

Course ID:	Course Title:	Fall 2018
BIO 211	Principles of Genetics	Prerequisite: BIO 131
		Credits: 3

Class Information		Instructor Information		Important Dates	
Days:	Wed/Fri	Instructor:	Dr. Matthew Morris	First day of classes:	Wed., Sept 5
Time:	11:15-12:30	Email:	Matthew.Morris@ambrose.edu	Last day to add/drop, or change to audit:	Sun, Sept 16
Room:	A2210 (class) A2145 (lab)	Phone:	403-410-2000 ext 6932	Last day to request revised exam:	Mon, Oct 22
Lab/ Tutorial:	6 hrs/wk	Office:	A2158	Last day to withdraw from course:	Mon, Nov 12
	11 am –2 pm (Section 1) 2:30 – 5:30 pm (Section 2)	Office Hours:	By appointment	Last day to apply for coursework extension:	Mon, Nov 19
Final Exam:	Sat Dec 15, A2133, 9-12			Last day of classes:	Tue, Dec 11

Course Description

This course examines the principles of heredity and 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. **Required.**

Course Schedule – Subject to change; stay updated on the Moodle page

Week	Topic	Ch: pg
Sept 5	Phenotypes	1: 2-27
Sept 7	Mendelian genetics	2: 31-39 3: 87-93
Sept 12	Chromosomal theory of inheritance	2: 39-53 3: 93-108
Sept 14	Sex-linked inheritance and pedigree analysis	2: 53-70
Sept 19	Linkage and recombination	4: 127-158
Sept 21	Allelic and genic interactions	6: 215-242
Sept 26	DNA replication	7: 259-280
Sept 28	RNA, the central dogma, and transcription	8: 292-301
Oct 3	Spiritual Emphasis Day – No Daytime Classes	
Oct 5	Translation	9: 319-344
Oct 10	Methods I: PCR and electrophoresis	
Oct 12	Prokaryotic genome	5: 173-192
Oct 17	Methods II: DNA fingerprinting	10: 352-376
Oct 19	Eukaryotic genome	7: 280-287 8: 301-315
Oct 24	Epigenetics I: Prokaryotes	11: 398-413
Oct 26	Epigenetics II: Eukaryotes	12: 431-465
Oct 31	Mitochondrial genome	3: 110-117
Nov 2	Viral genome	
Nov 7	Reading break - NO CLASS	
Nov 9	Reading break - NO CLASS	
Nov 14	Variation I: Transposable elements	15: 547-577
Nov 16	Variation II: Point mutations and indels	16: 581-612
Nov 21	Variation III: Changes to ploidy	17: 617-634
Nov 23	Variation IV: Chromosomal rearrangements	17: 634-652
Nov 28	Population genetics	18: 665-683
Nov 30	TBA	TBA
Dec 5	TBA	TBA
Dec 7	Review	

Lab Schedule

Week	Topic	Lecture based on
Sept 10	Introduction	
Sept 17	Corn	Mendelian genetics
Sept 24	Meiosis	Chromosomal theory
Oct 1	Fruit flies I	Sex-linked inheritance
Oct 8	Thanksgiving – no lab	
Oct 15	Fruit flies II	Sex-linked inheritance
Oct 22	Midterm	
Oct 29	DNA extraction/PCR	Methods I
Nov 5	Reading break – no lab	
Nov 12	Gel electrophoresis	Methods I
Nov 19	Gene mapping	Linkage and recombination/DNA fingerprinting
Nov 26	Human genome	Variation I-IV
Dec 3	DNA barcoding	Mitochondrial genome
Dec 10	DNA barcoding II	Mitochondrial genome

Requirements:

Mark distribution:

Homework assignments: 10%

Midterm: 20%

Final exam: 30%

Lab: 40%

The midterm will occupy a lab session to allow greater time for completion. 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. There are 12 labs, not including the midterm, this semester. **Miss four or more labs and you automatically fail the course. Assignments from missed labs cannot be handed in.**

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.

- Lab 1 (Chi-squared) – 1%
- Lab 1 (DNA barcoding sample sheets) – 1%
- Lab 2 (Corn genetics) – 3%
- Lab 3 (Meiosis) – 2%
- Labs 4 and 5 (Fruit fly genetics) – 6%
- Lab 6 (DNA extraction and PCR) – 5%
- Lab 7 (Gel electrophoresis) – 4%
- Lab 8 (Gene mapping) – 5%
- Lab 9 (Human genome) – 4%
- Labs 10 and 11 (DNA barcoding) – 9%

Attendance:

Although attendance to lectures is not mandatory, homework assignments 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; **missing four or more labs results in automatic failure of the course.**

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.

Late assignment policies

Homework or lab assignments cannot be submitted late without cause and approval from the professor. Homework assigned during lecture is **due at the start of lecture** for which it is due; anything after the start of lecture will be considered late. Lab assignments **are due at the beginning of lab**; anything after the start of the lab will be considered late. The penalty for late homework or lab assignments are as follows:

- 5%/day for late assignments that have been communicated to the professor ahead of time.
- 10%/day for late assignments if the professor has to track you down to find out what is going on.
- 0% on any assignments passed in one week after the due date, unless otherwise stated by the instructor. *These assignments will still be “graded” so that you can have feedback before the exam, even if your official grade is 0.*

If your name is not on the assignment, it will not be graded and you will receive a grade of 0 for failing to submit an assignment.

Missed midterms or final exams, without cause, cannot be made up. The only acceptable reason for missing an exam is illness, for which a doctor’s note will be required. Give yourself plenty of time to get to school on exam days. Traffic or weather is no reason for missing an exam.

Plagiarism policy

Some lab assignments will be submitted as a single copy per lab group. It is expected that all members of the group contribute equally to the assignment. This is a good opportunity to help your fellow students understand concepts they may be struggling with. Please ensure all members of the group are named on such assignments. **Group members whose names are not on the submitted assignment will receive a grade of zero.**

All other assignments will be submitted as one original piece of work per person. If you submit an assignment with only your name on it, it is assumed that you are the sole contributor of the work.

See below for Ambrose’s statement defining plagiarism and outlining its consequences. In brief, it is your responsibility as a citizen of Ambrose to be aware of the policies of Ambrose and abide by them. Ignorance is no excuse. Plagiarism will not be tolerated.

Examples of plagiarism include, but are not limited, to:

1. Copying an assignment from someone else and submitting it as your own work.
2. Working with a friend and writing down identical answers, whether you understand the content or not, and submitting the assignments separately.
3. Quoting directly from a source without supplying quotation marks or a citation.
4. Quoting directly from a source without supplying quotation marks, even if it is referenced.
5. Copying nearly word-for-word from a source, changing only the occasional word, without providing quotation marks, even if it is referenced.
6. Submitting an assignment in which >30% of the content is properly quoted; that is, at least 70% of the words in an assignment need to be your own. A general rule of thumb: for every line quoted, there should be three lines of your own material explaining that quote.

7. Submitting the same or similar assignment for more than one class, or more than one iteration of the same class.
8. Not citing illustrations used in a paper.

A tutorial explaining some of the above can be found at:

<http://library.acadiau.ca/sites/default/files/library/tutorials/plagiarism/>

Penalties for plagiarism

For a first offense in any one of my classes, a zero on the assignment with no chance of rewriting it, and a note in your academic file.

For a second offense in any one of my classes, a zero in the class, and recommendation for a note on your transcript.

For a third offense in any one of my classes, a zero in the class and a recommendation for expulsion from the university.

Note that Ambrose has an appeals process in place if you feel that allegations of plagiarism are unfounded; these are for final marks only, and not for individual assignments.

Note that my record of a student's past plagiarism does not reset with each semester.

Classroom Etiquette:

It is expected that students will take an active role in the learning process. This includes: (a) regular class and lab attendance, (b) reading course material in advance of class or labs, and (c) engaging in discussions during class or labs.

In respect to the professor and to your fellow students, we ask that you:

- a) Turn your phone off during class and that you don't use it for texting during lecture or lab;
- b) Not have conversations with the people beside you during lecture – it is very distracting to the people around you;
- c) Use your laptops for lecture material and assignments only – that you are not using the internet or Facebook during class time;
- d) Arrive to lecture and lab on time;
- e) Don't listen to music in class or lab.

These will help to maximize the learning experience for you and your fellow students (and will keep your professor in a good mood).

See the lab Moodle page for lab rules.

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. 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.