

# **BMEG4510: Biomolecular Engineering**

Course Introduction

Prof. Jonathan Choi

The Chinese University of Hong Kong

1<sup>st</sup> Semester of 2014-2015

# Instructor



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**Research interests:** Drug delivery, “bio-nano” interactions, nucleic acids, bionanomaterials, biological imaging

**Courses:** BMEG3210 (Biofluids), BMEG4450 (Bionanotechnology), BMEG4510 (Biomolecular Engineering)

# Tutors

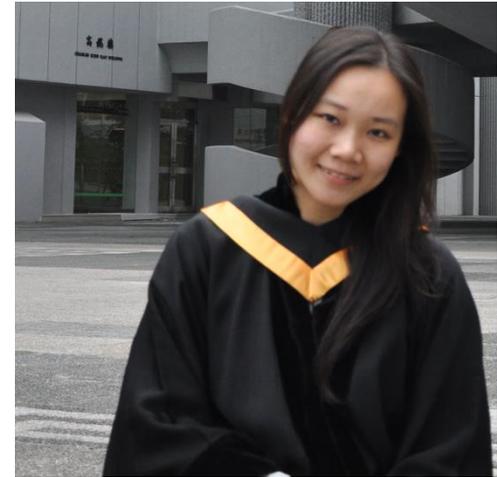
All tutors are current PhD students in biomedical engineering at CUHK, and are available for consultation during tutorials and by email.



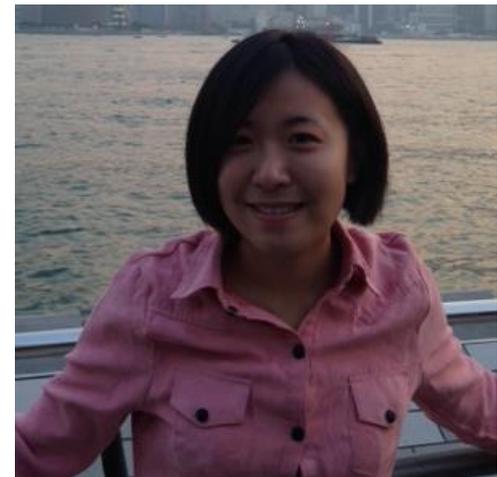
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# Timetable and venue

Meeting	Day	Time	Venue
Lectures	M	11:30 – 13:15	ERB 804
	W	12:30 – 13:15	ERB 401
Tutorial – <i>Session 1</i>	W	13:30 – 14:15	LPN LT
Tutorial – <i>Session 2</i>	W	13:30 – 14:15	LHC G04

## Notes:

1. Lectures are held weekly except during the mandatory lab sessions (to be explained).
2. Tutorials are not regular weekly sessions, and take place only when course needs arise (e.g., discussion of assignments, review for the midterm and/or final).
3. Instructor is available to meet with students by appointment.

# Arrangements for the lab session

<b>Group</b>	<b>Lab task</b>	<b>Date</b>	<b>Time</b>	<b>Venue</b>
A	Polymerase chain reaction	20/10/14	11:30 – 13:15	ERB 1112
A	Electrophoresis	22/10/14	12:30 – 14:15	ERB 1112
B	Polymerase chain reaction	27/10/14	11:30 – 13:15	ERB 1112
B	Electrophoresis	29/10/14	12:30 – 14:15	ERB 1112

## Notes:

1. Students will be divided into two groups, A and B.
2. When students in Group A have lab commitments in a certain week, students in Group B will attend lectures, vice versa.
3. The lab report is due Monday of the following week.

# Assessment

<b>Task</b>	<b>Due Date</b>	<b>Weight</b>	<b>Remarks</b>
Assignment 1	29/09/14	5%	
Midterm	13/10/14	35%	Closed-notes; in-class
Lab Report	27/10/14 or 03/11/14	15%	5% for lab performance 10% for the report
Assignment 2	17/11/14	5%	
Final	Exam period	40%	Closed-notes

## Notes:

1. Assignments and lab report are due at the beginning of Monday lectures. Unjustified late submissions will receive zero credit.
2. The 1.5-hour midterm will cover topics up to Week 6.
3. The 3-hour final will emphasize topics covered after the midterm as well as untested topics before the midterm.

# Objectives

1. Understand the basic concepts and terminology in (bio)molecular engineering (biology + engineering).
2. Cite examples to learn fundamental thought processes.
3. Gain practice in using scientific literature.
4. Learn about practical approaches and limitations.

## Learning strategies

1. Reveal breadth rather than depth.
2. Use many different examples.
3. Hold lab sessions and assignments to reinforce concepts.
4. Practice understanding journal articles.

# Topics

<b>Chapter</b>	<b>Topic</b>
1	Basic classes of biomolecules
2	Central dogma and gene regulation
-- MIDTERM --	
3	DNA engineering
4	Protein engineering

## **Notes:**

1. Lecture slides will be posted on the eLearning System in advance.
2. Supplementary notes will also be posted periodically.

# References

- **Molecular Biology:**
  - Robert F. Weaver (McGraw Hill, 2<sup>nd</sup> edition)
- **Biochemistry:**
  - Jeremy M. Berg, John L. Tymoczko, Lubert Stryer (W. H. Freeman, 5<sup>th</sup> edition)

Reference books are placed under reserve at the University Library and can be borrowed for a maximum of 24 hours.

- **Collection of published papers**

**NOTE:** The midterm and final will cover lecture notes. Optional reference readings serve as reinforcement to lecture presentations.

# Expectations for students and teachers/ tutors

## Teachers/tutors → Students

1. Provide a positive, respectful, and engaged academic environment inside and outside the classroom;
2. Organize regularly scheduled courses without undue variations, and offer adequate make-up classes to cover missed materials due to the leave of absence of the teacher and cancellation arisen from emergency situations;
3. Review assignments according to fair guidelines and in a timely fashion

## Students → Teachers/tutors

1. Fully attend class activities punctually with the exception of formal pre-approved excused absence or emergency situations;
2. Avoid phone-calls or conversations unrelated to lecture topics;
3. Be prepared for class and appear with appropriate materials and completed assignments;
4. Act with integrity and honesty (<http://www.cuhk.edu.hk/policy/academichonesty>)