Anthropology 2DO3: DNA Meets Anthropology

Fall 2018

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**Lecture:** Tu/Th/Fr 11:30-12:20 JHE 210

**Office:** CNH 530

**Office Hours:** Friday 1:00-2:00 or by appointment

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# Course Description

This course is an introduction to the application of molecular biology and DNA to anthropological topics. We will discuss these topics primarily within a human context but will also consider non-human primates, and will examine how the study of other organisms such as pathogens and domesticates inform our own evolutionary history. We will discuss what DNA can tell us about human origins, patterns of global migration and colonization, phenotypic variation, selection and adaptation. We will consider the application of genetics to medicine, forensics and politics.

Much of the material in this course will be cumulative, in the early weeks we will discuss the basics of DNA, evolution and inheritance and we will continue to apply these concepts throughout the remaining weeks. As your instructor, it will be my role to demonstrate the relevance of these topics to anthropology but it is crucial that you understand the foundations. If you feel you are slipping behind or not grasping some of these ideas please speak up and bring it to my attention early.

# Course Objectives

By the end of the course students should be able to:

1. Explain factual and conceptual basics of DNA and genetics such as inheritance, evolution and human variation.
2. Evaluate how genetic data is obtained from a sample and the ethics of sample collection and analysis.
3. Summarize the basics of genetic analyses – how do we extrapolate from As, Ts, Cs and Gs to greater functional or evolutionary meaning.
4. Describe how genetic information has informed our understanding of modern human origins, migration, relationships with archaic hominins, and adaptation.
5. Develop your ability to apply basic genetic theory to questions of anthropological importance.

# Required Materials and Texts

* *An Introduction to Molecular Anthropology*, Mark Stoneking, ISBN:978-1-118-06162-6, available from campus bookstore, **also available from McMaster library system as both e-book and physical copy on reserve**. Any additional readings will be made available through the Avenue to Learn course shell.

# Class Format

We will structure this course such that every week we break the topic down into three components: the Tuesday class will be spend discussing the concept, on Thursdays we will cover the application to anthropology and on Fridays we will have a class dedicated to either practicing or interpreting the weekly topic. Friday classes will have an assigned participation mark for showing up and the practice problems and questions discussed will be topical to those presented on both the in-class tests (October 5th and November 2nd) as well as the final exam.

# Course Evaluation – Overview

1. Test #1 - 20%, October 5
2. Test #2 – 20%, November 2
3. Participation – 20%
4. Final exam – 40%

# Course Evaluation – Details

**Tests – 40%**

Two in-class tests will contain a combination of multiple choice and short answer questions. Test #1 will cover the material of weeks 1-4 and Test #2 will cover the material of weeks 5-8 lectures as well as assigned readings will be considered testable material. In addition to testing your knowledge of factual material, the in-class tests will assess your ability to apply the concepts covered in class. Test #1 will occur in-class on October 5th and Test #2 will occur in-class on November 2nd.

**Participation – 20%**

Friday classes will cover the interpretation or practice of material covered during the weekly lectures. Attendance will be recorded. Practice problems or discussion topics from Friday classes will reflect the types of problems you may encounter on the in-class tests and the final exam.

**Final Exam – 40%**

The final exam will be cumulative, and contain a combination of multiple choice, short answer and long answer questions. All material covered in class or in any assigned reading is considered testable material. Final exam date and time to be assigned by registrar.

# Weekly Course Schedule and Required Readings

## Week 1 (September 4, 6 & 7)

### Welcome & Introduction to Molecular Anthropology

## Week 2 (September 11, 13 & 14)

### DNA basics: Genes and molecular markers

Readings: Stoneking chapters 1, 2 and 7

## Week 3 (September 18, 20 & 21)

### Genetic sampling and ethics

Readings: Stoneking chapters 3, 8 and 9

## Week 4 (September 25, 27 & 28)

### Molecular evolution and population genetics

Readings: Stoneking chapters 4, 5 and 6

## Week 5 (October 2, 4 & 5)

### Human origins

Readings: Stoneking chapters 13 and 14

**Notes: Test #1, October 5 in-class**

## Week 6 (October 8 - 12)

### Date – Reading Week

## Week 7 (October 16, 18 & 19)

### Human migration and culture

Readings: Stoneking chapters 16 & 19

## Week 8 (October 23, 25 & 26)

### Human history through alternative organisms

Readings: To be provided

## Week 9 (October 30, November 1 & 2 )

### Selection and adaptation

Readings: Stoneking chapters 17 and 18

**Notes: Test #2, November 2 in-class**

## Week 10 (November 6, 8 & 9)

### Ancient DNA

Readings: Stoneking chapter 15

## Week 11 (November 13, 15 & 16)

### Forensics

Readings: To be provided

## Week 12 (November 20, 22 & 23)

### Medical genetics

Readings: To be provided

## Week 13 (November 27, 29 & 30 )

### “Omics” and DNA applied to you

Readings: Stoneking chapter 20

## Week 14 (December 4)

### Exam review

# Course Policies

## Submission of Assignments

All evaluations will be completed in-class or as part of the final exam.

## Grades

Grades will be based on the McMaster University grading scale:

| **MARK** | **GRADE** |
| --- | --- |
| 90-100 | A+ |
| 85-90 | A |
| 80-84 | A- |
| 77-79 | B+ |
| 73-76 | B |
| 70-72 | B- |
| 67-69 | C+ |
| 63-66 | C |
| 60-62 | C- |
| 57-59 | D+ |
| 53-56 | D |
| 50-52 | D- |
| 0-49 | F |

## 

## Avenue to Learn

In this course we will be using Avenue to Learn. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

# University Policies

## Academic Integrity Statement

You are expected to exhibit honesty and use ethical behavior in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behavior can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at [www.mcmaster.ca/academicintegrity](http://www.mcmaster.ca/academicintegrity).

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one’s own or for which credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations.

## Academic Accommodation of Students with Disabilities

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail [sas@mcmaster.ca](mailto:sas@mcmaster.ca). For further information, consult McMaster University’s Policy for [Academic Accommodation of Students with Disabilities.](http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf)

**AODA**

If you require this information in an alternate/accessible format, please contact Marcia Furtado at 905-525-9140 extension 24423 or email [furtam1@mcmaster.ca](mailto:furtam1@mcmaster.ca)

**Religious, Indigenous and Spiritual Observances (RISO)**

The University recognizes that, on occasion, the timing of a student’s religious, Indigenous, or spiritual observances and that of their academic obligations may conflict. In such cases, the University will provide reasonable academic accommodation for students that is consistent with the Ontario Human Rights Code.

Please review the [RISO information for students in the Faculty of Social Sciences](https://socialsciences.mcmaster.ca/current-students/riso) about how to request accommodation.

## Faculty of Social Sciences E-mail Communication Policy

Effective September 1, 2010, it is the policy of the Faculty of Social Sciences that all e-mail communication sent from students to instructors (including TAs), and from students to staff, must originate from the student’s own McMaster University e-mail account. This policy protects confidentiality and confirms the identity of the student. It is the student’s responsibility to ensure that communication is sent to the university from a McMaster account. If an instructor becomes aware that a communication has come from an alternate address, the instructor may not reply at his or her discretion.

**Privacy Protection**

In accordance with regulations set out by the Freedom of Information and Privacy Protection Act, the University will not allow return of graded materials by placing them in boxes in departmental offices or classrooms so that students may retrieve their papers themselves; tests and assignments must be returned directly to the student. Similarly, grades for assignments for courses may only be posted using the last 5 digits of the student number as the identifying data. The following possibilities exist for return of graded materials:

1. Direct return of materials to students in class;
2. Return of materials to students during office hours;
3. Students attach a stamped, self-addressed envelope with assignments for return by mail;
4. Submit/grade/return papers electronically.

Arrangements for the return of assignments from the options above will be finalized during the first class.

## Course Modification

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check his/her McMaster email and course websites weekly during the term and to note any changes.

**McMaster Student Absence Form (MSAF) policy**

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”. Please note these regulations have changed beginning Spring/Summer 2015.

If you have any questions about the MSAF, please contact your Associate Dean’s office.

<http://academiccalendars.romcmaster.ca/content.php?catoid=11&navoid=1698#Requests_for_Relief_for_Missed_Academic_Term_Work>

**Academic Skills Counselling** and **Services for Students with Disabilities** are available through the Student Accessibility Services (SAS)

Tel: 905-525-9140 x28652 Email: [sas@mcmaster.ca](mailto:sas@mcmaster.ca) Website: <http://sas.mcmaster.ca>

**Academic Dishonesty**

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g., the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, Appendix 3, [www.mcmaster.ca/senate/academic/ac integrity.htm](http://www.mcmaster.ca/senate/academic/ac%20integrity.htm)

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g., the submission of work that is not one’s own for which other credit has been obtained. *(Insert specific course information, e.g., style guide)*
2. Improper collaboration in group work. *(Insert specific course information)*
3. Copying or using unauthorized aids in tests and examinations.

**The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.**

**USE OF COMPUTERS: Computer use in the classroom is intended to facilitate learning in that particular lecture or tutorial. At the discretion of the instructor, students using a computer for any other purpose may be required to turn the computer off for the remainder of the lecture or tutorial.**