City University of Hong Kong
Course Syllabus

offered by
Department of Mechanical Engineering
with effect from Semester A 2022 / 23

Part I Course Overview

Course Title:	Micro Systems Technology
Course Code:	MNE8117
Course Duration:	1 semester
Credit Units:	3 credits
Level:	R8
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	Nil
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	MBE6005/MNE6005 Micro Systems Technology
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

The aim of the course is to introduce the state-of-the-art knowledge of micro systems technologies for modern manufacturing. It will enable students to understand the basic principles and develop skills in the areas of micro manufacturing, micro-electronic-mechanical systems (MEMS), sensors and actuators, micro electronics such as VLSI (very-large-scale-integration) and semiconductor manufacturing.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Identify the basic principles of micro systems technology and micro manufacturing.		✓	✓	
2.	Apply micro manufacturing process for MEMS and sensor and actuator technologies.			✓	✓
3.	Design a micro systems relating to basic mechanics and micro electronics of VLSI (very-large-scale-integration).			✓	✓
4.	Investigate modern manufacturing and related business.			✓	
** If weighting is assigned to CILOs, they should add up to 100%.*		N.A.			

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
Lecture	Introduction of key concepts	✓	✓	✓	✓	2 hours/week for 11 weeks
Tutorial	Sample questions and case studies related to the assignments	✓	✓	✓	✓	1 hour/week for 11 weeks
Mini-project	Mini-project covering various topics on micro systems technology and micro manufacturing	✓	✓	✓	✓	3 hours/week for 2 weeks

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 100%						
Assignment (2)	✓	✓	✓	✓	50%	
Mini-project Report (one per group)	✓	✓	✓	✓	30%	
Mini-project Presentation (one per group)	✓	✓	✓	✓	20%	
** The weightings should add up to 100%.*					100%	

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Assignment (2)	ABILITY to EXPLAIN in details and with the acquired engineering methods for ANALYZING and DESIGNING laboratory procedures for micro system applications	High	Significant	Moderate	Not even reaching marginal levels
2. Mini-project Report	CAPACITY for SELF-DIRECTED LEARNING to COMPARE existing methods and DEVELOP new designs for micro system applications	High	Significant	Moderate	Not even reaching marginal levels
3. Mini-project Presentation	ABILITY to REPORT the literature survey and EVALUATE the result of different approaches	High	Significant	Moderate	Not even reaching marginal levels

Applicable to students admitted before Semester A 2022/23

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Assignment (2)	ABILITY to EXPLAIN in details and with the acquired engineering methods for ANALYZING and DESIGNING laboratory procedures for micro system applications	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Mini-project Report	CAPACITY for SELF-DIRECTED LEARNING to COMPARE existing methods and DEVELOP new designs for micro system applications	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Mini-project Presentation	ABILITY to REPORT the literature survey and EVALUATE the result of different approaches	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

N.A.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

N.A.

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Crystal Fire: The Birth of the Information Age, W W Norton & Co Inc, 1998 Michael Riordan and Lillian Hoddeson ISBN-10: 0393318516 ISBN-13: 978-0393318517
2.	Liu, C., Foundations of MEMS (2nd Edition), Prentice Hall, 2011 ISBN-10: 0132497360
3.	Microchip Manufacturing Stanley Wolf Lattice Press (www.latticepress.com) ISNB 0-9616721-8-8
4.	Understanding Fabless IC Technology Jeorge Hurtarte Evert Wolsheimer Lisa Tafoya, Fabless Semiconductor Association Elsevier