



COURSE INFORMATION SHEET

BIO 211 Principles of Genetics (3)

Fall 2013

Course description:

This course examines the principles of heredity, Mendelian laws, recombination, and basic concepts of gene structures and function.

Further Course Information

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, and introduction to genetic engineering.
4. Able to present and discuss issues regarding genetic analysis.

Class schedules:

Lectures: A2145. Wednesdays and Fridays, 11:15 am – 12:30 pm

Laboratory: A2151. Wednesdays, 4:00 – 6:30 pm

Instructor: Jessmi Ling, PhD.

Office: A2158

Email: jliling@ambrose.edu

Telephone: 1-403-410-2000 ext. 2919

Course prerequisites: Biology 133

Required textbook:

Genetics: a conceptual approach. 4th Edition (2012). Pierce, B.A. W.H. Freeman and Co. New York. ISBN-13: 978-1-4292-3250-0.

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
Wed. Sept 4	Course introduction.	1
Fri. Sept 6	DNA: Chemistry and structure, DNA-interacting proteins. Ch 10. Chromosome structure. Ch 11a.	10, 11a
Wed. Sept 11 Lab	DNA: Replication (synthesis) and recombination. Lab 1: PBS Cracking Your Genetic Code documentary. Documentary worksheet A due Sept 18 .	12
Fri. Sept 13	Transcription of DNA.	13
Wed. Sept 18 Lab	RNA molecules and RNA processing. Lab 2: Cloning Lab Series Part A. - Overview of cloning lab series. - Purification of plasmid DNA. - Cloning series worksheet A due Sept 25 .	14
Fri. Sept 20	The genetic code and translation.	15
Wed. Sept 25 No lab.	Spiritual Emphasis Day	
Fri. Sept 27	Test 1. (Ch 10, 11a, 12, 13, 14, 15)	
Wed. Oct 2 Lab	Bacterial genetic systems. Lab 3: Cloning Lab series Part B. - Isolation of <i>gfp</i> and preparation of pET28a vector. - Cloning series worksheet B due Oct 9 .	8a

Fri. Oct 4	Viral genetic systems.	8b
Wed. Oct 9 Lab	Control of gene expression in prokaryotes. Lab 4: Cloning Lab series Part C. <ul style="list-style-type: none"> - Construction of recombinant plasmid and transformation of <i>E. coli</i>. - Cloning series worksheet C due Oct 16. 	16
Fri. Oct 11	Control of gene expression in eukaryotes. Lab: Identify transformants, subculture for expression lab.	17
Wed. Oct 16 Lab	Transposons. Lab 5: Cloning Lab series Part D. <ul style="list-style-type: none"> - Expression of <i>gfp</i> from pGLO and pET28a-<i>gfp</i>. - Cloning series worksheet D due Oct 23. - Cloning series summary report due Oct 30. 	11b
Fri. Oct 18	Gene mutagenesis and DNA repair.	18
Wed. Oct 23 Lab	Test 2. (Ch 8, 11b, 16, 17, 18). Lab 6: DNA Polymorphism (Worksheet due on Oct 30)	
Fri. Oct 25	Chromosomes and cellular reproduction.	2
Wed. Oct 30 Lab	Basic principles of heredity. Lab 7: Mono and dihybrid crosses (Worksheet due on Nov 6)	3
Fri. Nov 1	Sex determination and sex-linked characteristics.	4
Wed. Nov 6 Lab	Extensions and modifications of basic principles. Lab 8: Statistics in genetics (Worksheet due on Nov 13)	5
Fri. Nov 8	Pedigree analysis, applications and genetic testing.	6
Wed. Nov 13 Lab	Linkage, recombination and eukaryotic gene mapping. Lab 9: Case study – King Tut’s family. Case study worksheet A due Nov 20 .	7

Fri. Nov 15	Chromosome variation.	9
Wed. Nov 20 Lab	Test 3. (Ch 2, 3, 4, 5, 6, 7, 9). Genomics and proteomics. Lab 10: PBS Ghost in Your Genes documentary. Documentary worksheet B due Nov 27.	20
Fri. Nov 22	Organelle DNA.	21
Wed. Nov 27 Lab	Developmental genetics and immunogenetics. Cancer genetics. Lab 11: Case study – Bioinformatics and colon cancer. Case study worksheet B due Dec 4.	22 23
Fri. Nov 29	Quantitative Genetics.	24
Wed. Dec 4 Lab	Population Genetics. Lab 12: Dr. Rod Remin’s talk. Dr. Rod Remin’s talk summary due Dec 6.	25
Fri. Dec 6	Evolutionary Genetics.	26
Fri. Dec 13	Final Exam. 9 am – noon. A2141.	

Mark distribution:

Tests (3 x 15%)	45%
Final exam	30%
Lab component	25%

Tests consist of short answer questions based on topics covered during lectures. The tests are not cumulative. Each test carries 15% of the total course marks. The final exam consists of mostly short-answer questions and sets of related questions. Questions will be based on topics covered during lectures and corresponding chapters from the required textbook. The final exam will cover topics from the whole course including chapters 20 to 26.

There will be no exam or tests for the laboratory component. However, the theory and problems behind the lab topics may be included in any of the tests and final exam. Due dates for assignments are provided in the lecture and laboratory schedule. Late submissions are not accepted unless sufficient reason is provided in a written request for

extension to the instructor prior to the due date. Please note that students must earn at least 70% of the laboratory component marks in order to have these marks added to the final marks for grading.

Marks for the laboratory component are distributed as follows:

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| 1. Cloning Lab Series: | |
| a. Worksheets A – D (4 × 5%) | 20% |
| b. Summary report | 12% |
| 2. Monohybrid and dihybrid crosses | 15% |
| 3. Statistics in genetics | 15% |
| 4. DNA polymorphism | 15% |
| 5. Case study worksheets | 10% |
| a. King Tut's family | |
| b. Bioinformatics and colon cancer | |
| 6. Documentary worksheets | 10% |
| a. Ghost in your genes | |
| b. Cracking your genetic code | |
| 7. Dr. Rod Remin's talk summary | 3% |

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 dates:

Residence opens: Sunday, September 1.

Fees due: Wednesday, September 4.

Convocation Chapel: Thursday, September 5.

Last day to enter course without permission; last day to withdraw from a course, change to audit, and receive tuition refund: Sunday, September 15.

Spiritual Emphasis Day: Wednesday and Thursday, September 25 – 26.

Graduation application deadline: Friday, October 18

Last day to request revised time for a final exam: Monday, October 28.

Last day to withdraw from courses without academic penalty: Thursday, November 12.

Last day to apply for time extension for coursework: Monday, November 25.

Last day of classes: Monday, December 9.

Residence closes: Friday, December 20.

From the Registrar:

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.