

Course ID:	Course Title:	Fall 2017
BIO 211	Principles of Genetics	Prerequisite: BIO 131
		Credits: 3

Class Information		Instructor Information		Important Dates	
Days:	Wed/Fri	Instructor:	Matthew Morris, PhD	First day of classes:	Wed., Sept. 6
Time:	9:45-11:00 am	Email:	Matthew.Morris@ambrose.edu	Last day to add/drop, or change to audit:	Sun, Sept. 17
Room:	A2210	Phone:	403-410-2000 ext 6932	Last day to request revised exam:	Mon, Oct. 23
Lab/ Tutorial:	Wed 2:30-5:30 A2145 / A2151	Office:	A2158	Last day to withdraw from course:	Mon, Nov. 13
		Office Hours:	By appointment	Last day to apply for coursework extension:	Mon, Nov. 20
Final Exam:	Sat Dec 16, 9-12, A2133			Last day of classes:	Mon, Dec. 11

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 molecular techniques.

Expected Learning Outcomes

This course will cover classical (Mendelian) and modern (molecular) genetics. Students should come out of this course being able to:

1. Demonstrate the Mendelian principles of inheritance through Punnett squares and pedigrees.
2. Understand the chemical nature of DNA and how its properties contribute to phenotypic variation.
3. Describe the central dogma and the molecular pathways involved in replication, transcription, translation, DNA repair, and epigenetic inheritance.
4. Compare and contrast the genomes of prokaryotes, eukaryotes, mitochondria, and viruses, and understand how the properties of different genomes can be used to address real-world problems.
5. Demonstrate competence in basic lab skills, including sample preservation, pipetting, electrophoresis, and PCR.

Textbooks

Griffiths AJ, Wessler SR, Carroll SB, Doebley J (2015) *An Introduction to Genetic Analysis, 11th Edition*. W.H. Freeman & Company: NY.

This textbook is required reading for this course. It is expected that you will be doing readings in order to supplement lecture content.

Course Schedule

Week	Topic	Ch: pg
Sept 6	Phenotypes	1: 2-27
Sept 8	Mendelian genetics	2: 31-39 3: 87-93
Sept 13	Chromosomal theory of inheritance	2: 39-53 3: 93-108
Sept 15	Sex-linked inheritance and pedigree analysis	2: 53-70
Sept 20	Linkage and recombination	4: 127-158
Sept 22	Allelic and genic interactions	6: 215-242
Sept 27	NO CLASS	
Sept 29	DNA replication	7: 259-280
Oct 4	RNA, the central dogma, and transcription	8: 292-301
Oct 6	Translation	9: 319-344
Oct 11	Methods I: PCR and electrophoresis	
Oct 13	Prokaryotic genomes	5: 173-192
Oct 18	Methods II: Restriction mapping	10: 352-373, 382-391
Oct 20	Methods III: Transgenics	
Oct 25	Eukaryotic genome	11: 398-413 7: 280-287
Oct 27	Epigenetics I	8: 301-315, 12: 431-465
Nov 1	Epigenetics II	
Nov 3	Mitochondrial genome	3: 110-117
Nov 8	NO CLASS	
Nov 10	NO CLASS	
Nov 15	Variation I: Transposable elements and other fun things	15: 547-577
Nov 17	Variation II: Mutations	16: 581-612
Nov 22	Variation III: Chromosomal rearrangements	17: 617-652
Nov 24	Population genetics	18: TBD
Nov 29	Methods IV: Sequencing	
Dec 6	What is a gene?	
Dec 8	Review	

Lab Schedule

Week	Topic	Dates due
Sept 6	NO LAB	
Sept 13	Corn	Corn Pre-lab
Sept 20	Fruit flies I	Corn parts 2-4/ Fruit flies I
Sept 27	NO LAB	
Oct 4	Fruit flies II	Fish samples due
Oct 11	DNA damage	Fruit flies II
Oct 18	Midterm	
Oct 25	DNA extraction/PCR	DNA damage
Nov 1	Gel electrophoresis	
Nov 8	NO LAB	
Nov 15	Microsats and Linkage	PCR/Electrophoresis
Nov 22	Genetic disease	Linkage
Nov 29	DNA barcoding	
Dec 6	DNA barcoding II	Barcoding presentations/ Genetic disease

Requirements:

Mark distribution:

Quizzes or homework assignments: 10%

Midterm: 20%

Final exam: 30%

Lab: 40%

The midterm will occupy a lab session to allow greater time for completion. Quizzes may be conducted at the beginning or end of class and will address only the previous lecture. Homework assignments will occur throughout the semester. They will be due the beginning of class. There will be no exam or tests for the laboratory component. However, lab content may be included in the midterm and/or final exam.

The schedule provided above is flexible and may be altered. Consult the Moodle website for the most up-to-date 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 **61% of the laboratory component marks** in order to pass the class; that is, you could have 80% in the overall course and still fail the class if you miss too many labs. There are 10 labs, not including the midterm, this semester. Miss four labs and you automatically fail the course.

Marks for the laboratory component are distributed as follows. Percentages add up to 40%, which is the contribution of the lab to your total mark.

1. Corn genetics – 3%
2. Fruit fly genetics – 4%
3. DNA damage – 4%
4. PCR/Gel electrophoresis – 7%
5. Microsats and Linkage – 5%
6. DNA barcoding – 9%
7. Genetic disease – 8%

Attendance:

Although attendance to lectures is not mandatory, homework assignments and quizzes will not be announced ahead of time, will not be posted on Moodle, and cannot be made up. Attendance is compulsory for all laboratory exercises and exams.

Grade Summary:

The available letters for course grades are as follows:

<u>Letter Grade</u>	<u>Description</u>
A+	Excellent
A	
A-	
B+	Good
B	
B-	
C+	Satisfactory
C	
C-	
D+	Minimal Pass
D	
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 University-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.

Ambrose University Academic 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.

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.

Exam Scheduling

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 devices 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.