



COURSE INFORMATION SHEET

Biology 211 Principles of Genetics (Tentative schedule for Fall 2010)

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Lecture venue and time: A2145, Wednesdays and Fridays, 11:15 – 12:30 pm
Laboratory venue and time: A2151, Mondays, 4:00 – 6:30 pm

Course prerequisites: Biology 131 and 133

Course description:

Genetics is a study of the structure and function of the genetic material of organisms. This course introduces students to the fundamentals of genetic information and analysis. The course begins with linking genes to phenotype, and therefore the study of gene inheritance. Following which, topics are discussed in a gradual shift toward the molecular aspects of gene structure, function and regulation. Students taking this course are required to enroll in Bio 211L, which encompass the laboratory accompaniment for this course.

Course objectives:

The course will cover both classical and molecular genetics. It is the aim of the course that students acquire the following skills:

1. Understand the principles of gene inheritance and statistical analysis.
2. Understand the molecular basis of genetics.
3. Understand techniques used in the study of genetics.
4. Able to present and discuss issues regarding genetic analysis.

Required textbook:

Genetics: a conceptual approach. 3rd Edition (2008). Pierce, B.A. W.H. Freeman and Co. New York.

Supporting textbook:

Introduction to Genetic Analysis. 9th Edition (2008). Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. W.H. Freeman and Co. New York.

Attendance:

There are no penalties for non-attendance for any lectures. However, attendance is compulsory for all laboratory exercises, presentations, tests and exams. Allocated marks will not be awarded if student is absent from any laboratory, presentation, test or exam without notice and sufficient reason.

Lecture and laboratory schedule:

Date	Topic	Chapter
Sept 8	Course overview. Ethical issues debate topics and groups.	1
Sept 10	Chromosome and reproduction	2
Sept 15	Epigenetics (NOVA presentation) No lab.	
Sept 17	Ethical issues debate	
Sept 22	Principles for heredity Lab: Monohybrid and dihybrid crosses	3
Sept 24	Sex determination and sex-linked characteristics	4
Sept 29	Extensions and modifications of basic principles Lab: Statistics in genetics	5
Oct 1	Pedigree analysis, applications and genetic testing	6
Oct 6	Linkage, recombination and eukaryotic gene mapping Lab: DNA polymorphism	7
Oct 8	Chromosome variation	9
Oct 13	Test I Lab: Introduction to cloning. Plasmid miniprep and mapping. Guideline and expectations for the lab logbook and final report.	
Oct 15	Bacterial and viral genetic systems	8
Oct 20	Community days (no lecture or lab)	
Oct 22	DNA, chromosomes and transposable elements	10 & 11
Oct 27	DNA replication and recombination Lab: Overview of <i>gfp</i> cloning and expression. Lecture on polymerase chain reaction (PCR). Amplification of <i>gfp</i> gene from pGLO.	12
Oct 29	Transcription	13
Nov 3	RNA molecules and RNA processing Lab: PCR check, cleanup, digestion and ligation to pET28a.	14
Nov 5	The genetic code and translation	15
Nov 10	Test II Lab: Bacterial transformation with ligation products. Bacterial conjugation experiment.	
Nov 12	Control of gene expression in prokaryotes	16

Nov 17	Control of gene expression in eukaryotes Lab: Conformation of transformants – UV, colony PCR	17
Nov 19	Gene mutagenesis and DNA repair	19
Nov 24	Organelle DNA Lab: Gene expression analysis – induction of <i>gfp</i> expression by D-arabinose or IPTG	21
Nov 26	Developmental genetics and immunogenetics	22
Dec 1	Cancer genetics Lab: Genetic applications – Genomics and proteomics, animal breeding in agriculture (Dr. Rod Remin)	23 20
Dec 3	No lecture	
Dec 8	Test III Lab: Course review, lab review.	
Dec 15	Final exam (1 – 4 pm, A2145)	

Mark distribution:

Debate (Sept 17)	5%
Tests (2 x 20%, and 1 x 5%)	45%
Final exam	30%
Lab component	20%

Tests will consist of short answer questions based on topics covered during lectures. The tests are not cumulative. Each test carries 20% of the total course marks, but the lowest test score carries 5% of the total course marks. The final exam will consist of multiple-choice questions, short and long answer questions. Questions will be based on topics covered during lectures, corresponding chapters from the required textbook as well as any additional reading material provided over the duration of the course. The final exam will cover topics from the whole course (cumulative).

There will be no exam or tests for the laboratory component. However, the theory and problems behind the lab topics will be included in the tests and final exam. Marks for the laboratory component are distributed as follows:

1. Monohybrid and dihybrid crosses	15%
2. Statistics in genetics	15%
3. DNA polymorphism	15%
4. Bacterial conjugation	15%
5. <i>gfp</i> cloning and expression lab logbook	25%
6. <i>gfp</i> cloning and expression report	15%

Grading scheme:

A+	93 – 100%	C+	66 – 69%
A	86 – 92%	C	62 – 65%
A–	82 – 85%	C–	58 – 61%
B+	78 – 81%	D+	54 – 57%
B	74 – 77%	D	50 – 53%
B–	70 – 73%	F	Below 50%

Important Notes/Dates:

I will be absent from Ambrose between Sept 11 – 16 to attend a conference in Banff. I do expect to have access to the internet and will reply to any email inquiries as soon as I can.

The last day to enter a course without permission and /or voluntary withdrawal from a course without financial penalty – Friday, September 17

Graduation application deadline – Friday, October 15

The last day to voluntarily withdraw from a course or change to audit without academic penalty – Friday, November 12

Last day to request revised time for a final exam – Monday, November 29

Last day to apply for time extension for coursework – Monday, November 29

Please note that final grades will be available on your student portal. Printed grade sheets are no longer mailed out.

Other Syllabus Features:

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Student Handbook and Academic Calendar. Personal information, that is information about an individual that may be used to identify that individual, may be collected as a requirement as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at privacy@ambrose.edu.

Although extensions to coursework in the semester are at the discretion of the instructor, students may not turn in coursework for evaluation after the last day of the scheduled final examination period unless they have received permission for a “Course Extension” from the Registrar’s Office. Requests for course extensions or alternative examination time must be submitted to the Registrar’s Office by the appropriate deadline (as listed in the Academic Calendar <http://www.ambrose.edu/publications/academiccalendar>). Course extensions are only granted for serious issues that arise “due to circumstances beyond the student’s control.”

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university college. Students are expected to be familiar with the policies in the current Academic Calendar and the Student Handbook that deal with plagiarism, cheating,

and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean.

Students are advised to retain this syllabus for their records.

Course changes, including adding or dropping a course, may be made during the Registration Revision period, as outlined in the Calendar of Events. All course changes must be recorded on a Registration form, available from the Office of the Registrar. Due to circumstances such as class size, prerequisites or academic policy, the submission of a Registration form does not guarantee that a course will be added or removed from a student's registration. Students may change the designation of any class from credit to audit up to the date specified in the Calendar of Events, although students are not entitled to a tuition adjustment or refund after the Registration Revision period.

Withdrawal from courses after the Registration Revision period will not be eligible for tuition refund. Students intending to withdraw from some or all of their courses must submit a completed Registration form to the Registrar's office. The dates by which students may voluntarily withdraw from a course without penalty are listed in the Calendar of Events. A grade of 'W' will be recorded on the student's transcript for any withdrawals from courses made after the end of the Registration Revision period and before the Withdrawal Deadline (also listed in the Calendar of Events). 'W' grades are not included in grade point average calculations. A limit on the number of courses from which Academic a student is permitted to withdraw may be imposed. Students wishing to withdraw from a course, but who fail to do so by the applicable date, will receive the grade earned in accordance with the course syllabus. A student obliged to withdraw from a course after the Withdrawal Deadline because of health or other reasons may apply to the Registrar for special consideration.

An appeal for change of grade on any course work must be made to the course instructor within one week of receiving notification of the grade. An appeal for change of final grade must be submitted to the Office of the Registrar in writing within 30 days of receiving notification of the final grade, providing the basis for appeal. A review fee of \$50.00 must accompany the appeal to review final grades. If the appeal is sustained, the fee will be refunded.

Academic dishonesty is taken seriously at Ambrose University College as it undermines our academic standards and affects the integrity of each member of our learning community. Any attempt to obtain credit for academic work through fraudulent, deceptive, or dishonest means is academic dishonesty. Plagiarism involves presenting someone else's ideas, words, or work as one's own. Plagiarism is fraud and theft, but plagiarism can also occur by accident when a student fails or forgets to give credit to another person's ideas or words. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from Ambrose. Students are expected to be familiar with the policy statements in the current academic calendar and the student handbook that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean and become part of the student's permanent record.