

University of Macau
Faculty of Science and Technology
Department of Electrical and Computer Engineering

Part A: Course Outline

Course Title:	System Design		
Course Code:	ELEC437	Year of Study:	4
Course Mode:	Special		
Compulsory/Elective:	Compulsory		
Course Prerequisites:			
Prerequisite Knowledge			
Class/Laboratory Schedule:	Practice: 6 hours per week		
Duration	One semester	Credit Units	2.5
Text Books and References:			
Course Description:	System Design helps students prepare for the Final Project. Students are admitted to the course after defining an acceptable topic and gaining a proposal mentor from among the faculty. It aims at training the students to use their scientific knowledge to gather and interpret information for the selected topic. It also trains the student to have elementary designing or synthesis ability.		
Topics Covered	<p>There are four main disciplines under the program</p> <ul style="list-style-type: none"> i. Biomedical Engineering ii. Microelectronics iii. Electric Power Engineering and its Automation iv. Wireless <p>Student could choose the direction of system design in one of the discipline or any other direction related to the Electrical and Computer Engineering.</p>		
Course Objectives:	<ol style="list-style-type: none"> 1. To develop the ability to search for technical information resources on software and hardware, such as the library, research and technical literature, electronic database and the World Wide Web. [d, i, j, k,l] 2. To train students to have elementary designing, synthesis, and analysis abilities. [a, c, d, e, k] 3. To work in a team environment to gather and interpret scientific information and to write project report. [c, e, k, g] 		
Course Assessment:	Performance + Report : 100%		
Relationship to Program Objectives and	This course primarily contributes to ECE program outcomes that develop students abilities to:		

<p>Outcomes</p>	<p>a. Ability to apply knowledge of mathematics, science and engineering. c. Ability to design a system, component or process to meet desired needs. e. Ability to identify, formulate and solve engineering problems. g. Ability to communicate effectively</p> <p>This course secondarily contributes to ECE program outcomes that develop students abilities to:</p> <p>d. Ability to function on multidisciplinary teams. i. Recognition of the need for and an ability to engage in life-long learning. j. Knowledge of contemporary issues. k. Ability to use the techniques, skills and modern engineering tools necessary for engineering practice. l. Ability to use the computer/IT tools relevant to the discipline along with an understanding of their processes and limitations</p>												
<p>Course Contents and Relationship to Program Criteria:</p>	<table border="1"> <thead> <tr> <th data-bbox="467 927 563 1003">Week no.</th> <th data-bbox="563 927 1323 1003"></th> <th data-bbox="1323 927 1460 1003">Program Criteria</th> </tr> </thead> <tbody> <tr> <td data-bbox="467 1003 563 1048">6</td> <td data-bbox="563 1003 1323 1048">Literature Review</td> <td data-bbox="1323 1003 1460 1048">*</td> </tr> <tr> <td data-bbox="467 1048 563 1093">6</td> <td data-bbox="563 1048 1323 1093">Project Progress and Analyses</td> <td data-bbox="1323 1048 1460 1093">*</td> </tr> <tr> <td data-bbox="467 1093 563 1135">2</td> <td data-bbox="563 1093 1323 1135">Final Report Preparation</td> <td data-bbox="1323 1093 1460 1135">*</td> </tr> </tbody> </table>	Week no.		Program Criteria	6	Literature Review	*	6	Project Progress and Analyses	*	2	Final Report Preparation	*
Week no.		Program Criteria											
6	Literature Review	*											
6	Project Progress and Analyses	*											
2	Final Report Preparation	*											
<p>Contribution of Course to meet the professional component:</p>	<p>This course contributes primarily to the students' ability to define and solve a problem related to engineering topics. Students should be able to gather and interpret information and have elementary design and analyses ability.</p>												
<p>Course Instructor(s):</p>													
<p>Prepared by:</p>	<p>Dr. Dai Ning Yi , Prof. Wong Man Chung</p>												

Part B: General Course Information and Policies

Instructor: _____ Office: _____
Office Hour: _____ Phone: _____
e-mail: _____

Programme Educational Objectives

1. **Problem Solving:** Graduates have the ability to think in a critical and evaluative manner and to consider a broad perspective, in order to solve technical and nontechnical problems.
2. **Leadership and Communication:** Graduates will provide effective leadership, act in an ethical manner and skills will include the ability to communicate well and to work successfully within diverse groups.
3. **Market Acceptance:** Graduates will have successful careers in the academic environment, industrial and government organizations.
4. **Technical Competence:** Graduates will be technically competent and have a thorough grounding in the fundamentals of math and science in electrical and computer engineering and experience in engineering design. They will be able to use modern engineering techniques, skills, and tools to fulfill societal needs.

Scale: 1 (Highest) to 4 (Lowest)

	Problem Solving	Leadership and Communication	Market Acceptance	Technical Competence
Measurement And Instrumentation II	1	3	2	1

Remark:

- Objective for “Problem Solving” can be achieved by data analysis, simulations, laboratories and projects or report.
- Objective for “Leadership and Communication” can be achieved by report writing and presentation. However, leadership training can be achieved by the project group work.
- Objective for “Market Acceptance” can be achieved by the project(s) that is/ are required in industries.
- Objective for “Technical Competence” can be achieved by using fundamentals of math and science in electrical and computer engineering and experience in engineering project design and computer simulation.

Program Criteria Policy:

Course VS Program Criteria

Scale: 1 (Highest) to 4 (Lowest)

Course	PS	DIC	BS	CS	ES	DE	LA	CV	DM
Project	*	*	*	*	*	*	*	*	*

Terms:

Probability and Statistics (PS), Differential and Integral Calculus (DIC), Basic Science (BS), Computer Science (CS), Engineering Science (ES), Differential Equation (DE), Linear Algebra (LA), Complex Variables (CV), Discrete Mathematics (DM)

* The relationship with program criteria varies according to different topics the students select.

Program Outcome Policy:

Course VS Course Outcomes

(H= Highly Related, S = Supportive, N = None)

Course	a	b	c	d	e	f	g	h	i	j	k	l
Project	H	N	H	S	H	S	H	S	S	S	S	S

The electrical and electronics engineering program outcomes are:

- a. Ability to apply knowledge of mathematics, science and engineering.
- b. Ability to design and conduct experiments.
- c. Ability to design a system, component or process to meet desired needs.
- d. Ability to function on multidisciplinary teams.
- e. Ability to identify, formulate and solve engineering problems.
- f. Understanding of professional and ethical responsibility.
- g. Ability to communicate effectively.
- h. Broad education necessary to understand the impact of engineering solutions in global and societal context.
- i. Recognition of the need for and an ability to engage in life-long learning.
- j. Knowledge of contemporary issues.
- k. Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.
- l. Ability to use the computer/IT tools relevant to the discipline along with an understanding of their processes and limitations

Curriculum Detail

ELEC 437 System Design

Timetabled work in hours per week			No of teaching weeks	Total hours	No /Duration of exam papers	Max marks available from:	
Lecturer	Tutor	Practice				Exams	Course
0.5	1.5	2	14	56	0	*	*

* : not available

Term: 7th

Hours			Percentage content of					
Lecturer	Lab/tut	Other	Maths	Basic Science	Engineering Science	Engineering Design and Synthesis	Complementary Studies	Computer Studies
10	30	16	**	0**	50**	35**	0**	5**

** : can be varied and is mainly determined by the project itself

Design Elements

% of Design Content	Design Content in Course Work	Design Project	Design Content in Laboratories
20%~ 90%**	X	X	X

Course Assessment Policy:

It aims at training the students to use their scientific knowledge to gather and interpret information for the selected topic. It also trains the student to have elementary designing or synthesis ability.

Course Work: 50%

Report: 50%