

**ANTH 506 Anthropological Genetics Fall 2021**  
**Department of Anthropology & Archaeology | University of Calgary**

**a) Course Information**

Lecture: Monday 2pm – 4:45pm (synchronous)

Location (Blended): Zoom and SS 012, on-site lab tour will be in HMRB 202 (see calendar).

Zoom link is available on D2L and also here:

Join Zoom Meeting

<https://ucalgary.zoom.us/j/97975478716>

Meeting ID: 979 7547 8716

Passcode: 472914

Instructor: Associate Professor Amanda Melin

Email: [amanda.melin@ucalgary.ca](mailto:amanda.melin@ucalgary.ca);

Office Hours (Earth Science 710F or Zoom): By appointment

If interested, you can learn more about your instructor's research at [www.amandamelin.com](http://www.amandamelin.com)

Teaching Assistant

Swellan Pinto

Email: [swellan.pinto@ucalgary.ca](mailto:swellan.pinto@ucalgary.ca)

Office Hours (Earth Sciences ES 722 or Zoom): By appointment

**COURSE DESCRIPTION**

This seminar course will examine the principles of evolutionary genetics with a focus on applications to current topics in Anthropology such as behavior, life history, adaptation, migration and disease. We will explore the contents of the primate genome as well as human and non-human primate genetic variation in an evolutionary framework and discuss the latest advances in molecular techniques and their applications to addressing fundamental questions in biology. Special topics may include sensory adaptations, gene flow and migration, and conservation genetics. Key concepts will be illustrated using examples pulled from literature on humans, non-human primates and other animals. We will use a textbook, as well as discuss primary literature and have several guest lectures by experts in evolutionary genomics.

As this is a small seminar, students are expected to be active participants in student-led presentations and discussions (see grading). The aim is to have students engaged with the literature at an advanced level and be introduced to the kind of critical analysis of current research that is typical of senior undergraduate and post-graduate studies.

**PREREQUISITES**

***Anth 201, Anth 311, and Anth 350 or one additional senior primatology course and consent of the Department.***

Courses in biological sciences may be substituted at the instructor's discretion. Advanced, prior knowledge of genetics is not expected for this course and we will cover a general introduction. However, this is a 500-level course and you are expected to seek out additional readings or assistance as needed to firmly grasp the basic biological principles we will build on. (It's a good idea to do this earlier, rather than later in the course!)

## **QUESTIONS ABOUT COURSE MATERIAL**

All questions about course material must be posted to the designated D2L page, and **not** via email to instructors or TA. This allows all students to review questions and answers. Questions must start with the Topic. Students are encouraged to answer classmates' questions and the TA/Instructor will check this page twice a week, and add to these answers as needed. Students providing **answers** must provide their names to be eligible for bonus marks (below). Office hours and before/after class are also a great time to ask questions.

## **COURSE OBJECTIVES**

With the successful completion of this course, students should be able to:

1. Describe the components of the human genome
2. Explain different methods used for genetic investigations and analyses
3. Understand how concepts in evolutionary genetics are used to answer questions about human migration, diversity, adaptation and evolution
4. Identify some of the pitfalls and limitations of molecular-based approaches for answering questions about human and other primates
5. Be able to read, and understand at a basic level, data papers in the discipline
6. Critically evaluate and discuss primary literature and review articles
7. Write a well-organized, clear and structured essay

## **COURSE LEARNING OUTCOMES**

The Department of Anthropology & Archaeology is committed to student knowledge and skill development. Below is a list of the key learning outcomes for this course, the program-learning outcomes to which they contribute, and the expected level of achievement.

1. Demonstrate an understanding of the basic concepts, terminology, methods, theoretical perspectives, issues, and contemporary concerns in biological anthropology and evolutionary genetics at an advanced level.
2. Brainstorm, obtain, organize, visualize and present primary research papers in an accessible way for classmates.
3. Ask questions and discuss ideas and information presented in a format appropriate for a specialized audience at an intermediate level.

**REQUIRED TEXT:** Jobling et al. 2013 Human Evolutionary Genetics (2nd edition)

This book does a great job introducing many fundamentals and key concepts of the human genome and human genome variation. These principals are relevant for all downstream aspects of the course. Reading assignments are provided for each lecture. For additional context and help with broader concepts, you may wish to read the entire book.

Students will also be responsible for accessing and reading journal articles that are assigned to each lecture and be prepared to discuss them in class. Some of these articles will be selected during the first week of class.

## **REQUIRED TECHNOLOGY**

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology.

- A computer with a supported operating system (Mac OS, Linux, Windows), as well as the latest security and malware updates
- A current and updates web browser

- Webcam (built in or external)
- Microphone and speaker (built in or external) or headset with microphone
- Reliable, broadband internet connection
- Zoom software (either accessed through browser or desktop application)

Our seminar will take place during the regular, calendar-scheduled time over Zoom, and will rely on real-time discussion and guided learning. Students must have reliable access to internet and be able to use Zoom during designated class times, with video and audio functions present and enabled. Students and instructors are expected to participate with “video on” mode during discussions. Short periods where the camera is disabled are fine. Attendance is required for participation in course activities. Please notify the instructor if you need assistance in accessing an internet-enabled computer with audio and video functions. Students must also use a UCALGARY.CA email address, and should regularly check and use D2L for course communications and questions.

We also have several class periods that are flagged for in-person activities (**Oct 4, Oct 26, Nov 22**) to enhance the experience for students, including small group project planning with the instructor, peer editing, and individual writing feedback for the final project. These meetings can be over Zoom if the student prefers. A tour of the primate molecular ecology laboratory is also planned. This tour is also available as a video for those students who choose not to participate.

#### **CLASSROOM NORMS**

On the first day of class, we will discuss and negotiate norms of online seminar participation, including the following areas:

- Attendance and punctuality
- Questions, participation, and online conduct

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## **(b) Assessment and Evaluation Information**

### **ATTENDANCE AND COURSE MATERIALS**

Students should make every effort to attend each class. There will be short quizzes on the current week's assigned textbook readings and previous week's lecture materials at the start of each class. Students should work on these on their own. **Students will be allowed to drop their two lowest quiz grades, including missed quizzes**; make-up quizzes are not permitted. If you do miss a class, the videos will be available online via D2L after class. However, attendance and participation in discussions is required for the participation component of grading. Students may be granted permission to submit written discussion materials if they must miss a class.

*Students may be asked to provide supporting documentation for an exemption/special request. This may include, but is not limited to, a prolonged absence from a course where participation is required, a missed course assessment, a deferred examination, or an appeal. Students are encouraged to submit documentation that will support their situation. Supporting documentation may be dependent on the reason noted in their personal statement/explanation provided to explain their situation. This could be medical certificate/documentation, references, police reports, invitation letter, or a statutory declaration, etc. The decision to provide supporting documentation that best suits the situation is at the discretion of the student. Students cannot be required to provide specific supporting documentation, such as a medical note.*

*Students can make a Statutory Declaration as their supporting documentation (available at [ucalgary.ca/registrar](http://ucalgary.ca/registrar)). This requires students to make a declaration in the presence of a Commissioner for Oaths. It demonstrates the importance of honest and accurate information provided and is a legally binding declaration. Several registered Commissioners for Oaths are available to students at no charge, on campus, please see [ucalgary.ca/registrar](http://ucalgary.ca/registrar).*

*Falsification of any supporting documentation will be taken very seriously and may result in disciplinary action through the Academic Discipline regulations or the Student Non-Academic Misconduct policy.*

### **GRADING**

There will be weekly quizzes each class during the semester, excluding the first class. Participation in weekly critical discussions will also count towards the course grade, and there will also be a final written assignment. Finally, there is an optional bonus assignment, described below.

As this is an upper division course, to the greatest extent possible the multiple-choice questions will require basic knowledge of the information presented in class and (most importantly) a strong grasp of relevant underlying concepts.

**Weekly quizzes (50% total):** Quizzes must be submitted before the start of each lecture. They are open book and students can use lecture material and the textbook to answer the questions. Questions will be based on assigned readings for that week (i.e. to reward students for being prepared for class) and also on integration of the previous weeks' lecture and/or journal article materials (to reward to students for mastering content previously introduced). Each quiz will have **10 questions** worth one point each. Quizzes will be posted by Friday at 10am each week and the instructor may draw from suggestions submitted in class or **posted before 2pm the previous day (Thursday)** on D2L by students. Students will be allowed to drop their two lowest quiz grades, including missed quizzes. Students will not be allowed to submit late quizzes. Make-up quizzes will not be provided. **The expectation is that students will complete the quizzes independently.**

**Participation in Critical Discussion of Journal Articles (30%).** Students will receive a score of "1" (attendance, minimal participation), "2" (attendance, engaged participation), or "3" (attendance, excellent participation)

during each discussion period for demonstrating they have carefully read the assigned papers and are prepared to discuss their methods, results and importance. We ask that people are considerate and do not dominate the conversation, allowing other students to share their thoughts. Questions and comments can be posted in the chat or shared by raising hands. Instructors will contribute and moderate. **Students absent from class due to illness or other excused absence must notify instructor before class and will be permitted to submit a written discussion of the assigned articles.**

### **Course Assignment – Genomics Essay (20% total).**

The final assignment, a 3 to 5page essay, will allow students to conduct research in an area of their interest and to iteratively improve their writing content and structure by working on the essay with feedback from the instructor and their peers.

**3%** of the paper grade will be based on participating in the peer-editing session (see calendar). The grade assigned to the assignment itself will constitute the remaining 17%. Late papers – submitted after the due date, will be decreased by one letter grade per day late. (E.g. an A- paper submitted one day late will receive a B-).

Write a **3-5 page essay (not including references)**. **Students are asked to include one figure visualizing a main point of their essay. This doesn't count towards the page limit. 11 point Arial font, 1 inch margins, 1.5 line spacing, on a topic in personalized genomics** describing the methods and results from one or more papers analysing genotype and phenotype data together to understand the genetic basic of disease risk or trait expression, drawing links to concepts covered in the course. Essays should detail EACH of these components: What were the questions the authors asked? What data did they collect? What did they learn? What are the broader impacts of this research?

Importantly, your essay should **also include** a separate section with 2 or so paragraphs discussing the benefits and potential problems of the personalized genomics era more broadly. There are papers published on this that can inform your understanding, but the student should also present their unique perspective and thoughts on this complicated topic. Where possible, try to draw links or examples to the main body of the research paper.

**The final assignment should be submitted by email to the instructor by 11:59pm on the due date using the email header: “Anth 506 Final Essay”.** We will exchange papers for peer editing and instructor feedback earlier in the semester. In the final lecture of the semester, students will be asked to briefly discuss their research and their thoughts on the personal genomics future.

**Bonus Assignment (up to 3% final grade):** - This optional assignment will **be due on last day of class**. Students may earn an additional 1%, 2% or 3% towards their overall course grade by submitting a transcript of their answers to student questions posted on D2L. Grades will be assigned based on both quality (correctness, thoroughness), consistency (answering throughout course) and quantity of questions answered. Assignments should be printed and handed to the instructor at the beginning of class, with the student ID in the top right-hand corner.

### **GRADE BREAKDOWN**

A+ 100-94.9%	A 94.8-89.9%	A- 89.8-84.9%
B+ 84.8-79.9%	B 79.8-74.9%	B- 74.8-70.9%
C+ 70.8-66.9 %	C 66.8-62.9%	C- 62.8-58.9%
D+ 58.8-54.9%	D 54.8-49.9%	F 49.8% and less

## GRADE DISPUTES

Please see the University's policies for grade disputes.

**Reappraisal of Graded Term Work:** <http://www.ucalgary.ca/pubs/calendar/current/i-2.html>

**Reappraisal of Final Grade:** <http://www.ucalgary.ca/pubs/calendar/current/i-3.html>

## **COMMUNICATION ETIQUETTE (e.g., Email, D2L Questions)**

- Please use your university account for email. If forwarded to another service (e.g. gmail), and account visible use an account with an appropriate name (Example of an unacceptable email: geneticsgrrrrrrl@gmail.com).
- Use a clear subject line that includes the course name/section and the topic of the email such as "ANTH 506 Question about the course schedule"
- Please be respectful (i.e., not too casual) when addressing me in an email. Use an appropriate greeting (acceptable: "Dear Prof Melin"; unacceptable: "Hey there"). Please proof-read, spell check and use complete sentences. The instructor will respond in kind.
- On D2L please try to keep the question(s) short and to the point. Questions may be anonymous. Show that you have made an effort to find the answer first in the text and lecture material (or even an outside source). State what you know in relation to what you are having a difficult time understanding. Replies should be tactful, supportive and helpful. Responses should **not** be anonymous and can be used for the bonus assignment (see section on bonus assignment).
- Allow 48 hours for an email response, excluding weekends and holidays. The instructor or TA will check D2L twice weekly and moderate discussions as needed.

**REMINDER – Instructor will NOT answer questions about course content by email – these questions should be posted to D2L.**

\*Please note: The instructor may choose not to respond to emails that do not follow the format outlined above so please be thorough and respectful when raising a concern and in return, and the instructor will try their very best to get back to you as soon as possible to accommodate your needs.

## **TENTATIVE SCHEDULE OF COURSE TOPICS**

**\*May be subject to modifications**

<b>DATE</b>	<b>First half of class (2-3:15)</b>	<b>Assigned Text Chapters</b>	<b>Second half of class (3:30-4:45)</b>
Sept 13	Introduction to course and instructor	Ch 1	Lecture: Evolutionary concepts, history of human genetics
Sept 20	Lecture: Organization of the human genome	Ch1, Ch 2	Discussion 1: two thematically linked and current papers TBA
Sept 27	Lecture: Sources of variation in the genome	Ch 3	Discussion 2: two thematically linked and current papers TBA
Oct 4	Lecture: Phenotypic effects of genome variation	Chapter 3 (esp. 43-46, 57-62) & Chapter 15	<b>In person meeting and discussion</b> about research project ideas; time for individual research

Oct 11	Thanksgiving Day - no classes		
Oct 18	Lecture: Simple and complex traits	Chapter 3 (43-6), Chapter 15 (483-4)	Discussion 3: two thematically linked and current papers TBA
Oct 26	<b>In person lab tours in small groups;</b> overview of projects in Melin lab and technologies used *video participation optional	Ch 4 – genomics technologies	<b>In person lab tours in small groups;</b> overview of projects in Melin lab and technologies used *video participation optional
Nov 1	Lecture: Comparative genomics	Ch 5(160-1), Ch 7(237-238), Ch 8(265-71)	Discussion 4: two thematically linked and current papers TBA
Nov 8	Fall Break - no classes		
Nov 15	Lecture: Evolutionary theory and population genetics	Chapter 5, 16(523-26)	Discussion 5: two thematically linked and current papers TBA
Nov 22	Lecture: Human variation and evolution (Draft assignment due)	Chapter 6 (6.1, 6.2, 6.7, 6.8), 10 (335-8)	<b>In person peer review</b> of independent papers, individual meetings with instructor
Nov 29	Lecture: Ancient DNA and human evolution	Chapter 4 (123-8), 8(272-3), 9(303-13)	Discussion 6: two thematically linked and current papers TBA
Dec 6	Lecture: Epigenetic modification and evolution (Revised assignment due; bonus assignment due)	20, 29, 56, 85-8; 483-5	Discussion 7: two thematically linked and current papers TBA

### **INCLUSIVITY STATEMENT**

As instructors we recognize that systemic racism against Black, Indigenous, and other People of Color exists in academia. As instructors we will strive to build an inclusive community among course participants. We will not tolerate discriminatory, racist, or sexist behaviour or comments in discussions, on assignments, or in D2L.

In an effort to amplify the voices and work of Black, Indigenous, and other People of Color within biological anthropology, we strive to assign readings from these researchers throughout the course. We recommend that when students are considering which readings they would like to research that they take race and ethnicity of the authors into account.

We would also like to acknowledge the land on which University of Calgary is situated. Here we acknowledge the traditional territories of the people of the Treaty 7 region in Southern Alberta, which includes the Blackfoot Confederacy (comprising the Siksika, Piikani, and Kainai First Nations), as well as the Tsuut'ina First Nation, and the Stoney Nakoda (including the Chiniki, Bearspaw, and Wesley First Nations). The City of Calgary is also home to Métis Nation of Alberta, Region 3.

## **(c) Course Policies and Procedures**

### **ACADEMIC ACCOMMODATIONS**

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit <https://live-ucalgary.ucalgary.ca/student-services/access>. Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor or the Department Head. The full policy on Student Accommodations is available at <https://www.ucalgary.ca/legal-services/university-policies-procedures/accommodation-students-disabilities-procedure>.

### **ACADEMIC MISCONDUCT**

“Academic Misconduct” includes such things as cheating, falsification, plagiarism, unauthorized assistance, and failure to comply with exam regulations or an Instructor’s expectations regarding conduct required of Students completing academic assessments. Students who participate in, or encourage the commission of, Academic Misconduct will be subject to disciplinary action which could include Probation, Suspension, or Expulsion from the University. For information on academic misconduct and its consequences, please see the University of Calgary Calendar at <https://www.ucalgary.ca/pubs/calendar/current/k-3.html>

Further support on academic integrity is available at: <https://ucalgary.ca/student-services/student-success/learning/academic-integrity>

### **INSTRUCTOR INTELLECTUAL PROPERTY**

Course materials created by professor(s) (including course outlines, presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the professor(s). These materials may NOT be reproduced, redistributed or copied without the explicit consent of the professor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

### **FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT**

Student information will be collected in accordance with typical (or usual) classroom practice. Students’ assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary.

### **COPYRIGHT LEGISLATION**

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (<https://ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy>) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks, etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.



**USRI:**

At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses ([www.ucalgary.ca/usri](http://www.ucalgary.ca/usri)). Your responses make a difference. Please participate in USRI Surveys.

**SUPPORT AND RESOURCES:**

Please visit the Registrar's website at: <https://www.ucalgary.ca/registrar/registration/course-outlines> for additional important information on the following:

Emergency Evacuation/Assembly Points  
Wellness and Mental Health Resources  
Student Success Centre  
Student Ombuds Office  
Student Union (SU) Information  
Safewalk

**HIGHLIGHTING RESOURCES FOR STUDENTS**

**Writing Support:** The Student Success Centre – SO HELPFUL FOR STUDENTS AT ALL STAGES

[http://www.ucalgary.ca/ssc/writing\\_support/overview](http://www.ucalgary.ca/ssc/writing_support/overview)

Taylor Family Digital Library 3rd Floor

Hours of Operation:

Monday - Friday

9 a.m. - 4 p.m.

\* Hours differ for drop-in consultations

**Wellness Centre**

370, MacEwan Student Centre, Phone: 403.210.9355 Open: Monday to Friday 0900-1630 hrs. (Walk-ins stop at 15:30, but subject to demand) Website: <http://www.ucalgary.ca/uhs/>

“University Health Services provides quality health care and education in a reassuring friendly manner. Its primary focus is centered on students.”

**SAFETY AND SECURITY****Safewalk**

Phone: 403.220.4750 Email: [safewalk@ucalgary.ca](mailto:safewalk@ucalgary.ca) Website: <http://www.ucalgary.ca/security/safewalk>

Available 24 hours a day/7 days a week/365 days per year

“Safewalk volunteers walk people safely to their destination on campus. This service is free and available to students, staff and campus visitors. Safewalks are done in male/female pairs. The volunteers walk anywhere on campus (including McMahon Stadium, Health Sciences, Student Family Housing, the Alberta Children's Hospital and the University LRT station).”

**Campus Security**

Phone: 403.220.5333 Email: [Campuse.security@ucalgary.ca](mailto:Campuse.security@ucalgary.ca) Website: <http://www.ucalgary.ca/security/>

Campus Security works closely with the university community, Calgary Police Service and other agencies to maintain the University of Calgary as a pleasant place to live, work and study. If you have a safety concern or a

question about the services Campus Security offers please contact us.” Not only does Campus Security provide for on campus emergency service, but also routinely posts campus wide security alerts/bulletins. Campus Security also offers a Working Alone Program that enhances student safety while working alone on campus outside of regular work hours, such as evenings and weekends.

**Emergency evacuation**

In the event that the classroom should need to be evacuated due to an emergency please note that the primary assembly point shall be the Professional Faculties Food Court and the secondary assembly point shall be the Social Science Food Court.

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