



**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)	Special Topics in Biomedical Engineering 生物醫學工程專題				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:	This course 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 signal to manipulate liquid droplets on an array of micro-electrodes. The course also covers the introduction of the fabrication technology in 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: <ul style="list-style-type: none"> <li>• Acquire the state of the art knowledge in the development of biomedical engineering</li> <li>• Get information of new technologies in the field of biomedical engineering</li> <li>• Understand the working principles of microfluidics, including PDMS based channel microfluidics and electronic based digital microfluidics</li> <li>• Acquire the fabrication techniques of silicon- or glass-based micro-electrode fabrication and 3D pattern on-chip.</li> <li>• Be aware of the various biological applications of biomedical technologies</li> <li>• Develop a self-learning capability</li> <li>• Initiate a multidisciplinary research mind</li> </ul>														
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			50 %												
Assignment(s)			0 %												
Test(s)			0 %												
Examination			0 %												
Others: Project			50 %		√										
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														