Biology 211 (BIO 211) Fall 2015

Principles of Genetics 3 credits

Prerequisite(s): BIO 131

Class Information		Instructor Information			
Days	Weds/Fri	**Instructor:**	Jessmi Ling, PhD	**First day of classes:**	Wed., Sept. 9, 2015
Time:	9:45 – 11:00	**Email:**	JLing@ambrose.edu	**Last day to add/drop, or change to audit:**	Sun, Sept 20, 2015
Room:	A2141	**Phone:**	(403)410-2000 ext. 2919	**Last day to request revised exam:**	Mon., Oct. 26, 2015
Lab/Tutorial:	Wednesdays, A2151, 11:15 – 14:15	**Office:**	A2158	**Last day to withdraw from course:**	Thu, Nov. 12, 2015
FINAL EXAM: December 19 (Saturday), 9:00 – 12:00, A2141		**Office Hrs:**	By appointment.	**Last day to apply for time extension for coursework:**	Mon, Nov 23, 2015
				Last day of classes:	Mon, Dec 14, 2015

Textbook:

Genetics: a conceptual approach. 5th Edition (2014). Pierce, B.A. W.H. Freeman and Co. New York. ISBN-13: 978-1-4641-0946-1.

You may use the older edition, but please note any updates. Lectures, tests and exams are based off the newer edition.

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

Course Description:

This course examines the principles of heredity, Mendelian laws, as well as basic concepts of gene structure and function, gene regulation and genetic recombination. Principles from prokaryotes, eukaryotes and viruses will be explored. The accompanying laboratory component contains experiments and exercises to illustrate key genetic principles and DNA recombination techniques.

Expected Learning Outcomes:

The course will cover both classical and molecular genetics. It is the aim of the course that students display 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.

Course Schedule:

Date	Topic	Chapter
Wed. Sept 9 Lab 1	Course introduction. Lab 1: PBS Cracking Your Genetic Code documentary. Documentary worksheet A due **Sept 16**.	1
Fri. Sept 11	DNA: Chemistry and structure, DNA-interacting proteins. Ch 10. Chromosome structure. Ch 11.	10, 11
Wed. Sept 16 Lab 2	DNA: Replication (synthesis). Lab 2: Cloning Lab Series Part A. - Overview of cloning lab series. - Purification of plasmid DNA. - Cloning series worksheet A due **Sept 23**.	12a
Fri. Sept 18	Transcription of DNA.	13
Wed. Sept 23 Lab 3	RNA molecules and RNA processing. Lab 3: Cloning Lab series Part B. - Isolation of *gfp* and preparation of pET28a vector. - Cloning series worksheet B due **Sept 30**.	14
Fri. Sept 25	The genetic code and translation.	15
Wed. Sept 30	Spiritual Emphasis Day (No class, No lab)	

No lab.		
Fri. Oct 2	Review session 1 – practice questions	
Wed. Oct 7 Lab 4	**Test 1 (Ch 10, 11, 12a, 13, 14, 15)** Lab 4: Cloning Lab series Part C. - Construction of recombinant plasmid and transformation of *E. coli*. - Cloning series worksheet C due **Oct 14**.	
Fri. Oct 9	Bacterial genetic systems. Lab: Identify transformants, subculture for expression lab.	9a
Wed. Oct 14 Lab 5	Viral genetic systems. Lab 5: Cloning Lab series Part D. - Expression of *gfp* from pGLO and pET28a-*gfp*. - Cloning series worksheet D due **Oct 21**. - Cloning series summary report due **Nov 11 (Wednesday)**.	9b
Fri. Oct 16	Control of gene expression in Bacteria.	16
Wed. Oct 21 Lab	Control of gene expression in eukaryotes. No wet lab. Review session 2 on gene expression.	17
Fri. Oct 23	Gene mutagenesis and DNA repair.	18a
Wed. Oct 28 Lab 6	Transposons and transposition Genomics and proteomics. Lab 6: DNA Polymorphism (Worksheet due on **Nov 4**)	18b 20
Fri. Oct 30	Spiritual Emphasis Day (no daytime classes)	
Wed. Nov 4 Lab 7	Chromosomes and cellular reproduction. Ch 2; Mechanism of recombination. Ch 12b Lab 7: Mono and dihybrid crosses (Worksheet due on **Nov 25 with Lab 8**) Review session 3 – practice questions.	2, 12b
Fri. Nov 6	**Test 2 (Ch 9, 16, 17, 18, 20)**	

Wed. Nov 11 No Lab	Remembrance Day (No classes, no Lab)	
Fri. Nov 13	Basic principles of heredity.	3
Wed. Nov 18 Lab 8	Sex determination and sex-linked characteristics. Extensions and modifications of basic principles. Lab 8: Statistics in genetics (Worksheet due on **Nov 25 with Lab 7**)	4 5
Fri. Nov 20	Pedigree analysis, applications and genetic testing.	6
Wed. Nov 25 Lab 9	Linkage, recombination and eukaryotic gene mapping. Lab 9: Epigenetics. PBS Ghost in Your Genes documentary. Documentary worksheet B due **Nov 27 (Friday)**.	7 21
Fri. Nov 27	Chromosome variation.	8
Wed. Dec 2 Lab 10	Review session 4 – practice questions Lab 10: Dr. Rod Remin's talk – Genetics and Animal Breeding. Summary of Dr. Remin's talk due **Dec 2 (midnight)**.	
Fri. Dec 4	**Test 3 (Ch 2, 3, 4, 5, 6, 7, 8, 12b)**	
Wed. Dec 9 Lab 11	Developmental genetics and immunogenetics. Lab 11: Cancer genetics. Case study – Bioinformatics and colon cancer. Case study worksheet due **Dec 11**.	22 23
Fri. Dec 11	Revision session 5 – Course review	
TBD	**Final Exam (30% from Ch 21, 22, 23; 70% from Ch 2 – 20).**	

Requirements:

Mark distribution:

Quizzes (4 x 2%)	8%
Tests (2 x 18%)	36%
Final exam	26%
Lab component	30%

Quizzes, tests and the final exam consist of multiple-choice questions and short answer questions. For the most part, these tests are not cumulative. Questions are derived from topics covered during lectures and corresponding chapters from the required textbook. 70% of the final exam will cover topics from the whole course (cumulative), while the remainder will consist of questions from topics covered after Test 2.

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 60% 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:

1. Cloning Lab Series:
   a. Worksheets A – D (4 x 6%) 24%
   b. Summary report 20%
2. Monohybrid and dihybrid crosses 12%
3. Statistics in genetics 12%
4. DNA polymorphism 12%
5. Dr. Remin's talk 5%
6. Case study worksheets 5%
   a. Bioinformatics and colon cancer
7. Documentary worksheets 10%
   a. Ghost in your genes
   b. Cracking your genetic code

Attendance:

There are no penalties for absence from 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 written notice and sufficient reason.

Grade Summary:

The available letters for course grades are as follows:

Letter Grade	Description
A+	
A	Excellent
A-	
B+	
B	Good
B-	
C+	
C	Satisfactory

C-	
D+	
D	Minimal Pass
F	Failure

Grading scheme for Bio 211:

A+	93.0 – 100%	C+	66.0 – 69.9%
A	86.0 – 92.9%	C	62.0 – 65.9%
A–	82.0 – 85.9%	C–	58.0 – 61.9%
B+	78.0 – 81.9%	D+	54.0 – 57.9%
B	74.0 – 77.9%	D	50.0 – 53.9%
B–	70.0 – 73.9%	F	Below 49.9%

Because of the nature of the Alpha 4.00 system, there can be no uniform College-wide conversion scale. The relationship between raw scores (e.g. percentages) and the resultant letter grade will depend on the nature of the course and the instructor's assessment of the level of each class, compared to similar classes taught previously.
Please note that final grades will be available on student registration system. Printed grade sheets are not mailed out.

Other

It is the responsibility of the student to keep up with required reading and submit completed assignments by their due dates.

Policies:

Communication

All students have received an Ambrose e-mail account upon registration. It is the student's responsibility to check this account regularly as the Ambrose email system will be the professor's instrument for notifying students of important matters (cancelled class sessions, extensions, requested appointments, etc.) between class sessions. If students do not wish to use their Ambrose accounts, they will need to forward all messages from the Ambrose account to another personal account.

Registration

During the **Registration Revision Period** students may enter a course without permission, change the designation of any class from credit to audit and /or voluntary withdraw from a course without financial or academic penalty or record. Courses should be added or dropped on the student portal by the deadline date; please consult the List of Important Dates. After that date, the original status remains and the student is responsible for related fees.

Students intending to withdraw from a course after the Registration Revision Period must apply to the Office of the Registrar by submitting a "Request to Withdraw from a Course" form or by sending an email to the Registrar's Office by the **Withdrawal Deadline;** please consult the List of Important Dates on the my.ambrose.edu website. Students will not receive a tuition refund for courses from which they withdraw after the Registration Revision period. A grade of "W" will appear on their transcript.

Exam Scheduling

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.

Students, who find a conflict in their exam schedule must submit a Revised Examination Request form to the Registrar's Office by the deadline date; please consult the List of Important Dates. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; 2) the student has three final exams within three consecutive exam time blocks; 3) the scheduled final exam slot conflicts with an exam at another institution; 4) extenuating circumstances. Travel is not considered a valid excuse for re-scheduling or missing a final exam.

Electronic Etiquette

Students are expected to treat their instructor, guest speakers, and fellow students with respect. It is disruptive to the learning goals of a course or seminar and disrespectful to fellow students and the instructor to use electronics for purposes unrelated to the course during a class session. Turn off all cell phones and other electronic devices during class. Laptops should be used for class-related purposes only. Do not use iPods, MP3 players, or headphones. Do not text, read, or send personal emails, go on Facebook or other social networks, search the internet, or play computer games during class. Some professors will not allow the use of any electronic devises in class. The professor has the right to disallow the student to use a laptop in future lectures and/or to ask a student to withdraw from the session if s/he does not comply with this policy. Repeat offenders will be directed to the Dean. If you are expecting communication due to an emergency, please speak with the professor before the class begins.

Academic Policies

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Academic Calendar. Personal information (information about an individual that may be used to identify that individual) may be required 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.

Extensions

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 deadline date; please consult the List of Important Dates. Course extensions are only granted for serious issues that arise "due to circumstances beyond the student's control."

Appeal of Grade

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 Registrar's Office

in writing and providing the basis for appeal 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. If the appeal is sustained, the fee will be refunded.

Academic Integrity

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Academic dishonesty is taken seriously at Ambrose University 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 acknowledge 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 the university college. Students are expected to be familiar with the policies in the current Academic Calendar 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.

Note: Students are strongly advised to retain this syllabus for their records.