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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 ☐ L&S – Languages and Skills ☐ MI – Minor ☑ RE – Required Elective ☐ CPE – Community and Peer Education ☐ * GE – General Education ☐ FE – Free Elective		
Course Title: (in Chinese and English)	Special Topics in Biomedical Engineering 生物醫學工程專題	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 on multidisciplinary topics covering microelectronics, biomedical engineering, and digital microfluidics. As a special topic course, it will focus on the principles and biomedical applications of digital microfluidics, which utilizes electronic signals to manipulate liquid droplets on an array of micro-electrodes. The course also covers the introduction of the fabrication technology in a clean room related to MEMS and soft-lithography. The coating and etching techniques on silicon wafers or glass chips will be introduced and practiced in this course.		
Intended Learning Outcomes (ILO):	This course enables students to have: · Introduce state-of-the-art knowledge in the development of biomedical engineering. · Design microfluidic chips and implement chips into microfluidic systems, including PDMS-based channel microfluidics and electronic-based digital microfluidics. · Apply microfluidic systems in biomedical applications.		

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 ____15____ %			√												
Assignment(s) ____45____ %								√							
Test(s) ____0____ %															
Examination ____0____ %															
Others: Project ____40____ %				√											

Course Content: (topic outline)	-Introduction of biomedical engineering -Principles and applications of microfluidics on biomedical engineering -Principles of electrowetting on dielectric -Digital microfluidics -Lab practices in clean room