

# LIFS 5240 Molecular and Developmental Neurobiology

(2017/18 Fall Semester)

## 1. Instructor(s)

*Name:* Dr. Amy Fu

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*Name:* Dr. Kim Chan

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*Name:* Dr Weimin Zhong (Guest Lecturer)

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## 2. Teaching Assistant(s)

*Name:* NA

*Contact Details:*

## 3. Meeting Time and Venue

*Lectures:*

**Date/Time:** Mon/Wed/Fri 10:00-12:50

**Venue:** Room 5506, Lifts 25/26 (Mon)

Room 1504, Lifts 25/26 (Wed & Fri)

*Tutorials:*

**Date/Time:** NA

**Venue:** NA

## 4. Course Description

Credit Points: 3

Pre-requisite: NIL

Exclusion: NIL

Brief Information/synopsis:

This course will cover fundamental concepts of neural development and plasticity, providing basic background and up-to-date progress in specific areas. Topics include neurogenesis and brain patterning, neuronal migration and axon guidance, formation and plasticity of synapses, learning and memory, and diseases of the nervous systems. Emphasizes will be on the cellular and molecular basis of development

and functioning of nervous systems, and how alternation of these processes lead to neural disorders.  
Enrollment limited to graduate students.

### Intended Learning Outcomes

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

No.	ILOs
1	Acquire in-depth and up-to-date knowledge in the field of molecular and developmental neurobiology
2	Develop expertise in advanced methodologies and technologies employed in Neuroscience
3	Students will be able to critically assess and evaluate new research ideas, communicate effectively with scientific community on advanced neuroscience research topics, and formulate ideas
4	Students will attain understanding of the principles and applications of the major cutting-edge methodology and experimental design in molecular and developmental neurobiology and be able to apply them in the student-led research

### 5. Assessment Scheme

a. Percentage of coursework, examination, etc.:

Assessment	Assessing Course ILOs
40% presentation	1-4
60% Class Participation	1-4

b. The grading is assigned based on students' performance in assessment tasks/activities.

### 6. Student Learning Resources

Recommended Reading:

- (1) Kandel et al: Principles of Neural Science (5th Edition, McGraw-Hill)
- (2) Sanes et al: Development of the Nervous System (Academic Press)
- (3) Sheng et al: The Synapse (Cold Spring Harbor Perspectives in Biology)

### 7. Teaching and Learning Activities

Scheduled activities per session: 3 hrs (lecture + tutorial)

## 8. Course Schedule

<b>Date</b>	<b>Content</b>	<b>Instructor</b>
Sep 4 (Mon)	Neuron Migration	Fu
Sep 13 (Wed)	Molecular Approaches to Neural Development & Neural Induction	Zhong
Sep 15 (Fri)	Embryonic & CNS Patterning	Zhong
Sep 22 (Fri)	Cell Fate Determination through Lineage Dependent Mechanisms	Zhong
Sep 25 (Mon)	Cell Fate Determination through Cell-Cell Signaling	Zhong
Oct 9 (Mon)	Axon development	Fu
Oct 16 (Mon)	Synapse Development and plasticity	Fu
Oct 23 (Mon)	Molecular and cellular basis of neurodegenerative diseases	Fu
Oct 30 (Mon)	Ion Channels, Sensations and Pain	Chan
Nov 6 (Mon)	Glutamate Ionotropic Receptors in CNS Functions	Chan
Nov 13 (Mon)	Optogenetics - Mapping and Control of Neuronal Circuit	Chan
Nov 20 (Mon)	Grid Cells, Place Cells and Memory	Chan
Nov 27 (Mon)	Functional roles of Glial cells in the nervous system	Chan