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 a systematic method in analyzing and designing 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 of the students' performance.

Intended Learning Outcomes (ILO):
This course enables students to have:
- Recognize the systematic design approach on how to design amplifiers and opamps.
- Explain the theories for simulations.
- Implement master a practical circuit design project.

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