BIOL 130    Introductory Cell Biology

Instructors:  
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Course Description  
This course introduces the basic concepts of cell biology with an emphasis on the structural organization of the cell and critical molecular processes that are characteristic of living organisms. The course provides an exposure to the vast vocabulary of cell biology, to prepare students to explore these topics in more depth in subsequent life science courses.

Learning Outcomes  By the end of this course, you should be able to …
• identify the features common to all cells, and those that distinguish the major cell types
• identify the key features of the major classes of biological macromolecules
• explain how … cells capture energy and use it to power cellular activities  
  genetic information stored as DNA is decoded to direct synthesis of proteins  
  the plasma membrane regulates the passage of material in and out of cells  
  organelles and proteins interact to organize movement of material within the cell  
  cells communicate, and appreciate the consequences of miscommunication  
  cells divide and pass on their genetic information, and how this is regulated  
  cells associate to form communities → tissues → organs

Lectures:  You are registered for 2 x 1.5 hours of lectures per week in one of the following four sections:  
001      8:30 - 9:50    Mon, Wed    HH 159
002      11:30 - 12:50   “        HH 159
003      2:30- 3:50      “        M3 1006

You are encouraged to attend the section for which you are registered but can come to other sections if you need to catch up on a missed class (or hear one twice?!). Every effort will be made to keep lectures ‘in synch’. All students will write the same exams.

Waterloo LEARN site:  
https://learn.uwaterloo.ca
Look here for a downloadable version of this course outline, FAQs, exam info, tutorial info, your grades and PowerPoint lecture outlines. We recommend setting notifications in your profile to let you know by email if anything new has been posted.

It is your responsibility to check the course Waterloo-Learn site frequently for course announcements.

Lack of website access due to non-payment of fees is your problem, not ours.

The PowerPoint files available on LEARN are not your ‘notes’, but can form the basis of your notes. Full course content can only be obtained by attending classes. If you miss a lecture, you will need to obtain notes from a classmate or make your own by consulting the PowerPoint outlines and the textbook. The LEARN email function is a good way of contacting others in the course.

Required Materials
i>clicker:  $40

- textbook: Essential Cell Biology, Alberts et al. 4th edition (previous editions of this text also acceptable)  
- hardcopies - available from bookstore as traditional hardcover ($169) or unbound ($121)  
- various electronic options (see LEARN website)  
- on reserve at the Davis Centre library

For those expecting to take further courses in cell biology: the full version of this textbook will be required for Biol 331 (Molecular Biology of the Cell, 5th edition, Alberts et al, also available used).
Tentative Lecture Schedule:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topic</th>
<th>Chapter, pages (4th edition; see Learn for 3rd ed refs)</th>
<th># lectures</th>
</tr>
</thead>
</table>
| 1    | Intro | a) cell biology and microscopy  
b) prokaryotes versus eukaryotes  
c) model organisms | 1 - p 1-29, 32-33 | 2 |
| 2    | Cellular Chemistry | a) chemical bonds  
b) biomolecules | 2 – p 39 -79  
4 - p 120-142; 5 - p 171-173, 177-179; 11 – p 359-368 | 4.5 |
| 3    | Thermodynamics and Catalysis | a) thermodynamics, free energy  
b) carrier molecules and biosynthesis | 3; 4 - p 144 & p 148-156 | 1.5 |
| 4    | Energy | a) cellular respiration  
b) chemiosmosis | 13 - p 419-441  
14 - p 447-478 | 3.5 |
| 5    | Gene Expression | a) transcription  
b) translation | 7 | 1.5 |
| 6    | Membranes | | 11, 12 - p 383-403 | 1.5 |
| 7    | Intracellular Compartments & Transport | a) membrane-bound organelles  
b) protein sorting & vesicular transport  
c) secretory & endocytic pathways | 15 | 2.5 |
| 8    | Cell Communication | a) overview  
b) G-protein coupled receptors  
c) enzyme-coupled receptors | 16 - p 525-555 | 2 |
| 9    | Cell Cycle | a) eukaryotic chromosomes  
b) phases of cell cycle  
c) control of cell cycle  
d) apoptosis  
Meiosis | 5 - p 171-187  
18  
“  
“  
19 - p 645-657 | 2.5 |
| 10   | Cytoskeleton | | 17 - p 565-592 | 1 |
| 11   | Social Networking of Cells | a) extracellular matrix  
b) cell junctions, tissue types  
c) cancer | 20 - p 689-719 | 2 |

About Tutorials
You will be registered in one of 29 tutorial sections. They are on your schedule as weekly 1 hour sessions, but in fact there will only be 7 tutorials. Please see the Tutorial News box on the Learn homepage for more information about tutorial scheduling.

Tutorial activities provide opportunities to solidify and extend lecture concepts in an interactive setting. Tutorials will also help you develop and practice skills that you will need throughout your years of university study, such as:

- seeking out scientific information using library resources
- interpreting articles in scientific journals
- writing concisely and effectively
- orally communicating information on topics related to cell biology

Tutorial assignments constitute **15% of your final grade.**
### How will I be assessed?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Learning Outcome</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quizzes (available on-line for ~ one week after each unit, open or closed book)</td>
<td>assess your grasp of material, practice with exam-type questions, promote regular review of notes</td>
<td>5%</td>
</tr>
<tr>
<td>Clicker Sessions*</td>
<td>self-assessment of your grasp of information</td>
<td>5%</td>
</tr>
<tr>
<td>Midterm 1</td>
<td>demonstrate grasp of lecture material (midterm 2 not cumulative)</td>
<td>15%</td>
</tr>
<tr>
<td>Midterm 2</td>
<td></td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>demonstrate recall, synthesis and integration of information across the course</td>
<td>40%</td>
</tr>
<tr>
<td>Tutorials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essay</td>
<td>seeking out scientific information exposure to peer-reviewed research in cell biology technical writing skills</td>
<td>5%</td>
</tr>
<tr>
<td>Group Oral Presentation</td>
<td>real world applications of lecture material, communicating to peers</td>
<td></td>
</tr>
<tr>
<td>Face-to-Face (F2F) Orals (slot booked with your TA)</td>
<td>linking together course concepts, communication skills</td>
<td>5%</td>
</tr>
</tbody>
</table>

*To obtain the full 5% for clicker sessions, you must attain at least 75% of the total clicker points over the term. Participation at less than that level will be pro-rated. Note that these marks are awarded for participation rather than correct answers. This grading scheme is set such that forgetting your clicker or missing a few classes will not impact on your grade.

### Important Dates

**Exams (all multiple choice):**
- Midterm 1: Saturday Oct 4, 10:30-11:30 am, locations TBA
- Midterm 2: Saturday Nov 8, "
- Final Exam: as scheduled by registrar

**Tutorial Activities:**
- Essay: week of Oct 20
- Cell Bio Bite oral: week of Nov 10, 17 or 24 (depending on topic)
- F2F oral: after Nov 10 (you book a 10-minute slot)

**You must pass one midterm and the final exam to pass the course.**
- If you failed one midterm and did not write the other, you will be required to write a supplemental exam during the final exam period in addition to the normal final exams. (See Policy on Missed Exams)
- If your final mark adds up to 50% or more but you did not pass at least one midterm and the final exam, a final grade of 45% will be assigned.

The final exam will be cumulative, i.e. include material from the entire term. The final exam period is Dec 4-19. Start checking [here](#) beginning Oct 15 for the date of the final exam and for final exam policies at UW. Note that student travel plans are not considered acceptable grounds for granting an alternative examination time.

### Conflicts with Midterms
If you have a conflict with a midterm (e.g. another class, lab or midterm, varsity sports competition), contact me at least two weeks prior to the exam (ideally as soon as possible) to arrange to write at an alternate time. The most likely accommodation would be to write the exam earlier than the rest of the class.

### Students with Disabilities
AccessAbility Services, located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations, please register with this office at the beginning of each term. If your need for accommodation arises later in the term, be aware that arrangements need to be initiated seven working days before the exam.

### Student Grievances
Students who believe they have been wrongfully or unjustly treated have the right to grieve; refer to Policy 70 – Student Petitions and Grievances.
Policy on Missed Exams
If a midterm is not written and no arrangement has been made, your grade will be zero on that test. If the final exam is not written, you will receive a DNW grade, which is valued as 32% for the calculation of your average.

If the exam was missed due to illness or another valid, documentable reason, you can avoid a zero grade / DNW through the following process:
1. **Contact your instructor within 24 hours of the missed exam.** Phone messages and emails can be received 24 hours per day.
2a. If you are ill, have yourself examined at UW Health Services* **before or within 24 hours** of the missed exam. They will complete a **Verification of Illness form** (VIF) for you. Assessment of illness must be based on actual examination **before or within 24 hours** of the exam rather than an account of how you felt several days ago. Note that only Moderate to Severe Incapacitation is an acceptable reason to miss an exam. If you are ill on a weekend, during off-hours, while out-of-town or receiving ongoing care from a family physician or specialist, it is acceptable to provide documentation from other health service providers. Information should include date of physician assessment, dates of illness, level of incapacitation and whether the diagnosis was made by the physician or based on description by the student. If you do not have University of Waterloo's VIF with you at the time you are seen by the external health service provider, or the documentation provided does not include the required information, you will need to go back and have them complete and sign the **Verification of Illness form.** This official verification is necessary before any action can be taken.
2b. For absences not related to illness, consult the **FAQ** on the Science webpage for suggested documentation.
3. Bring your documentation to the Science Undergraduate Office (ESC 253) and complete their process. An automated message will be sent to your instructor by email once you have filed.
4. Bring a copy of your documentation to H. Engelhardt. The Science Undergraduate Office does not do this. You have **two weeks** from the date of the missed exam to clear your zero / DNW grade.
*It is Faculty of Science policy that for missed assessments (midterms, final exams, etc.), instructors are to consider only VIFs issued by the University of Waterloo's Health Services, when this service is open. Further details are provided here.

Again, **failure to carry out the above four steps will result in a grade of zero on a midterm or a DNW on a final exam.**

**Note that filing documentation with the Science office does NOT automatically excuse the missing of a test.** The instructors will consider the information provided on the VIF when deciding whether a student should be excused. Students should carefully consider the wisdom of missing a test or exam.

The following applies in the case of a properly documented, acceptable reason to miss a test:
- midterm: weight transferred to final; may write different version or format of final exam
- final exam: you will be required to submit an incomplete (INC) agreement, in which you contract to write a deferred final exam on a specific date. This will be at the beginning of the following term (Jan 2015) or during the final exam slot when the course is next offered (April 2015). Failure to fulfill this agreement will result in a grade revision to DNW.

If Multiple or Continuous Personal or Medical Calamities have prevented the writing of both midterms, you will be required to take a supplemental exam in addition to the final exam. This supplemental exam, which may be a different format than the other exams including oral, will be scheduled during the final exam week.

Expectation of Academic Integrity
All students registered in courses in the Faculty of Science are expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for their actions. When the commission of an offence is established, disciplinary penalties will be imposed in accord with Policy 71 (Student Academic Discipline). For information on categories of offences and types of penalties, see Policy 71. There is a module within the Science Communication theme of the tutorials dedicated to academic integrity, and successful completion of the academic integrity quiz (AIQ) is required before assignments can be submitted. See Learn / Content / Tutorials for further information.

Use of Turnitin (Plagiarism Prevention Service)
Your instructors are participating in a pilot project to develop the best practices for the use of Turnitin at UW. As part of this endeavour, you will be given the opportunity to submit a draft version of each of your BIOL 130 assignment for Turnitin analysis prior to submitting your final document. You will be allowed to submit only one draft for each assignment. It is hoped that this helps you to identify, and then correct, any problems before you submit your final version for grading. Your instructor will not access the draft versions for grading but they will be reviewed at the end of the term for statistical purposes only. The goal of the draft submissions is to teach you the capabilities of Turnitin analysis and to encourage you to use the software to improve your paraphrasing and summarizing. Details on how to interpret Turnitin reports and use the draft dropboxes will be provided on the course Learn site.