announcements, the BTRS should grant privileged access to ABC Bus's administrators who can access the system using username and password, enabling them to effortlessly insert and delete announcements for all available bus trip positions within the system. Each admin can add many trips and each trip ass by one admin. | | | | | | | | | |
| Assignment activity and guidance | | | | | | | | | |
| You need to work on this project by dividing it into several activities (Note: reference all resources):  **Activity 1:Project analysis and design**  An initial step in developing a new web application is to decide why it should be developed, design an appropriate solution including a set of initial requirements, and implement the required requirements:   1. **Analyze** the problem at the core of the web application concept, offer a solution, and describe the needs of users and the system requirements to implement this solution. 2. During the development process of an online BTRS application, there could be various potential challenges that may arise. **Identity** and list the risks that could be faced. 3. In accordance with your identification of the problem-definition statement and the application requirements, your task is to complete the analysis and create a software design document. This document should encompass the following steps: 4. Thoroughly **investigate** and categorize the requirements into functional and non-functional aspects, ensuring a comprehensive understanding of the application's scope. 5. **Draw** a Sequence Diagram, building upon the classification achieved in the previous step. This diagram should visually represent the sequence of interactions and events between different components of the system. 6. **Create** an Entity Relationship Diagram (ERD) that illustrates the relationship between various entities in the application database, offering an insightful view of the data structure. 7. **Implement** the system functionality using flow chart techniques, providing a clear representation of the application's logic and how different components interact. 8. **Determine** the **testing** technique(s) you will employ during the implementation phase to validate and verify your work. Ensure that these testing techniques are effective in detecting and resolving any potential issues. 9. **Specify** the programming languages that will be utilized for implementing the application, considering factors such as compatibility, efficiency, and the application's specific needs.   **Activity 2: Project methodologies and tools**  To implement the ABC project successfully, you need to determine which methodologies you may use during the implementation and what kind of tools will be useful. Here are some steps you need to follow:   1. Developing your "Bus Trips Reserving System" (BTRS) project will be more streamlined when you opt for a software development tool from categories such as operating systems, Integrated Development Environments (IDEs), and diagram software tools, along with exploring different Software Development Life Cycle (SDLC) methodologies. To do so, you will need to **study** and **examine** these various categories in order to develop your project. 2. Moving on, now **differentiate and justify** why you chose the tools and methods you picked in the previous step, and provide reasons for your choices. . 3. Provide **reasoning** for your response by **establishing** a connection between the methodology and tools you selected in the previous step and the solution you proposed for the problem-definition statement.   **Activity 3: Project Implementation**  It is now time to implement the requirements that you analyzed and designed in task one using the specific tools and methodology you learned in task two, so you need to do the following:   1. **Develop** a presentation to assess the following aspects:  * Business application * Problem definition statement * Proposed solution that outlines functional and non-functional requirements * Development strategy   **Conduct** a peer review and identify opportunities that were not previously considered by interpreting the recorded feedback. Document any feedback given.   1. **Create** the "Bus Trips Reserving System" (BTRS) web application, incorporating all the functional requirements identified in task 1.3, along with the software design document. Create separate documentation to detail the development process, including screenshots and comprehensive descriptions of each implemented feature , and apply the **testing your mention in activity 1.3.**   (**The grading for this question will be done using observation**)   1. Following your presentation, it is essential to elaborate on the feedback received and address any new opportunities or aspects that were not previously covered in the presentation. Provide a comprehensive **Explain** of the feedback and **Show** the additional areas that have been identified for further exploration and development. 2. Enhance and demonstrate how the tools and methodology you favor strongly support your work following the development and successful implementation of this web application. 3. Explore potential opportunities or novel concepts that could enhance the Bus Trips Reserving System (BTRS) project and provide explanations for why they should be integrated or excluded.   **Activity 4: Project Evaluation**  Once you have completed activity 3, you are ready to assess your progress from activity 1 to activity 3. To evaluate your work, follow these steps:   1. **Reflect** how the implementation of your code in task number 3 aligns with the Problem Definition Statement and functional requirements determined in task number 1.3. 2. **Examine** the factors that can affect the project's performance and **evaluate** their impact on the phases of implementation, such as the design, development, and testing phases for the “BTRS” application, as well as how the risks that you identified in task number 1.2 also affected this implementation**.** 3. To wrap up, **critique** both the strengths and weaknesses of the project you constructed and **evaluate** the possibilities for enhancing it. | | | | | | | | | |
| **Recommended Resources**  **Please note that the resources listed are examples for you to use as a starting point in your research – the list is not definitive.**  <https://www.w3schools.com>  <https://www.w3.org>  <https://lucid.app/>  <https://erdplus.com/> | | | | | | | | | |

**Learning Outcomes and Assessment Criteria**

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| **Pass** | **Merit** | **Distinction** | |
| **LO1** Produce a Software Design Document by analysing a business-related problem and deduce an appropriate solution including a set of initial requirements | | | **LO1 & LO2**  **D1** Justify your solution to a business-related problem and your preferred software development methodology, by comparing between the various software development tools and techniques researched | |
| **P1** Explore a business-related problem and produce a well-defined Problem Definition Statement supported by a set of user and system requirements.  **P2** Determine any areas of risk related to the successful completion of your application. | **M1** Analyse a business-related problem using appropriate methods and produce a well-structured Software Design Document that defines a proposed solution and includes relevant details on requirements, system analysis, system design, coding, testing, and implementation. |  | |
| **LO2** Use design and development methodologies with tools and techniques associated with the creation of a business application | |
| **P3** Research the use of software development tools and techniques and identify any that have been selected for the development of this application. | **M2** Compare the differences between the various software development tools and techniques researched and justify your preferred selection as well as your preferred software development methodology |
| **LO3** Work individually and as part of a team to plan and produce a functional business application with support documentation | | **D2** Evaluate any new insights, ideas, or potential improvements to your system and justify the reasons why you have chosen to include (or not to include) them as part of this business application. | |
| **P4** Create a formal presentation that effectively reviews your business application, problem definition statement, proposed solution, and development strategy. Use this presentation as part of a peer-review and document any feedback given.    **P5** Develop a functional business application with support documentation based on a specified business problem. | **M3** Interpret your peer-review feedback and identify opportunities not previously considered.  **M4** Develop a functional business application based on a specific Software Design Document with supportive evidence of using the preferred tools, techniques, and methodologies. |
| **LO4** Evaluate the performance of a business application against its Software Design Document and initial requirements | | **D3** Critically evaluate the strengths and weaknesses of your business application and fully justify opportunities for improvement and further development. | |
| **P6** Review the performance of your business application against the Problem Definition Statement and initial requirements. | **M5** Analyse the factors that influence the performance of a business application and use them to undertake a critical review of the design, development and testing stages of your application. Conclude your review by reflectively discussing your previously identified risks. |