

# Information Session on CHEM Options and Capstone (For Student Cohort of 2015/16)

Date: Nov 13<sup>th</sup>, 2017

# Outline

- Requirements for the B.Sc. Degree in Chemistry
- Introduction of the Four Chemistry Options
- How to fulfill the Option requirements
- Capstone Projects
- Q & A

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# B.Sc. Degree in Chemistry

- University requirement for a B.Sc. degree: **min. of 120 credits**
- B. Sc. (Chemistry): **~108** credits (+ ~12 credits in free electives, minor, etc)
- B.Sc. (Chemistry with an **Option**): **121** credits
- *The requirements for students with in the **IRE track** are different from above.*

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# The Four Chemistry Options (14 credits)

- (1) Pure Chemistry Option
- (2) Biomolecular Chemistry Option
- (3) Materials Chemistry Option
- (4) Environmental and Analytical Chemistry Option

*(2 Lab Courses + 4 Chem Electives = 14 credits total)*

# (1) Pure Chemistry Option

Advanced study in **Fundamental Chemistry** plus in any **area of YOUR CHOICE**.

## Requirements

- **CHEM 4550** *Advanced Synthetic Laboratory (1)*
  - **CHEM 4555** *Advanced Molecular Characterization Laboratory (1)*
  - **CHEM 4430** *Symmetry in Chemistry and Spectroscopy (3)*
- + **THREE** other **Chemistry Electives (9)** in any area of your choice: organic, inorganic, physical, or analytical chemistry, or other specialized areas

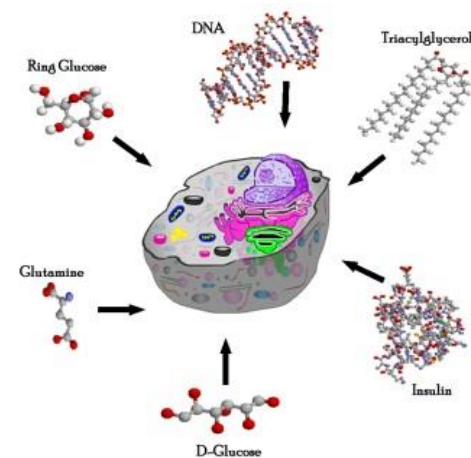
## Career prospects

- Chemistry (e.g. chemists, environmental protection, food industry, pharmaceutical companies, education, etc.)
- Further post-graduate study (chemistry, environmental science, biochemistry, chemical engineering, etc.)

# (2) Biomolecular Chemistry Option

## Things you will learn:

- DNA & RNA, proteins, carbohydrates and lipids
- Their structure, reactivity, detection, analysis
- Drug-target interaction: how structure is linked to activity
- Strategies for drug discovery and optimization



## Career Perspectives

- Graduate schools (Chemistry, Medicinal Chemistry, Biochemistry)
- Health care
- Medical school
- Pharmaceutical Industries
- Biotech Companies





## (2) Biomolecular Chemistry Option

### Lab courses:

- **CHEM 4150 Biomolecular Synthetic Laboratory (1)**
- **CHEM 4155 Biomolecular Characterization Laboratory (1)**

### Core CHEM Electives: (6 – 12)

- **CHEM 4110 Structural Elucidation in Organic Chem (3)**
  - **CHEM 4120 Biomolecular Chemistry (3)**
  - **CHEM 4130 Medical Chemistry (3)**
  - **CHEM 4340 Bioanalytical Techniques (3)**
- Take at least two

### Other CHEM electives: (0 – 6)

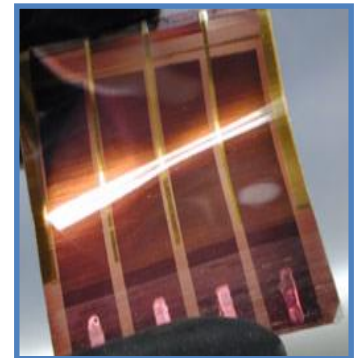
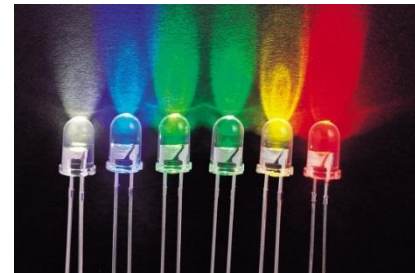
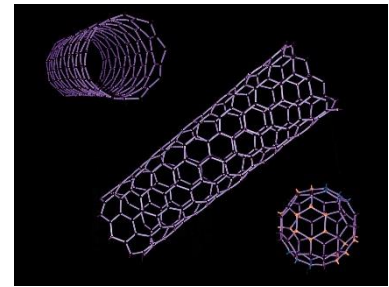
# (3) Materials Chemistry Options

## Things you will learn:

- Structure-property relationships in new, innovative materials
- Nanostructured materials, light emitters, conductive polymers, liquid crystals, plastic solar cells
- Design, synthesis and applications of these materials

## Career Perspectives

- Technological Companies
- Graduate school
- Research and Development
- Manufacturing industries



# (3) Materials Chemistry Options

## Lab courses:

- **CHEM 4250 Materials Preparation Laboratory (1)**
- **CHEM 4255 Materials Characterization Laboratory (1)**

## Core CHEM Electives: (6 – 12)

- **CHEM 4210 Solid State Chemistry (3)**
- **CHEM 4220 Materials Chemistry (3)**
- **CHEM 4230 Materials Characterization Method (3)**
- **CHEM 4640 Chemistry for Advanced Solar Cell Technologies (3)**

Take  
at least  
two

## Other CHEM Electives (0 – 6)

# (4) Environmental and Analytical Chemistry Option

## Things you will learn:

- Modern analytical techniques
- Chemical phenomena in water, soil and atmosphere
- Treatment of pollutants and waste
- Environmental monitoring

## Career Perspectives

- Testing and Certification labs
- Consumer products
- Government labs
- Food Safety
- Environmental Protection



## (4) Environmental and Analytical Chemistry Option

### Lab courses:

- **CHEM 4350 Environmental Chem Lab (1)**
- **CHEM 4355 Instrumental Analytical Chem Lab (1)**

### Core CHEM Electives: (6 – 12)

- **CHEM 4310 Environmental Chemistry (3)**
- **CHEM 4320 Environmental Analytical Chemistry (3)**
- **CHEM 4330 Separation Science (3)**
- **CHEM 4340 Bioanalytical Techniques (3)**

Take at least  
two

### Other CHEM Electives: (0 – 6)

# Suggested Study Pathway for B.Sc. in Chemistry (without an Option)

## Year 1

### *Fall (12):*

Gen. Chem. I (2)  
Gen. Chem. Lab I (1)  
Calculus I (3)  
Science (3)  
Eng. (3)

### *Spring (16):*

Gen. Chem. II (3)  
Gen. Chem. Lab II (1)  
Calculus II (3)  
Eng. (3)  
U core (3)  
Science (3)

## Year 2

### *Fall (17):*

Org. I (3)  
Org. Lab (1)  
Inorg. I (3)  
Inorg. Lab (1)  
Math (3)  
U core (3)  
Eng. (3)

### *Spring (17):*

Org. II (3)  
Inorg. II (3)  
Syn Lab (2)  
Computer (3)  
U. Core (6)

## Year 3

### *Fall (17):*

Fund. An. Chem. (3)  
P. Chem. I (3)  
An. Chem. Lab (1)  
P. Chem. Lab (1)  
Science (3)  
U core (6)

### *Spring (12):*

Inst. Analysis (3)  
P. Chem. II (3)  
MC Lab (2)  
Eng. (1)  
U core (3)

## Year 4

### *Fall (11):*

Capstone (3)  
CHEM Elective (3)  
Eng (2)  
U core (3)

### *Spring (6):*

U core (3)  
U core (3)

**Total: ~108 credits (+ other FREE Electives to make up to 120 credits)**

# Suggested Study Pathway

## for B.Sc. in Chemistry (with an Option)

### Year 1

*Fall (12):*

Gen. Chem. I (2)  
Gen. Chem. Lab I (1)  
Calculus I (3)  
Science (3)  
Eng. (3)

*Spring (16):*

Gen. Chem. II (3)  
Gen. Chem. Lab II (1)  
Calculus II (3)  
Eng. (3)  
U core (3)  
Science (3)

### Year 2

*Fall (17):*

Org. I (3)  
Org. Lab (1)  
Inorg. I (3)  
Inorg. Lab (1)  
Math (3)  
U core (3)  
Eng. (3)

*Spring (17):*

Org. II (3)  
Inorg. II (3)  
Syn Lab (2)  
Computer (3)  
U. Core (6)

### Year 3

*Fall (17):*

Fund. An. Chem. (3)  
P. Chem. I (3)  
An. Chem. Lab (1)  
P. Chem. Lab (1)  
Science (3)  
U core (6)

*Spring (15):*

Inst. Analysis (3)  
P. Chem. II (3)  
MC Lab (2)  
Eng. (1)  
U core (3)  
Opt. Chem Elective (3)

### Year 4

*Fall (13):*

Capstone (3)  
Eng (2)  
U core (3)  
Opt. Adv. lab (1)  
Opt. Adv. Lab (1)  
Opt. Chem Elective (3)

*Spring (12):*

U core (3)  
U core (3)  
Opt. Chem Elective (3)  
Opt. Chem Elective (3)

**\*NOTE: we suggest to start taking Option Chem Elective courses from Spring semester of Year 3**

**Total: 121 credits**

# How to declare a Chemistry Option?

□ In Mid-August, 2018 (Course Registration Period)

You **MUST** submit *Course Enrollment Requests via SIS* for the corresponding **Option Lab courses**:

- *Pure CHEM Option: CHEM 4550 and 4555*
- *Biomolecular Option: CHEM 4150 and 4155*
- *Materials Option: CHEM 4250 and 4255*
- *Env. & An. Option: CHEM 4350 and 4355*

- Depending on lab capacity, we might selectively approve students based on their CGA ranking.
- **Successful enrollment into the lab courses means you have declared the Chemistry Option and are eligible to fulfill that Option.**
- For the **required CHEM Elective courses**, you need to register them by yourself.  
(**Advice:** You may consider taking some of the CHEM Electives starting from **Spring semester of Year 3**)



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# CHEM Capstone Courses

- **ALL CHEM students** (*w or w/o Options*) may choose:

1) CHEM 4689\* - Capstone Project (3-credits)

OR

2) CHEM 4691\* - Capstone Research I (3-credits)

\**Language Co-requisite course: LANG 4012*

# CHEM 4689 – Capstone Project

- Offered in Fall and Spring only
- **Instructor's approval** needed prior to course enrollment.
- **Course Requirements:**
  - (i) Library Workshops (use of data base, referencing, structure drawing, poster design)
  - (ii) Consultation Sessions
  - (iii) Literature Review Report
  - (iv) Oral Presentation
  - (v) Poster Presentation

# CHEM 4691 – Capstone Research I

- Offered in Fall, Spring and Summer semesters
- Conducted in a **Research lab** under the guidance of a **research faculty supervisor**.
- **Instructor's approval** needed prior to course enrollment.
- **Course Requirements (*tentative only*):**

9 hrs per week
Lab Participation (50%)
Research Thesis (30%)
Oral Presentation (20%)

# Timeline for Selection of Capstone Projects

## Feb - March 2018:

If you plan to take **CHEM 4691 – Capstone Research:**

- ❑ - Browse our Departmental Website for the research areas of our faculties.
- ❑ - Meet with target faculties to learn more about their current research projects.
- ❑ - Complete **On-line Safety Training and Exam from HSEO** (further details will be annouced in Feb 2018)

**Early April:** submit a form to indicate your choices of Capstone courses/supervisors.

- ❑ **Put down 5 choices:** CHEM 4691 with names of research faculty, or CHEM 4689
- ❑ Attach a hardcopy of your HSEO Safety Certificate (for CHEM 4691 only)

**Late May 2018:** Announcement of Results

*Depending on availability, the earliest term to enroll into CHEM 4691 is Summer 2018.*

(Note: **CHEM 4691** is offered in **Summer, Fall & Spring**  
**CHEM 4689** is offered in **Fall & Spring only.**)



The Hong Kong University of Science and Technology  
Department of Chemistry

Form for Selecting Capstone Projects/Supervisors for Students in the BSc. in Chemistry Program (B4201)

\*This form is **to be** completed by ALL current Year-3 students (for academic year 2015-16).

Student Name	HKUST Email
Student No.	Mobile Phone No.

To fulfill the Chemistry Capstone requirement, students admitted in 2013-14 cohort may choose from:

3-credit CHEM4689 - 'Capstone Project' (conducted in a Teaching Laboratory)

OR

3-credit CHEM4691 - 'Capstone Research I' (conducted in a Research Laboratory under the supervision of a Faculty member)

Please **LIST YOUR TOP FIVE CHOICES** of Capstone Courses and Supervisors in the table below.

IMPORTANT NOTE:

- 1<sup>st</sup> Choice being your *most preferred choice*.
- For CHEM 4691 *only*, please also indicate a Faculty supervisor's name.
- Each particular Faculty Supervisor can only be ranked ONCE (i.e., same supervisor cannot appear in more than one choice).

Choice	CHEM 4689 OR CHEM 4691	Faculty Supervisor's Name (for CHEM 4691 only)
1 <sup>st</sup> Choice		
2 <sup>nd</sup> Choice		
3 <sup>rd</sup> Choice		
4 <sup>th</sup> Choice		
5 <sup>th</sup> Choice		

\*\*\* Please **return the completed form in person** to Ms. Vera Tang of Chemistry General Office **by Friday, 15 April 2016** \*\*\*

# Further Information

- Dr. Emily Tsang, UG Coordinator  
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- Ms. Vera Tang, Chemistry General Office  
e-mail: [chvera@ust.hk](mailto:chvera@ust.hk)

Q&A