

SS3843A Introduction to Study Design Course Outline

1. Course Information

Course Information

Course Name: Introduction to Study Design (SS3843A)

Academic Term: Fall 2024

Lecture Hours: Monday, Wednesday, Friday 8:30 – 9:30 AM

Lecture Location: SSC 2020

List of Prerequisites

Prerequisite(s): A minimum mark of 60% in Statistical Sciences 2858A/B or a minimum mark of 70% in one of Statistical Sciences 2035, Statistical Sciences 2141A/B, Statistical Sciences 2143A/B, Statistical Sciences 2244A/B, Biology 2244A/B, Economics 2222A/B, MOS 2242A/B, Psychology 2812A/B or the former Psychology 2810; and enrollment in a module offered by the departments of Applied Mathematics; Mathematics; and Statistical and Actuarial Sciences.

Unless you have either the requisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Advisors) to enroll 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.

2. Instructor Information

| Instructors | Email | Office | Phone | Office Hours (in-person) |
|-------------------------|--|---------|---------------------------|--------------------------|
| Dr. Hyukjun (Jay) Gweon | hgweon@uwo.ca | WSC 211 | 519-661-2111 ext.87792 | Wed 10 – 11 AM |
| TA: TBA | | WSC | | |
| TA: TBA | | WSC | | |

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

3. Course Syllabus, Schedule, Delivery Mode

The course consists of two main parts: survey sampling design and experimental design. Topics of survey sampling covers include simple random sampling, ratio and regression estimation, stratified random sampling and cluster sampling. Topics of experimental design include fundamentals (randomization, blocking, replication), randomized designs, ANOVA, randomized block designs and factorial designs with two-way interactions.

Lecture hours are MWF 8:30 – 9:30 AM and all lectures are delivered in person.

Below is the tentative weekly schedule.

| Week | Topics |
|------|--|
| 1 | Review of estimation and mean squared error |
| 2 | Simple probability sampling |
| 3 | Stratified sampling |
| 4 | Ratio and regression estimation |
| 5 | Cluster sampling, Review |
| 6 | Thanksgiving |
| 7 | Reading week |
| 8 | Review of hypothesis testing, Type I/II errors |
| 9 | Experimental design introduction |
| 10 | Experiments with a single factor |
| 11 | Randomized blocks |
| 12 | Factorial designs |
| 13 | 2^k factorial design |
| 14 | Summary |

Key Sessional Dates

Classes begin: September 5

Fall Reading Week: October 12 – 20

Classes end: December 6

Exam period: December 9 – 22

Other Important Dates (no class)

Canada life day: September 13

Non-instructional day: September 30

4. Course Materials

The instructor will use his own course notes and examples.

Course notes are heavily based on the following two books (**not required but highly recommended**):

- (a) Sampling Design and Analysis by Sharon L. Lohr
- (b) Design and Analysis of Experiments by Douglas C. Montgomery

Software: We will use **R** for covering examples. A laptop or personal computer with R/RStudio installed is recommended.

All R codes that we use in class will be posted to OWL: <http://owl.uwo.ca>.

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.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

| | |
|------------------------|------------|
| Assignments (2) | 10% |
| Tests (3) | 45% |
| Final Exam | 45% |

Assignments

There will be **two homework assignments (each is worth 5%)** during the course (**due dates: Oct 25th, Nov 29th**).

Tests

There will be **three in-class tests** that cover the course material. The dates of the tests are **Oct 4th (Test 1), Nov 1st (Test 2) and Nov 22nd (Test 3)**. Each midterm test will be worth 15%. The topics covered for each test will be announced later.

Final Exam

The date of the final exam (3-hour long) will be set by the university.

Specific conditions that are required to pass the course:

- Before the final exam, students are required to have completed assessments whose weight totals at least **30% of their final grade**. Students who do not meet this requirement may be given an opportunity to complete the requirement with the next offering of the course.

Notes:

- All tests are closed book.
- Late assessments with valid document(s) should be completed no later than 48 hours from the scheduled deadlines. Late assessments without any valid document will not be accepted.
- The weight for a missed assignment is not transferrable.

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,

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/

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:**

- **Examinations scheduled during official examination periods (Defined by policy)**

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

Missed test: There are no make-up exams for missed tests. For those who do legitimately miss a test AND their Academic Consideration has been granted, the weight of the missed test will be transferred to the final exam. If the Academic Consideration is not granted, then you will receive a mark of 0 for the missed test.

When a student misses the Final Exam and their Academic Consideration has been granted, they 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.

Essential Learning Requirements

Even when Academic Considerations are granted for missed coursework, the following are deemed essential to earn a passing grade.

Specific conditions that are required to pass the course:

- Before the final exam, students are required to have completed assessments whose weight totals at least **30% of their final grade**. Students who do not meet this requirement may be given an opportunity to complete the requirement with the next offering of the course.

6. 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.

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,

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.

Calculators: Only non-programmable calculators are permitted on tests and exams.

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.

Tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:

<https://remoteproctoring.uwo.ca>.

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.

To connect with a case manager or set up an appointment, please contact 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

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.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

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