Subject Description Form

<table>
<tr><td>Subject Code</td><td>EIE3373 (for 42375)</td></tr>
<tr><td>Subject Title</td><td>Microcontroller Systems and Interface</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>3</td></tr>
<tr><td>Pre-requisite</td><td>EIE2261 Logic Design</td></tr>
<tr><td>Co-requisite/ Exclusion</td><td>Nil</td></tr>
<tr><td>Objectives</td><td>To provide students with the concepts and techniques required in designing computer hardware interfaces and embedded software for microcontrollers.</td></tr>
<tr><td>Intended Subject Learning Outcomes</td><td>Upon completion of the subject, students will be able to:

<u>Category A: Professional/academic knowledge and skills</u>
1. Understand the architecture of 8-bit and 32-bit microcontrollers.
2. Use the C programming language in developing programs for the use of microcontrollers.
3. Apply basic skills for interfacing common devices to microcontrollers.

<u>Category B: Attributes for All-roundedness</u>
4. Present ideas and findings effectively.
5. Think critically and creatively.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>Syllabus:
1. Overview of Typical Microcontrollers:
Features and architectures of 8-bit and 32-bit microcontrollers; hardware connections, hex file and flash loaders; overview of different built-in devices in a microcontroller;

2. Software Development Environment:
Understand C compilers, microcontroller programming in C.

3. Microcontroller Programming:
I/O programming, timer/counter programming, interrupt programming, serial port programming, programming for other (built-in) devices connected to microcontrollers.

4. Laboratory Exercises:
I/O programming, timer/counter programming, interrupt programming, serial port programming, programming for other (built-in) devices connected to microcontrollers.</td></tr>
<tr><td>Teaching/ Learning Methodology</td><td>
<table>
<tr><th>Teaching and Learning Method</th><th>Intended Subject Learning Outcome</th><th>Remarks</th></tr>
<tr><td>Lectures</td><td>1,2,3</td><td>Fundamental principles and key concepts of the subject are delivered to students</td></tr>
<tr><td>Laboratory sessions</td><td>1,2,3,4,5</td><td>Students will make use of software and hardware tools to carry out laboratory assignments</td></tr>
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Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/ Task	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)				
		1	2	3	4	5
1. Continuous Assessment (Total: 50%)						
• Laboratory Exercises	20%	✓	✓	✓	✓	✓
• Tests	30%	✓	✓	✓		
2. Examination	50%	✓	✓	✓		
Total	100%					

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

Specific Assessment Methods/Tasks	Remark
Assignments	Enhance the understanding of the taught materials in the lectures
Tests and examination	End-of chapter type problems are used frequently to evaluate students' ability in applying concepts and skills learned in class The students are also needed to think critically and creatively in the process of solving problems
Laboratory sessions	Each student is required to illustrated their achievement and produce a detailed work record when presenting his/her demonstrations Students are also needed to think critically and creatively to accomplish certain laboratory assignments

Student Study Effort Expected

Class contact (time-tabled):	
• Lecture	24 Hours
• Tutorial/Laboratory/Practice Classes	33 Hours
Other student study effort:	
• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	24 Hours
• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	24 Hours
Total student study effort:	**105 Hours**

Reading List and References

Reference Books:

1. The AVR Microcontroller and Embedded Systems: Using Assembly and C, M. A. Mazidi, S. Naimi, and S. Naimi, Pearson, 2014.
2. The Definitive Guide To The ARM Cortex-M3, Joseph Yiu, 2nd edition, Newnes, 2010.

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