



BIOB10Y: Cell Biology and Molecular Aspects of Genetic Processes

Dr. Aarthi Ashok
Department of Biological Sciences, UTSC
Course Syllabus
Summer 2013

Course description:

A course designed to introduce theory and modern experimental techniques in cell and molecular genetics. Emphasis will be on eukaryotic cells. First half topics include: Structure and function of major animal and plant organelles, the role of the cytoskeleton, the role of the plasma membrane and extracellular matrix in the context of cellular interactions with the environment. In the second half of the course, topics will include structure and function of the nucleus, DNA replication and cell cycle control, transcription and translation, gene regulation and signal transduction. Please note this course contains the content of both BIOB10H and BIOB11H.

Prerequisites: BIOA01H & BIOA02H & CHMA10H & CHMA11H

Exclusions: BIOB10H, BIOB11H, (BIOB10H), (BIOB10Y), (BIOB11H), BIO240H, BIO241H, (BIO250Y)

Time and Location:

Lectures: Thursdays 10am –noon in AC 223, **AND** Thursdays, 2-4pm in AC 223

Tutorials: Thursdays 4-5pm in AC 223 as listed below.

The thinking tutorials are MANDATORY; the review sessions are optional.

1. Thus, May 9th = Thinking Tut 1: “Thinking the impossible”
2. Thus, May 16th = Thinking Tut 2: “Pathogen exploits of the secretory pathway”
3. Thus, May 23rd = Review 1 = optional
4. Thurs, June 6th = Thinking Tut 3: “Artificial Tissues and Organs”
5. Thus, June 13th = Review 2 = optional
6. Thus, June 27th = Thinking Tut 4: “Telomeres & Longevity”
7. Thurs, July 11th = Review 3 = optional
8. Thurs, July 18th = Thinking Tut 5: “Genomic Imprinting”
9. Thurs, Jul 25th = Thinking Tut 6: “Personalized medicine & the treatment of Cancer”
10. Thurs, Aug 1st = Review 4 = optional

Textbook:

Cell and Molecular Biology: Concepts and Experiments, 6th edition (Wiley), Gerald Karp

Online Course resources:

Login and access the Blackboard site (<https://portal.utoronto.ca/webapps/portal/frameset.jsp>) for BIOB10Y for Summer 2013. This site will contain:

- The course syllabus – including a course description & schedule.
- Contact information for the instructor, TA and course coordinator.
- Important announcement regarding lectures, tutorials or course content – **please check this site regularly for any such announcements.**
- Lecture outlines (Powerpoint slides) will be posted 1 day prior to each class.

Note: these outlines will not contain ALL contents of the lectures. Please print out these lecture outlines, bring them to class and take additional notes on them during the class.

Course staff:

1. Instructor: Dr. Aarthi Ashok

Office hours: **Tuesdays, 2-3pm ; NOTE: these hours will be extended prior to term tests (please see BB for announcements)**

Office location: SW 521D

Email: aashok@utsc.utoronto.ca

- Please use only your UTSC/UToronto email address for correspondence.
- I will respond to email inquiries by email within 48 hours (in most instances) during the workweek (does NOT apply to weekends). If a question cannot be answered easily by email, I will send a reply to indicate to the student that they should attend my office hours.
- Email should NOT be used as an alternative to office hours or as a mechanism to receive private tutorials.
- Specific questions regarding prerequisites should be addressed to the course coordinator.

2. TA: Sadek Shorbagi: sadek.shorbagi@mail.utoronto.ca

- TA will check and answer email inquiries within 48 hours (does NOT apply to weekend).
- Please pose straightforward questions that can be readily answered by email communication.
- TA should be contacted for appointments regarding the optional assignment.

3. Course coordinator: Angela Jiang: ajiang@utsc.utoronto.ca

Office hours: Mon/Wed/Fri 10am – noon; Tues/Thurs 2pm-4pm

Office location: SW 421D

- Please contact Angela for:
 - Questions regarding course prerequisites or exclusions
 - Questions regarding exam conflicts
 - Questions regarding missing/missed exams (UTSC medical certificates)
 - Questions regarding viewing graded exams
 - Marks verification for term test and final exams
- Please consider attending Angela's office hours for detailed or complex questions.

Evaluation:

1. There will be **4 exams** in this course:
 1. Term test 1 (Lec 1-6): 2 hours -20% of final grade
 2. Term test 2 (Lec 6-12): 2 hours -28% of final grade
 3. Term test 3(Lec 13-18): 2 hours -20% of final grade
 4. Final exam (Lec 13-24): 3 hours -32% of final grade

The format of the exams may vary from all multiple-choice questions to a combination of short-answer and multiple-choice questions.

2. There will be an **optional assignment** in this course: Value = 14%. The assignment would be done in a group of 2 students only.

Assignment will involve reading 1 primary literature article (from a list provided by the instructor) that is related to a topic discussed in class. The students would then contact and record an interview with the scientists (one of the scientist authors) who performed the study detailed in the article. The students would make an edited soundclip of their own in-depth summary of the paper which should include implications for the field of cell biology and advances made by the study described in the paper, as well as segments of the interview with the scientist which will be posted on the course website for the educational benefit of the entire class. Think: podcast! This assignment will present a unique opportunity to learn more about a specific topic in cell biology and link it to real-world science. If students decide to take on this assignment, then the value of the 4 exams in the course **would change as follows:**

1. Term test 1 (Lec 1-6): 2 hours -18% of final grade
2. Term test 2 (Lec 6-12): 2 hours -23% of final grade
3. Term test 3(Lec 13-18): 2 hours -18% of final grade
4. Final exam (Lec 13-24): 3 hours -27% of final grade

Classroom Performance System (CPS) – *i-Clickers*

This technology enables better student-instructor interaction in a large class such as BIOB10Y through the use of a Radio Frequency Response Pad (commonly known as a "i-clicker"). Your responses — via the "i-clicker" — to questions will tell us when the class is having difficulty and will help you assess your learning. We can also use the system to give you sample test questions (not graded) to help you prepare for tests in this course. Your individual responses will NOT be shown in the classroom; only the aggregate (and anonymous) responses for the class will be displayed. **In order to participate in your lectures using the CPS, you will need to purchase an "i-clicker" from the UTSC Bookstore.** The "*i-Clicker*" will work in each course you take that uses this technology and can be retained from year to year if needed.

Accessibility Needs:

(text provided by Centre for Teaching and Learning, UTSC)

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. I will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or ability@utsc.utoronto.ca.

Academic Integrity:

(text provided by The Centre for Teaching and Learning, UTSC)

Please consult: <http://www.utoronto.ca/academicintegrity/resourcesforstudents.html>.

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's *Code of Behaviour on Academic Matters* (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to: **On tests and exams:** Using or possessing unauthorized aids. Looking at someone else's answers during an exam or test. Misrepresenting your identity. **In academic work:** Falsifying institutional documents or grades. Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes. All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. There are other offences covered under the Code, but these are the most common. *Please respect these rules and the values that they protect.*

Continued....

Course Schedule:

Lecture #	Date	
1	May 9 th 2013	COURSE INTRODUCTION; PROKARYOTES & EUKARYOTES
1	May 9 th 2013	STUDYING CELLS
2	May 9 th 2013	MACROMOLECULES IN CELLS
2	May 9 th 2013	PROTEIN STRUCTURE
ThinkingTutorial 1	May 9 th 2013	THINKING THE IMPOSSIBLE
3	May 16 th 2013	ORGANELLES IN CELLS
3	May 16 th 2013	THE ER: SECRETORY & MEMBRANE PROTEIN SYNTHESIS
4	May 16 th 2013	THE GOLGI: VESICULAR TRANSPORT & SECRETION
4	May 16 th 2013	PROTEIN SORTING & LYSOSOMES
ThinkingTutorial 2	May 16 th 2013	PATHOGEN EXPLOITS OF THE SECRETORY PATHWAY
5	May 23 rd 2013	PLASMA MEMBRANE: STRUCTURE
5	May 23 rd 2013	PLASMA MEMBRANE: FUNCTION
6	May 23 rd 2013	ENDOCYTOSIS & PHAGOCYTOSIS
6	May 23 rd 2013	STUDYING PROTEINS I
OptionalTutorial	May 23 rd 2013	REVIEW 1
		Midterm 1 for B10Y
7	May 30 th 2013	MITOCHONDRIA: STRUCTURE
7	May 30 th 2013	MITOCHONDRIA: FUNCTION
8	May 30 th 2013	CHLOROPLAST: STRUCTURE
8	May 30 th 2013	CHLOROPLAST: FUNCTION
9	June 6 th 2013	THE CYTOSKELETON
9	June 6 th 2013	MICROTUBULES & MOTORS
10	June 6 th 2013	STUDYING PROTEINS II
10	June 6 th 2013	STUDYING PROTEINS II
ThinkingTutorial 3	June 6 th 2013	ARTIFICIAL TISSUES & ORGANS
11	June 13 th 2013	ACTIN FILAMENTS AND MOTORS
11	June 13 th 2013	INTERMEDIATE FILAMENTS
12	June 13 th 2013	EXTRACELLULAR MATRIX AND CELL-CELL INTERACTIONS
12	June 13 th 2013	CELL SPECIALIZATIONS AND TISSUES
OptionalTutorial	June 13 th 2013	REVIEW 2
		Midterm 2 for B10Y
		READING WEEK (no class on June 20th)

13/1	June 27 th 2013	HEREDITY & CHROMOSOMES
13/1	June 27 th 2013	GENES & DNA
14/2	June 27 th 2013	GENOMES
14/2	June 27 th 2013	MOBILE DNA
ThinkingTutorial 4	June 27 th 2013	TELOMERES AND LONGEVITY
15/3	July 4 th 2013	TRANSCRIPTION IN PROKARYOTES
15/3	July 4 th 2013	TRANSCRIPTION IN EUKARYOTES
16/4	July 4 th 2013	TRANSCRIPTION IN EUKARYOTES - II
16/4	July 4 th 2013	RNA PROCESSING
17/5	July 11 th 2013	RNA SPLICING; NON-CODING RNAs
17/5	July 11 th 2013	TRANSLATION - I
18/6	July 11 th 2013	TRANSLATION - II
18/6	July 11 th 2013	TRANSLATION - II
OptionalTutorial	July 11 th 2013	REVIEW 3
		Midterm 3 B10Y & Midterm 1 B11H
19/7	July 18 th 2013	THE CELL NUCLEUS: STRUCTURE
19/7	July 18 th 2013	THE CELL NUCLEUS: CHROMATIN
20/8	July 18 th 2013	TRANSCRIPTIONAL CONTROL OF GENE EXPRESSION
20/8	July 18 th 2013	POST-TRANSCRIPTIONAL CONTROL OF GENE EXPRESSION
ThinkingTutorial 5	July 18 th 2013	GENOMIC IMPRINTING
21/9	July 25 th 2013	DNA REPLICATION
21/9	July 25 th 2013	DNA REPAIR
22/10	July 25 th 2013	CELL PROLIFERATION: THE CELL CYCLE
22/10	July 25 th 2013	CONTROL OF THE CELL CYCLE & CHECKPOINTS
ThinkingTutorial 6	July 25 th 2013	PERSONALIZED MEDICINE & TREATMENT OF CANCER
23/11	Aug 1 ST 2013	CANCER: LOSS OF CONTROL OVER CELL PROLIFERATION
23/11	Aug 1 ST 2013	MOLECULAR TARGETS OF CANCER THERAPIES
24/12	Aug 1 ST 2013	CELL SIGNALING & CHEMICAL MESSENGERS
24/12	Aug 1 ST 2013	CELL SIGNALING & CHEMICAL MESSENGERS
OptionalTutorial	Aug 1 ST 2013	REVIEW 4
		Final exam B10Y & Final exam B11H