Subject Description Form

Subject Code	EIE1002
Subject Title	Electronics Science
Credit Value	3
Level	1
Pre-requisite	Nil
Co-requisite/ Exclusion	Nil
Objectives	To provide a broad treatment of the fundamentals of electronics science with emphasis of multimedia technologies.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the fundamentals of electronics science with its associated components. 2. Appreciate the relationships between the associated components and a variety of devices used in multimedia technologies. 3. Apply the learned fundamentals for achieving a basic understanding on the working principle of a variety of devices used in multimedia technologies. Category B: Attributes for all-roundedness 4. Present ideas and findings effectively. 5. Learn independently. 6. Work in a team and collaborate effectively with others.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction to electronics science Basic concept of electricity and its safety issue in the context of product development. Appreciate the three basic characteristics of electronics components; the issue of poor tolerance and its remedies, e.g. use of negative feedback and redundancy. Overview of the two basic components in electronics science: resistors and capacitors with their applications. 2. Introduction to human sensory organs Basic relation between human sensory organs and audiovisual signals. Concept of sound pressure and its associated components and technologies, e.g. speakers, microphones, modern volume control. Concept of image and colours and their associated components and technologies. 3. Analog subsystems Basic concept of amplification and its associated components, e.g. transistor amplifiers. Basic DC power supplies and regulators with the use of negative feedback. 4. Digital subsystems Basic concept of switches and logic circuit implementation in the context of remote control via internet. Operation and design of CMOS logic gates. A simple RC charging circuit and its application in multi-vibrators and timers. **Laboratory Experiments:** 1. CMOS Astable Multi-vibrators 2. Voltage regulators **Case Study:** A selected topic in electronics

Teaching/ Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures	1, 2	fundamental principles and key concepts of the subject are delivered to students
Tutorials	1, 2, 3	students will be able to clarify concepts and to have a deeper understanding of the lecture material; problems and application examples are given and discussed
Laboratory sessions	1, 2, 3, 6	students in groups of 2-3 will conduct practical measurement and evaluate the performance of electronic circuits
Case study	3, 4, 5, 6	Each student is required to perform a detailed study on a subject in electronics in a team and present the result independently

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)					
		1	2	3	4	5	6
1. Continuous Assessment	40%						
• Short quizzes		✓					
• Assignments		✓	✓				
• Laboratory sessions, mini-project		✓	✓	✓			✓
• Case study				✓	✓	✓	✓
2. Examination	60%	✓	✓	✓			
Total	100%						

The continuous assessment will consist of a number of assignments and a series of quizzes.

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

Specific Assessment Methods/Tasks	Remark
Short quizzes	short quizzes conducted to measure students' understanding on subject materials
Assignments and examination	end-of chapter type problems used to evaluate students' ability in applying concepts and skills learnt in the classroom; students need to think critically and creatively in order to come with an alternate solution for an existing problem
Laboratory sessions, mini-project	each student is required to produce a written report; accuracy and the presentation of the report will be assessed;
Case study	each group of students will produce a written report on a selected topic in electronics; students will be assessed based on the content/organization of the report

Student Study Effort Expected		
	Class contact (time-tabled):	
	• Lecture	20 Hours
	• Tutorial/Laboratory/Practice Classes/Case Study	19 Hours
	Other student study effort:	
	• Lecture: preview/review of notes; assignment; preparation for quizzes/examination	30 Hours
	• Tutorial/Laboratory/Practice Classes/Case Study: preview of materials, revision and/or reports writing	36 Hours
	Total student study effort:	**105 Hours**

Reading List and References

Textbooks:

1. Floyd, Buchla, Electric circuits fundamentals, 8th ed., Prentice Hall, 2010.
2. Stan Gibilisco, *Teach yourself electricity and electronics*, 3rd ed., McGraw-Hill, 2002.
3. Shamieh, Cathleen, *Electronics for dummies*, 2nd ed., Wiley, 2009.

Reference Books:

1. Larry D. Wolfgang, *Understanding basic electronics*, American Radio Relay League, 1992.
2. Nick Dossis, *Basic electronics for tomorrow's inventors*, Osborne, 2013.

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