

LIFS2040: Introduction to Cell Biology (Spring 2018)

Course Instructors:

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Entry level: A level Biology or with permission of the Course Director

Course schedule: Monday 10:30 – 11:50 in LT-A
Wednesday 10:30 – 11:50 in LT-A

Course objectives: This course aims to introduce students to some of the fundamental features of eukaryotic cells by emphasizing experimental approaches to studying cell biology.

Learning Outcomes: Upon completion of this course students will be able to:

Describe and comprehend important features and functions of the cell nucleus as they relate to gene organization, DNA replication, protein synthesis and regulation of cell division.

Describe how the amino acid sequences of proteins facilitate protein folding and protein targeting within the cell.

Describe the features and functions of the endomembrane transport machinery that comprise the endocytic and exocytic membrane trafficking pathways.

Describe features of biological membrane structures and their transport mechanisms.

Describe important features of the cytoskeleton as well as basic mechanisms of cell communication and cell division.

Understand the experimental basis / techniques employed in modern cell biological research.

Course Assessment: Two examinations:

Midterm Exam (Exam I) 35% (1 hour 20 minutes) (Banfield)

Final Exam (Exam II) 65% (3 hours; 15% Banfield / 50% Guo)

Recommended Text Book: *Essential Cell Biology*, 4th edition, by Alberts *et al.*
(2014, Garland Publishing Co.).

Reference Books: *The Cell: A Molecular Approach*, by Cooper and Hausman. (2006, ASM Press).
The World of the Cell, 7th edition by Becker *et al.* (2008, Pearson Press).
Molecular Cell Biology, 6th edition by Lodish *et al.* (2008, Freeman Press).

LIFS2040: Cell Biology (Spring 2018)**Course Calendar:**

Date	Topic	Instructor
5 February	Course Overview / Cells: their properties and behaviours	Banfield
7 February	The composition of cells	Banfield
12 February	How do we study cells?	Banfield
21 February	The organization of cellular genomes I	Banfield
26 February	The organization of cellular genomes II	Banfield
28 February	The structure of eukaryotic chromosomes	Banfield
5 March	Biological membranes	Banfield
7 March	How molecules cross biological membranes: Pumps, transporters and channels	Banfield
12 March	How cells target proteins to membranes and organelles I	Banfield
14 March	How cells target proteins to membranes and organelles II	Banfield
19 March	Autophagy, Unfolded protein response, nutrient sensing	Banfield
21 March	Midterm 35% (covers material up to March 7)	Banfield
26 March	The nucleus	Guo
28 March	Vesicular traffic, secretion and endocytosis I	Guo
9 April	Vesicular traffic, secretion and endocytosis II	Guo
11 April	The cytoskeleton and cell movement I	Guo
16 April	The cytoskeleton and cell movement II	Guo
18 April	Mechanisms of cellular communication	Guo
23 April	The cell-division cycle	Guo
25 April	Sexual reproduction and the power of genetics	Guo
2 May	The extracellular matrix	Guo
7 May	Cell communities and the formation of tissues and organs	Guo
9 May	Stem cell biology, cell biology and cancer	Guo