

KAIST

**Department of Chemical and
Biomolecular Engineering**

Handbook for Graduate Students

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1. Overview

This handbook is a guide for students in the Department of Chemical and Biomolecular Engineering for all academic procedures involved in fulfilling course requirements and conducting research.

2. Student Classifications

Pursuant to Article 3 of the KAIST Academic Regulations, students are classified as follows: government scholars, KAIST scholars (including EPSS, KEPSI, LGenius, CEPP, EPLL), and general scholars.

If there arises a need to change the classification, the required documents shall be submitted **within four weeks** of the date on which the cause for status change took place (date of appointment to position, etc.). Such changes must be approved by the President. If a government scholar or KAIST scholar is **employed by an industrial entity** or has been **confirmed as a recipient of financial support under the condition of future employment**, the student must be classified as a general scholar and return the entire amount of financial support received before the classification change. If the student does not apply for a classification change and keeps the status of government scholar or KAIST scholar, the status change will be applied retroactively and the difference in tuition (registration fee and school supported association fee) from that applied to general scholars shall be charged as accumulated from the semester in which the requirement for status change took place.

However, students who find employment after the dissertation evaluation shall submit to the relevant office the application form for extracurricular activities instead of the application form for student classification change (Refer to Guidelines for Changes to Student Classification Article 3 Paragraph 3).

3. General Guidelines

- Time limit for degree completion – Master’s: 3 years, Doctorate: 5 years, Integrated M.S. and Ph.D. Program: 6 years including the Master’s program [Academic Regulations Article 65].
- Shortest period for course completion – Master’s: 2 semesters, Doctorate: 2 semesters, Integrated M.S. and Ph.D. Program: 4 semesters including the Master’s program [Academic Regulations article 64].

Leaves of absence are not included in the time limit; the time limit can be extended up to 2 times for a period of 1 year each time.

Leaves of absence cannot exceed 2 semesters in total for Master’s programs and 4 semesters for Doctoral programs. Leaves of absence of up to 4 semesters due to military obligations or pregnancies (2 semesters maximum for male students) shall not be included in the total period of leave.

It is strongly recommended that doctoral programs be completed in 3 years (6 semesters).

4. Testing and Grading System

Course grades are determined through written and oral exams as well as through homework; grades are given in the form of A+, A0, A-, ... D+, D0, D-, F, S and U, [Academic Regulations Article 49].

Academic probation is issued before the beginning of the new semester for any student whose accumulated GPA up to the previous semester is lower than 2.5/4.3. Students who are put on academic probation 2 times in a row (3 times for part time students) shall be subject to review for expulsion [Academic Regulations Act 58, Act 71].

5. Graduation Requirements– Credits and Grades

Credits are classified into course credits, research credits, and seminar credits. Students have to satisfy the following requirements by degree type. The accumulated GPA for all credits completed has to be above 2.5/4.3 for each degree type.

● Master's Program

Course			Research	Total
Mandatory General	Mandatory Major	Elective Major	Thesis Research	
CC5xx (3 credits) ¹⁾ CC010 Leadership Lecture ²⁾ CC020 Ethics and Safety I ³⁾	CBE601 Research Methods in Chemical Biomolecular Engineering (3 credits) ⁴⁾ CBE602 Problem Solving in Chemical Biomolecular Engineering (3 credits) ⁵⁾	12 credits *9 credits in CBE courses ⁶⁾	12 credits *Including 2 seminar credits ⁷⁾	33 credits -Course 21 -Research 12

● Doctoral Program

Course			Research	Total
Mandatory General	Mandatory Major	Elective Major	Thesis Research	
CC5xx (3 credits) ¹⁾ CC020 Ethics and Safety I ³⁾	CBE601 Research Methods in Chemical and Biomolecular Engineering (3 credits) ⁴⁾ CBE602 Problem Solving in Chemical and Biomolecular Engineering (3 credits) ⁵⁾	21 credits *12 credits in CBE courses ⁶⁾	30 credits	60 credits -Course 30 -Research 30

1) Mandatory General: Courses with subject codes that start with CC. Choose 1 from Scientific Writing, Introduction to Computer Application, Probability and Statistics, Introduction to Materials Science and Engineering, Engineering Economy and Cost Analysis, Introduction to Instruments, Entrepreneurship and Business Strategies, Patent Analysis and Invention Disclosure, and Collaborative System Design and Engineering.

2) CC010 Leadership Lecture: No credits. General scholars and foreign students do not need to take this course.

3) CC020 Ethics and Safety I(1AU)

- Course contents: research ethics, laboratory safety, human rights and sexual ethics (comprised of 3 sub-subjects).

- To be completed in: First semester of enrollment.

- Log in with KAIST portal ID on the “Ethics and Safety” website (<http://eethics.kaist.ac.kr>) to take courses and exams.

- Period for course completion and exams: Beginning of semester to end of semester.

- The course has to be retaken if a student fails or does not complete it. The student has to enroll himself/herself for retaking the course.

- The course has to be taken only once for students completing both the M.S. and Ph.D. programs.

4) CBE601 <Research Methodology for Chemical and Biomolecular Engineers> must be taken as a mandatory major course starting from the cohort admitted in 2012 (2013 for Integrated M.S. and Ph.D.). As the course is offered only during the spring semester, freshmen admitted in the fall semester should take it in their 2nd semesters.

5) CBE602 <Problem Solving in Chemical and Biomolecular Engineering> is a major required course at the graduate level from the cohort admitted in 2013 onwards. The course is connected to the Ph.D. qualification exam; students who obtain a grade of B+ or above in this course are exempted from the written part of the examination (※ A- and above for students who took CBE602 in 2013).

6) Courses offered at the EEWS Graduate School taught by professors from the Department of Chemical and Biomolecular Engineering shall be recognized as courses offered by the department.

7) Seminar: 2 compulsory credits. These credits can be replaced with Korean language courses or internships required by the interdisciplinary programs. However, as Korean language courses are not related to research, the credits shall not be counted toward the research credit requirements of 12 course credits.

8) Course credits obtained during the master’s program are combined with course credits for the doctoral program (Research credits are not included).

6. Course Registration and Completion

Course registration is done at the KAIST Portal website (<http://portal.kaist.ac.kr>) by logging in and connecting to the ‘academic system’ menu. Students from the KAIST undergraduate program can continue to use their existing ID and password from the undergraduate program and do not have to register for a new ID.

Integrated M.S. and Ph.D. Program is recognized as a doctoral program after 2 semesters (including any completed master’s programs) have been completed. M.S. and Ph.D. Integrated Program students are issued a new student identification number at this point and must register for courses according to doctoral program requirements.

Course credits completed per semester for full-time students must be between 9 and 12 credits, including research credits. The limit can be extended to 18 credits under approval of the adviser and department head. Part time students need to complete 3 to 9 course credits per semesters while the limit can be extended to 12 credits under approval of the adviser and department head.

For master's and doctoral program students who wish to have **undergraduate course credits recognized**, all mutually recognized courses in the 400 range can count toward graduation credits, while up to 9 credits from other undergraduate major courses can count as graduation credits under recommendation of the adviser and approval of the department head [Academic Program Operation Guidelines article 16]. Students who studied in the KAIST undergraduate program cannot retake courses completed at the undergraduate level. This applies to courses with changed course numbers and titles as well.

Special lecture courses with different subtitles are taken as separate courses. Up to 3 courses can count toward graduation credits in the Master's program.

Seminars (CBE966) are comprised of internal seminars (for Master's and 3rd year Doctoral students) and external seminars. Each seminar counts as 1 credit. Master's candidates must obtain 1 seminar credit for 2 semesters (2 credits in total). Doctoral candidates do not register for seminar courses, but should make 1 presentation in English in their 3rd year.

- Internal Seminar: Master's students must present their progress on their research in English for 2 seminars while Doctoral students must present once in English in their 3rd year (Wed 3:30 PM~, Presentation schedule to be arranged by TA at the beginning of the semester).
- External Seminar: Seminars conducted by external invited lecturers (Wed 4:30 PM~)

As external seminars are usually conducted in English, **foreign students** can participate in seminars offered by other departments in lieu of the external seminar. However, in order to have their participation recognized, visiting students have to obtain verification from the TA or external lecturer using the designated application form, which should be submitted to the seminar TA.

7. Credit Transfer

Course credits obtained at other institutions, if applicable to the academic program offered by the department, may be recognized as **graduate level courses (in the 500-800 range)** for up to 12 credits for Master's students and 18 credits for Doctoral students under recommendation of the adviser and related teaching staff, seconded by the department head, and with the following documents submitted for the President's approval. Applications can be made during the period of enrollment (it is recommended that application be made within 1 year of admission). Recognized course credits obtained from other institutions shall be included in the total credits obtained for graduation but shall be excluded from GPA calculation.

- Procedure: Students must apply for Credit Recognition of Completed Courses online at the Academic System → receive approval from the course professor (after interview) and the head of department of the course → Students must submit it online(manual) at the Academic System

to the advisor professor and submit the original transcript to Academic Registrar's Team offline → receive approval from the advisor professor and the head of department.

- Document Submission
 - Original copy of transcript from the other university (or graduate school).
 - Syllabus

Students from the KAIST undergraduate program who completed mutually recognized courses in the graduate program (in the 500 range) at the undergraduate level (assuming that these credits were not included in graduation credits for the undergraduate program) or students who **completed graduate level courses as Honor Student** can have those credits transferred toward their Master's degree.

- Application Period: Until the end date of the final enrolled semester for master course (※ MS and PhD Integrated course(Master) students: Within the second enrolled semester (before entering PhD course))
- Procedure: Students must apply for credits completed before admission online at the Academic System → receive approval from the course professor(after interview) → Students must submit it online(manual) at the Academic System to the department/program office of undergraduate → confirmation from the Department/Major Staff of undergraduate program and recommendation(receive approval) by the advising professor and confirmation(receive approval) from the department head → approval of credit recognition.

8. Master's Program

8-1. Major events by semester

March admission			September admission	
year	time	events	time	events
1	Mar. Semester 2 Nov.	Selection of adviser and topic Presentation (int. seminar) Thesis plan submission	Sep. Semester 2 May(yr 2)	Selection of adviser and topic Presentation (int. seminar) Thesis plan submission
2	Semester 3 Semester 4 Dec.	Presentation (int. seminar) Presentation at academic society (recommended) M.S. thesis defense	Semester 3 Semester 4 Jun.	Presentation (int. seminar) Presentation at academic society (recommended) M.S. thesis defense

8-2. Selection of adviser

Freshmen in the Master's program are to consult their desired adviser and submit the 'Application Form for Adviser Selection' at the freshman orientation. Advisers are confirmed at the end of March for students admitted in the spring and at the end of September for students admitted in the fall. Freshmen should obtain information from department introduction brochures, department websites, and consultations with at least three professors before selecting an adviser.

8-3. Submission of Thesis Plan for Master's Degree

Students in the Master's program should complete their thesis proposals within 10 months of admission for successive approvals of the adviser, department head, and president. Notices are given in May and November for the submission of thesis proposals.

8-4. Thesis Defense for Master's Degree

The schedule for thesis defense and submission is announced to eligible candidates in October or March. The thesis defense committee shall be comprised of 3 full time teaching staff including the chair (adviser) (*February graduates shall be notified by the department of all details related to defense schedule and the defense committee).

- Thesis defense period: February graduates → in December / August graduates → in June
- Submission of hard copies: 2 copies hard bound (with official seal) and 2 copy soft bound should be submitted to the department office together with an "Agreement to Disclose Electronic Thesis" printed from the library website.
- Hard copy submission period: February graduates → Mid-January / August graduates → Mid-July

8-5. Leadership Lectures for the Master's Degree

Leadership lectures are offered at the KAIST Leadership Center for students to learn to successfully perform leadership roles in society upon graduation. Leadership lectures are usually conducted by CEOs of industrial entities as well as personalities of social renown. These lectures constitute a general required course for the Master's program and must be taken for students to graduate. The course number is CC010; no course credits are given but students are obligated to register. Students have to attend at least 5 lectures to fulfill requirements for course completion; the grade conferred is 'S' ('U' for failing to meet requirements). General scholars and foreign students are exempt from taking the lectures.

9. Doctoral Program

9-1. Requirements for conferral of doctorate

- ① Credits: The number of credits obtained must fulfill requirements defined in article 66 paragraph 1 of the Academic Regulations.
- ② Minimum and maximum period of study: At least 2 semesters (1 year) of full time study has to be completed for conferral of a Doctoral degree. The total number of years taken cannot exceed 5 years from the date of admission.
- ③ Comprehensive examination: In this department, an oral examination regarding the thesis and major conducted together with dissertation defense.
- ④ Dissertation defense: The candidate has to pass the doctoral dissertation defense according to regulations for degree conferral.

9-2. Major events by year

Year	Event	Period	Note
1	Ph.D. qualification examination	Within 1 year and 6 months from admission	Conducted every Jan & Jul, guidelines issued separately
2	Thesis Proposal Defense	Within 2 years of admission. Conducted according to defense schedule proposed in 4 th semester, Nov and May	Can be retaken if failed
4	Dissertation Defense		

9-3. Ph.D. qualification examination

The Ph.D. qualification exam is comprised of a written examination and review of documents; it is conducted every year in January and July. Schedules and documents to be submitted are announced 1 month before the examination date on the department's website and bulletin board, and by email. The written examination is based on the contents of CBE602 and evaluates the candidate's knowledge of basic principles of chemical engineering and their application. Candidates who obtain a grade of B+ or above for CBE602 are exempted from the written examination.

The Ph.D. qualification exam must be passed within 1 year and 6 months of admission. Students in our department must take the qualification exam within 1 year of admission; those who fail to do so will be deemed as having failed the examination. The qualification exam can be retaken.

9-4. Defense of thesis proposal

Within 2 years of admission to the Doctoral Program, students must complete the thesis proposal pursuant to article 4 paragraph 1 of the Regulations for Degree Conferral and submit it to the doctoral thesis defense committee; students must also pass an oral examination. Students who fail to meet the above deadline due to unforeseen circumstances must complete the 'Application Form for Delayed Review of Doctoral Dissertation Proposal' and submit it to the department head after confirmation by the adviser. The delayed defense of thesis proposal must take place within 1 year of the original deadline.

The 'Request for Appointment of Doctoral Dissertation Committee' must be submitted to the department office at least 15 days before the thesis proposal defense. The doctoral dissertation defense committee, appointed by the President, shall be comprised of 5 full time teaching staff in the relevant major. However, when need is acknowledged by the President, the defense committee may be comprised of more than 5 members or include up to 2 full time teaching staff from other departments or external experts (including part-time teaching staff).

9-5. Dissertation defense for doctoral degree

The department shall notify defense candidates of the schedule for dissertation defense and submission in October or March. Candidates must submit the 'Request for Dissertation Defense for Degree Conferral' and 5 copies of the dissertation 15 days before the defense date. The period for dissertation defense is in November (for February graduates) or May (for August graduates).

In order to pass the defense, part or the entire dissertation has to have been published or approved for publication in an international journal recognized by the department. Candidates must refer to the department's list of recognized journals and submit proof of publication in an overseas journal to the department office.

2 copies hard bound (with official seal) and 1 copy soft bound of the dissertation should be submitted to the department office together with an "Agreement to Disclose Electronic Thesis" printed from the library website. The printed copies of the dissertation should be submitted in December (for February graduates) or June (for August graduates).

9-6. Compulsory laboratory teaching assistantship for government scholars

Government scholars in the doctoral program must perform teaching assistant duties for undergraduate laboratory classes in the 2nd semester of year 1 and 1st semester of year 2. TAs selected as outstanding through undergraduate student voting shall be given bonuses at the end of the semester.

10. Scholarships and Life on Campus

1) Financial aid application for Master's program

- Amount: 265,000 KRW/month for 12 months per student
- Criteria: Government scholarship recipients in the Master's program (Up to year 2)
- Duties: Education and research support for the department of up to 10 hours/week
- Loss of eligibility: Failure to perform duties, leave of absence, probation, termination of support period (4 semesters)
- Remittance date: 1st of each month
- Application: Submission of 'Financial Aid Application Form' every February and August (under notification from department office)

2) Allowance for TAs in Doctoral Program

- Amount: 450,000 KRW (300,000 KRW for 4th year students)/month for 12 months per student
- Criteria: Government scholarship recipients in the doctoral program (Up to year 4)
- Duties: Education and research support for the department of at least 16 hours/week. Teaching assistant duties for undergraduate laboratory classes must be performed in semesters 2 and 3.
- Remittance date: 25th of each month
- Application forms need not be submitted.

3) Special TAs for undergraduate courses

TAs for undergraduate courses in the 200 and 300 range shall be selected from graduate students with TA allowances provided for 1 semester (4 months). Details of application are announced by the department office before the beginning of each semester.

4) Government Scholarship TA/CA

In order to ensure the lowest possible living expenses for government scholars in the graduate program, and to retain outstanding students, TAs and CAs (Academic Counselor Assistant) are selected from among government scholars and are provided with allowances. Students selected as TAs perform course

TA duties of up to 10 hours a week or provide support for the department's activities. CAs provide academic and career consultation to undergraduates under the management of the Leadership Center.

5) Dormitory

The Student Welfare Team is in charge of all duties pertaining to the dormitory, such as application, allocation, collection and refunding of fees, facilities management, and housemaster offices management.

- Dormitory website: <http://kds.kaist.ac.kr>
- Inquiries to the Student Welfare Team: 042-350-4711~2

6) Extracurricular activities

Students may not engage in separate profit-seeking activities without approval of the president. Students may participate in extracurricular activities, as long as such activities are within the scope designated by the Academic Regulations. Extracurricular activities must be approved by the student's advisor, and must not interfere with education and research tasks; such activities must also be such as retain order within the school. Students who wish to conduct extracurricular activities have to obtain approval from adviser and department head 2 weeks before the planned activity and submit the designated form for student extracurricular activities to the student support team.

11. Military Service- Specialized Research Personnel

- 1) Doctorate:** Students become eligible for service as specialized research personnel upon admission to the Doctoral program; the minimum period of study for the commencement of service is 2 semesters. Military duty is completed after 3 years of service (Eligible at year 1 → 3 years of service from year 2).
 - 2) Master's:** Military duty is completed when the student is employed by designated companies or corporate research institutes in a field of academic, science, or technology research and completes 3 years of service from the date of enlistment. Students become eligible for admission to the specialized research personnel program when they enter the Doctoral Program at KAIST.
 - 3) Integrated M.S. and Ph.D. Program:** Students become eligible for enlistment as specialized research personnel in year 1 of the Doctoral program; the minimum period of study for the commencement of service is 2 semesters. Military duty is completed after 3 years of service (Eligible in year 1 of integrated program → 3 years of service from year 2).
- Inquiries to the Student Support Team: 042-350-2164

12. Usage of Department Facilities

1) Joint equipment analysis room (Rm. 1115) – Staff in charge: Jang Bok Lee (Office: #3422@N25, int. extension: 3909)

The equipment analysis room is operated to effectively manage important equipment frequently used by all research centers and to maximize the benefits of joint usage.

The following should be taken into consideration when using the equipment analysis room.

- Students shall obtain permission from their advisers or professors in charge, as well as from management staff and the manager of the respective equipment before usage; necessary details should be recorded in the usage log before using the equipment.
- First time users are prohibited from operating equipment on their own and must receive supervision from experienced doctoral students or management staff.
- Usage of the equipment room is limited to working hours (9 am to 6 pm); students can use their student IDs to enter the room outside of working hours or on public holidays.
- Equipment usage is limited to management staff and those who have obtained permission for usage. Even those who wish to learn how to operate equipment can only do so after learning the necessary procedures for usage.
- If anyone should be found ignoring or breaking the rules stated above, the professor in charge or management staff can stop or prohibit the user from using the equipment.
- When abnormal situations or problems arise during equipment usage or operation, relevant details must be conveyed to the management staff in charge of the respective equipment so that maintenance or repairs can be conducted with priority.

2) Photocopy room (Next to 2F cargo elevator)

The common photocopier installed in the department's photocopy room can be used with a password allocated to each lab. Photocopy paper is procured by the department office; usage fees are paid from the research fund of each lab. Photocopies for personal usage should be made at the photocopy room in the 1st floor lobby.

3) Study room (Rm. 2501-3)

A study room in the 2nd floor of the Applied Engineering Building jointly used by the Department of Chemical and Biomolecular Engineering, Department of Civil and Environmental Engineering, and Department of Materials Science and Engineering is open 24 hours. Management retains the right to clear unused seats that remain occupied for prolonged periods; in consideration of other students, students are thus advised not to leave their belongings behind when not using the room.

4) Usage of lecture rooms and seminar rooms

Lecture and seminar rooms available for use in our department are as follows.

- Lecture rooms: no. 1119, no. 2116, no. 2122

- Seminar rooms: Seminar room 1 (no. 1101), Undergraduate seminar room 2 (no. 2501-2), Seminar room 3 (no. 6108)

All rooms remain open during working hours between 9 am and 6 pm. For other times, student ID (for lecture rooms) or card keys issued by the department office (for seminar rooms) can be used for entry. Lecture rooms and seminar rooms can be used after reservation on the department website. Joint card keys have to be returned immediately to the department office after the allocated usage time, so that the next user can utilize them.

13. Accounting for Purchases of Experimental Materials, Equipment, and Renovation Fees

1) Purchase of supplies for amounts below 10 million KRW (including reagents, materials, and equipment)

A. Purchase using ERP system

When purchasing necessary consumables, reagents, and material in the laboratory, a 'billable' electronic (tax) receipt should be obtained to remit the amount directly to the supplier through the ERP system. When the receipt is sent to the student's email address, information from the receipt is automatically registered in the ERP system within 2 to 3 days.

Amounts exceeding 30,000 KRW must be handled through an electronic tax receipt (suppliers with tax privileges must attach a copy of their business registration certificate). Amounts below 30,000 can be handled through ordinary receipts but it is recommended that students use electronic tax receipts as much as possible as the total amount billable by ordinary receipts is limited. Even when handling these matters through ordinary receipts, payment must be directly remitted to the supplier issuing the receipt and not made through a personal card.

After purchasing necessary supplies, electronic receipts or electronic tax receipts for billing must be obtained and the purchase drafted as a 'direct purchase' in the ERP system. A copy of the drafted document and the electronic receipt or electronic tax receipt must be submitted to the department office in an attachment. When the total amount goes above 3 million KRW, transaction details must be attached as a file when drafting the direct purchase in the ERP system.

B. Purchase through central warehouse (Daedeok Science)

The majority of supplies necessary for academic life within the institute can be purchased at the central warehouse (extension 2135-2136). Available supplies include reagents, building materials, tools, and other laboratory equipment.

Purchases from the central warehouse should be handled by composing the purchase statement using the 'print statement' menu in the ERP system and obtaining approval from the account manager. Purchases can also be handled through electronic tax receipts or by using KAIST corporate cards.

C. Purchases on the internet

Supplies can also be purchased on the internet, but purchases above 300,000 KRW require the use of the school's accredited certificate. Such purchases can be made upon inquiry to the administrative staff in charge (Bo Bin Kim, extension 3903).

2) Purchases of above 10 million KRW, or of imported supplies

A. Supplies and equipment produced domestically

After obtaining a quote from a supplier, the purchase request should be drafted on the ERP system. The drafted document and quote, and an explanation of the usage of the supplies, should then be submitted to the department office.

B. Supplies and equipment produced overseas

After checking the price of the necessary supplies with the supplier, the purchase request should be drafted on the ERP system. The drafted document, a letter explaining the special need, and an explanation of the usage of the supplies should be submitted to the department office. As the purchase of laboratory equipment from overseas usually takes more than 3 months, preparations should be made beforehand.

3) Account for renovation works

A. Prohibition of appropriation and unapproved use of account

Renovations and construction of electrical, water supply, HVAC, and gas facilities for the installation of equipment or structure modification of the laboratory must be done using the correct account for usage; accounts must not be appropriated for other uses or used without approval.

B. Procedures related to construction

Serious problems can arise if construction or facility renovations are carried out autonomously by the laboratory without obtaining prior approval. When renovation or construction is needed, prior inquiry should be made to the person in charge of the department office (Jang Bok Lee), regardless of costs incurred; renovation or construction should be carried out under procedures defined in school regulations.

4) Types of cards by usage

- A. Card for research funding: Ministry of Education, Science and Technology projects, Rural Development Administration projects, Ministry of Culture Sports and Tourism projects (Shinhan card) / Ministry of Knowledge Economy project, Ministry of Land, Transport and Maritime Affairs projects (BC card) / BK projects.
 - B. KAIST corporate card for research funding: Other research projects (industrial entities, (KAIST) department operated, (KAIST) education and student support, KAIST scholarship, accumulation of research resources, research incentive account, balance management etc.).
 - C. Corporate clean card: All accounts excluding research funding.
 - D. Woori BC card: Technology Business Incubation Center projects
 - E. When personal cards have to be used, letters of explanation signed by the user, the account manager, and the department head have to be submitted
 - F. Minutes signed by the account manager should be attached to a request for the meeting fee.
- ※ All card payments are registered automatically on the ERP system and the 'approval number' and 'amount' can be searched 2-3 days after payment to look up payment information and handle research costs.

14. Administrative Team for the Department of Chemical and Biomolecular Engineering

- Location/ Contact: **Applied Engineering Building Rm. 2102 / Tel: 042-350-3902~4, FAX: 042-350-3910**
- Staff: Team leader Gyu Young Song (3999), Hyunsook Lim (3902, academics), Bo Bin Kim

(3903, funding), Chae Bin Song (3904, academics), Jang Bok Lee (3909, technical support), Hyun Sook Lee (8404, BK+ project)

- Korean address: 34141, 대전광역시 유성구 대학로 291 KAIST 생명화학공학과
- English address: Dept. of Chemical & Biomolecular Engineering, KAIST, 291 Daehak-ro, Yuseong-gu, Daejeon, 34141, KOREA
- Department website: <http://cbe.kaist.ac.kr>

15. Designated Forms

Designated forms for various academic procedures such as leave of absence and modification of course registration, etc., can be downloaded from the 'Forms' menu under the 'Education' tab on the KAIST website.

Link: http://www.kaist.ac.kr/html/kr/edu/edu_030308.html

16. Emergency Contact Numbers

Safety Team & Campus Police	4000 /0119
Health Management System	2175
Building repairs (doors, windows, ceiling leaks, etc.)	3100
Machinery (Heating, AC, water supply, pressurized air- excluding individual heaters and air conditioners)	3200
Electric facilities (lights, power switches, blackouts, etc.)	3300
Entry restriction system/Entrances/Card Keys and IDs	8000

[Appendix]

Laboratory Safety Regulations

Laboratory safety regulations must be adhered to in order to prevent loss of life and property damage from dangerous accidents, and to carry out experiments efficiently.

All actions that go against these principles can become causes of accidents and increase the risk of accidents.

The first step to accident prevention is adherence to all safety principles.

Laboratories in the Department of Chemical and Biomolecular Engineering contain a large number of risk factors such as chemicals, pressurized gas, and electrical equipment, any of which could lead to large scale accidents. Special care is needed from participants in research activities.

Students must always keep in mind that safety regulations and precautions are not just for their own safety but also for the safety of others. Safety regulations should be internalized and students must always adhere to various regulations required for the use of major research facilities, such as cleaning up after experiments.

1. Those involved in accidents or those who discover accidents must report such accidents immediately to the KAIST disaster prevention center (Campus Police- extension 4000/0119) and the department office. No accident, regardless of how minor, should be ignored. All accidents regardless of occurrence during working hours or outside of working hours, however minor, should be immediately reported to the department's staff in charge of safety (Jang Bok Lee 3909/010-9793-5588) so that directions for follow-up measures can be given.
2. Those involved in accidents or those who discover accidents should do their best to carry out emergency measures and responses until the arrival of the Campus Police or external support staff and equipment.

In the event of accidents such as substance leakage, gas leakage, or fires, which pose safety risks, the accident should be made known in the surrounding area and instructions for evacuation should be given. Evacuation to a safe place should take place as soon as possible after the area has been closed off.

In the event of fire, elevators should not be used and evacuation stairs should be used for rapid escape.

3. In the event of a major disaster or an event requiring the rescue of human lives, reports should be made simultaneously to campus extension **4000 (Disaster Prevention Center)** and to the fire department at 119.
4. When emergency support is needed following the witnessing of fire, explosion, accidents during experiments, water leakage, and disasters during normal activities, report should be made to campus extension 4000 to receive guidance and support.

5. On campus emergency numbers are as follows.

- **Campus extensions 4000/0119 (Disaster Prevention Centre), 2500 (Fire and Rescue), 3000 (Night Duty Office).**
- **Department Administration Team (3902-4).**
- **Campus extensions 3909 / 5181 (Jang Bok Lee), 010-9793-5588 (Nighttime).**
- **Major disasters and accidents requiring emergency rescue and ambulance transportation should be reported simultaneously to 119 and to campus extension 4000.**

Usage of Extinguishers and Fire Hydrants

Extinguishers are located in the corridors and at the entrances of laboratories. All users should be well informed of their locations and of operation methods, so as to enable effective use in the initial stages of fire.

Extinguishers are operated in the following order.

1. Pull out the safety pin of the extinguisher.
2. Point the hose at the fire (When there is wind, make sure person's back is facing the direction from which the wind is blowing).
3. Hold the extinguisher handle tightly to spray.

Hydrants are facilities that combat fires in the initial stage by supplying water. They are located in corridors and passages. They should be used according to guidelines written on the cover of the hydrant container.

The Fire Alarm Call Point located on top of the hydrant should also be pressed to notify the disaster prevention center and the entire building of the fire.

Safety Rules for Chemicals

1. All containers holding substances should be used with the designated labels attached. Substances in unlabeled containers and unidentified substances should be disposed of.
2. Before any use of equipment of substances, MSDS should be utilized in the handling of all materials to ensure full understanding of substance properties, methods of handling, and potential dangers.
3. Reagents should have an information label attached that shows the purchase date, date opened, and user.
4. Inflammable or toxic reagents must be handled under the fume hood.
5. Metal powders and alkaline metals carry the risk of explosion and are prohibited from use near water supply facilities as well as in wet environments; these materials must be kept away from moisture during storage.

6. Leaked white phosphorus should be handled using wet sand or absorbents.
7. Leaked mercury should be covered with sulfur powder; the droplets should be collected separately for disposal.
8. When acidic chemicals are leaked, they should first be covered with Na_3PO_4 or sand and then neutralized with NaHCO_3 solution or powder.
9. When chemicals in paragraphs 2~7 are located within the laboratory, they should be listed in the reagent management file kept in the laboratory. The Material Safety Data Sheet (MSDS) for the relevant substances should be provided within the laboratory.
10. When an experiment is over, chemicals should be stored in the storage locker, organized according to chemical properties; the surroundings should be tidied up.
11. Designated waste must never be disposed of in a sink. Waste liquids and empty bottles must be separated according to chemical properties, packaged or placed in containers according to their classifications, and disposed in the designated area after the registration at the Portal board.
12. When disposing of waste, a designated sign containing the relevant information enabling the contents to be identified must be attached.
13. Waste disposal must be carried out in teams of two and waste must be transported and handled in a safe manner that protects it from external shocks and prevents overloading and liquid leakage.

Disposal of Chemical Substances and Containers

1. Various reagents, substances, containers, plastic, glass, and needles used in the laboratory must be emitted or disposed of according to designated procedures. When substances to be disposed of are registered beforehand on the Safety Team website, a team will be sent to the laboratory to collect the waste reagents and other experimental waste.

For large scale disposal or handling of special substances and waste, the department office or the safety team should be contacted.

2. Gloves used in experiments must not be mixed into ordinary waste during disposal and must be handled in the same manner as waste substances and waste reagents.
3. On the date of a waste collection visit, designated waste must be packaged according to type and placed in the corridor outside the entrance to the laboratory before 9 am. Before disposal, waste liquids and substances must be given designated labels containing relevant information.
4. So that waste can be properly collected, external container for waste must be labeled with a sticker showing waste type, substance name, laboratory name, person in charge, etc.

Procedure for Medical Waste Disposal

1. Classification of medical waste

- ◇ Organic tissue– animal bodies, human blood, pus, and other blood products.
 - ◇ Contagious waste – Cultivation liquids used in tests and examinations, cultivation containers and strains, waste test tubes, slides, cover glass, gloves, culture substrates.
 - ◇ Damaged waste – injection needles, acupuncture needles, broken glass equipment.
 - ◇ Biochemical waste – waste vaccines, waste cancer treatments, waste chemotherapy treatments.
 - ◇ Ordinary medical waste – gauze and cotton containing blood, bodily fluids, secretions and fecal matter.
2. Medical waste must be put into designated specialized containers or packaging and disposed of at the entrance of the laboratory after prior declaration according to procedures identical to those used for designated waste. The waste will be collected for disposal on the designated date.
 3. If medical waste is disposed of without declaration or not in compliance with designated packaging and storage methods, the adviser (research director) can be penalized or fined according to relevant laws.
 4. Specialized medical waste containers must be labeled with the disposer’s name, contact information, and date of first usage and disposed of in the collection container after being attached with an RFID Tag denoting waste type. When containers are used or disposed of without proper labelling, the director of the research laboratory can be fined up to 3 million KRW according to relevant laws by government institutions.
 5. Date of first usage on specialized containers refers to the date on which waste was first put into the container. The date of collection need not be recorded. The maximum period from first usage to container disposal cannot exceed 10 days for solid, liquid, isolation, and organic tissue waste and 15 days for damaged waste. When this limit for disposal is exceeded, penalization or fines can be imposed according to relevant laws, in a manner identical to that shown in paragraph 4.
 6. Individual protection gear including masks and protective gloves must be worn when handling medical waste.

Precautions

All waste must be handled according to regulation procedures and methods; failure to comply will result in sanctions from related institutions, government employees, or staff in charge. In the case of failure to comply with national laws, the research director (adviser) shall be charged with fines as defined by law. Thus, waste disposal must be conducted in compliance with regulations.

Safety Rules for Pressurized Gas

1. Soapy water should be used to test connecting areas frequently for leaks.
2. Gas containers should be fastened with belts and storage holders to prevent them from falling over.
3. Exposed power outlets or electrical devices should not be installed near gas containers.
4. Flame devices should not be used near dangerous substances or inflammable or explosive gases.

5. When strange smells are detected, the room should be ventilated immediately by opening the windows. The smell should be traced to the source and tests should be conducted. The disaster prevention center (extension 4000) should also be contacted and given a detailed report.
6. When inflammable, combustible, and explosive gases are present in the laboratory, the gas management file should be used to record all incoming and outgoing gas supplies. Frequent safety checks should also be carried out.
7. Where leakage detectors and alarms have been installed, the operational status of the devices should be checked daily together with the state of gas containers.

Other Safety Rules

1. Covering for electrical circuitry and connecting cords for laboratory equipment should not be made of PVC materials. Requests for technical examination and support should be made to the staff in charge of department facilities and safety for power supply, water supply, and gas facilities for major equipment.
2. Waste bins should be made of steel (PVC materials must not be used).
3. Slippers or sandals must not be worn in the laboratory.
4. Food and alcohol must not be consumed in the laboratory.
5. Designated safety equipment such as laboratory gowns, masks, protective gloves, and protective goggles must be worn when conducting experiments in the laboratory.

Handling of Unused Asset Type Supplies (Disposal)

A form containing the name of the laboratory, name of supplies, and asset number should be submitted to the administrative staff (Jang Bok Lee, extension 3909); supplies should be kept in the basement or in a designated storage area.

According to the Waste Control Act, furniture, steel products, and structures without asset numbers cannot be disposed of together with ordinary waste and must be disposed of under prior consultation and direction from the department staff (Jang Bok Le, extension 3909).

Safety Education and Certification

1. Safety education is carried out in monthly courses, regular courses, and special courses.
2. Monthly safety education is carried out online on the Safety Team website; all information regarding an individual's completion of education can be accessed under "My-menu" on the same website.
3. Monthly education is carried out under the 『Law on Laboratory Safety』 and there must be at least 1 hour of the education completed each month. Individual education completion requirements are 360 minutes (6 hours) in the first half of the year and 360 minutes (6 hours) in the second half of

the year. Results of individual education completion are reflected in lab evaluation and department evaluation; thus, every individual must complete the designated education hours.

4. Other regular and special education courses are carried out under a separate schedule and students must participate when notified. When the hours as specified in paragraph 3 for monthly education are not fulfilled, other regular or special courses can be completed to make up the hours.
5. All students must pass the laboratory safety certification examination before being allowed to enter laboratories. As is mandatory under relevant laws, the names of failing students are publically announced and these students may be restricted from entering laboratories when necessary.
6. The safety certification examination is conducted online twice annually, in March and September.
7. Those who pass the certification examination shall print out the certification for safety education and display it on the designated notice board outside the laboratory entrance.
8. Although the certification examination can be retaken, failure to obtain certification within the designated number of attempts or failure to take the examination shall be announced by the Safety Team (Certification Examination Dept.) to the department and adviser.
9. Students who enter the certification program without having obtained safety certification can be penalized in the event of accidents or other issues; such students may be placed under restrictions for future research and experimental activities.
10. Online education and tests should be conducted on the Safety Certification Center website <http://safetest.kaist.ac.kr>.

SAFETY FIRST! SAFE CBE!

Laboratory Rules

Safety begins with preparedness and organization

- 1. Laboratory gowns, protective goggles, and gloves must be worn in the lab.**
- 2. Read through course materials to fully understand the contents and methods before any experiment.**
- 3. Plan experiments beforehand so that they can begin and end on time.**
- 4. Check the location and operation methods of extinguishers and safety devices within the lab beforehand.**
- 5. Check reagents and equipment before and after experiment, comparing them against the contents of the course materials.**
- 6. Conduct all experiments with a serious attitude.**

- 7. Operate lab equipment according to the rules of operation.**
- 8. Do not directly smell or taste any substance.**
- 9. Do not place a reagent back into its bottle once it has been extracted or used.**
- 10. Inflammable or toxic reagents shall be used under instruction of lab TAs or seniors. These materials may also be handled in the fume hood after reporting to the TA or to a senior student.**
- 11. When abnormalities occur during an experiment, take emergency procedures and report the incident to a senior student, TA, or experiment manager.**
- 12. In case of accidents, use the eyewash or emergency shower, depending on the situation.**
- 13. Wash and organize all lab equipment at the end of every experiment and thoroughly check all facilities such as gas, electricity, water, and other equipment.**