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)	Integrated Circuits Research Methodology and Applications 集成電路研究方法和應用	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 is an introductory course of integrated circuits research methodology and applications. It aims to aid the students to build up an internationally competitive research goal by understanding the state-of-the-art, trends in applications and technologies, and systematically formulate a feasible schedule, with available resources, to approach the research goals. Preparation of related academic publications and system-level case studies of advanced integrated circuits and systems will be organized for the students to digest and present them. The course aims to provide the students a set of essential engineering skills for research in the integrated circuits area.
Intended Learning Outcomes (ILO):	This course enables students to have: ・To introduce the essential knowledge on starting integrated circuits research. ・To introduce the trend of integrated circuits for practical applications. ・An ability to communicate effectively and understand the integrated circuits industrial trends. ・An ability to understand the impact of integrated circuit solutions in a global and societal context. ・Ability to use the computer/IT tools relevant to the discipline along with an understanding of their processes and limitations.

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) 30 %							√	√							
Test(s) 30 %			√	√											
Examination _____%															
Others: Project 40 %			√		√										

Course Content: (topic outline)	- Introduction: brief history of integrated circuit (IC), state-of-the-art trend and industrial examples - Preliminaries: essential reading, drawing and writing skills in the IC area, including problem definition, research scheduling, resource planning, performance comparison, etc. - Overview of major IC areas: analog, biomedical, sensor, digital, mixed-signal, wireless, radio frequency, power management, memory, non-silicon emerging technologies, etc. - System-level case studies: integrated transceiver, sensor system-on-chip, mixed-signal system, etc.