



澳門大學
UNIVERSIDADE DE MACAU
UNIVERSITY OF MACAU

Major Programme:	Master of Science in Microelectronics & Master of Philosophy in Microelectronics														
Course Type:	<input type="checkbox"/> CM – Compulsory Major <input type="checkbox"/> L&S – Languages and Skills <input type="checkbox"/> * GE – General Education <input type="checkbox"/> MI – Minor <input checked="" type="checkbox"/> RE – Required Elective <input type="checkbox"/> CPE – Community and Peer Education <input type="checkbox"/> FE – Free Elective														
Course Title: (in Chinese and English)	Flexible Alternating Current Transmission System 柔性交流輸電系統				Suggested Year of Study:		Year 1								
Duration:	<input checked="" type="checkbox"/> Semester Course <input type="checkbox"/> Yearly Course				Credit Units:		3								
Grading System:	<input checked="" type="checkbox"/> Letter Grade <input type="checkbox"/> P/NP				Pre-requisite: (if any)		None								
Medium of Instruction:	English														
Course Description:	<p>The Flexible Alternating Current Transmission System and Distribution Flexible AC Transmission System (FACTS/DFACTS) are a new converging technology based on the Power Electronics, Control Theory and Power System for revolution of ever more efficient control and better utilization of power and energy in the existing systems. The FACTS offers an opportunity to enhance controllability, stability and power transfer capability of AC transmission systems with fastest control speed. DFACTS is the extended modern technique of FACTS to focus on the Custom issues or power line conditioning in the distribution site as well as the Information Technology's Electricity Issues.</p>														
Intended Learning Outcomes (ILO):	<p>This course enables students to have:</p> <ul style="list-style-type: none"> • Students can understand the basic concepts, fundamental operational principles, advantages and disadvantages of different FACTS/DFACTS devices. • Students can also understand the control strategies of some selected FACTS/DFACTS devices, in which FACTS/DFACTS devices are commonly found in nowadays power and distribution power systems. 														
Major Assessment Methods:	Case Study	Role Playing	Student Presentation	Individual project / paper	Group project / paper	Group discussions	Writing Assignment	Exercises & problems	Service learning	Internship	Field study	Company visits	Reading & Writing Assessments / tests	Listening & Oral Assessments / tests	Others (please specify)
Class Participation / Discussion															
Assignment(s)	0 %	√			√										
Test(s)	60 %														
Examination	0 %														
Others: Project	0 %			√											
Course Content: (topic outline)	<ul style="list-style-type: none"> - Review of AC Power - Power Electronics: Fundamentals, etc. - Introduction of FACTS - Introduction of HVDC - FACTS Case Study - SVC vs ASVG - Tutorial of Power System Computer Aided Design (PSCAD) Software - Introduction of DFACTS - Modern Power Quality Issues and Indices - Power Quality Compensation - Instantaneous Reactive Power Theory - Voltage Source Inverters & PWM Techniques - DFACTS Case Study - Design and Control of Voltage and Current Quality Compensators - Special Topics on Practical Engineering Knowledge 														