Table 2: Mapping Project Elements to the Gold Standard PBL ‘Essential Project Design Elements’

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| **Academic Year:** | | AY2021/2022 | | |
| **Name of Department:** | | Engineering | | |
| **Name/ Code of Programme:** | | HD in Computer and Electronic Engineering / EG114403, EG314403, EG524403 | | |
| **Name/ Code of Module/ Syllabus content that the PBL Project for:** | | Artificial Intelligence and Big Data / EEE4463 / Data analytics topic | | |
| **Name of PBL Project:** | | Data analytics: Insight extraction from projectile motion | | |
| **Date, Created/Revised by:** | | 11 May 2022, CHEUNG Hoi Kok, Calvin | | |
| 1. **KEY KNOWLEDGE, UNDERSTANDING, AND SUCCESS SKILLS**  * List MILOs of existing modules to make sure the combination of MILOs reflects key knowledge, understanding and skills required when handling the challenging problem /question. * Collaborate with other discipline(s) when necessary, e.g. SD/LC/ other disciplines | | | **Code, Name, and MILOs of modules which contribute to the Project** | |
| EEE4463, Artificial Intelligence and Big Data | LAN3100, Workplace Interaction |
| MILO 2, 3, 4 | MILO 2 |
| 1. **CHALLENGING PROBLEM OR QUESTION**  * Consult industry’s or NGO’s advice and come up with a real-life and authentic topic for the setting the project. | | | **Challenging problem or question (Driving Question):**  As a data analytics engineer, how do we condition the noise corrupted data? How do we build a model to model the projectile motion? What insight can be extracted from the model built? How do we use this new insight? | |
| 1. **AUTHENTICITY**  * Work with industry’s or NGO’s partners on an authentic project. | **Authenticity:** The project has an authentic context, involves real-world tasks, tools, industrial standards and quality standards, makes contribution to the society, and speaks to students’ personal concerns, interests. | | | |
| 1. **SUSTAINED INQUIRY** 2. **STUDENT VOICE & CHOICE**  * Make sure the Teaching and Learning Strategies section stated in the syllabus of the modules include student-led and active learning approach. | **Details of the Project on Student Inquiry, Student Voice and Choice** | | | |
| EEE4463 | | | LAN3100 |
| Students take active initiation to solve the project problem. The inquiry is sustained and examples are listed below. | | | |
| * What is linear regression? * What is the difference between noise and outliers? * Interpret/analyze the positions coordinates of the cannonball stored in the CSV file. * Propose a solution to condition the data and build a model * Extract insight from built model * Evaluate if the proposed solution can properly handle outliers * Evaluate if the built model is influenced by the outliers * Extract insight from the model * Suggest application based on new insight * Difference in performance of linear regression and RANSAC regression. * Search for Python code from the website to perform linear regression and RANSAC regression * Design and develop a Python code to condition the data and build a model | | | * What is the appropriate report format? * How to present the information? * How to present the analysis with justification?      * Explain your developed Python code handling outliers and building model |
| 1. **REFLECTION** 2. **CRITIQUE & REVISION**  * Self-reflection mechanism such as an evaluation form, for students to self-evaluate and peer-evaluate during the learning process. * Formative and summative assessments justifying the integration of selected MILOs | **Details of Modules on Reflection, Critique, Revision and Public Product** | | | |
| EEE4463 | | | LAN3100 |
| Learning tools or assessment on students’ reflection, critique and revision include: | | | |
| * Oral feedback will be provided to each group * Reflection given after submission in terms of marks/ grade * Based on the feedback, students refine/amend their solution in solving the problem | | | Feedback in effectively present the idea verbally and in written form |
| 1. **PUBLIC PRODUCT**  * Learning opportunities for students to demonstrate, present, exhibit, when appropriate, what they have learnt to the public. * Students are expected to learn more from publicizing the product outside classroom. | | Publicizing the product/ outcome by:   * Present and demonstrate students’ analysis on the data. * Present and explain the proposed solution in solving the problem | | * Writing a report explaining the analysis and proposed solution to the problem. |