# BIOLOGY 2244A v Analysis & Interpretation of Biological Data
## and
# STATISTICS 2244A v Statistics for Science
## Fall 2018

## Calendar Descriptions

Stat 2244: An introductory course in the application of statistical methods, intended for honors students in departments other than Statistical and Actuarial Sciences, Applied Mathematics, Mathematics, or students in the Faculty of Engineering. Topics include sampling, confidence intervals, analysis of variance, regression and correlation. Cannot T9>deJtasio Prerequisites:

A full mathematics course, or equivalent, numbered 1000 or above. Statistical Sciences 1024A/B can be used to meet 0.5 of the 1.0 mathematics course requirement.

Anti-requisites: All other courses or half courses in Introductory Statistics except Statistical Sciences 1023A/B, Statistical Sciences 2037A/B and Statistical Sciences 1024A/B.

Unless you have either the requisites for this course or written special permission from your Dean to enrol in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

## Course Timetable

Lectures:  Sect 001: Mondays and Wednesdays, 10:30 am t 11:30 am in AHB 1R40
           Sect 002: Tuesdays and Thursdays, 4:30 pm t 5:30 pm in MC 110

Labs:

| Section | Day | Time | Location |
|---|---|---|---|
| 003 | Tuesday | 6:30 t 9:20 pm | HSB 16 |
| 004 | Tuesday | 6:30 t 9:20 pm | HSB 14 |
| 005 | Wednesday | 6:30 t 9:20 pm | HSB 14 |
| 006 | Wednesday | 6:30 t 9:20 pm | NCB 105 |
| 007 | Thursday | 6:30 t 9:20 pm | HSB 16 |
| 008 | Thursday | 6:30 t 9:20 pm | HSB 14 |
| 009 | Friday | 11:30 am t 2:20 pm | NCB 105 |
| 010 | Tuesday | 1:30 t 4:20 pm | HSB 16 |
| 011 | Tuesday | 1:30 t 4:20 pm | HSB 14 |
| 012 | Thursday | 1:30 t 4:20 pm | HSB 16 |
| 013 | | | |

# Instructor Information

Name: Jennifer Waugh
Departments: Biology and Statistical & Actuarial Sciences

## Learning Resources

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Statistical software package(s): R ([www.r-project.org](www.r-project.org)) and R studio ([www.rstudio.com](www.rstudio.com))
A major learning objective for the course is using statistical software (see learning objectives, LO4 and LO7). The lab component of the course (including associated assignments) involves using R. I recommend the integrated

## Expectations for Students & Instructor

This course is a required course in several degree programs (e.g. Biology, Medical Sciences, Computer Science, Environmental Sciences). There is a reason for this requirement. Statistics is a science that deals with collecting, analyzing, interpreting, and presenting data; that is, statistics is science. However, it is a science for which many students have little experience, and as such, this course can be challenging. To help us maintain a safe and respectful community in which we can productively tackle potential challenges, we should endeavor to follow these expectations:

| Student Expectations | Instructor Expectations |
|---|---|
| a. be active and participate in class settings; <br> b. listen and respect others (e.g. peers, instructor, and TAs) in all settings (in class, lab, and online); <br> c. be prepared for class (e.g. by completing the relevant preparatory work or activities); <br> d. be comfortable taking risks in your learning; <br> e. be willing to learn from your mistakes and seek support when needed; <br> f. be cognizant of the constraints associated with a large, multi-section class (e.g. for response time in returning marks and answering questions); | a. be active and enthusiastic to facilitate/motivate student learning; <br> b. o ] • š v š } v Œ • ‰ š • š µ views and suggestions; <br> c. be prepared for, and ready to begin (and end) class at the scheduled times; <br> d. promote an inclusive and safe environment to take risks in learning; <br> e. provide support and opportunities to learn from mistakes; <br> f. respond effectively to student questions and concerns in a reasonable time frame; <br> g. grade objectively, consistently, and in a timely manner; |
| If you have suggestions or comments on how to promote a safe and inclusive community, I welcome feedback you are willing to offer, at any time. | |

In addition to the above expectations, we are a learning community within an academic setting. While it may not be immediately obvious, there are some additional expectations related to being part of an academic community.

- ask your Instructor and/or TA before you make an audio recording of class. This expectation provides basic respect for their privacy and personal safety, and is in keeping with Intellectual Property rights. If you would like to make audio recordings of our lecture sessions, please send an OWL message to me (via Instructor Role or Jennifer Waugh)
- use materials and resources provided on OWL or through class for your individual use during the course. Sharing or reproducing class materials online (for free or for profit) and/or sharing materials with individuals who are not taking the course is not acceptable without first receiving permission from the owner or creator of those resources/materials. Again, this is based on Intellectual Property rights.

## Course Structure

This course follows a blended learning approach; that is, we will engage in learning and assessment through a mix of online and in-person formats. The following table gives an overview of the split:

| Online | In-person |
|---|---|
| interactive modules for lab component <br> modules to prepare for class <br> activities to promote and motivate learning <br> activities/quizzes to assess preparedness for class <br> assignment submissions <br> virtual application sessions | class sessions associated with lecture <br> class sessions associated with labs <br> drop-in hours for help and support <br> clicker participation to motivate and assess learning <br> tests and exams to assess learning |

## Course Structure Quiz

Purpose: To motivate you to understand the course structure and policies, so you know wh expected/needed to be successful in the course

Format: Multiple choice/true-false quiz administered through OWL Tests & Quizzes Approximately 7-10 questions. Students may use non-programmable calculators

Details: Requires thorough understanding of the content of this course syllabus, and a ca exploration and observation of the structure and content of the OWL course websit

Grading scheme: Your mark out of 1% is calculated based on the percentage of questions answered correctly (e.g. 6/10 correct questions results in a mark of 0.6% from the possible 1%).

Accommodations: The quiz is available for approximately one week; students should endeavor to complete the quiz as early as possible in the availability period so that any proble can be dealt with accordingly. No accommodation for missing the quiz will be provided after the final deadline.

## Clicker Participation

Purpose: To provide real-time, formative feedback on your preparation for class and comprehension of course material;
To provoke thought, discussion, and engagement with course material during class

Format: Multiple choice questions asked at various times during each lecture session Approximately 3-5 questions each class.

Details: Information on setting up your clicker account is provided on the OWL course site under Course Materials\Administration\Clicker Registration and Setup
Please also r

# Preparation Quizzes

Purpose:    To assess your understanding of foundation vocabulary or concepts needed for upcoming lectures/labs

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Accommodations: Activities are typically available for 36 hours, or frequently, longer. Consequently,

## Academic Policies

The website for Registrarial Services is http://www.registrar.uwo.ca

In accordance with policy, http://www.uwo.ca/its/identity/activatenonstudent.html, the centrally administered e-

## Classroom Environment

The Department of Statistical and Actuarial Sciences has adopted a "Mutual Expectations" policy governing the classroom environment and all work submitted by students. The full of the policy can be found at: http://www.uwo.ca/stats/undergraduate/mutual expectations.html In summary, the policy was developed under the premise that all interactions between students and faculty should be governed by the principle of courtesy, respect and honesty.

## Support Services

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661 11 ext. 82147 for any specific question regarding accommodation.

The policy on Accommodation for Students with Disabilities can be found here: www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_disabilities.pdf

The policy on Accommodation for Religious Holidays can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Learning skills counsellors at the Student Development Centre (http://www.sdc.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health @ Western (http://www. uwo.ca/uwocom/mentalhealth) for a complete list of options about how to obtain help.

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opportunity to give or withhold consent. Such research will not replace the usual end of term Student Questionnaire given by the University.

Academic Integrity

Use of a clicker associated with an identity other than your own is an academic offense. Granting permission for someone else to submit answers on your behalf in your absence is an academic offence. In a test, lab, lecture, or tutorial, possession of more than one clicker device, or one associated with the identity of another student, will be interpreted as intent to commit an academic offense and will be reported as such. This means that it will be considered an academic offense to answer a clicker question using an account other than your own.

# Course Schedule

The following schedule is tentative; some adjustments may be made as the course progresses, depending on the rate at which individual topics are covered. At certain points in the course, you will be responsible for covering some course material on your own time (e.g. through readings or posted videos or other resources). These "Individual" topics have been strategically chosen based on recommendation from previous students and level of complexity. Their position in this schedule is a suggestion, i.e. based on when they are most relevant and students will have the relevant background. Individual students, however, may choose to cover the material at any time they wish (acknowledging that the material may be testable on subsequent tests, labs, etc.).

The only hard due dates are the two test dates. Generally, Assignments for labs will be due the week specified, although the particular day of the week may vary (to align with coverage of relevant material in lectures). For Activities, the time required for completion is an estimate only; this may vary from student to student. As well, some additional Activities may be added throughout the course; these will be a

Oct 29Nov 2    Lecture 13Introduction to confidence intervals (foundations)
               Lecture 14.K v  •  u ‰ o  •   /  ( } Œ   u   v  ~ ^  v  o Ç • ] • _ •
               Labs:Science communicationReporting results, and, Assignment 9work/help period