澳門大學
UNIVERSIDADE DE MACAU
UNIVERSITY OF MACAU

Major Programme:	Master of Science in Microelectronics & Master of Philosophy in Microelectronics		
Course Type:	☐ CM – Compulsory Major ☑ RE – Required Elective ☐ L&S – Languages and Skills ☐ CPE – Community and Peer Education ☐ * GE – General Education ☐ MI – Minor ☐ FE – Free Elective		
Course Title: (in Chinese and English)	Analog IC Design Methodology 模擬電路芯片設計方法	Suggested Year of Study:	Year 1
Duration:	☑ Semester Course ☐ Yearly Course	Credit Units:	3
Grading System:	☑ Letter Grade ☐ P/NP	Pre-requisite: (if any)	None
Medium of Instruction:	English		
Course Description:	This course provides the necessary systematic approach methodology in generic analog IC designs. The topics covered include the technique in systematic method in analysis and design of the amplifiers and opamps, such as using the scaled current and multiplier techniques, the impedance rules-of-thumb, and layout-oriented amplifier design techniques. Advanced layout techniques in detail, the analog IC simulations methodology, etc. will be covered. Project-based evaluations will be the primary assessments for the students' performance.		
Intended Learning Outcomes (ILO):	This course enables students to have: ・Understand the systematic design approach on how to design amplifiers and opamps, ・An ability familiar with the advanced layout techniques; ・To understand the theories for simulations; ・To master the above topics through practical design projects.		

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 0 %															
Assignment(s) 0 %															
Test(s) 0 %															
Examination 0 %															
Others: Project 100 %				√	√										

Course Content: (topic outline)	- Introduction: the objective and learning outcomes of this course - Overview of systematic analog IC design methodology - Systematic design methodology of amplifiers and operational amplifiers, and impedance rule of thumbs; - Process-tracked biasing techniques; scaled current and multipliers opamp design technique - Advanced analog layout considerations; - Theory of simulations in Analog IC Designs: DC, AC, Noise, Transient, Transient-Noise, PSS, PAC and PNoise analysis. - Practical projects: related to opamp, layout designs with simulations