

## SS 1023A/2037A: Statistical Concepts Course Outline

### 1. Course Information

#### Course Information

**Term:** Fall 2024

**Location:** Mondays and Fridays at MC-110, Wednesdays at TC-141

**Time:** Mondays, Wednesdays and Fridays from 11:30AM-12:30PM

**List of Prerequisites:** none

**List of Anti-requisites:** For students registered in SS2037, the anti-requisites are SS1023A/B, DS1000A/B, SS2244A/B, and Bio2244A/B. For students registered in SS1023, the anti-requisites are SS2037A/B, DS1000A/B, SS2244A/B, and Bio2244A/B.

### 2. Instructor Information

| Instructors          | Email  | Office Hours |
|----------------------|--|--------------|
| Ana Carolina da Cruz | <a href="mailto:adacruz@uwo.ca">adacruz@uwo.ca</a> | TBD          |

#### Communication:

Please use the Discussion board on the OWL site (<https://westernu.brightspace.com/>) to post questions about course material (e.g., lecture, reading, etc). This helps other students who may have the same question, and I encourage you to help each other if you can. The Discussion board will be monitored on a regular basis and the instructor or TAs will interject with corrections or responses as necessary. As this is an open Forum, please be respectful of your peers, instructor(s), and TAs. Derogatory, discriminatory, or otherwise inappropriate language or topics will be removed and dealt with at the instructor's discretion.

E-mail is appropriate for private communication. Students must use their Western ([@uwo.ca](mailto:@uwo.ca)) email addresses when contacting their instructors, and include the course code (SS 1023A) in the subject line. You can expect a response to a message to the instructor within **approximately 48 hours** during the work week (during busy times, it may take a little longer). **Note**

**that messages will not be answered within the 24-hour period before exams or project deadlines,** nor can I guarantee responses over weekends/holidays.

Office hours are open drop-in times for students who have questions about any content of the course.

### **3. Course Syllabus, Schedule, Delivery Mode**

**Course description:** an examination of statistical issues aiming towards statistical literacy and appropriate interpretation of statistical information. Common misconceptions will be targeted. Assessment of the validity and treatment of results in popular and scientific media. Conceptual consideration of study design, numerical and graphical data summaries, probability, sampling variability, confidence intervals and hypothesis tests.

#### **Learning outcomes:**

By the end of this course, a successful student will be able to:

- Understand and correctly use foundational vocabulary associated with statistics;
- Interpret, create and critically evaluate graphical and numerical summaries;
- Understand and appreciate probability, chance, randomness, and ‘average’;
- Understand, assess, and critique the validity of conclusions of statistical studies;
- Critically evaluate statistical information presented in the media and society;
- Apply concepts learned in this course to future courses, careers, and everyday life.

#### **Key Sessional Dates**

Classes begin: September 5, 2024

Fall Reading Week: October 12 – 20

Classes end: December 6, 2024

Exam period: December 9 – 22, 2024

**Course schedule:** See final page of syllabus for detailed course breakdown of topics and tentative course schedule.

#### **Contingency Plan**

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

#### **Personal Teaching Approach**

I want students to have a meaningful learning experience in this course, having an inclusive, respectful, and welcoming learning environment. A typical class will involve a lecture period covering the materials scheduled for the day followed by check-in activities. When check-in activities provide immediate

feedback, I will design the next class to cover most misunderstood concepts. I encourage students to participate during class activities and ask questions that promotes discussion during class. I also expect students to be respectful to their peers during the activities in class and outside class.

## 4. Course Materials

- **Required textbook:** Utts, J. M., (2015) Seeing through statistics, 5th edition. Brooks/Cole, Cengage Learning.

- Students can order a physical copy or purchase an e-book version through the following link:

<https://www.cengage.ca/c/seeing-through-statistics-5e-utts/9780357757505/>

Additional resources will be uploaded to the course site on OWL: <https://westernu.brightspace.com/>

### **OWL site:**

Students are responsible for checking the course OWL site (<https://westernu.brightspace.com/>) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

If students need assistance with the course OWL site, they can seek support on the [OWL Brightspace Help](#) page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

### **iClicker:**

iClicker will be used for in class feedback and non-graded assessments.

## 5. Methods of Evaluation

### Grading Scheme and Assessment Dates

| Component    | Weight | Deadlines/Due dates  |
|--------------|--------|--|
| Assignment 1 | 5%     | Sep 27th, due at 11:55 pm  |
| Assignment 2 | 5%     | Oct 11th, due at 11:55 pm  |
| Assignment 3 | 5%     | Nov 8th, due at 11:55 pm   |
| Assignment 4 | 5%     | Dec 6th, due at 11:55 pm   |
| Midterm 1    | 15%    | Oct 9, 7 pm to 9 pm (to be confirmed by the Registrar's Office)  |
| Midterm 2    | 20%    | Nov 20, 7 pm to 9 pm (to be confirmed by the Registrar's Office) |
| Final exam   | 45%    | During exam period (to be scheduled)                             |

#### 1. Assignments

- There will be **four** assignments, each worth 5% of your final grade. **Assignment submissions are due 11:55pm (Eastern Time) on the due date.**

- Assignments **will be available on the course OWL site and Gradescope. However, submissions will be made to Gradescope** (<https://www.gradescope.com/>) an on-line collaborative grading system. It is your responsibility to make sure that your assignment is successfully uploaded and legible. Submissions that cannot be read by the grader will receive a grade of zero.

- Solutions to assignments **will not** be posted; however, TAs will provide comments on wrong answers using Gradescope, which will allow students to find out the correct solutions. In addition, students can ask the instructor and TAs for more details on solutions during office hours. After receiving assignment grades, you will have 7 days to submit regrade requests on Gradescope, using the regrade request tool. After this seven-day period, regrade requests will NOT be accepted.

- Assignments that are up to 24 hours late will receive a deduction of 15% on their mark unless late coupons are used. Late assignments up to 48 hours will receive a deduction of 30% on their mark unless late coupons are used. No extensions will be given beyond 48 hours.

- Each student will have **2 late coupons** worth 24 hours each that they can use at their own discretion for whatever reason (Note: I do not need to know the reason) towards their assignments. You can use them together on one assignment for a 48-hour extension or on two separate assignments for a 24-hour extension each. **No extensions will be given for any reason beyond the use of the late coupons; therefore, I suggest saving them until you absolutely need them.** You do not need to tell me when you will use the coupons; they will automatically come off the first two late days.

## 2. Midterm and final exams

There will be two **2-hour midterm exams (closed book)** tentatively scheduled for **Oct 9th and Nov 20th, 7 - 9 pm** to be confirmed by the Registrar's Office. Non-programmable hand-held calculators are allowed. The topics covered for each midterm will be announced later. You will be allowed **one single-sided, letter-sized, handwritten cheat sheet**. Handwritten means pen to paper, no printing from a computer or any kind.

There will be a **3-hour final exam and its time will be scheduled by the Registrar's Office during the exam period (December 9 to 22)**. The final exam is closed book and cumulative. Non-programmable hand-held calculators are allowed. You will be allowed **one single-sided, handwritten, letter-sized cheat sheet**. Handwritten means pen to paper, no printing from a computer or any kind.

### Rounding of marks

Across the Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. **Final grades** on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark "bumping" will be denied.

## 6. Accommodation and accessibility

### General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar:  
[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/academic\\_consideration\\_Sep24.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf),

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage:

[https://registrar.uwo.ca/academics/academic\\_considerations/](https://registrar.uwo.ca/academics/academic_considerations/)

All requests for Academic Consideration **must be made within 48 hours** after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make **one** Academic Consideration request **without supporting documentation** in this course. However, the following assessments are excluded from this, and therefore always require formal supporting documentation:

- Final exam (by policy)
- Students are allowed to submit an Academic Consideration request without supporting documentation for **one (but not both)** midterm exams.

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

## Evaluation Scheme for Missed Assessments

### Assignments:

Further accommodation beyond late coupons and late penalty must be approved via the Dean's Office/Academic Counselling unit of your Home Faculty. Students who obtain appropriate accommodation will have the weight of the missed assignment distributed to further assessments.

### Midterms:

There will be no make-ups exam for midterms. If you miss a midterm you must request accommodation from Academic Counselling in your Faculty's Dean's Office. Students who obtain **appropriate** accommodation will have the weight of the missed midterm redistributed to the final exam.

### Final exam:

If you miss the Final Exam you must request accommodation from Academic Counselling in your Faculty's Dean's Office and contact the instructor immediately. Students with **appropriate accommodation** will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam). See the Academic Calendar for details (under [Special Examinations](#)), especially for those who miss multiple final exams within one examination period.

## 7. Additional Statements

### Religious Accommodation

When conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor

and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible but not later than two weeks prior to the writing or the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays:

<https://www.edi.uwo.ca>.

### **Accommodation Policies**

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf).

### **Academic Policies**

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

In accordance with policy,

[https://www.uwo.ca/univsec/pdf/policies\\_procedures/section1/mapp113.pdf](https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf),

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

### **Use of Generative Artificial Intelligence (AI):**

Students may use generative artificial intelligence tools for learning and practicing the concepts in this course, but these tools are **not acceptable** for completing assignments in this course.

Clickers, specifically iClicker, will be used in this class for instant feedback and non-graded assessments. Clickers will not be used for any marks towards the course.

A scientific calculator will be allowed on the midterm and final exams. A graphics calculator will not be allowed.

Participants in this course are **not permitted to record the sessions**, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

**Scholastic offences** are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

### **Support Services**

Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic-related matters: <https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

[https://www.uwo.ca/health/student\\_support/survivor\\_support/get-help.html](https://www.uwo.ca/health/student_support/survivor_support/get-help.html).

To connect with a case manager or set up an appointment, please contact [support@uwo.ca](mailto:support@uwo.ca).

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at

[http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html)

if you have any questions regarding accommodations.

Learning-skills counsellors at Learning Development and Success (<https://learning.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.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.

## 8. Tentative Course Schedule

| Week |             | Chapter        | Topics  | Reminder                               |
|------|-------------|----------------|---|--|
| 1    | Sep 5 - 6   | Chapter 1      | - Introduction to course<br>- Statistics (Chapter 1)                            |  |
| 2    | Sep 9 - 13  | Chapter 2      | - Statistics in the news (Chapter 2)<br>- Seven critical components (Chapter 2) |  |
| 3    | Sep 16 - 20 | Chapter 3      | - Measurement bias (Chapter 3)<br>- Vocabulary (Chapter 3)                      |  |
| 4    | Sep 23 - 27 | Chapters 4 - 5 | - Sampling strategies (Chapter 4)<br>- Study design (Chapter 5)                 | <b>Fri Sep 27<br/>Assignment 1 due</b> |



|    |                |                    |   |  |
|----|----------------|--------------------|---|--|
| 5  | Sep 30 - Oct 4 | Chapter 7          | - Summarizing data: five-number summary; boxplots; histograms (Chapter 7)   | No classes on Mon Sep 30 (National Day For Truth and Reconciliation)   |
| 6  | Oct 7 - 11     | Chapter 8          | - Normal distribution and standardized scores (Chapter 8)<br>- Applying the empirical rule (Chapter 8)  | <b>Midterm 1 Wed Oct 9, 7 - 9 pm (to be confirmed by the Registrar's Office)</b><br><br><b>Fri Oct 11 Assignment 2 due</b> |
| 7  | Oct 14 - 18    |                    | <b>Reading week</b>   |  |
| 8  | Oct 21 - 25    | Chapters 9         | - Misleading graphs (Chapter 9)   |  |
| 9  | Oct 28 - Nov 1 | Chapters 10 - 11   | - Relationships between quantitative variables; correlation coefficient; linear regression models (Chapters 10 and 11)                              |  |
| 10 | Nov 4 - 8      | Chapter 12         | - Relationships between qualitative variables; contingency tables; odds ratio; relative risk (Chapter 12)   | <b>Fri Nov 8 Assignment 3 due</b>  |
| 10 | Nov 11 - 15    | Chapters 13        | - Statistical significance for 2 by 2 tables (Chapter 13)   |  |
| 11 | Nov 18 - 22    | Chapters 14 and 19 | - Understanding probability (Chapter 14)<br>- Introduction to inference: sampling variability and sampling distributions (Chapter 19)               | <b>Midterm 2 Wed Nov 20, 7 - 9 pm (to be confirmed by the Registrar's Office)</b>  |
| 12 | Nov 25 - 29    | Chapters 20 and 22 | - Introduction to inference: confidence intervals (Chapter 20)<br>hypothesis testing, p-value, level of significance, type I/II errors (Chapter 22) |  |
| 13 | Dec 2 - 6      | Chapter 23         | - Introduction to inference: hypothesis testing, p-value, level of significance, type I/II errors (Chapter 23)                                      | <b>Fri Dec 6 Assignment 4 due</b>  |