



# Introductory Biology 151/153 - Fall 2016

Lectures begin Wed. Sept 7, Labs and Discussions begin Monday Sept 12.  
Lecture 1 = 11:00 MWF; Lecture 2 = 12:05 MWF – **both in Rm B10 Ingraham**

## Course Summary and Philosophy:

Introductory Biology 151-152 is a two semester introductory sequence for majors in the biological sciences. Emphasis will be placed on learning, understanding and being able to use key biological concepts and the scientific method. The study of modern biology is not only a matter of assimilating factual information. Learning how to use that information for problem-solving, posing hypotheses and interpreting experimental results is also critical to understanding biology as a science. The lectures examine key concepts. Discussions allow you to more fully investigate these. In the laboratory, you will need to use the scientific method and apply a number of the concepts from lecture to carry out the various activities. In addition, labs stress the development of written and oral presentation skills. These are required to successfully communicate scientific concepts and your research findings to others. Introductory Biology 153 is a one semester terminal course which includes all of 151 except the lab.

<b>Lecturers:</b>	<b>Donna Fernandez</b> B215 Birge Hall 608-262-9033 dfernand@wisc.edu	<b>Marc Wolman</b> 213 Zoology Research 608-890-1962 mawolman@wisc.edu	<b>David Abbott</b> C203 Primate Center 608-698-1953 abbott@primate.wisc.edu
-------------------	--	---	---

**Course Coordinators:** 11:00 MWF – Jean Heitz [jgheitz@wisc.edu](mailto:jgheitz@wisc.edu) Rm 230 Noland 608-263-2186  
12:05 MWF – Jeremiah Yahn [jyahn@wisc.edu](mailto:jyahn@wisc.edu) Rm 229 Noland 608-263-5336

**Teaching Assistants:** See Lab and Discussion Schedules posted on L@UW.

TA Offices: Rm 216 Noland Hall; Rm 546 Noland Hall

TA office hours will be announced in lab and discussion sections

## Textbooks & Other Required Materials – All available at the University Book Store

- **Biology** 10<sup>th</sup> Edition, by Campbell and Reece – You can use **either** the hardcopy **or** three-hole punch version – available at University Books Store or Underground Books
- **iClicker** – *Highly recommended* – either the old or new model is okay
- **Practicing Biology Lab Manual** (for Intro Bio 151 only)

**151 is a 5 credit course and includes** lecture, lab and discussion. Attendance in all of these is mandatory. In calculating your final grade for the course, students in 151 whose grades average less than 50% in either the lecture or the lab portion of the course will be given a grade of F for the course as a whole.

- In 151, the lecture portion of the course will comprise 60% (3 credits) of the final grade. Each lecturer will assign 20% of the final grade in the course. Lecture quizzes/activities may make up a part of this 20%. Specific information will be provided by each lecturer.
- Discussions are mandatory and attendance and graded activities in discussion will comprise 6% of your final course grade.
- The 151 lab comprises 34% of the final grade. Your discussion and lab TAs will explain how these sections will be graded.

**153 is a 3 credit course that includes lecture and discussion.** Attendance in these is mandatory.

- In 153, the lecture portion of the course will comprise 90% of the final grade. Each lecturer will assign 30% of the final grade in the course. Lecture quizzes/activities may make up a part of this 30%. Specific information will be provided by each lecturer.
- Discussions are mandatory and attendance and graded activities in discussion will comprise 10% of your final course grade. Your discussion TA will explain how the discussion will be graded.

## Learn@UW & Weekly Emails – Mandatory Reading each week

A weekly newsletter is sent to the classlist each Friday and posted to Learn@UW. Other notifications about the course are also sent via email periodically. All students are responsible for the information contained in these communications and are expected to check them regularly. If you have any difficulty doing so, contact us immediately. These bulletins are required reading and contain essential information regarding homework, course policies, exam scheduling, and other matters.

## Professional Email Etiquette

Students are expected to communicate with their faculty, coordinators, TAs and fellow students in a professional manner. This includes using appropriate phrasing and punctuation, addressing your recipient courteously, and voicing any concerns in a respectful manner. Also note that we do not respond to questions that are easily answered with information posted on Learn@UW or in a previous email. Please review the Email Etiquette document on L@UW for further information.

## Lecture Exam Schedule

Exam Ia	Mon. Oct 10: 8:15 – 9:45 pm	Location: To Be Announced (TBA)
Exam Ib	Thurs. Oct. 13: 8:15 – 9:45 pm	Location: TBA
Exam IIa	Mon. Nov 14: 8:15 – 9:45 pm	Location: TBA
Exam IIb	Thurs. Nov 17: 8:15 – 9:45 pm	Location: TBA
Exam IIIa	Thurs. Dec 15: 8:15 – 9:45 pm	Location: TBA
Exam IIIb	Sat. Dec 17: 7:45 – 9:15 AM	Location: TBA

Two exams will be given after each of the three major sections of the course.

**All students must take the first exam.** Students may opt to take the second exam as well.

Scoring the exams – Example: If your score on Exam Ia is higher than on Exam Ib – your score for the section will be the Exam Ia score. If your score on Exam Ib is higher than your score on Exam Ia, your score for the section will be the average of the two exam scores.

## Exam Policy

- **There will be no late make-up exams** except for extreme cases such as a death in the family or an illness. All late make-up exams will be in the oral or modified essay format. See your coordinator for scheduling a make-up exam.
- **Exam Conflicts:** University policy specifies that exams cannot disrupt classes held during regularly scheduled times. If you have an exam for another course that conflicts with your lab, discussion, or lecture period in Intro Bio 151/153, you must request an alternate exam time from your professor. Likewise, we will provide alternate exam times for students with legitimate course conflicts of this nature. This will apply to only the first exam, or “a” version of each exam.
- **No electronic devices** will be allowed during exams, including calculators. Any calculations required as part of an exam will require only basic math skills that you should be competent in at this time.
- In the unlikely event of a disturbance during an exam, you will be expected to observe the following rules. Failure to do so will negatively impact your grade.
  - Follow the directions of your proctors and exit the building in an orderly fashion.
  - Wait at a safe distance outside, in a single location as instructed by you proctor.
  - While waiting to return to the testing room, do not check your notes or discuss the exam with your peers. If caught doing so, you will receive an automatic deduction of 20 points from your exam grade.
  - If you are able to return to the testing room, you will be given extra time amounting to the duration of the alarm plus 10 minutes to compensate for the disturbance.
  - If you are unable to return to the testing room, your coordinators will schedule a make-up exam. This exam will contain different questions and we reserve the right to change the format (short answer, fill-ins, etc).

## Grading Scale (for lecture and lab)

90-100%	= A
88-89.99%	= AB
80-87.99%	= B
78-79.99%	= BC
70-77.99%	= C
60-69.99%	= D

Additional information on course policies regarding late assignments, etc. will be available on the L@UW web site.

**Honors:** In 151, the honors option is an outreach project. Specifically, students meet weekly outside of class and work in small groups to develop interactive presentations on biological topics for elementary and middle school students. In the process, you will increase your mastery of complex biological information and improve your communication skills by translating this information for a younger audience. We partner with the Wisconsin Institutes of Discovery and our students present at Saturday Science events. If you are interested in the Honors option, an information meeting will take place on Wed. Sept 14<sup>th</sup>, at either 8:30 am or 4pm. You must send an email to Julie Collins ([jecollins4@wisc.edu](mailto:jecollins4@wisc.edu)) by Friday, Sept 9<sup>th</sup> indicating whether you prefer the 8:30 am or 4:00 pm meeting. She will get back to you with the room location, etc.

**To register for Honors credit** in this course, update your registration via My UW and Web Enrollment. Log in to My UW, click on enrollment, click on web enrollment, select the current semester, click on update classes, select your Intro Bio course, click on honors, (scroll down a lot to) click submit, read the information that pops up, click OK, it should say “successful”. You can also remove Honors if you do not plan to participate.

## Students Requiring Alternate Accommodations including UW Athletes

If you should need instructional accommodations for any course activities, please see your coordinator to make any necessary arrangements. Students are expected to inform the coordinator of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a problem or disability has been incurred or recognized. The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. In addition, the Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. For more information on the many services available on campus see the Referral Guide listing on the course L@UW site.

## Abbreviated Lecture 1 & 2 Schedule - Fall 2016

### INTRO BIO 151/153 – Rm B10 Ingraham

You can access the full syllabus, lab schedule and other information on the course Learn@UW site.

Day of week	Month	Date	Instructor	Topic	Reading Material Campbell Biology, 10 <sup>th</sup> Ed.
W	Sept.	7	Fernandez	Introduction	Ch. 1: pp. 1-26 (skim)
F	Sept.	9	Fernandez	The molecules of life	Ch. 2: pp. 36-43 & Ch. 3&4: pp. 44-65
M	Sept.	12	Fernandez	Macromolecules	Ch. 5: pp. 66-91
W	Sept.	14	Fernandez	Cells and membranes	Ch. 7: pp. 124-129
F	Sept.	16	Fernandez	Membrane function	Ch. 7: 130-140
M	Sept.	19	Fernandez	Cell structure	Ch. 6: 93-108
W	Sept.	21	Fernandez	Eukaryotic cell structure <b>Activity 1 – In-Lecture</b>	Ch. 6: 93-108
F	Sept.	23	Fernandez	The cytoskeleton	Ch. 6: 112-123
M	Sept.	26	Fernandez	Introduction to metabolism	Ch. 8: 141-161
W	Sept.	28	Fernandez	Mitochondria and Respiration I	Ch. 6: 109-110, Ch. 25: 528-529, Ch. 9: 162-171
F	Sept.	30	Fernandez	Respiration II	Ch. 9: 172-184
M	Oct.	3	Fernandez	Chloroplasts and photosynthesis I <b>Activity 2 – In-Lecture</b>	Ch. 6: 109-111, Ch. 10: 185-190, 199-200
W	Oct.	5	Fernandez	Photosynthesis II	Ch. 10: 191-199, 204-209
F	Oct	7	Fernandez	Cell division <b>Activity 3 – In Lecture</b>	Ch. 12: 232-241
Sun	Oct	9	Fernandez	<b>Review session – 2-3:30 pm Rm 6210 Social Science</b>	
M	Oct	10	Wolman Fernandez	Intro: Inheritance and DNA <b>Exam 1a – 8:15 to 9:45 pm</b>	Ch. 5.5, 16.1
W	Oct	12	Wolman	DNA structure & replication	Ch. 16.2
R	Oct.	13	Fernandez	<b>Exam Ib - 8:15 – 9:45 pm</b>	
F	Oct	14	Wolman	DNA replication	Ch. 16.3
M	Oct	17	Wolman	DNA transcription & RNA processing	Ch. 17.1-17.3
W	Oct	19	Wolman	RNA processing and translation	Ch. 17.4
F	Oct	21	Wolman	Translation	Ch. 17.4
M	Oct	24	Wolman	From DNA to Protein; Mutations <b>Activity 1</b>	Ch. 17.5
W	Oct	26	Wolman	Regulation of gene expression	Ch. 18.1 - 18.3
F	Oct	28	Wolman	Meiosis	Ch. 13
M	Oct	31	Wolman	Mendelian Genetics <b>Activity 2</b>	Ch. 14.1 - 14.2

W	Nov	2	Wolman	Beyond Mendelian Genetics	Ch. 14.3	
F	Nov	4	Wolman	Chromosomal basis of inheritance	Ch. 15	
M	Nov	7	Wolman	Animal Development and Cancer <b>Activity 3</b>	Ch. 18.4 - 18.5	
W	Nov	9	Wolman	Mutagenesis and Genetic Manipulation	TBD	
F	Nov	11	Abbott	Introduction and Concepts	Ch 40:868-876, 882-883, Ch 45:1000-01, Ch 46:1024-25	
Sun	Nov	13	Wolman	<b>Review session – 3pm</b> <b>Rm TBD</b>		
M	Nov	14	Abbott Wolman	Concepts cont. <b>Activity 1: Neg. Feedback Reg.</b> <b>Exam 2a – 8:15 – 9:45 pm</b>	Ch 41:908-10, Ch 46:1031	
Wed	Nov	16	Abbott	You are what you eat	Ch 9:180, Ch 41:897, 900-5, 908-9	
Thurs	Nov	17	Wolman	<b>Exam 2b – 8:15 – 9:45 pm</b>		
Fri	Nov	18	Abbott	You are what you eat cont... <b>Activity 2: Digestion and absorp.</b>	Ch 9:180, Ch 41:897, 900-5, 908-9	
M	Nov	21	Abbott	Vascular transport and heart	Ch 42:920-27, 931-32 Ch 49:1083-4	
W	Nov	23	Abbott	Cardiovascular fx & blood press. <b>Activity 3: Cardio. Regulation</b>	Ch 42:920-27, 931-32 Ch 49:1083-4	
F	Nov	25	<b>THANKSGIVING BREAK!</b>			
M	Nov	28	Abbott	Kidney	Ch 44:971-2, 976-7, 980-85, 988-9	
W	Nov	30	Abbott	Innate and Specific Immunity	Ch 43:946-47, 950-53, 957, 960- 62	
F	Dec	2	Abbott	Specific Immunity cont. HIV/AIDS <b>Activity 4: Immune System</b>	Ch 43:954, 956, 958-9	
M	Dec	5	Abbott	Hormonal regulation; Stress Type II Diabetes	Ch 43:966-68	
W	Dec	7	Abbott	Reproduction: battle of the sexes <b>Activity 5: Stress &amp; Glucose</b>	Ch 45:994-7, 1003, 1006-8	
F	Dec	9	Abbott	Reproduction continued	Ch 45: 1008-9 Ch 46:1025-9	
M	Dec	12	Abbott	Nerve cell function	Ch 48:1062-6	
W	Dec	14	Abbott	Nerve cell function continued <b>Activity 6: Nerve cell function</b> <b>Review session – 8 – 10:30 pm</b>	Ch 48:1066-75	
Thurs	Dec	15	Abbott	<b>Exam 3a – 8:15 – 9:45 pm</b> <b>Rm TBD</b>		
F	Dec	16	Abbott	Study Day! (National hug a coordinator day)		
Sat	Dec	17	Abbott	<b>Exam 3b – 7:45 – 9:15 am</b> <b>Rm TBD</b>		

# Concepts central to the existence of all life

To be alive, and to continue to survive in changing environments, organisms must be able to:			
<p><b>A. Keep their integrity separate from that of the environment and of other organisms.</b>  <b>As a result, life:</b></p> <ol style="list-style-type: none"> <li>is cellular</li> <li>must be able to control movement of substances into and out of the cell and as a result, must deal with the properties of diffusion and osmosis, flow rates and SA/V ratios.</li> </ol>	<p><b>B. Transfer information:</b></p> <ol style="list-style-type: none"> <li>within cells</li> <li>between cells (to maintain homeostasis or the conditions required for life to exist)</li> <li>between organisms (to survive or to be able to reproduce effectively)</li> <li>from one generation to the next (to provide for a continuation of the species over time)</li> </ol>	<p><b>C. Transfer energy:</b></p> <ol style="list-style-type: none"> <li>within cells</li> <li>between cells</li> <li>between the environment and itself (e.g. from sun or from other organic compounds or organisms)</li> </ol>	<p><b>D. Evolve</b>            Environmental conditions determine which organisms will survive. Over time, environmental conditions can change. As a result, if species are to survive, they must include variants that can survive in the changed conditions. Variation within species is the result of genetic changes/mutations. Organisms do not evolve; populations evolve.</p>

## Some key principles/concepts that recur through the above include the following.

- SA/V ratios, osmosis/diffusion rates and the properties of membranes affect the flow of substances into and out of cells and organisms.
- Energy obtained from the environment must be converted into forms that can be used by living cells/organisms.
- Interactions of organisms with the chemical and physical forces in their environment and with other organisms affect their evolution. E.g. SA/V ratios and flow of substances affect structure and function of cells and whole organisms (including how energy is stored).
- Information for the basic structural components of life is stored in DNA and can be translated within cells into the basic structural components required for life.  
 However, life is more than the sum of its individual components (emergent properties).
- Modifications (mutations) of the information stored in DNA can affect the structure and function of organisms and their evolution.