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**Detailed Assessment Brief**

**Assessment 2**

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| **Unit Code/Description** | ICT305 – Topics in IT |
| **Course/Subject** | BIT |
| **Semester** | 2025- S2 |
| **Assessment Overview** | |
| **Unit Learning Outcomes Addressed** | ULO 1, 2, and 3. |
| **Assessment Objective** | The primary objective of this assessment is to provide students with hands-on experience in designing, implementing, and analysing a project in one of the emerging technology fields: Internet of Things (IoT), Machine Learning, Cybersecurity, Cloud Computing, or Blockchain. |
| **Assessment Title/Type** | Individual Report |
| **Due Date** | The report should be submitted online in Moodle by each student at the end of week 8. |
| **Weighting** | 25% |
| **Instructions to Students** | Check section Assessment Description |
| **Format/Structure** | The report must be a PDF/Word document |
| **Word/Page limit** | Total word count will be 2000 words in length excluding abstract, table of contents, references, tables, and figures. |
| **Referencing Style** | American Psychological Association (APA) Referencing Style/IEEE Referencing Style Sheet |
| **Submission Guidelines** | Your name and student ID must appear at the beginning of your report. This assessment must be submitted to Turnitin. Login to your Turnitin account, locate and click on the assignment submission link, carefully review the instructions, and then submit your assessment.  *You must present a demo of the project to your lecturer during week 9 tutorial session. Otherwise,* ***you will receive no mark.*** |
| **Plagiarism and Academic Integrity**  **This section MUST remain as it is (Do not make any changes)** | |
| At CIHE, we take academic integrity seriously and expect all students to maintain the highest standards of honesty and ethical behaviour in their academic work. As a student, it is your responsibility to ensure that all your academic endeavors are conducted with integrity and in accordance with the principles of honesty, fairness, and respect for intellectual property. Please refer to “CIHE Student Academic Integrity and Honesty Policy” in the Moodle for details. | |
| **Late Submission Policy** | Requests for extensions will be granted only for exceptional circumstances that are supported by credible evidence. Duration of the extension period is only one week.  Late submissions are subject to 10% reduction in marks for each day of delay. Submissions after the extended date will not be marked. |

**Assessment Title: Project Development and Analysis in Emerging Technologies**

**Assessment Overview**

In this assessment, students are required to choose a project from one of the following fields: Internet of Things (IoT), Machine Learning, Cybersecurity, Cloud Computing, or Blockchain. Students will implement their chosen project, analyse the results, and compile a comprehensive report. The report must include an abstract, introduction, methodology (including design, database design if applicable, dataset description, model description, and diagrams), tools required, implementation, result analysis, conclusion, and references.

**Report Structure**

1. **Abstract**
   * Provide a concise summary of the project, including the main objectives, methods, and key findings.
2. **Introduction**
   * Introduce the project topic, its significance, and the problem it aims to solve.
3. **Methodology**
   * **Design:** Outline the design of the project, including architecture and key components.
   * **Database Design (if applicable):** Describe the database structure and how it supports the project.
   * **Dataset Description (for Machine Learning projects):** Provide details about the dataset used, including its source, structure, and any preprocessing steps.
   * **Model Description (for Machine Learning projects):** Explain the machine learning model used, including its architecture and parameters. Include diagrams if applicable.
   * **System Design and Description (for IoT or Cloud projects):** Provide a detailed description of the system, including diagrams to illustrate the setup and flow.
4. **Tools Required**
   * List and describe the tools and technologies used to implement the project.
5. **Implementation**
   * Detail the steps taken to implement the project, including code snippets, configurations, and setup procedures.
6. **Result Analysis**
   * Analyse the results of the project, discussing the outcomes, any challenges faced, and how they were addressed.
7. **Conclusion**
   * Summarize the key findings and implications of the project. Discuss any potential future work or improvements.
8. **References**
   * List all the sources and references used in the preparation and implementation of the project.

**Choose one of the projects from one of the categories:**

**Category 1: Internet of Things (IoT)**

***For this category of projects, you must implement it using hardware or a simulator and demonstrate the implementation to the unit lecturer.***

1. **Smart Home Automation System Using Arduino**
   * Design and implement a home automation system to control lights, temperature, and security using IoT devices. [Source](https://ieeeprojectsmadurai.com/IEEE%202019%20IOT%20BASEPAPERS/36_IOT%20BASED%20HOME%20AUTOMATION.pdf).
2. **IoT-Based Environmental Monitoring System**
   * Create a system to monitor environmental parameters such as temperature, humidity, and air quality using sensors and Arduino. [Source](https://electronics-project-hub.com/iot-based-weather-monitoring-system-using-arduino/).
3. **IoT-Enabled Smart Agriculture System**
   * Develop an IoT system to monitor soil moisture, temperature, and other factors to optimize agricultural practices.
4. Temperature Monitoring with Arduino IoT Cloud using DHT22
5. Heartbeat Monitoring with Arduino Uno or Raspberry pi
6. Traffic Light Controller Using Arduino Uno
7. Automated Plat Watering System
8. Arduino Lie Detectors
9. IoT COVID Patient Health Monitoring in Quarantine
10. IoT Based Intelligent Gas Leakage Detector using Arduino

**Category 2: AI& Machine Learning**

**You need to write a report and demonstrate the project implementation to the unit lecturer during the class session.**

1. Image Classification Using Convolutional Neural Networks (CNNs)
2. Predictive Maintenance Using Machine Learning
   * Develop a predictive maintenance system using machine learning models to predict equipment failures.
3. Natural Language Processing for Sentiment Analysis
   * Implement a sentiment analysis system using NLP techniques to analyze customer reviews or social media data.
4. [Disease Prediction Using Machine Learning](https://www.geeksforgeeks.org/disease-prediction-using-machine-learning/)
5. ML| Heart Disease Prediction Using Logistic Regression
6. Parkinson’s Disease Prediction Using Machine Learning
7. Credit Card Fraud Detection
8. Calories Burnt Prediction using ML
9. Detecting Spam Emails using ML
10. Fake News Detection Using ML

**Category 3: Cybersecurity**

**You need to write a report and demonstrate the project implementation to the unit lecturer during the class session.**

1. **Intrusion Detection System Using Machine Learning**
   * Design and implement an IDS that uses machine learning to detect anomalies and potential threats in network traffic.
2. **Secure Data Transmission Using Cryptography**
   * Develop a system to securely transmit data between devices using modern cryptographic techniques.
3. **Phishing Detection Using Machine Learning**
   * Create a machine learning model to detect phishing emails and websites.
4. Other Machine Learning Project for Cybersecurity
   * + Intrusion Detection System (IDS) using ML
     + Zero-day Attack Detection
     + Phishing Website Detection
     + Malware Classification
     + User Behavior Analytics
     + Credit Card Fraud Detection
     + Spam Email Filter
     + Secure Multi-party Computation with ML
     + Domain Generation Algorithm (DGA) Detection
     + Security Log Analysis
     + Intelligent Threat Hunting
     + File less Malware Detection
     + Password Strength Assessment
     + Security Awareness Training Analysis
     + Automated Threat Intelligence
     + Security Policy Optimization

**Category 4: Cloud Computing**

**You need to write a report and demonstrate the project implementation to the unit lecturer during the class session.**

1. **Scalable Web Application Deployment on Cloud**
   * Deploy a scalable web application using a cloud platform like AWS or Azure, focusing on load balancing and auto-scaling.
2. **Cloud-Based Data Storage and Retrieval System**
   * Implement a cloud-based system for storing and retrieving large datasets efficiently.
3. **Serverless Computing with AWS Lambda**
   * Develop a serverless application using AWS Lambda, focusing on the benefits of serverless architecture.

**Category 5: Blockchain**

**You need to write a report and demonstrate the project implementation to the unit lecturer during the class session.**

1. **Decentralized Voting System Using Blockchain**
   * Design and implement a blockchain-based voting system to ensure secure and transparent elections.
2. **Blockchain-Based Supply Chain Management**
   * Develop a blockchain solution to track and verify the supply chain of products from origin to destination.
3. **Cryptocurrency Wallet and Transaction System**
   * Create a cryptocurrency wallet application that allows users to securely manage and transact digital currencies.
4. Other Blockchain related Projects:
   * dApp: Secure Decentralized Application Development
     + Decentralized Energy Trading
     + Charity Donation
     + Identity Management System
     + Decentralized Autonomous Organization (DAO)
     + Prediction Market Platform
     + Decentralized File Storage System
     + Decentralized Insurance Platform
     + Supply Chain Management System
     + Decentralized Social Network
     + Decentralized Voting System
     + Decentralized Marketplace

**Example Project Reports**

1. [**IoT-Based Home Automation System Using Arduino**](https://ieeeprojectsmadurai.com/IEEE%202019%20IOT%20BASEPAPERS/36_IOT%20BASED%20HOME%20AUTOMATION.pdf)
2. [**IoT-Based Weather Monitoring System Using Arduino**](https://electronics-project-hub.com/iot-based-weather-monitoring-system-using-arduino/)

**Submission Guidelines**

* Compile your report into a single document. Ensure that your analysis is thorough and well-documented, with relevant diagrams and code snippets.
* Submit your completed assessment through the course's Moodle submission portal by the due date.
* *You must present a demo of the project to your lecturer during week 9 tutorial session. Otherwise,* ***you will receive no mark.***

**Assessment Criteria**

* **Abstract and Introduction:** Clarity, depth, and relevance of the project overview and introduction.
* **Methodology:** Detailed and accurate description of the project design, database (if applicable), dataset, model, and system with appropriate diagrams.
* **Tools and Implementation:** Correctness and completeness of the implementation steps, including the use of appropriate tools and technologies.
* **Result Analysis:** Depth of analysis, identification of key issues, and the quality of insights gained from the project.
* **Conclusion and References:** Clear summarization of findings, potential future work, and proper citation of references.

**MARKING GUIDE:**

| **Citeria** | **Excellent (4-5 points)** | **Good (3-4 points)** | **Fair (2-3 points)** | **Poor (1-2 points)** | **Very Poor (0-1 points)** |
| --- | --- | --- | --- | --- | --- |
| **Abstract and Introduction** | Exceptionally clear, detailed, and relevant overview and introduction. Demonstrates a strong understanding of the project. | Clear and relevant overview and introduction. Demonstrates a good understanding of the project. | Adequate overview and introduction. Demonstrates a basic understanding of the project. | Limited clarity and relevance in the overview and introduction. Demonstrates minimal understanding of the project. | Lacks clarity and relevance in the overview and introduction. Demonstrates no understanding of the project. |
| **Methodology** | Thorough and precise description of project design, database (if applicable), dataset, model, and system with excellent diagrams. | Detailed and accurate description of project design, database (if applicable), dataset, model, and system with good diagrams. | Adequate description of project design, database (if applicable), dataset, model, and system with some diagrams. | Limited description of project design, database (if applicable), dataset, model, and system. Diagrams may be missing or unclear. | Very poor or missing description of project design, database (if applicable), dataset, model, and system. Lacks diagrams. |
| **Tools and Implementation** | Implementation steps are detailed, correct, and complete. Appropriate tools and technologies are expertly used. | Implementation steps are mostly correct and complete. Appropriate tools and technologies are well used. | Implementation steps are adequate but may lack some detail. Tools and technologies are used adequately. | Implementation steps are incomplete or partially incorrect. Use of tools and technologies is limited or flawed. | Implementation steps are missing or mostly incorrect. Tools and technologies are poorly or not used. |
| **Result Analysis** | In-depth analysis with clear identification of key issues and high-quality insights. Demonstrates excellent understanding. | Good analysis with identification of key issues and good insights. Demonstrates a solid understanding. | Adequate analysis with some identification of key issues and insights. Demonstrates a basic understanding. | Limited analysis with minimal identification of key issues and insights. Demonstrates minimal understanding. | Very poor or missing analysis. Fails to identify key issues and insights. Demonstrates no understanding. |
| **Conclusion and References** | Clear and comprehensive summarization of findings. Identifies potential future work. References are thorough and properly cited. | Clear summarization of findings. Identifies some potential future work. References are adequate and properly cited. | Adequate summarization of findings. Limited identification of potential future work. References are basic and cited. | Limited summarization of findings. Minimal identification of potential future work. References are incomplete or poorly cited. | Very poor or missing summarization of findings. No identification of potential future work. References are missing or incorrect. |