College of Engineering
工學院

Department of Mechanical Engineering
機械工程學系

香港城市大學
City University of Hong Kong

Bachelor of Engineering in Nuclear and Risk Engineering (BEngNRE)

工學士(核子及風險工程)

Student Handbook

2021-2022

BACHELOR OF ENGINEERING IN

NUCLEAR AND RISK ENGINEERING (BEngNRE)

Student Handbook (2021-2022)

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August 2021

1. AIMS OF MAJOR

This major aims to educate and produce graduates who will:

1. be equipped with practical knowledge in nuclear engineering and risk engineering disciplines.
2. be able to contribute with their specialist skills, competencies and multi-disciplinary knowledge to a broad spectrum of related industrial sectors or areas such as nuclear engineering, risk engineering, safety engineering, radiation protection and dosimetry, power generation, medical equipment industry or insurance industry.
3. be able to evaluate engineering problems quantitatively and analyse them critically.
4. be able to communicate proficiently in a range of disciplines and skills.
5. be able to recognise that protection of society is the highest priority in any operation.
6. be able to take responsibility for their own personal and professional development.

Intended Learning Outcomes of Major (MILOs)

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

No.	*MILOs*	*Discovery-enriched curriculum related learning outcomes (please tick where appropriate)*		
		A1	*A2*	*A3*
1.	Describe the major sub-systems and waste management of nuclear reactor.		√	
2.	Apply the principles, analytical skills, computational techniques, modelling tools, experimental practices in the subject domain to serve the nuclear engineering, risk engineering and related sectors.	√		
3.	Demonstrate multi-disciplinary knowledge and skills in engineering and science to meet the technical needs of the related industrial sectors.		√	
4.	Integrate their problem solving, interpersonal, critical thinking and teamwork skills to cope with the dynamic nature of the related industries.			√
5.	Generate a positive and flexible approach to continuous professional and career development.		√	

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 real-life problems.

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

2. DEGREE REQUIREMENTS

2.1 Normal and Maximum Period of Study

	Normative 4-year Degree	**Advanced Standing I (Note 1)**	**Advanced Standing II (Senior-year Entry) (Note 2)**
Normal period of study	4 years	3 years	2 years
Maximum period of study	8 years	6 years	5 years

Note 1: For students with recognised Advanced Level Examination or equivalent qualifications.
Note 2: For Associate Degree/Higher Diploma graduates admitted as senior-year intake students.

2.2 Minimum Number of Credit Units Required for the Award and Maximum Number of Credit Units Permitted

Degree Requirements	**Normative 4-year Degree**	**Advanced Standing I**	**Advanced Standing II (Senior-year Entry)**
Gateway Education requirement *****	30 credit units	21 credit units	12 credit units
College/School requirement *****	6 credit units	waived	waived
Major requirement	81 credit units (Core: 72 Elective: 9)	78 credit units[+ #] (Core: 69[#] Elective: 9)	69 credit units[+ #] (Core: 66[#] Elective: 3)
Free electives / Minor (if applicable)	3 credit units	0 credit unit	0 credit unit
Minimum number of credit units required for the award	**120 credit units**	**99 credit units[#]**	**81 credit units[#]**
Maximum number of credit units permitted	**144 credit units**	**114 credit units**	**84 credit units**

***** *For details, please refer to the Curriculum Information Record for Common Requirements*.

[+] Course exemptions granted to individual students should be made up within electives in the Major Requirement.

[#] Students admitted with *Advanced Standing* should complete PHY1101 to fulfill the pre-requisite requirement of PHY3210.

2.3 Gateway Education Requirement

(The catalogue term of the Gateway Education requirement that students will follow will be the same as their admission term.)

Note 1: For students with recognised Advanced Level Examination or equivalent qualifications.
Note 2: For Associate Degree/Higher Diploma graduates admitted to the senior year.

Curriculum Catalogue Term	**Semester A 2021/2022 onwards**		
	Normative 4-year Degree	**Advanced Standing I (Note 1)**	**Advanced Standing II (Senior-year Entry) (Note 2)**
University requirements			
English			
• GE1401 University English	3 credit units	3 credit units	Not a compulsory requirement
• Discipline-specific English: GE2410 English for Engineering	3 credit units	3 credit units	3 credit units
GE1501 Chinese Civilisation – History and Philosophy	3 credit units	3 credit units	Not a compulsory requirement
Distributional requirements Area 1: Arts and Humanities Area 2: Study of Societies, Social and Business Organisations Area 3: Science and Technology	12 credit units *(At least one course from each of the three areas)*	6 credit units *(From two different areas)*	3 credit units
College/School-specified courses ^	9 credit units	6 credit units	6 credit units
Total	**30 credit units**	**21 credit units**	**12 credit units**

^ College/School-specified courses for fulfilling the Gateway Education requirement

Course Code	Course Title	Level	Credit Units	Remarks
Normative 4-year Degree				
MA1200/ MA1300	Calculus and Basic Linear Algebra I/ Enhanced Calculus and Linear Algebra I	B1	3	
MA1201/ MA1301	Calculus and Basic Linear Algebra II/ Enhanced Calculus and Linear Algebra II	B1	3	
MNE2066	Engineers in Society	B2	3	

Advanced Standing I
• Students who have <u>not</u> passed the MA placement test arranged by the Mathematics Department should take *MA1200 Calculus and Basic Linear Algebra I* (3 credit units) and *MNE2066 Engineers in Society* (3 credit units) as College-specified courses. **OR** • Students who have passed the MA placement test arranged by the Mathematics Department should take *MA1201 Calculus and Basic Linear Algebra II* (3 credit units) and *MNE2066 Engineers in Society* (3 credit units) as College-specified courses.
Advanced Standing II (Senior-year Entry)
Take MNE2066 Engineers in Society (3 credit units) **AND** any one course (3 credit units) not within the Major requirements (including Core Courses and Electives)

2.4 English Language Requirement

Normative 4-year degree students and Advanced Standing I students who passed the 6 credit units of specified GE English courses, and Advanced Standing II students who passed the 3 credit units of discipline-specific GE English course are recognized as fulfilling the University's English Language Requirement.

Students scoring below Level 4 in HKDSE English Language or Grade D in HKALE AS-level Use of English or students who do not possess an equivalent qualification are required to complete two 3-credit unit courses, LC0200A English for Academic Purposes 1 and LC0200B English for Academic Purposes 2, prior to taking the GE English courses. Students who demonstrate that they have achieved a grade B or above in their overall course results for LC0200A will achieve 3 credits and also be considered to have satisfied the pre-requisite for entry to the GE English courses without needing to take LC0200B. The credits earned from taking LC0200A (3 credits) and LC0200B (3 credits) will not be counted towards the minimum credit units required for graduation and will not be included in the calculation of the cumulative grade point average (CGPA). However, they will be counted towards the maximum credit units permitted.

2.5 Chinese Language Requirement

Students scoring below Level 4 in HKDSE Chinese Language, or below Grade D in HKALE AS-level Chinese Language and Culture will be required to complete a 3-credit unit course CHIN1001 University Chinese I. The 3 credit units will not be counted towards the minimum credit units required for graduation and will not be included in the calculation of the cumulative grade point average (CGPA). However, they will be counted towards the maximum credit units permitted.

In addition to the above requirement, Colleges/Schools also have the discretion to specify other Chinese language courses for their students, including students who do not possess the above qualifications (Senate/70/MM27-28 refers). Please indicate if there are such requirements.

2.6 College/School Requirement, if any

(The catalogue term of the College/School requirement that students will follow will be the same as their admission term.)

Course Code	Course Title	Level	Credit Units	Remarks
Normative 4-year Degree (6 credit units)				
CS1302	Introduction to Computer Programming	B1	3	
PHY1101	Introductory Classical Mechanics	B1	3	
Advanced Standing I (0 credit unit)				
College Requirement waived.				
Advanced Standing II (Senior-year Entry) (0 credit unit)				
College Requirement waived.				

2.7 Major Requirement

(The catalogue term of the major requirement that students will follow will be the effective term of the declared/allocated major.

For normative 4-year degree students who will join the majors allocation exercise, the catalogue term of major requirement will be one year after admission.

For advanced standing students and 4-year degree students who already have a major at the time of admission, the catalogue term of major requirement will be the same as their admission term.)

2.7.1 Core Courses (72 credit units)

- **Advanced Standing I students: 69 credit units[#]**
- **Advanced Standing II students: 66 credit units[#]**

Course Code	Course Title	Level	Credit Units	Remarks
PHY1101	Introductory Classical Mechanics	B1	3	[#]Students admitted with *Advanced Standing* should complete PHY1101 to fulfill the pre-requisite requirement of PHY3210.
PHY1202	General Physics II	B1	3	**Department-specified Course for top 40% majors allocation**
MNE2016	Engineering Graphics	B2	3	❖ **Department-specified Course for top 40% majors allocation** ❖ *Waived* for students admitted with *Advanced Standing I* and *Advanced Standing II*
MA2172/ MA2177	Applied Statistics for Sciences and Engineering/Engineering Mathematics and Statistics	B2	3	❖ Students under the Normative Four-Year Degree should complete MA2177 to fulfill the major requirement ❖ MA2172 *waived* for students admitted with *Advanced Standing II* / MA2177 *waived* for students admitted with *Advanced Standing I*
MNE2020	Engineering Workshop Practice	B2	0	*Waived* for students admitted with *Advanced Standing II*
MNE2029	Electrical and Electronic Principles I	B2	3	*Waived* for students admitted with *Advanced Standing II*
MNE2036	Engineering Computing	B2	3	
MNE2109	Engineering Mechanics	B2	3	
MNE2110	Engineering Materials	B2	3	
MNE2112	Thermodynamics	B2	3	
MNE3049	Control Principles	B3	3	
MNE3107	Principles of Nuclear Engineering	B3	3	
MNE3111	Introduction to Nuclear Power Plant	B3	3	
MNE3118	Mechanics of Materials	B3	3	
MNE3119	Manufacturing Technology	B3	3	
MNE3121	Heat Transfer	B3	3	
MNE3122	Fluid Mechanics	B3	3	
PHY3210	Modern Physics for Nuclear Technology	B3	3	

PHY3230	Nuclear Radiation and Measurements	B3	3	
PHY3275	Radiation Protection and Dosimetry	B3	3	
SEEM3101	Basic Methodologies and Tools for Risk Engineering	B3	3	
JC4231	Nuclear Reactor Physics	B4	3	
MNE4105	Nuclear Reactor Safety	B4	3	
MNE4112	Nuclear Materials	B4	3	
MNE4118	Project (Individual)	B4	6	

2.7.2 Electives (9 credit units)

- **Advanced Standing I students are required to complete at least 9 credit units of electives, in addition to credit units required to make up for exempted core courses**
- **Advanced Standing II students are required to complete at least 3 credit units of electives, in addition to credit units required to make up for exempted core courses**

Course Code	Course Title	Level	Credit Units	Remarks
FS2001	Workshop-based Study in Science and Engineering	B2	3	
CHEM3038A	Environmental Sampling and Risk Assessment	B3	3	Students are advised to take the course CHEM1200 Discovery in Biology before taking this course.
MNE3007@	CAD/CAM	B3	3	
MNE3046♦	Automation Technology	B3	3	
MNE3109	Hazard Effect Management Process	B3	3	
MNE3110	Safety Engineering Design	B3	3	
MNE3123	Internship in Engineering	B3	3	
MSE3169	Materials Testing Techniques	B3	3	
MSE3171	Materials Characterization Techniques	B3	3	
SEEM3102	Quality Engineering	B3	3	
CA4644	Wind and Earthquake Engineering	B4	3	Pre-cursor waiver given by ACE Dept.
CA4737	Fire Science and Modelling	B4	3	Pre-cursor waiver given by ACE Dept.
MNE4005♣	Finite Element Analysis	B4	3	
MNE4010	Dynamics and Control	B4	3	
MNE4047	Directed Studies	B4	3	
MNE4108	Nuclear Reactor Engineering	B4	3	
MNE4109	Reliability Engineering and Risk Analysis	B4	3	
PHY4230	Radiation Safety	B4	3	
PHY4232	Radiotherapy Physics	B4	3	
PHY4233	Imaging Physics	B4	3	
PHY4274	Radiation Biophysics	B4	3	

PHY4275	Radiological Physics and Dosimetry	B4	3	
PHY4283	Physics in Medicine	B4	3	
SEEM4064	Reliability Engineering	B4	3	
SEEM4101	Disaster and Crisis Management	B4	3	
SEEM4103	Decision Analysis and Risk Management	B4	3	

@ Course that would contribute towards the area of 'Design and Manufacturing' for Mechanical Engineering discipline of Scheme A training of HKIE.

♦ Course that would contribute towards the area of 'Automatic & Control Systems' for Mechanical Engineering discipline of Scheme A training of HKIE.

♣ Course that would contribute towards the area of 'Solid Mechanics' for Mechanical Engineering discipline of Scheme A training of HKIE.

2.8 Optional Courses

Course Code	**Course Title**	**Credit Units**	**Remarks**
FS4001	Co-operative Education Scheme (CES)	8	Internship (8 months)
FS4002	Industrial Attachment Scheme (IAS)	3	Internship (minimum 6 weeks)
FS4005	Overseas Internship Scheme (OIS)	3	Internship (9 to 13 weeks)

2.9 Classification of Award

For students who are on programmes of (i) Normative 4-Year Degree admitted from 2020/21 and thereafter, (ii) Advanced Standing I admitted from 2021/22 and thereafter, award with distinctions will be conferred (based on the CGPA ranking) upon the top 15% students in the respective departments/ schools graduating in the same semester/term as follows:

Award with Distinctions	**Awarded to Graduates Ranked in**
summa cum laude	top 2%
magna cum laude	next 5%
cum laude	next 8%

Advanced Standing II admitted in 2021/22, they will be granted an award with classification based on their CGPA as follows:

Award Classifications	**CGPA**
First Class Honours	3.5 or above
Upper Second Class Honours	3.0 - 3.49
Lower Second Class Honours	2.5 - 2.99
Third Class Honours	2.0 - 2.49
Pass	1.7 - 1.99

3. ACADEMIC REGULATIONS AND GUIDELINES

Students should observe the University's academic regulations and guidelines at all times. More information is available at the website maintained by the Academic Regulations and Records Office (ARRO).

ARRO Homepage: *http://www.cityu.edu.hk/arro*

4. 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 2021** in order to access their course grades online.
For details, please refer to the website of Office of the Provost:
http://www.cityu.edu.hk/provost/academic_honesty/university_requirment_on_academic_honesty.htm

5. COMMUNICATIONS

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

a) Students who have difficulties with a course of study should seek advice from the course teacher concerned.

b) Students who wish to discuss the overall organization of the major should consult the Major Leader.

c) Students who wish to discuss issues on a particular part of the major should approach the relevant Year Tutor.

d) The major's Joint Staff & Student Consultative Committee helps to facilitate consultation and communication. A student from each entry cohort will be elected to sit in the Committee.

e) In addition, a student from each entry cohort will be elected to sit in the Major Programme Committee which meets in every semester to discuss major-related matters.

f) Students should feel free to approach their respective academic advisors for advice regarding their study plan or personal and career development.

6. MAJOR LEADER AND YEAR TUTORS

Position	**Staff Name**	**Tel/Email**
Major Leader/ Chair:	Prof. J. J. KAI	3442-8071/ jijkai@cityu.edu.hk
Co-chairs:	Dr. Alice HU	3442-9469/ alicehu@cityu.edu.hk
	Prof. Peter K N YU	3442-7812 / appknyu@cityu.edu.hk
Year Tutors (By Cohort and Programme Code):		
2018 BENGEGU4 & 2019 BENGEGU3/ ASI	Dr. Alice HU	3442-9469/ alicehu@cityu.edu.hk
2019 BENGEGU4 & 2020 BENGEGU3/ ASI	Dr. Jiyun ZHAO	3442-9395 / jiyuzhao@cityu.edu.hk
2020 BENGEGU4 & 2021 BENGEGU3/ ASI	Dr. Shijun ZHAO	3442-9013/ shijzhao@cityu.edu.hk

7. INFORMATION FOR NEW STUDENTS

7.1 How to access your Personal Class Schedule

i) Go to CityU home page (www.cityu.edu.hk) from any terminal on campus or off campus.
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 timetable for current semester. Timetable for Semester A 2021/22 is available from 27 July 2021 onwards.

7.2 How to get Instructors' handouts through Canvas

i) Log onto Canvas (https://canvas.cityu.edu.hk) from any terminal on campus or off campus
ii) Click "Courses" to see all the courses that you have registered in current and previous semesters.

7.3 How to check Major Requirement and Course Syllabuses

Log onto the CityU home page and click "Academic Programmes".

To access DegreeWorks, please go to the "Study Plan" tab in AIMS. For details, please refer to ARRO website: *www6.cityu.edu.hk/arro/content.asp?cid=482*

7.4 Course Registration for Semester A 2021-2022

For Semester A 2021-2022, students will be pre-registered in required courses and major electives in most cases if possible.

i) The date for release of your class schedule is **27 July 2021**. Please check your curriculum requirements, review your study plan and then make appropriate adjustments to your pre-registered courses.
ii) Add/Drop of courses can be processed through AIMS for web-enabled courses during the web registration period. For non-web-enabled courses, approval is required from the major department and you can submit your change request by using the electronic Add/Drop Form available in AIMS.

How to do the Add/ Drop:
- Go to *http://www.cityu.edu.hk* from any terminal on campus or off campus and click "Students".
- Log onto "AIMS" and then click "Course Registration".
- Click "Main Menu for Web Add/Drop" and then choose "Add or Drop Classes".

iii) Web registration begins on **23 August 2021** (please refer to your time ticket via AIMS).
iv) All add/drops end on **6 September 2021**.

v) Detailed arrangements on Course Registration for Semester A 2021-2022 will be posted by **27 July 2021**. For details, please refer to ARRO website: *http://www.cityu.edu.hk/arro/content.asp?cid=163*

7.5 How to access your Student Email Account

i) Go to *http://www.cityu.edu.hk* from any terminal on campus or off campus, 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-ID**" 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 **full name**, **student number** and **contact number**.*

7.6 Course Exemption/Credit Transfer

Applications for course exemption or credit transfer must be made before the start of the first semester after student's admission to the University. Students who have been granted course exemption are required to take other courses to make up the credits required for fulfilling the award requirements. For Semester A 2021-2022, the application period is from **15 July to 28 August 2021**. For details, please refer to ARRO website:
http://www6.cityu.edu.hk/arro/content.asp?cid=10

7.7 Laboratory Safety Orientation

All students are REQUIRED to complete the on-line Laboratory Safety Orientation through "MNE Lab for New Students" under "Courses" menu of Canvas. A Lab Tour session will be held by the Laboratory Office in week 1 of Semester A 2021-22 for interested students. Details of the session will be sent to you by e-mail.

7.8 Administrative Support from General Office

Office Hours

Mon to Fri	8:30 am to 5:30 pm
Lunch Break	*12:30 pm to 1:45 pm*

Inquiry:	3442-2067
Fax:	3442-0235
Email:	mnego@cityu.edu.hk

Suggested Study Path

Suggested Study Path for BENGEGU4 NRE 2020/21 Cohort

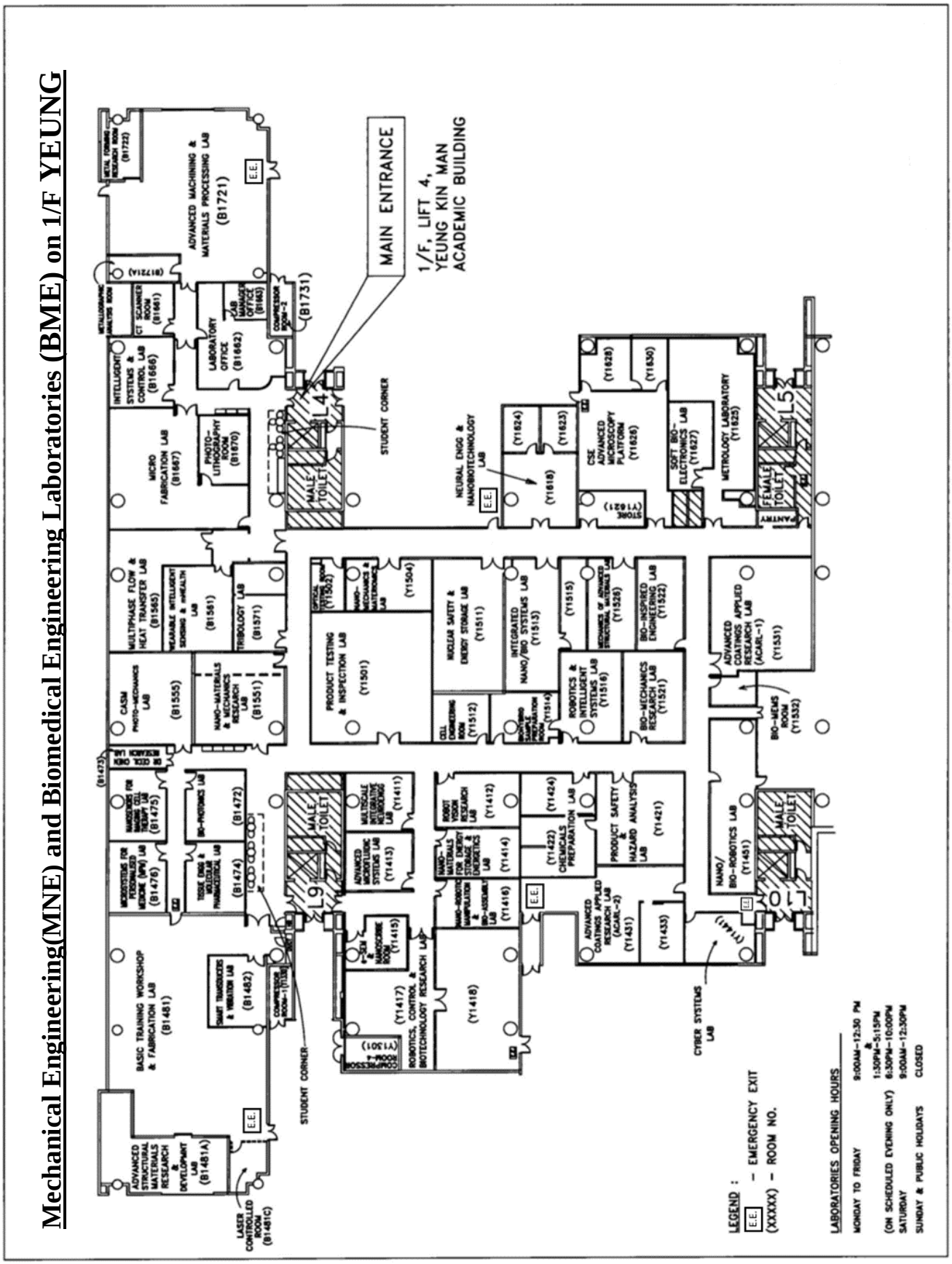
Yr	Sem	College Requirements (6 CUs)	Gateway Education (GE): College-specified Courses (9 CU) & Chinese (3 CUs)			GE: English@ (6 CUs)	Department-specified Courses (6 CUs)	Gateway Education & Others	CUs
1	A	PHY1101 Introductory Classical Mechanics (3)	MA1200 Calculus and Basic Linear Algebra I / MA1300 Enhanced Calculus and Linear Algebra I (3)		MNE2066 Engineers in Society (3)	GE1401 University English (3)	MNE2016 Engineering Graphics (3)		15
	B	CS1302 Introduction to Computer Programming (3)	MA1201 Calculus and Basic Linear Algebra II / MA1301 Enhanced Calculus and Linear Algebra II (3)		GE1501 Chinese Civilisation – History and Philosophy (3)	GE2410 English for Engineering (3)	PHY1202 General Physics II (3)	GE 1 (3)	18
	S								
2	A	MNE2109 Engineering Mechanics (3)	MNE2112 Thermodynamics (3)	MA2177 Engineering Mathematics and Statistics (3)		GE 2 (3)	MNE2020 * Engineering Workshop Practice (0)	Free Elective (3)	15
	B	MNE2110 Engineering Materials (3)		MNE2029 Electrical & Electronic Principles I (3)	MNE2036 Engineering Computing (3)	PHY3210 Modern Physics for Nuclear Technology (3)		GE 3 (3)	15
	S								
3	A	MNE3118 Mechanics of Materials (3)	MNE3107 Principles of Nuclear Engineering (3)	MNE3111 Introduction to Nuclear Power Plant (3)	PHY3275 Radiation Protection and Dosimetry (3)	SEEM3101 Basic Methodologies and Tools for Risk Engineering (3)			15
	B	MNE3122 Fluid Mechanics (3)	MNE3049 Control Principles (3)	MNE3121 Heat Transfer (3)	PHY3230 Nuclear Radiation and Measurements (3)	MNE3119 Manufacturing Technology (3)			15
	S	Reserved for IAS (3)							
4	A	MNE4118 Project (3)		Major Elective 1 (3)	Major Elective 2 (3)	Major Elective 3 (3)		GE 4 (3)	15
	B	MNE4118 Project (3)	MNE4112 Nuclear Materials (3)	JC4231 Nuclear Reactor Physics (3)	MNE4105 Nuclear Reactor Safety (3)				12
	S								
( ) indicates number of credits								Total credits (minimum):	120

@ *Students whose entry qualifications in HKDSE English Language is below Level 4 are required to take LC0200A and LC0200B, and should take the GE English courses in the following semesters/terms. Furthermore, Students who demonstrate an overall grade B or above in the LC0200A course will be granted an exemption from taking LC0200B, and will be considered to have fulfilled the pre-requisite requirement for the GE1401 (University English) course. These students will be permitted to proceed to directly to the GE University English course.*

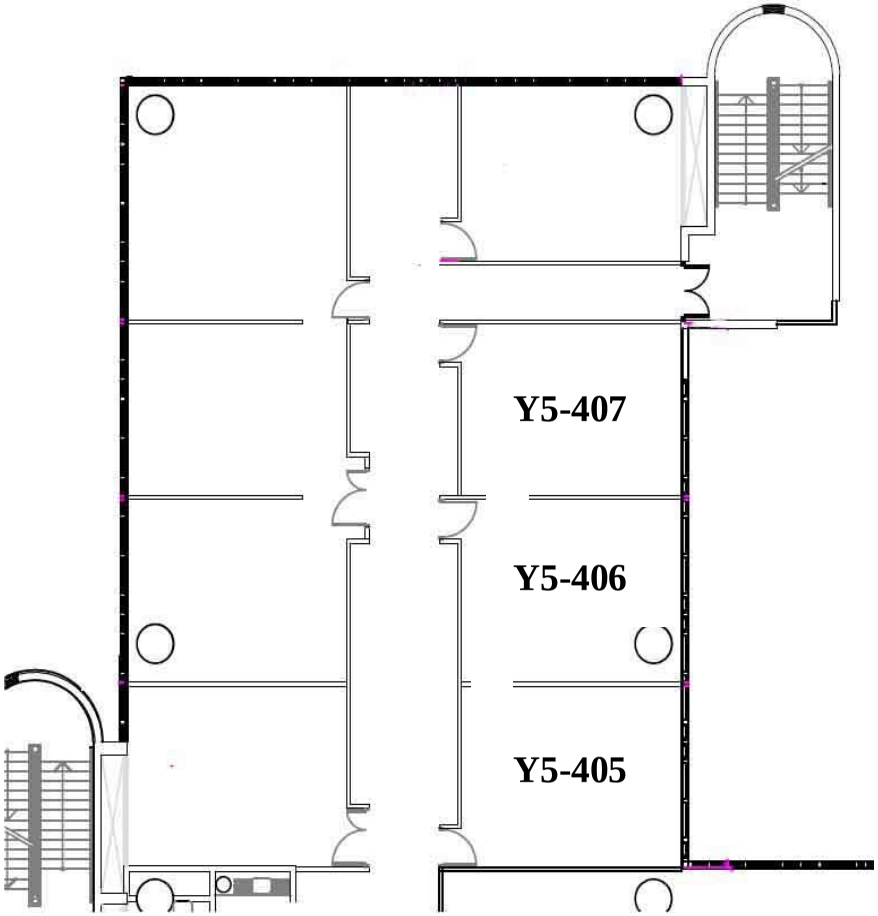
** MNE2020 should be taken in Year 2 during Semester A, Semester B, or Summer Term depending on the allocation and availability of workshop training places.*

Students are advised to consult their Academic Advisor in planning their own study paths. Please note that study path planning is both the privilege and responsibility of each student, so do it with care and diligence. Please refer to Student Handbook and revision/ update announcements by the Department for further details.

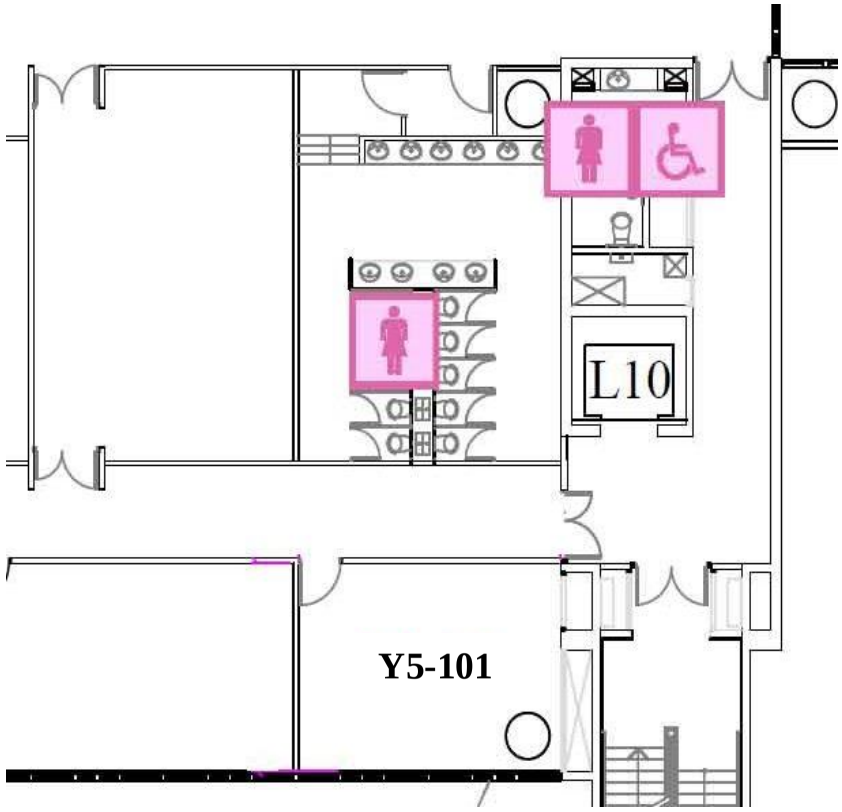
Mechanical Engineering(MNE) and Biomedical Engineering Laboratories (BME) on 1/F YEUNG



Mechanical Engineering (MNE) Laboratories on 5/F YEUNG

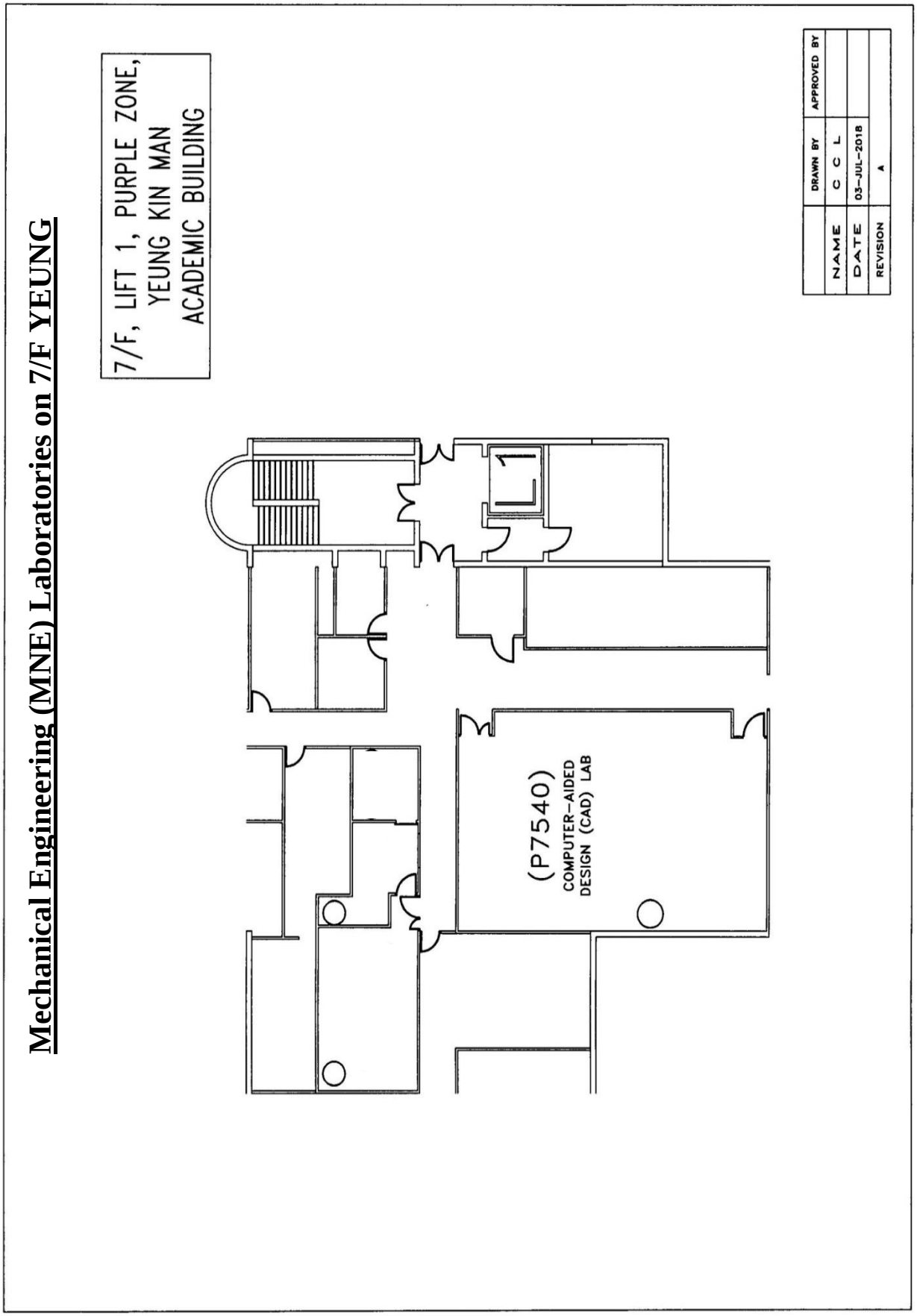


Rm. Y5405/Y5406/Y5407
Mechanics and Tribology Laboratory

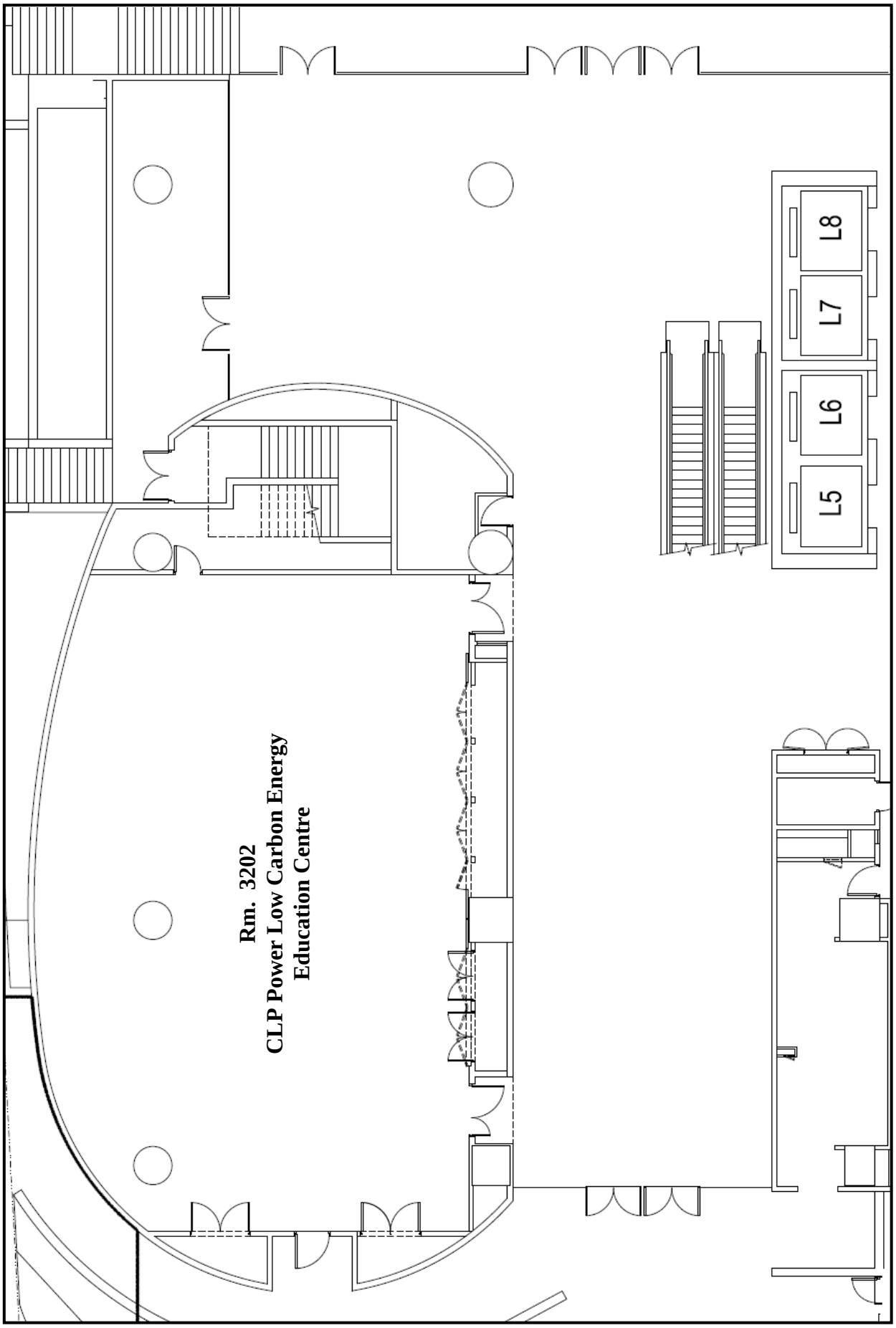


Rm. Y5101
Thermal-fluids Laboratory

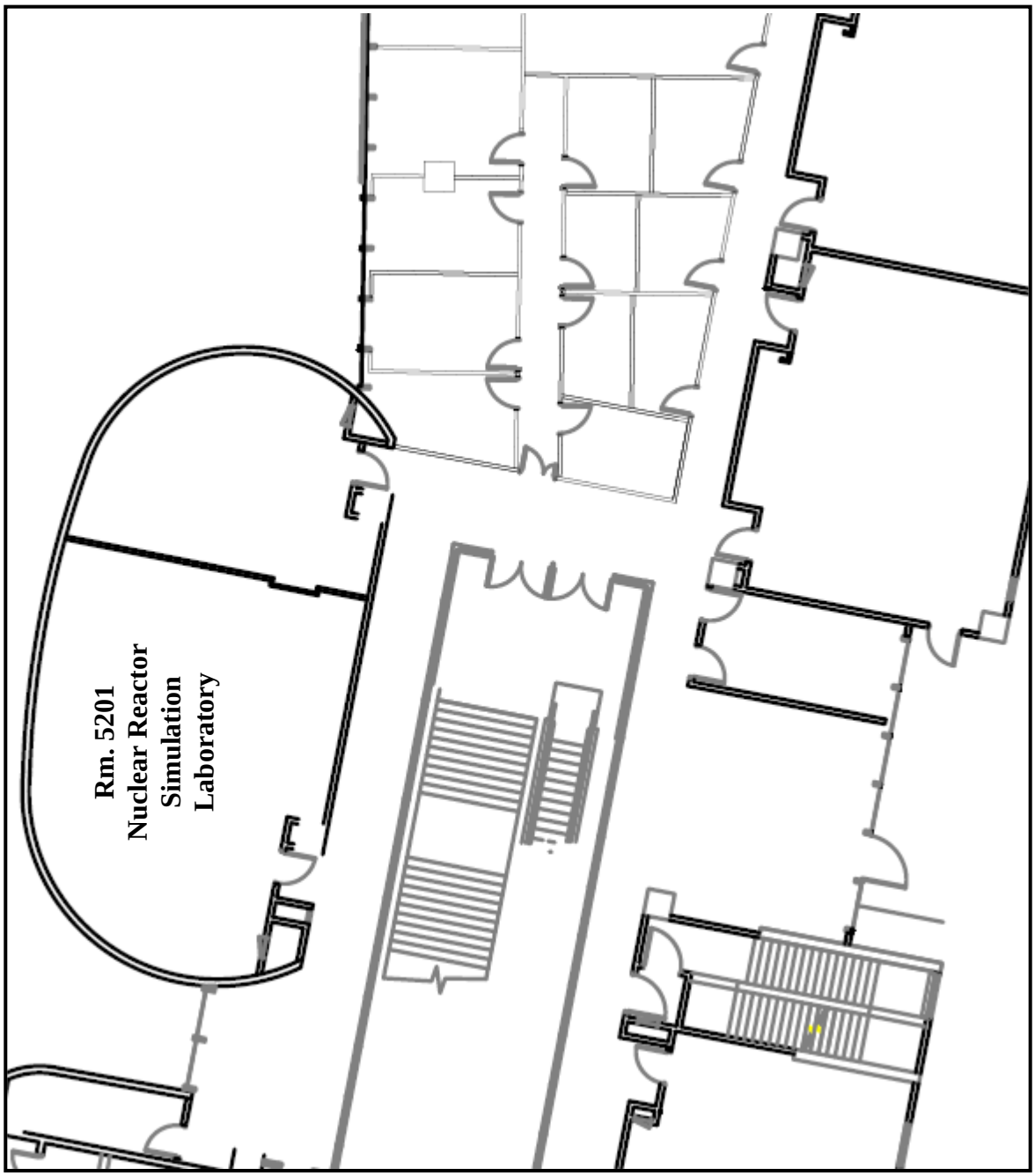
Mechanical Engineering (MNE) Laboratories on 7/F YEUNG



Mechanical Engineering (MNE) Laboratories on 3/F LAU

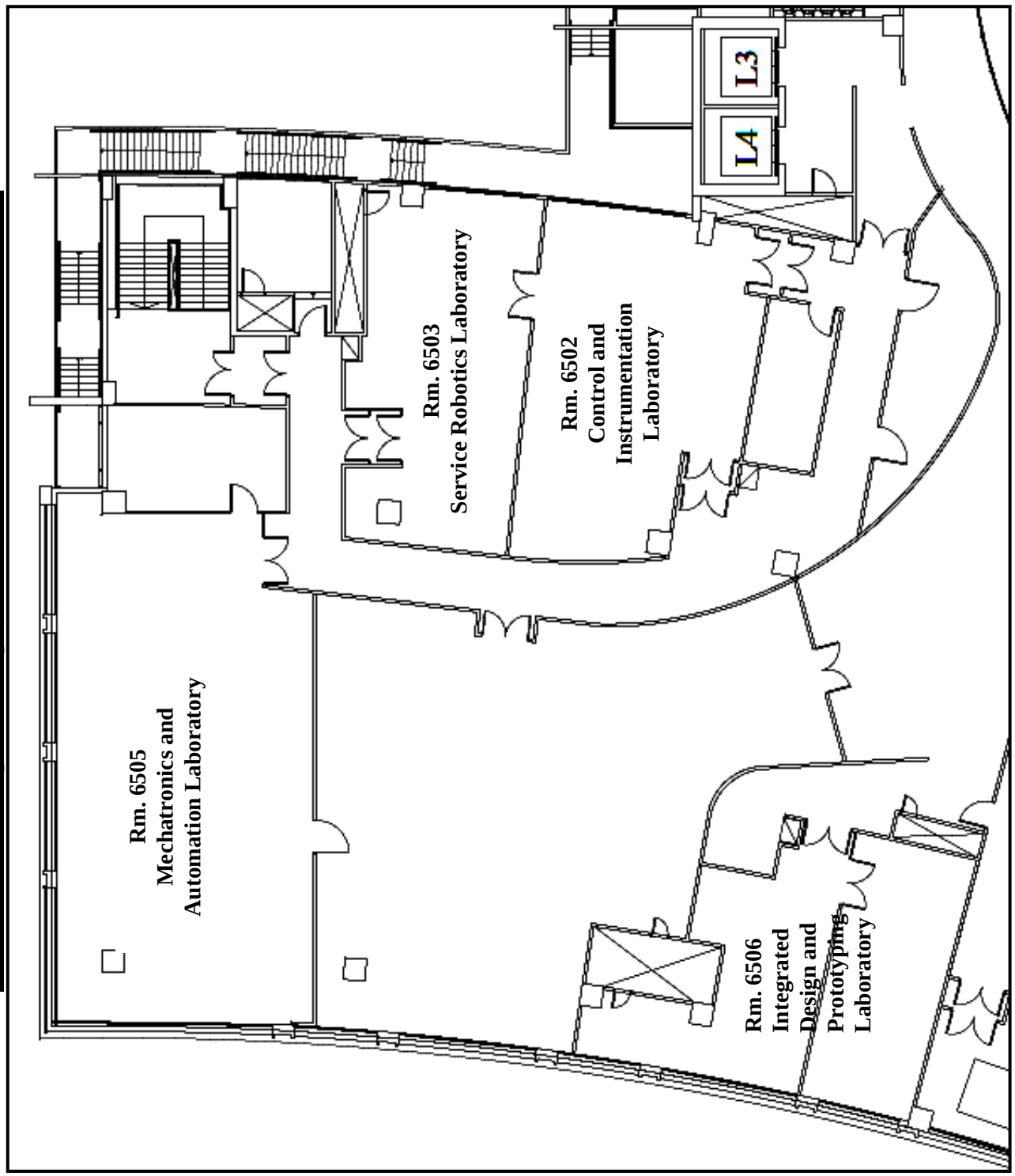


Mechanical Engineering (MNE) Laboratories on 5/F LAU



Appendix II-f

Mechanical Engineering (MNE) Laboratories on 6/F LI



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