Subject Description Form

Subject Code	EE1001A / EE1001B
Subject Title	Freshman Seminar: Introduction to Electrical Systems
Credit Value	3
Level	1
Pre-requisite/ **Co-requisite/ Exclusion**	Nil
Objectives	**The objectives of this subject are to:** 1. Introduce students to the electrical systems discipline and to enthuse them about their major study. 2. Cultivate students' creativity and problem-solving ability, and global outlook. 3. Introduce students to the concept of entrepreneurship. 4. Engage the students in desirable forms of learning at university that emphasizes self-regulation, autonomous learning and deep understanding.
Intended Learning Outcomes	**Upon completion of the subject, students will:** a. Be able to demonstrate an understanding and an enthusiasm about electrical systems, and other fields of engineering. b. Develop their practical hands-on ability and problem-solving ability. c. Be able to demonstrate an understanding of entrepreneurship. d. Be able to formulate a simple project plan, and manage a project with initiative. e. Be able to demonstrate an understanding of academic integrity.
Subject Synopsis/ Indicative Syllabus	**Tutorial on Academic Integrity – online exercise (4 hours)** Students will be required to complete successfully an Online Tutorial on Academic Integrity on or before week 5 of the first semester. The students will understand the importance of academic integrity by completing the Online Tutorial. **Basic Circuits Principles - lecture (6 hours)** This piece of knowledge is essential for the group project. It includes: introduction to dc circuits; voltage and current dividers; series and parallel circuits; Ohms law; Kirchhoff's laws; Thévenin and Norton theorems; nodal and mesh analyses; and maximum power transfer theorem. **Engineering Seminars - lecture (6 hours)** Seminars given by the Electrical Engineering department and other departments in Faculty of Engineering. The aims are to introduce the students to their own discipline, as well as other characteristics of the engineering faculty. This will cultivate the students' understanding and sense of belonging to the EE discipline, as well as broden the perspective beyond the field of specialization. Moreover, there will be a talk on entrepreneurship, marketing and global outlook delivered by experts outside the Electrical Engineering department. **Mini Project (9 hours)**

	Students will work individually on a small project. The works include component and pin identification, component testing, circuit measurement, soldering, wiring connections, trial, test run, and final demonastration of the fabricated hardware. The background knowledge to support this project is based on the "Basic Circuit Principles" lectures. **Group Project (18 hours)** The group project aims at stimulating students' creativity, problem-solving skills, research for information, and project management abilities through practical and hands-on tasks at a level commensurate with their first-year engineering backgrounds. Students will work in small groups engaged in group problem solving under the guidance of teachers/instructors within and outside the Electrical Engineering department. Towards the end of the project, students will develop their interpersonal skills, interdisciplinary problem-solving skills, entrepreneurship concepts, and acquire the skills identifying key features of electrical systems. The deliverables include practical hands-on hardware and software, demonstration, report and presentation.
Teaching/Learning Methodology	***Online Tutorial on Academic Integrity*** The *Online Tutorial on Academic Integrity (OTAI)* is developed by the University to help the students understand the importance of academic integrity. By going through the Online Tutorial, students will be aware of the importance of upholding academic integrity during University study. Completing the OTAI is a completion requirement of Freshman Seminar. For successful completion of the OTAI, the students need to attempt the pre-test in the Tutorial, read all four modules in the Tutorial, obtain at least 75% in the post-test in the Tutorial and sign the Honor Declaration before the completion deadline. ***Basic Circuit Principles*** Basic circuit principles are delivered as mass lectures, supplemented with exercises on solving electric circuit problems. This knowledge is essential for the smooth implementation of the group project, especially for students who do not have adequate science/physics/electricity knowledge. Two tests will be conducted to evaluate the students' ability in this field. ***Seminars*** The seminars are designed to arouse students' interest about engineering. The delivery mode will be interactive and engaging. Students will be encouraged to raise questions and discuss with the presenters. Assessment tasks (quizzes) will be designed to measure students' learning outcomes as well as to encourage participation and interaction. ***Mini Project*** Each student will work on the building of a mini-project. They will be given a small tools kit set, a measuring meter, and a set of electronic components. The works include the basic skills of component identification, pins assignment, soldering, measuring, testing and tuning. Theoretical knowledge of the mini project is based on the lecture contents of Basic Circuit Principles. ***Group Project*** Students will work collaboratively with their group members to design and implement an engineering solution to a given problem under the guidance of instructors. There will be close staff-students and students-students interaction. Students will be given opportunities to develop their interpersonal skills, creativity, entrepreneurial skills, interdisciplinary problem-solving skills, research for information and project management abilities. Assessment tasks will consist of demonstration, presentation, and report. These are designed to evaluate individual student's performance and achievement of the relevant intended learning outcomes as well as to encourage active participation. Towards the end of the teaching seminar, students will be given a general overview of electrical system project, including project features to be developed. They

	will then work in small groups in a workshop to identify appropriate action plan to implement the project and subsequently to produce the product and to present it to fellow classmates.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed				
		a	b	c	d	e
Tutorial on Academic Integrity (online quiz)	0%					✓
Basic Circuit Principles (tests, mini project)	40%	✓	✓			
Seminars (quiz)	10%	✓		✓		
Group Project (demo, report, present)	50%		✓		✓	
Total	100 %					

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

Quizzes (online or paper-based) can measure the students' understanding about the discipline. Through tests, students can demonstrate their technical knowledge on the subject matter. Through project demonstration, presentation and project reports, students can demonstrate their creativity and problem-solving skills abilities. They can also demonstrate their ability to research for information, formulate a project plan, and manage a project with initiative. Through business plan report, students can demonstrate their understanding on business promotion.

Pass Conditions

In order to pass this subject, students must obtain a Grade D or above for total marks comprising the Seminars, Mini Project and Entrepreneurship Group Project as described here AND successfully complete the Online Tutorial on Academic Integrity (OTAI) on or before week 5 of semester 1 as described in the previous section.

Student Study Effort Expected

Class Lecture:	
▪ Seminars	6 Hrs.
▪ Basic Circuit Principles	6 Hrs.
Laboratory Works:	
▪ Mini Project	9 Hrs
▪ Group Project	18 Hrs.
Other Study Effort:	
▪ Tutorial on Academic Integrity (online mode)	4 Hrs.
▪ Background works on Group Project	30 Hrs.

	▪ Study on quiz, and test. Prepare report, demo, and presentation	35 Hrs.
	Total student study effort	108 Hrs.
Reading List and References	1. C.K. Alexander and M.N.O. Sadiku, Fundamentals of Electric Circuits, 6th Edition, New York: McGraw-Hill, 2017. 2. H. Scott Fogler and Steven E. LeBlanc, Strategies for creative problem solving, Upper Saddle River, N.J. : Prentice Hall, 2008 3. N.J. Smith (ed), Engineering project management, Oxford, UK; Malden, MA: Blackwell, 2008	