Subject Description Form

Subject Code	EIE2903/IC2141
Subject Title	Internet and Multimedia Product Development
Credit Value	5 Training Credits
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject provides to students hands-on practical training with a focus on Internet and multimedia product development. This subject also trains students on the use of scientific computing software.
Intended Learning Outcomes	**Upon completion of the subject, students will be able to:** a. Design simple Internet and multimedia applications for experimentation and demonstrations; b. Build simple product prototypes using contemporary microcomputer platforms; c. Apply troubleshooting techniques and tools in product and system development; and d. Apply scientific computation software to solve engineering problems
Contribution of the Subject to the Attainment of the Programme Outcomes	**Programme Outcomes:** This subject contributes to the programme outcomes 3, 5, 6, 7 and 10 through practical training. <u>Category A: Professional/academic knowledge and skills</u> • Programme Outcome 3: This subject contributes to the programme outcome through practical training and contemporary professional practice in the design and development of Internet and multimedia system. • Programme Outcome 5: This subject contributes to the programme outcome through training in scientific computing software and microcomputer development tools. <u>Category B: Attributes for all-roundedness</u> • Programme Outcome 6: This subject contributes to the programme outcome through practical training in student groups. Students should be able to practice and demonstrate their team work skills, realise the needs for leadership, critical thinking ability and creativity through working with others to realise the products in the project module. • Programme Outcome 7: This subject contributes to the programme outcome through induction and practical training in a recognized professional training centre. Professional practice, ethics and responsibility as demanded by the society can be observed through the process in training and the operation of the training centre. • Programme Outcome 10: This subject contributes to the programme outcome through induction and practical training in a recognized professional training centre that could bring up the awareness and cognition in self-learning and life-long learning for individual.

Subject Synopsis/ Indicative Syllabus	1 Microcomputer Applications and Practice for Internet & Multimedia 1.1 Introduction to Microcomputer systems and development tools 1.2 Knowledge on the corresponding operating system and its operation 1.3 Basic hardware concepts and practice: Input/output ports, peripherals, system design and testing 1.4 Hands-on practice on controlling the peripherals 1.5 Hands-on practice on typical sensor applications 2 Advanced System Applications and Practice for Internet & Multimedia 2.1 Introduction to contemporary IMT systems, related devices, tools and implementation 2.2 Basic database application and practice 2.3 Introduction to web application development tools 2.4 Web application practice 2.5 Basic graphics practice and introduction to Pygame 2.6 Hands-on practice on simple game development 3 Application of Computing Tool 3.1 Introduction to Python; interactive calculations and basic operations with basic data type; mathematical operations, matrix and array operations, data analysis and curve fitting; 3.2 Use of functions and popular Python packages, such as Numpy, Panda and Matplotlib; 3.3 Python script programming & debugging; logic operations & flow control; data visualization by using graphics packages; 3.4 Data manipulation and data science operations with Panda 4 Project with Internet and Multimedia Application 4.1 Project management techniques 4.2 System integration involving IOT, edge computing, web applications, data visualization, analysis and manipulation.
Learning Methodology	The teaching and learning methods include lectures, practical workshop tutorials, and group project. The lectures aim at providing students with background knowledge required for understanding key concepts in programming languages, use of microcomputer development systems and tools. The practical workshop tutorials aim at reinforcing students' knowledge and developing their ability in applying the knowledge and skills to complete specific tasks. Group project aims at facilitating students to review the diverse topics covered in this subject and perform active learning with research, practice, questioning, and problem solving in a unified activity. In addition, students should be able to cultivate their personal quality, creativity, management skills and leadership in teamwork collaborations.

Assessment Methods in Alignment with Intended Learning Outcomes

Assessment Methods	Weighting (%)	Intended Learning Outcomes Assessed			
		a	b	c	d
1. Assignment	45	✓	✓	✓	✓
2. Report	37	✓	✓	✓	
3. Product performance	18	✓	✓	✓	
Total	100				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

1. Assignment is to facilitate students to apply the skills and knowledge periodically throughout the training.
2. Report writing is to facilitate students to acquire deep understanding on the topics of the training, to present those concepts clearly, and to do reflection on achievement of learning outcomes.
3. Product performance is to review the completeness and quality of the product constructed by students.

Student Study Effort Expected

Class contact :

▪ Mini-Lecture	16 Hours
▪ Workshop Practices	134 Hours
Total student study effort:	**150 Hours**

Reading List and References

Reference Reading List:

1. Gareth Halfaceree, (2018). The Official Raspberry Pi Beginner's Guide, Raspberry Press
2. Samarth Shah, (2015). Learning Raspberry Pi, Packt Publishing
3. Andrea Chiarelli, (2018). Beginning React, Packt Publishing
4. *Padmanabhan, T. (2016). Programming with Python. Singapore: Springer.
5. McKinney, W. (2017). Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython (Second ed.). Sebastopol, CA: O'Reilly.

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