ANTH/BIO 3138L-FD1 Intro DNA Molecular Methods
Anthropology- Lakehead University
Fall 2021

Instructor Information

Instructor: Felicia Joseph
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Office Hours: Thursdays by appointment BB2002B

Course Identification

Course Number: 3138
Course Name: Intro DNA Molecular Methods
Course Location: Online
Class Times: Lectures Monday and Wednesday 2:30p-3:30p (Powerpoint with pre-recorded lectures will be posted on these days)
Laboratory Thursday 2:30am-5:30am

Course Description/Overview - An introduction to methods used in molecular biology, biochemistry and molecular anthropology with emphasis on the techniques and their application. The laboratory component covers the analysis of nucleic acids particularly DNA, and includes basic techniques such as gel electrophoresis, DNA extraction, and the polymerase chain reaction. Methods of DNA data analysis and interpretation are also introduced, including forensic science, molecular anthropology, molecular biology and molecular archaeology.

Course Learning Objectives

Upon completion of this course, students should be able to understand:

1. The Nature of DNA and DNA Extraction
    a. Different types of DNA
    b. Human DNA extractions and problems that can arise
    c. Physical, Chemical and Enzymatic extraction methods

2. DNA Quantification and Purification

3. Polymerase Chain Reaction

4. DNA Sequencing and STR Analysis
    a. Statistical methods related to DNA testing and reporting
    b. Sanger sequencing vs next generation sequencing

5. DNA Sampling

6. Case Studies
    a. Select Case Studies will be examined

7. Lab report write-ups
    a. How to write a comprehensive lab report and interpret data relating to DNA analysis
    b. Each lab will focus on a different aspect of DNA analysis

Course Resources

Course Website(s)

- myCourseLink

Required Course Text(s)

There is no required text for this course.

Selected web sites and electronic resources will comprise the reading materials for this course. Where possible, web links will be provided. Self-directed web investigation is required. Please contact the LU Library to take advantage of tips, workshops, and tutorials to improve online
research skills.

Course Schedule/Outline

Assignments and Evaluations

Item	Due Date(s)	Value
Formal Laboratory Write-Ups Lab #2 DNA Extraction Lab #3 PCR and Gel Electrophoresis	 October 18th 2021 November 11th 2021	 20% 10%
Group Seminar	November 10th (2 groups) November 15th (2 groups) November 17th (2 groups) November 22nd (2 groups) November 24th (2 groups)	25%
Mini Labs x2 Lab #1 Nature of DNA Lab #4 DNA Sequencing	 September 23rd 2021 November 25th 2021	 5% 5%
Midterm	October 20th 2021	15%
Final Exam	TBD	20%
Total		100

Late Assignments
Late assignments will be accepted but there will be a 10% deduction per day late. If you are handing in late, it is your responsibility to ensure that your lab reaches the person marking it.

Mini Labs

The Nature of DNA Mini-Lab #1: In order to help to prepare for laboratory write-ups, there will be a mini-lab to help make a template which will be used for your formal lab reports. This will include writing the introduction, materials, results and discussion for Lab #1 for assessment. The assignment and feedback received will help you understand the expectations that will be applied to Lab #2 and #3- The formal lab write ups.

Sequencing Mini-Lab #4: Lab #4 will focus on the use of sequence alignment programs to align multiple mtDNA sequences to identify polymorphisms. The mini-lab will include BLAST results, sequence alignments, polymorphism table and haplogroup determination.

Group Seminar:

Students will be split into groups of 4 which will be posted by September 20th . Each group will have the opportunity to prepare and present a seminar that will be based on various molecular methods that are used in DNA research.

- Each presentation should be approximately 20-25min in length containing 15-20 slides
- Each presentation should be pre-recorded and posted on the course website the morning of your group's presentation date.
- A discussion question should be posted along with your presentation to engage your fellow classmates in a lively discussion, or to ask follow-up questions
- Citations should be properly referenced, and presentations should include primary sources and peer-reviewed articles
- The final exam may include 1-2 questions from each presentation
- Each group will be asked to supply at least 1 potential exam question based on their presentation that could potentially be used for the final exam
- Each topic will cover a different aspect of the DNA analysis process and will allow for flexibility in regard to what types of techniques and analysis that you will focus on. If you do require assistance to help narrow down the topic, do not hesitate to set up a zoom meeting to discuss with myself and the whole group.
- An outline will be posted on the course website to reference when gathering information for your presentation

Regulations

"It is the responsibility of each student registered at Lakehead University to be familiar with, and comply with all the terms, requirements, regulations, policies and conditions in the Lakehead University Academic Calendar. This includes, but is not limited to, Academic Program Requirements, Academic Schedule of Dates, University and Faculty/School Policies and Regulations and the Fees and Refund Policies and Schedules."

Collaboration/Plagiarism
Plagiarism is defined in University Regulation IX with additional examples in Article I, Section 1 of The Code. Sanctions associated with Academic Misconduct are defined in Article II of The Code and Enforcement Procedures are outlined in Article III of The Code.

Students wishing to learn more about Academic Misconduct are encouraged to read the University and relevant Faculty Regulations and The Code (noted above) and access other resources on the Teaching Commons website.

University Policies – all University Policies can be found here. Pay particular attention to those found under the Category of "Regulations" and "Student-Related". If you have a question, please let me know by email or in-class. If you have a question, it is likely that at least a few others in the class are wondering the same thing.

Supports for Students – there are many resources available to support our students. These include but are not limited to:

- Health and Wellness
- Student Success Centre
- Student Accessibility Centre
- Library
- Academic Support Zone (Writing and Math Tutoring Centre)

Lakehead University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities and/or medical conditions to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact Student Accessibility Services (SAS) and register as early as possible. For more information, please contact Student Accessibility Services http://studentaccessibility.lakeheadu.ca (SC0003, 343-8047 or sas@lakeheadu.ca)