

# **Master of Science in Biomedical Engineering**

## **Student Handbook (2023-2024)**

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## **1. PROGRAMME AIMS**

Biomedical Engineering focuses on using engineering principles, techniques and design concepts for healthcare purposes. There is an increasing demand for education and development in the field to improve healthcare and quality of life. The demand has driven the need for developing professionals who will advance the evolution of modern healthcare system, treatment and technology. The Master of Science in Biomedical Engineering (MSBME) Programme aims to offer education and training opportunity to engineers to pursue higher-level study in biomedical field to promote engineering to future healthcare applications.

## **2. PROGRAMME INTENDED LEARNING OUTCOMES (PILOs)**

Upon successful completion of this programme, students should be able to:

- i. explore appropriate scientific and technological development in healthcare related industry that is of benefit to the society;
- ii. address the issues and challenges related to the development of biomedical instruments, systems and devices;
- iii. apply state-of-the-art technologies to generate creative solutions to improve healthcare products by using biomedical approach; and
- iv. apply knowledge of designing, implementing, manufacturing and evaluating equipment that can advance biomedical engineering practice.

## **3. TEACHING and LEARNING**

- i. The programme utilizes a variety of learning modes and methods including the following:
  - a. Lectures & Tutorials
  - b. Co-operative Learning
  - c. Seminars, Interactive Workshops & Panel Discussions offered by external, as well as by international experts, and active professionals working in the industry
- ii. Students can bring their problems from work to classes for group discussions and further analysis, and earn course credits upon satisfactory results.

#### 4. PROGRAMME STRUCTURE

**9 credit units** of Core Courses + **21 credit units** of Elective Courses (totaling 30 credit units)

Students may obtain the MSc degree either by completing:

- 3 core courses (9 CUs) + 7 elective taught courses (21 CUs)  
(to broaden knowledge in biomedical engineering and healthcare)

Or

- 3 core courses (9 CUs) + dissertation (9 CUs) + 4 elective taught courses (12 CUs)  
(to gain in-depth learning in biomedical engineering and healthcare)

##### **Core Courses (9 credit units):**

Course Code	Course Title	Level	Credit Units	Remarks
BME5110	Biomedical Engineering Design	P5	3	
BME5111	Regenerative Medicine	P5	3	
BME6111	Biomedical Instrumentation	P6	3	Continuing Education Fund (CEF) Approved Course

##### **Elective Courses (21 credit units) for the selection:**

Course Code	Course Title	Level	Credit Units	Remarks
BME5108	Human Machine Interface	P5	3	
BME6005	Micro Systems Technology	P6	3	Continuing Education Fund (CEF) Approved Course
BME6008	Dissertation	P6	9	Full-time students who want to complete <i>BME6008 Dissertation</i> within <u>one semester</u> must obtain prior approval from the Programme Leader and the Supervisor, and must have attained a CGPA of 3.9 or above.

BME6022	Project Development Study	P6	3	
BME6045	Industrial Case Study	P6	3	
BME6101	Manufacturing of Biomedical Devices	P6	3	Continuing Education Fund (CEF) Approved Course
BME6114	Advanced Control Systems	P6	3	
BME6115	Biorobotics	P6	3	
BME6117	Biomedical Safety and Risk Assessment	P6	3	
BME6118	Biomedical Imaging and Biophotonics	P6	3	
BME6121	Biomechanics	P6	3	Continuing Education Fund (CEF) Approved Course
BME6122	Physiological Modeling	P6	3	
BME6123	Flexible Bioelectronics for Medical Applications	P6	3	
BME6135	Engineering Principles for Drug Delivery	P6	3	
BME6136	Advanced Biomaterials for Healthcare and Biomedical Applications	P6	3	
BME6137	Medical Diagnostics	P6	3	
BME6138	Robotics in Minimally Invasive Healthcare	P6	3	
BME6139	AI in Medical Imaging	P6	3	

## Selection Hints on Elective Courses

### Electives offered in Semester A, 2023-24

Course Content	Weighting (0-100%)	Level of challenge (1 lowest - 5 highest)
	BME6101 Manufacturing of Biomedical Devices	
Biology	20	2
Chemistry	20	2
Mathematics	30	2
Engineering	30	3
Others		
Total	100%	

Weighting (0-100%)	Level of challenge (1 lowest - 5 highest)
BME6123 Flexible Bioelectronics for Medical Applications	
15	2
15	2
5	1
50	4
15	2
100%	

Weighting (0-100%)	Level of challenge (1 lowest - 5 highest)
BME6136 Advanced Biomaterials for Healthcare and Biomedical Applications	
20	4
30	4
5	2
35	4
10	3
100%	

### Electives offered in Semester B, 2023-24

Course Content	Weighting (0-100%)	Level of challenge (1 lowest - 5 highest)
Course Code	BME6005 Micro Systems Technology	
Biology		
Chemistry	20	2
Mathematics	20	2
Engineering	60	4
Other		
Total	100%	
Course Code	BME6118 Biomedical Imaging and Biophotonics	
Biology		
Chemistry		
Mathematics	50	4
Engineering	50	3
Other		
Total	100%	

Weighting (0-100%)	Level of challenge (1 lowest - 5 highest)
BME6114 Advanced Control Systems	
10	1
30	3
60	3
100%	
BME6121 Biomechanics	
20	2
40	3.5
40	3.5
100%	

Weighting (0-100%)	Level of challenge (1 lowest - 5 highest)
BME6115 Biorobotics	
20	2
40	3.5
40	3.5
100%	
BME6135 Engineering Principles for Drug Delivery	
20	1
20	2
10	3
30	4
20(Physiology)	3
100%	

Elective offered in Summer Term, 2024

Course Content	Weighting (0-100%)	Level of challenge (1 lowest - 5 highest)
BME6117 Biomedical Safety and Risk Assessment		
Biology	35	3
Chemistry	30	3
Mathematics		
Engineering	35	3
Other		
Total	100%	

Weighting (0-100%)	Level of challenge (1 lowest - 5 highest)
BME6138 Robotics in Minimally Invasive Healthcare	
14	2
8	1
8	1
50	4
20 (Medicine)	3
100%	

**5. ASSESSMENT AND AWARD CLASSIFICATIONS**

Students should observe the University's regulations and guidelines on assessment at all times. More information are available on the website of the Chow Yei Ching School of Graduate Studies (SGS): <https://www.cityu.edu.hk/sgs/student/tpg/regulations/cgpabanding>

Students will be awarded the degree with one of the following classifications based on their CGPA attained upon completion of all graduation requirements.

Taught Master's Degree	CGPA
Distinction	3.65 or above
Credit	3.30 - 3.64
Pass	2.85 - 3.29

**6. TUITION FEES AND PROGRAMME DURATION**

For students admitted in 2023/24

Academic Year	Tuition Fee
2023/24	HK\$5,600 per credit
The tuition fee indicated in the above schedule will apply until the end of your study in this programme.	

Duration of Study

	Full-time	Part-time/combined mode
Normal period of study	1 year	1.5 years (via Dissertation) / 2 years (via Taught Courses)
Maximum period of study	2.5 years	5 years

**7. ACADEMIC REGULATIONS AND GUIDELINES**

Students should observe the University's regulations and guidelines on assessment at all times. More information can be referred to the SGS website.

<https://www.cityu.edu.hk/sgs/student/tpg/regulation>

## 8. ACADEMIC HONESTY

Academic honesty is central to the conduct of academic work. Students are responsible for knowing and understanding the Rules on Academic Honesty. As part of the University's efforts to educate students about academic honesty, all students are required to complete an online tutorial, take an online quiz and fill out an online declaration by **30 November 2023** in order to access their course grades online.

For details, please refer to the Office of the Provost's website:

[https://www.cityu.edu.hk/pvdp/academic\\_honesty/university\\_requirement\\_on\\_academic\\_honesty.htm](https://www.cityu.edu.hk/pvdp/academic_honesty/university_requirement_on_academic_honesty.htm)

## 9. COMMUNICATIONS

The following communication channels between students and the Department are available:

- i. Students having academic difficulties in a course should first talk to the **course instructor** concerned.
- ii. Students wishing to discuss dissertation issues and other academic-related issues should speak to the relevant **Year Tutor**.
- iii. Students wishing to discuss the overall organisation of the programme should speak to the **Programme Leader** or the **Deputy Programme Leader**.
- iv. **The Joint Staff & Student Consultative Committee (JSSCC)** facilitates communication and enables formal consultations between students and staff of the Department. At least one student from each year will be nominated or invited to sit in the Committee.
- v. Class Representatives will be invited to sit in the **Programme Committee**.

## 10. PROGRAMME LEADER AND YEAR TUTOR

<u>Position</u>	<u>Staff Name</u>	<u>Tel / Email</u>
Programme Leader	Prof. King W. C. LAI	3442 9099 / kinglai@cityu.edu.hk
Deputy Programme Leader	Prof. Lidai WANG	3442 6157 / lidawang@cityu.edu.hk
Dissertation Coordinator & Year Tutor	Prof. Chenjie XU	3442 4169 / chenjie.xu@cityu.edu.hk



## 11. ACCESS TO INFORMATION

### 11.1 How to access your Personal Class Schedule

- i) Go to CityU homepage ([www.cityu.edu.hk](http://www.cityu.edu.hk)).
- ii) Log onto “Portal” under “Quick Links”. *If you have problems in logging in, please follow the instructions in “Having problems logging?”.*
- iii) Under the tab “Student”, you can find a quick link “Student Schedule” to view your class schedule for the current semester.

### 11.2 How to get instructors’ handouts through Canvas

- i) Log onto Canvas (<https://canvas.cityu.edu.hk>).
- ii) Click “All Courses” under “Courses” to see all courses you have registered in the current and previous semesters.

### 11.3 How to check Programme Requirements and Course Syllabi

Log onto the CityU homepage ([www.cityu.edu.hk](http://www.cityu.edu.hk)) and click “Programme and Course Catalogue” under “Academics”.

### 11.4 Course Registration for Semester A 2023-2024

For Semester A 2023-24, students will be pre-registered in required courses and programme electives in most cases if possible.

- i) Please check your class schedule in accordance with the programme curriculum requirements, review your study plan and then make appropriate adjustments to your pre-registered courses.
- ii) During the period of **14 August - 11 September 2023**, add/drops for courses which are not web-enabled, approval is required from the department, can be performed. Details on Add/Drop of Non-Web-enabled Courses can be referred to the SGS website: <https://www.cityu.edu.hk/sgs/student/tpg/coursereg>
- i) During the period of **28 August - 11 September 2023**, add/drops for courses which are web-enabled can be performed.

How is Add/ Drop done?

- Go to CityU homepage (<http://www.cityu.edu.hk>), then point to “Quick Links” at the top and click “AIMS”.
- Log onto “AIMS” and then click “Course Registration”.
- Choose “Add or Drop Classes”.

- iv) The deadline for all add/drops is **11 September 2023, 11:30 pm**.
- v) Detailed arrangements on Course Registration for Semester A 2023-24 can be referred to the SGS website: <http://www.sgs.cityu.edu.hk/student/tpg/coursereg/>

## 11.5 How to access your Student Email Account

- i) Go to CityU homepage (<http://www.cityu.edu.hk>), then point to “Quick Links” at the top and click “Email”.
- ii) In the Email Services homepage, click “@my.cityu.edu.hk” under “Student” to go to the CityU “Office 365” Sign In page.
- iii) At the “**Account:**” field in the Sign In screen, enter your Office 365 account in the form of “*YourEID-c*”, where *YourEID* is your CityU Electronic ID.
- iv) At the “**Password:**” field, enter your Office 365 Account password, then click “Log On”.

**Important note:**

For email communication, please state your **name in full**, **student number** and **contact telephone number**.

## 11.6 Course Exemption/Credit Transfer

Applications for course exemption or credit transfer must be submitted before the first semester of the student’s admission. Students granted course exemption are required to take other courses to make up the credits required for fulfilling the award requirements. For Semester A 2023-24, the application period is from **13 July to 1 September 2023**.

For details, please refer to the SGS website:

<http://www.cityu.edu.hk/sgs/student/tpg/records/credittransfer>

## 11.7 Laboratory Safety Orientation

All students are REQUIRED to complete the on-line Laboratory Safety Orientation through the Departmental On-line Information System (IntraMEL). A Lab Tour session will be held by the Laboratory Office in week 1 of Semester A for interested students. Details of the session will be sent to you by e-mail.

## 11.8 Chow Yei Ching School of Graduates Studies (SGS) 周亦卿研究生院

Students may contact the School of Graduates Studies for the following matters:

- *Student Identity Card*
- *Academic Transcript and Testimonial*
- *Graduation and Award Certificate*
- *Letter of Certification*

Address: 4/F Fong Yun Wah Building (方潤華樓)

Chow Yei Ching School of Graduate Studies

Tel: +852 3442 9014

Fax: +852 3442 0237

Email: [tpenquir@cityu.edu.hk](mailto:tpenquir@cityu.edu.hk)

Website: <https://www.cityu.edu.hk/sgs>

Office Hours:

Monday to Friday 9:00 am - 12:30 pm & 1:45 pm - 6:30 pm

Saturday 9:00 am - 12:00 noon

## 11.9 Global Engagement Office (GEO)

Students may contact the Global Services Office on student *visa-related issues*.

Address: Room 3210, 3/F, Cheng Yick-chi Building (鄭翼之樓)

Tel: +852 3442 8089

Fax: +852 3442 0223

Email: [geovisa@cityu.edu.hk](mailto:geovisa@cityu.edu.hk) (For student visa application enquiries)

Website: <http://www.cityu.edu.hk/geo/>

Office Hours:

Monday to Friday 9:00 am - 12:30 pm & 2:00 pm - 5:30 pm

Sat *Closed*

## 11.10 Department of Biomedical Engineering (BME General Office)

Students may contact the BME General Office for the following matters:

- *Add/Drop of courses*

- *CEF issues*

Address: Y6700, 6/F, Yeung Kin Man Academic Building

Tel: 3442-8420

Fax: 3442-0172

Email: [bmego@cityu.edu.hk](mailto:bmego@cityu.edu.hk)

Website: <http://www.cityu.edu.hk/bme/>

Office Hours:

Monday to Friday 8:45 am - 12:30 pm & 1:45 pm - 5:30 pm

Sat *Closed*

## **12. Continuing Education Fund (CEF) – For Non-UGC funded local students only**

### **12.1 CEF Application**

Please read carefully the guidelines and regulations under the CEF website [www.wfsfaa.gov.hk/cef/](http://www.wfsfaa.gov.hk/cef/) or call the 24-hour hotline 3142-2277 for more information.

With effect from 1 August 2022, applicants who apply for CEF for the first time are only required to complete the Application Form [SFO 313 (2022)], which is a combined application form for both account opening and fee reimbursement. The completed application form with certification by institution / course provider together with copies of supporting documents should be submitted to OCEF. The reimbursement procedures are available at the CEF website [www.wfsfaa.gov.hk/cef/en/application/procedures.htm](http://www.wfsfaa.gov.hk/cef/en/application/procedures.htm).

Course commencement date for 2023/2024:

Semester A: 4 September 2023

Semester B: 15 January 2024

Summer Term: 11 June 2024

Please note the references to be quoted on your documents on CEF forms:

Name of Institution/Course Provider : **City University of Hong Kong**

CEF Institution Code : **005**

The completed and certified application form and other required documents of CEF should be returned to the CEF Office before the commencement of the course(s). LATE APPLICATION WILL NOT BE ENTERTAINED.

### **12.2 CEF Reimbursement**

Please read carefully the reimbursement procedures under the CEF website [www.wfsfaa.gov.hk/cef/](http://www.wfsfaa.gov.hk/cef/) or call the 24-hour hotline 3142-2277 for more information.

If you have successfully completed any CEF reimbursable course(s) and plan to claim your reimbursement from CEF, you need a certification letter of "Proof of Completion of Course" from BME department.

COMPLETION CRITERIA: please refer to the CEF website [www.wfsfaa.gov.hk/cef/](http://www.wfsfaa.gov.hk/cef/) for details.

**12.3** Students seeking CEF reimbursement **MUST NOT** hold any other publicly-funded financial assistance for the same course.

**12.4** Please check for details and possible updates through the department website <https://www.cityu.edu.hk/bme/std-cef.htm>.

# Suggested Study Path

**MSBME Study Path (2023 Cohort)**  
**Full-time Normal Study Path via Taught Courses (1 Year)**

Yr.	Sem.	Courses			CU's
		BME5110 Biomedical Engineering Design (3CU's)	BME5111 Regenerative Medicine (3CU's)	BME6111 Biomedical Instrumentation (3CU's)	
1	A				15
	B	<u>Elective courses for selection<sup>@</sup>:</u> a) BME6101 Manufacturing of Biomedical Devices b) BME6123 Flexible Bioelectronics for Medical Applications c) BME6136 Advanced Biomaterials for Healthcare and Biomedical Applications			12 or 15
	S	<u>Elective courses for selection<sup>@</sup>:</u> a) BME6117 Biomedical Safety and Risk Assessment b) BME6138 Robotics in Minimally Invasive Healthcare			0 or 3
	<b>Total CU's =</b>				<b>30</b>

Remarks:

( ) number of credit units

@ Courses list may change subject to changes in the programme and/or demand for individual courses.

**MSBME Study Path (2023 Cohort)**  
**Full-time Normal Study Path via Dissertation (1 Year)**

Yr.	Sem.	Courses			CU's
		BME5110 Biomedical Engineering Design (3CU's)	BME5111 Regenerative Medicine (3CU's)	BME6111 Biomedical Instrumentation (3CU's)	
1	A				15
	B	BME6008 Dissertation (6 CU's)			12
	S	+ (3CU's)			3
		<b>Total CU's =</b>			<b>30</b>

Elective courses for selection<sup>@</sup> :

- a) BME6101 Manufacturing of Biomedical Devices
- b) BME6123 Flexible Bioelectronics for Medical Applications
- c) BME6136 Advanced Biomaterials for Healthcare and Biomedical Applications

Elective courses for selection<sup>@</sup> :

- a) BME6005 Micro Systems Technology
- b) BME6114 Advanced Control Systems
- c) BME6115 Biorobotics
- d) BME6118 Biomedical Imaging and Biophotonics
- e) BME6121 Biomechanics
- f) BME6135 Engineering Principles for Drug Delivery

Elective courses for selection<sup>@</sup> :

- a) BME6117 Biomedical Safety and Risk Assessment
- b) BME6138 Robotics in Minimally Invasive Healthcare

Remarks:  
 ( ) number of credit units  
 @ Courses list may change subject to changes in the programme and/or demand for individual courses.

MSBME Study Path (2023 Cohort)

Part-time Normal Study Path via **Taught Courses** (2 Years)

Students are required to complete the three core courses plus (i) seven electives OR (ii) dissertation + four electives. The advice is not to take more than 11 credit units in a semester.

Yr.	Sem.	Courses			CU's
1	A	BME5110 Biomedical Engineering Design (3CU's)	BME5111 Regenerative Medicine (3CU's)	BME6111 Biomedical Instrumentation (3CU's)	9
	B	Elective course (3CU's)	Elective course (3CU's)	Elective course (3CU's)	
2	A	Elective course (3CU's)	Elective course (3CU's)	Elective course (3CU's)	6
	B	Elective course (3CU's)	Elective course (3CU's)	Elective course (3CU's)	
<b>Total CU's =</b>					<b>30</b>

Remarks:  
( ) number of credit units



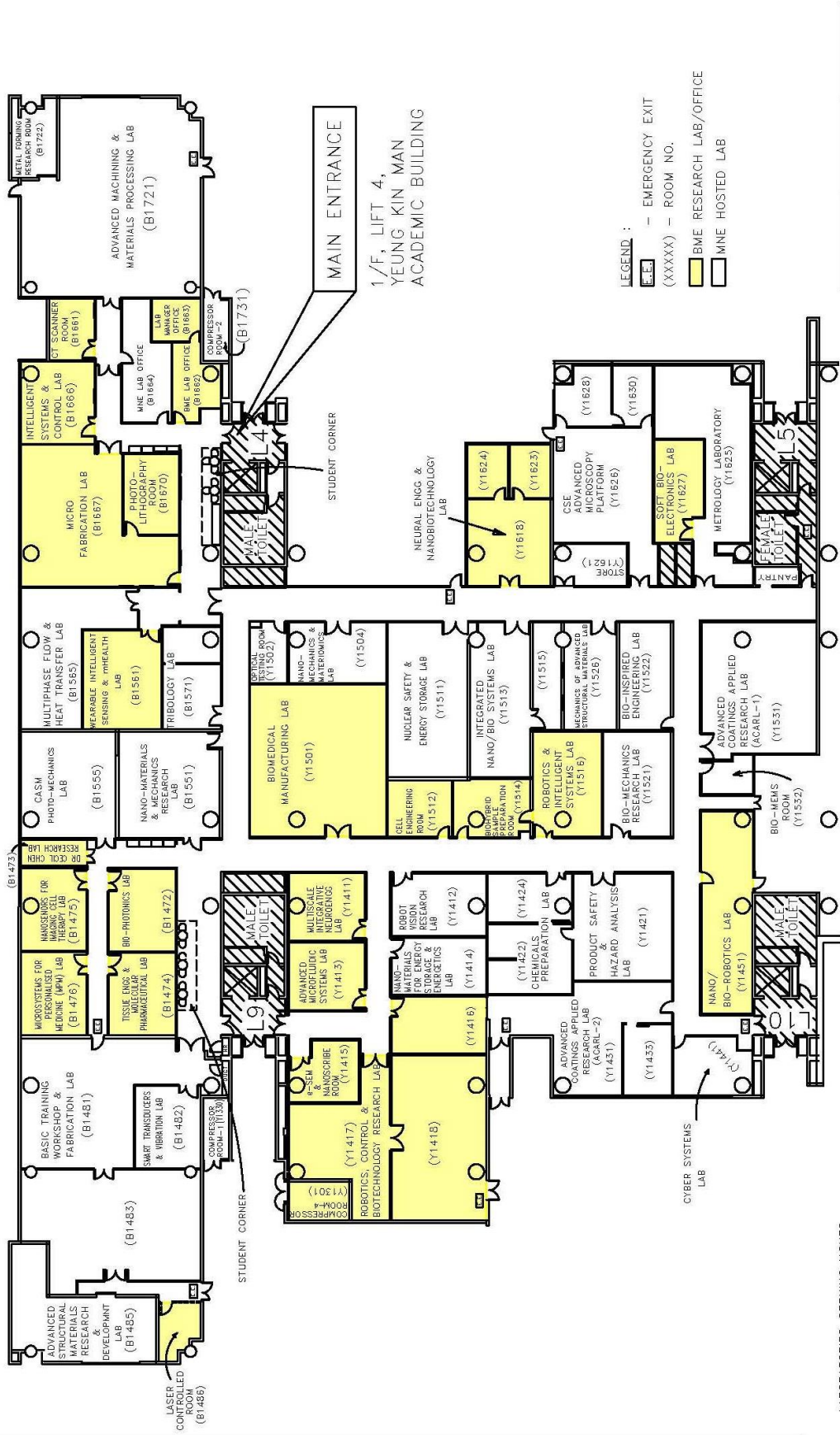
MSBME Study Path (2023 Cohort)  
Part-time Normal Study Path via **Dissertation** (1.5 Years)

Yr.		Courses			CU's
1	A	BME5110 Biomedical Engineering Design (3CU's)	BME5111 Regenerative Medicine (3CU's)	BME6111 Biomedical Instrumentation (3CU's)	9
		B	Elective course (3CU's)	Elective course (3CU's)	
	S	Elective course (3CU's)			3 or 6
		BME6008 Dissertation (2 CU's) + (3 CU's) + (4CU's) <i>Maximum 6 semesters</i>			
2	A	Elective course (3CU's)			4 or 7
<b>Total CU's =</b>					<b>30</b>

Remarks:  
( ) number of credit units

# Appendix II: Laboratory Maps

## Biomedical Engineering (BME) Laboratories



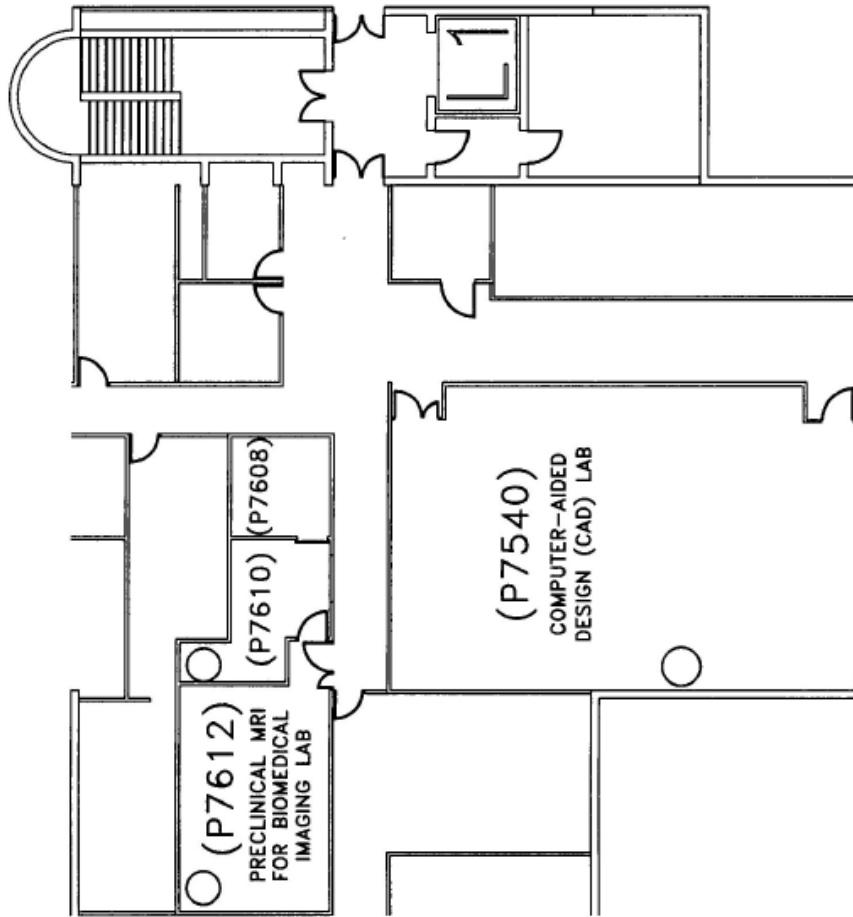
**LABORATORIES OPENING HOURS**

MONDAY TO FRIDAY	9:00AM - 12:30 PM
	&
	1:30PM - 5:15PM
(ON SCHEDULED EVENING ONLY)	6:30PM - 10:00PM
SATURDAY	9:00AM - 12:30PM
SUNDAY & PUBLIC HOLIDAYS	CLOSED

Biomedical Engineering (BME) and Mechanical Engineering (MNE) Laboratories

Appendix II-b

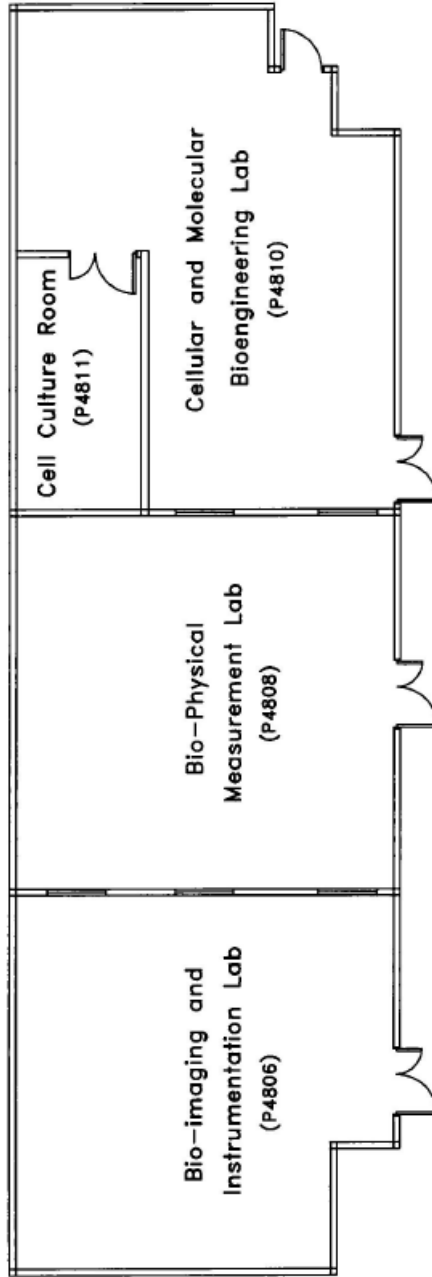
7/F, LIFT 1, PURPLE ZONE,  
YEUNG KIN MAN  
ACADEMIC BUILDING



NAME	DRAWN BY	APPROVED BY
DATE	C C L	
REVISION	03-JUL-2018	
	A	

BIOMEDICAL ENGINEERING LABORATORIES (BME LAB.)

4/F, LIFT 17, PURPLE ZONE,  
YEUNG KIN MAN  
ACADEMIC BUILDING



DRAWN BY		APPROVED BY	
NAME	C C L		
DATE	12-Jul-2019		
REVISION			Y