

LIFS2040: Introduction to Cell Biology (Spring 2017)

Course Instructors:

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

Course schedule: Monday 10:20 – 11:50 in LTB
Wednesday 10:20 – 11:50 in LTB

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% (1.5 hours) (Banfield)

Final Exam (Exam II) 65% (3 hours) (Banfield and 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 2017)**Course Calendar:**

Date	Topic	Instructor
1 February	Course Overview / Cells: their properties and behaviours	Banfield
6 February	The composition of cells	Banfield
8 February	How do we study cells?	Banfield
13 February	The organization of cellular genomes I	Banfield
15 February	The organization of cellular genomes II	Banfield
20 February	The structure of eukaryotic chromosomes	Banfield
22 February	Biological membranes	Banfield
27 February	How molecules cross biological membranes: Pumps, transporters and channels	Banfield
1 March	Midterm Exam (35%)	Banfield
6 March	How cells target proteins to membranes and organelles I	Banfield
8 March	How cells target proteins to membranes and organelles II	Banfield
13 March	The nucleus I	Guo
15 March	The nucleus II	Guo
20 March	Vesicular traffic, secretion and endocytosis I	Guo
22 March	Vesicular traffic, secretion and endocytosis II	Guo
27 March	Mechanisms of cellular homeostasis	Guo
29 March	The cytoskeleton and cell movement	Guo
3 April	Mechanisms of cellular communication I	Guo
5 April	Mechanisms of cellular communication II	Guo
10 April	The cell-division cycle	Guo
19 April	Sexual reproduction and the power of genetics	Guo
24 April	The extracellular matrix	Guo
26 April	Cell communities and the formation of tissues and organs	Guo
8 May	Stem cell biology, cell biology and cancer	Guo