

COURSE DESCRIPTION: The power and prominence of modern genetics have grown from a blend of classical and molecular approaches; both approaches are emphasized. Topics include: Mendelian, population and quantitative genetics; chromosome structure and variation; structure and function of nucleic acids; DNA replication, transcription and translation; gene expression; gene mutations; and genetic engineering.

TEACHING TEAM	Phone	Office	E-mail address
Joe Bielawski (Professor - Unit I)	494-7844	LSC 7058	J.bielawski@dal.ca
Paul Bentzen (Professor-Unit II)	494-1105	LSC 6052	Paul.Bentzen@Dal.Ca
Jonathan Wright (Professor- Unit III)	494-6468	LSC 6087	jmwright@dal.ca
Edna Staples (Instructor)	494-2464	LSC 6089	Edna.Staples@dal.ca
Lab and Tutorial TA's	See the class OWL web site for contact info.		

PRE-REQUISITES; C- or better in BIOL 1010/1020 & 1011/1021; 1st year chemistry recommended.

ASSESSMENT:	-Tutorial	9
	-Laboratory	19
	-Midterm 1 (Wed. Oct. 9, 18:30-20:30*)	24
	-Midterm 2 (Wed. Nov. 6, 18:30-20:30*)	24
	-Final Exam (scheduled by registrar)	24
	<u>Total</u>	<u>100</u>

* **Note EVENING midterms.** Email the Instructor NO LATER THAN TWO WEEKS BEFORE the exam should you have a scheduling conflict (i.e another Dal class). Include details of conflict.

NUMERIC TO LETTER GRADE CONVERSION:

90 - 100	A+	75 - 79.9	B+	62- 64.9	C+	50 - 54.9	D
85 - 89.9	A	70 - 74.9	B	58 - 61.9	C	< 50	F
80 - 84.9	A-	65 - 69.9	B-	50 - 54.9	C-		

Any consideration of a deviation from this grading distribution will require a written medical excuse or equivalent (see Study Guide for more details).

COURSE READINGS:

- **REQUIRED:** Pierce, Benjamin A. *Genetics, A Conceptual Approach* (4thed.). 2012. NY: W.H. Freeman &Co.

THREE OPTIONS:

- Softcover book + access card to Genetics Portal:
 - Price ~\$140 (CAN) + tax; For sale at Dal Bookstore (SUB).
- Access card to Genetics Portal + ebook:
 - Price: ~\$78.95(USD); Subscription length: 180 days. For sale at <http://courses.bfwpub.com/pierce4e.php> (Follow instruction for DAL-BIOL 2030)
- Used copies of 4th and 3rd edition (and Megamanual-Answer book) (Also on reserve in the Killam Library.)

- **REQUIRED:** Study Guide/Lab Manual (BIOL 2030-FALL 2013); Price-TBA. For sale at Dal Bookstore.

Buy and bring to the first lab!

- **Recommended:** Knisely, Karin. 2014. *A Student Handbook for Writing in Biology*. 4th. VA: W.H Freeman &Co.

BIOL 2030 OWL WEB SITE: Registered students can log on to our class web page from <https://dalhousie.blackboard.com/> or from my.dal.ca. Please check this site **daily** for announcements, grades, lecture notes, laboratory and tutorial assignments.

STUDENT ACCESSIBILITY SERVICES: Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic under the Nova Scotia Human Rights Act. Students who require academic accommodation for either classroom participation or the writing of quizzes, tests and exams should make their request to the Advising and Access Services Center (AASC) prior to or at the outset of the regular academic year. Please visit www.dal.ca/access for more information and to obtain the Request for Accommodation - Form A.

A note taker may be required as part of a student's accommodation. There is an honorarium of \$75/course/term (with some exceptions). If you are interested, please contact AASC at 494-2836 for more information.

Please note that your classroom may contain specialized accessible furniture and equipment. It is important that these items remain in the classroom, untouched, so that students who require their usage will be able to participate in the class.

CLASS FORMAT:

- (i) **Lectures:** McCain Arts & Soc. S AUD 1**, M.W.F., 12:35-13:25
- (ii) **Laboratories:** TWO hour labs are held biweekly.
 - Sections B01-B05 labs begin week of September 9th. (Bring a calculator.)
 - Sections B06-B10 labs begin week of September 16th. (Bring a calculator.)
- (iii) **Tutorials:** ONE hour tutorials 10 weeks of the term (not held biweekly).
 - Tutorials for all sections begin week of September 9th. (Bring a calculator.)

LABORATORY FORMAT: The Study Guide/Lab Manual contains more details of the lab content and weekly schedule. Note that labs are held every second week so you should go to DAL ONLINE to check your registration section and CRN. **Note: You must attend the lab for which you are registered.** The lab is located in LSC 6009 (6th floor of Biology wing).

TUTORIAL FORMAT: The yellow pages of the Study Guide/Lab Manual contain more details on the content and weekly schedule. Please go to DAL ONLINE to check your registration section, CRN and location**. **Note: You must attend the tutorial section for which you are registered.**

Please note room locations **may be changed by the registrar so check at <http://www.registrar.dal.ca/timetable/>

MIDTERM/EXAM FORMAT: The two midterms and final exam have equal weight. There will be an exam at the end of each lecturer's section. These tests are designed to test you on the material presented in lectures, the text and tutorials. The test papers consist mostly of questions requiring multiple choice answers, occasionally there may be problems or short answers type questions. More details on format will be given in lecture before each midterm.

Both midterms are two hours in length and are held in the evening. The exam on the third lecturer's material will be held during the final examination period scheduled by the registrar's office. The specific date and time for the BIOL 2030 final exam will be announced early in October or February and posted at <http://www.registrar.dal.ca/exam/>. We do not give early exams so check the schedule **before making travel arrangements.**

Alternate writing times for midterms/exam will ONLY be given to students who have another Dalhousie exam or class at the same time or who are ill. Students who have a timing conflict with a midterm or exam should contact the Instructor at least two weeks prior to the exam date to arrange another time. Students who are ill should see the ILL policy below.

EXAM VIEWING: You will not receive your midterm exams back. Each professor will hold midterm viewing sessions after the exam for you to look at your exam. Watch for announcements in OWL as to the date and location of the exam review session. Contact the exam professor if you have any questions about his/her exam.

REGULATIONS REGARDING MISSED MIDTERMS/EXAMINATIONS/ASSIGNMENTS:

Requests for an alternative midterm/exam time due to extenuating circumstances: A student requesting an alternative time for a midterm or final examination will be granted that request only in exceptional circumstances. Such circumstances include having another Dalhousie class or exam scheduled at the same time or other mitigating circumstances outside the control of the student. Elective arrangements (such as travel plans) are not considered acceptable grounds for granting an alternative examination time. Students should contact the Instructor at least two weeks prior to the exam date to arrange another time.

Special arrangements for missed exams, midterms, tutorials, labs and lab reports due to illness or other exceptional circumstances: Alternate arrangements will be considered provided that:

- A student who misses class work (assignment, lab, tutorial, midterm or exam) because of illness:
 1. notifies the Instructor on the day in question,
 2. notifies his/her physician at the time of illness (or within a few days) and obtains a valid* medical excuse,
 3. provides a medical certificate (signed by a physician) to the Instructor within one week.
- A student who, for medical reasons (e.g. scheduled day-surgery, etc), anticipates missing class work:
 1. notifies the Instructor at least one week in advance,
 2. provides the Instructor with appropriate documentation.
- A student who is absent due to other exceptional circumstances (e.g. death in immediate family, etc):
 1. notifies the Instructor on or before the day in question,
 2. is able to produce appropriate documentation upon request (e.g. death certificate, etc).

N.B. - A student who fails to comply with any or all of these rules may not be able to make up at for lost work. The decision on when and if special arrangements can be made will be at the discretion of the Instructor.

* “This certificate should indicate the dates and duration of the illness, when possible should describe the impact it had on the student’s ability to fulfill academic requirements, and should include any other information the physician considers relevant and appropriate.” (Dalhousie UG Calendar)

There will be times during your term when you will have deadlines in several different courses at the same time. **PLAN AHEAD. WORK CONSISTENTLY.** Your time at University should, among other things, teach you to develop effective time management skills and study habits. On the other hand, unforeseen events such as personal/family crises or illness CAN OCCUR during the term. These occurrences are unavoidable and the teaching staff of 2030 will be most understanding and willing to make alternate arrangements. Please speak to one of the teaching staff.

INTELLECTUAL HONESTY AND DISCIPLINE AT DALHOUSIE:

Most students know that cheating on an exam has serious consequences. However, many students do not seem to understand that cheating also includes submission of term papers and lab reports that are copied (full or partial) from others people’s work. This includes work from the current and previous terms. Consequences for submitting copied or plagiarized material in reports can also be very serious. Your penalty can be as harsh as a grade of F in the class and a notation on your transcript or even expulsion from the university. This may have a long lasting impact on your life!! What can you do to insure to avoid all circumstances in which your academic integrity is called into question? Here are a few hints:

- **Get organized.** Don’t leave your report to the last minute to write. Start as soon as you are given the assignment. Give yourself time to make a rough draft, set it aside for a few days and then revise.
- **Get help.** If you are stuck with the material then ask your instructor. If you are stuck with the writing process then get help at the Writing Center (<http://writingcentre.dal.ca>)
- **Learn how to research ethically and efficiently, cite sources and paraphrase correctly.** The library web site has helpful tutorials and libcasts at <http://infolit.library.dal.ca/tutorials/AcademicIntegrity/>. Karin Knisely’s book, *Writing in Biology*, is also helpful.
- **Work independently.** Don’t share electronic files. **Don’t** ask to look at anyone else’s report. Don’t give your report to any one else. Both the ‘copier’ and the ‘copied’ are liable for academic discipline.

The following statement about academic integrity is copied with permission from Dalhousie's web site on Academic integrity (<http://academicintegrity.dal.ca/>). This site is also a gateway for many resources to help students learn how to avoid plagiarism.

At Dalhousie University, we respect the values of academic integrity: honesty, trust, fairness, responsibility and respect. As a student, adherence to the values of academic integrity and related policies is a requirement of being part of the academic community at DalhousieUniversity.

What does academic integrity mean?

Academic integrity means being honest in the fulfillment of your academic responsibilities thus establishing mutual trust. Fairness is essential to the interactions of the academic community and is achieved through respect for the opinions and ideas of others. "Violations of intellectual honesty are offensive to the entire academic community, not just to the individual faculty member and students in whose class an offence occurs." [Intellectual Honesty section of University Calendar (<http://ug.cal.dal.ca/UREG.htm#12>)]

How can you achieve academic integrity?

- understand Dalhousie's policies on academic integrity at <http://academicintegrity.dal.ca/Policies/>
- give appropriate credit to the sources used in your assignment such as written or oral work, computer codes/programs, artistic or architectural works, scientific projects, performances, web page designs, graphical representations, diagrams, videos, and images
- Use RefWorks to keep track of your research and edit and format bibliographies in the citation style required by the instructor - <http://www.library.dal.ca/How/RefWorks>
- do not download the work of another from the Internet and submit it as your own
- do not submit work that has been completed through collaboration or previously submitted for another assignment without permission from your instructor
- do not write an examination or test for someone else
- do not falsify data or lab results

[these examples should be considered only as a guide and not an exhaustive list]

What will happen if an allegation of an academic offence is made against you?

Instructors are required to report a suspected offence. The full process is outlined in the Discipline flow chart (<http://academicintegrity.dal.ca/Files/AcademicDisciplineProcess.pdf>) and includes the following:

- Each Faculty has an Academic Integrity Officer (AIO) who receives allegations from instructors
- The AIO decides whether to proceed with the allegation and you will be notified of the process
- If the case proceeds, you will receive an INC (incomplete) grade until the matter is resolved
- If you are found guilty of an academic offence, a penalty will be assigned ranging from a warning to a suspension or expulsion from the University and can include a notation on your transcript, failure of the assignment or failure of the course. All penalties are academic in nature.

Where can you turn for help?

If you are ever unsure about ANYTHING, contact the Instructor.

- **Academic Integrity website** (<http://academicintegrity.dal.ca/>)
 - Links to policies, definitions, online tutorials, tips on citing and paraphrasing
- **Writing Center** (<http://writingcentre.dal.ca/>)
 - Assistance with proofreading, writing styles, citations
- **Dalhousie Libraries** (<http://www.library.dal.ca/How/>)
 - Workshops, online tutorials, citation guides, Assignment Calculator, RefWorks
- **Dalhousie Student Advocacy Service** (<http://www.dsu.ca/services/advocacy>)
 - Assists students with academic appeals and student discipline procedures.
- **Senate Office** (<http://senate.dal.ca/>)
 - List of Academic Integrity Officers, discipline flow chart, Senate Discipline Committee

SUCCESS IN THIS COURSE WILL BE INCREASED IF YOU:

- *Read assigned readings before lecture.*
- *Attend all lectures.*
- *Review your lecture notes daily and make connections to the assigned readings.*
- *Attempt to do all the suggested end of chapter problems.*
- *Attend review sessions.*
- *Attend all tutorials.*
- *Do all the assigned tutorial problems before attending tutorial.*
- *Attend all labs.*
- *Write lab reports on your own, understanding here will help with lecture material.*
- *Study when there are no tests.*
- *Don't cram for tests.*
- *Strive for understanding of concepts and processes.*

BIOL 2030.03 TENTATIVE Lecture Outline Unit I (FALL 2013)

(Changes to these readings may occur and will be announced in lecture.)

WK #	LEC #	TUT #	DATE	PROF	TOPIC	Pierce (4th edition)	Pierce (3 rd edition)
1	1		Sept. 5	Bielawski1	Introduction to Genetics;	Chapter 1 (5, 11-12) Chapter 2 (15-19)	Chapter 1 (5, 11-12) Chapter 2 (16 -20)
2	2	1	Sept. 9	Bielawski2	Cell Reproduction; Mitosis & Meiosis	Chapter 2 (18-31)	Chapter 2 (19-33)
2	3		Sept. 11	Bielawski3	Basic Principles of Heredity	Chapter 3 (44-64) Study Guide: Appendix F&G	Chapter 3 (44-65) Study Guide: Appendix F&G
2	4		Sept. 13	Bielawski4	Extensions and Modifications of Basic Principles; Complementation	Chapter 5 (99-113)	Chapter 5 (99-113)
3	5		2	Sept. 16	Bielawski5	Probability and Chi-square revisited Strategies to deal with ratios in crosses	Chapter 3 (52-64) Study Guide: Appendix H Chapter 5 (113)
3	6	Sept. 18		Bielawski6	Sex determination and Sex-linked Characteristics	Chapter 4 (74-90)	Chapter 4 (74-91)
3	7	Sept. 20		Bielawski7	Pedigree Analysis & Applications	Chapter 6 (136-146)	Chapter 6 (135-146)
4	8	3	Sept. 23	Bielawski8	Linkage and Mapping in Eukaryotes	Chapter 7 (162-176, 184-185)	Chapter 7 (160-175, 183)
4	9		Sept. 25	Bielawski9	Linkage & Mapping in Eukaryotes (cont'd)	Chapter 7 (162-176, 184-185)	Chapter 7 (160-175,183)
4	10		Sept. 27	Bielawski10	Intro to Quantitative Genetics	Chapter 24 (660-665)	Chapter 24 (646-651)
5	11	4	Sept. 30	Bielawski11	Quantitative Genetics	Chapter 24 (671-680) [self review 665-671]	Chapter 24 (658-666, overview 652-658)
5	12		Oct. 2	Bielawski12	Population Genetics	Chapter 25 (694-701 & overview 701-715)	Chapter 25 (680-687, overview 687-701)
			Oct. 9	Bielawski	Midterm 1 (1830 - 2030) (A WEDNESDAY night)	MCCAIN ARTS&SS AUD-2	

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BIOL 2030.03 TENTATIVE Lecture Outline Unit II (FALL 2013)

WK #	LEC #	TUT #	DATE	PROF	TOPIC	Pierce (4th edition)	Pierce (3 rd edition)
5	13	4	Oct. 4	Bentzen1	The Molecular Basis of Heredity	Chapter 10 (271-279)	Chapter 10 (267 – 281)
6	14		Oct. 7	Bentzen2	DNA Structure	Chapter 10 (279-285)	Chapter 10 (267 – 281)
6	15		Oct. 9	Bentzen3	DNA Replication and Recombination	Chapter 12 (321-345) Review Chapter 2 (21-30)	Chapter 12 (315 – 335) Review Chapter 2 (20-32)
6			Oct. 9	Bielawski	Midterm 1 (1830 - 2030) (A WEDNESDAY night)	McCain Arts & SS AUD-2	
6	16		Oct. 11	Bentzen4	DNA Replication and Recombination cont.	Chapter 12 (321-345) Review Chapter 2 (21-30)	Chapter 12 (315 – 335) Review Chapter 2 (20-32)
7			5	Oct. 14		HOLIDAY	
7	17	Oct. 16		Bentzen5	Transcription	Chapter 13 (351-368)	Chapter 13 (350 – 360)
7	18	Oct. 18		Bentzen6	RNA Molecules and Posttranscriptional Processing	Chapter 14 (375-396) Chapter 17 (470-474)	Chapter 14 (369 – 388) Chapter 17 (461 - 464)
8	19	Oct. 21		Bentzen7	RNA Molecules and Posttranscriptional Processing (cont.)	Chapter 14 (375-396) Chapter 17 (470-474)	Chapter 14 (369 – 388) Chapter 17 (461 - 462)
8	20	Oct. 23	Bentzen8	The Genetic Code	Chapter 15 (401-412) Chapter 18 (483-486)	Chapter 15 (396 – 406) Chapter 18 (472 – 474)	
8	21	Oct. 25	Bentzen9	Translation	Chapter 15 (412-423)	Chapter 15 (406 – 415)	
9	22	7	Oct. 28	Bentzen10	Chromosomal Rearrangements	Chapter 9 (240-252) Review Chapter 2 (19-21)	Chapter 9 (238- 249)
9	23		Oct. 30	Bentzen11	Variations in Chromosomal Number	Chapter 9 (252-262)	Chapter 9 (249- 259)
9	24		Nov. 1	Bentzen12	REVIEW		
			Nov. 6	Bentzen	Midterm 2 (1830 - 2030) (A WEDNESDAY night)	McCain Arts & SS AUD-2	

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BIOL 2030.03 TENTATIVE Lecture Outline Unit III (FALL 2013)

WK #	LEC #	TUT #	DATE	PROF	TOPIC	Pierce (4th edition)	Pierce (3 rd edition)	
10	25		Nov. 4	Wright1	Gel-electrophoresis and restriction endonuclease mapping.	Ch. 19 (515-518) Ch. 11 (292-293)	Ch. 19 (505-508) Ch. 11 (286-287)	
10	26		Nov. 6	Wright2	Southern blot & hybridization. Applications: diagnosis of genetic disease & RFLP.	Ch. 11 (301-302) Ch. 19 (517-519) Ch. 19 (533-534)	Ch. 11 (295-296) Ch. 19 (508-509) Ch. 19 (524-525)	
10			Nov. 6	Bentzen	Midterm 2 (1830 - 2030) (A WEDNESDAY night)		McCAIN ARTS & SS AUD-2	
10	27		Nov. 8	Wright3	Recombinant DNA technology.	Ch. 19 (519-522)	Ch. 19 (509-512)	
11		8	Nov. 11		HOLIDAY			
11	28		Nov. 13	Wright4	Cloning genes and their mRNA transcripts.	Ch. 19 (528-529)	Ch. 19 (518-519)	
11	29		Nov. 15	Wright5	DNA sequencing and the polymerase chain reaction.	Ch. 19 (534-537) Ch. 19 (523-525)	Ch. 19 (525-528) Ch. 19 (513-515)	
12	30	9	Nov. 18	Wright6	Prokaryotic gene regulation – the <i>lac</i> operon	Ch. 13 (354-362) Ch. 16 (435-444)	Ch. 13 (348-356) Ch. 16 (429-438)	
12	31		Nov. 20	Wright7	Four genetic systems for the control of prokaryotic operons.	Ch. 16 (436-439) Ch. 16 (446-448)	Ch. 16 (430-433) Ch. 16 (440-441)	
12	32		Nov. 22	Wright8	Catabolite repression and control of transcriptional termination.	Ch. 16 (454-446) Ch. 13 (362-363)	Ch. 16 (439-440) Ch. 13 (356-358)	
13	33	10	Nov. 25	Wright9	Eukaryotic gene regulation: sites of regulation from DNA to protein.	Ch. 13 (364-367) Ch. 16 (432-435) Ch. 14 (385-387)	Ch. 13 (358-361) Ch. 16 (426-429) Ch. 14 (378-379)	
13	34		Nov. 27	Wright10	Chromatin conformation & eukaryotic gene regulation.	Ch. 11 (293-298) Ch. 17 (460-462)	Ch. 11 (288-292) Ch. 17 (454-456)	
13	35		Nov. 29	Wright11	Mutation & its effect on phenotype.	Ch. 18 (482-494) Ch. 9 (240-242)	Ch. 18 (472-484) Ch. 9 (238-240)	
14	36		Dec. 2	Wright12	Mutagens and the Ames test.	Ch. 18 (494-500)	Ch. 18 (485-491)	
					FINAL EXAM SCHEDULED BY REGISTRAR DURING EXAM PERIOD			

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