Department of Statistical Sciences
University of Toronto

STA 305H1S
Design and Analysis of Experiments
Syllabus – Winter 2024

Land Acknowledgement
We wish to acknowledge the land on which the University of Toronto operates. For thousandsof years, it has been the traditional land of the Huron-Wendat, the Seneca, and most recently,the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

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Course Formats Highlights

This course is an in-person course. Any deviations from this document will be announced on the Quercus course pages. Please keep regularly visited the website link FAS student FAQs and the course pages at the Quercus.

1. **Course and Sections**

STA 305H1F: Design and Analysis of Experiments
Sections for STA 305 H1S: L0101 and L0201

2. **Instructor and Team**

Professor: Murari Singh
murarii.singh@utoronto.ca (mailto:murarii.singh@utoronto.ca)
Office hours (via zoom meeting): **3 – 4 pm** (The link will be posted on the Quercus.)

TAs and their office hours will also be announced on Quercus.

3. **Class Time**
Section L0101: **Monday** – BR200 (11:10 am - 12 pm), **Wednesday** – BR200 (11:10 am - 13 pm)
First lecture: Monday, January 8, 2024

Section L0201: **Tuesday** – MS3153 (1:10 - 2 pm), **Thursday** – MS3153 (1:10 - 3 pm)
First lecture: Tuesday, January 9, 2024

4. **Course Content**

This course will introduce the fundamental concepts of the design of scientific studies including the design of experiments and observational studies. Students will become acquainted with statistical methods used to design and analyze experiments and observational studies. This course will cover experiments versus observational studies, clinical trial design, comparing several groups using a completely randomized design, randomized blocks, nonparametric methods, Latin squares, incomplete block designs, square lattices, rectangular lattices, factorial designs, response surface designs, causal inference in randomized and non-randomized studies, and adjusting for selection bias using propensity score methods.

The learning objectives of this course are:
- Understand the ideas, principles, and considerations that are common to the design and analysis of scientific studies including the statistical design of experiments and observational studies.
- Develop a statistical toolbox of methods for the design and analysis of experiments and observational studies.
- Identify appropriate uses and interpretations of experimental designs, and observational studies, including their strengths and limitations.
- Integrate the application with theory, of experimental designs and observational studies, using R/Rmd tools.

Topics

Experiments, observational studies, and causal inference

Experiments versus observational studies, and causal inference in randomized experiments.

Selection Bias in Observational Studies

Causal inference in randomized experiments versus observational studies. Introduction to the propensity score and three ways to use the propensity score to adjust for selection bias: matching;

sub classification; direct regression adjustment.

Probability and Statistics

Mathematical statistics used in experimental design.

Comparing Several Groups

Comparing several groups in an experimental and observational setting and deciding whether differences that are found are likely to be real or due to chance.

Power and Sample Size

Power and sample size will be introduced for several designs. Applications will include the design and analysis of clinical trials with continuous or binary endpoints.

Blocking Techniques

Blocked designs, Latin squares, randomized incomplete block designs, square and rectangular lattices. Statistical analysis of data including nonparametric methods in few cases.

Factorial Designs

Factorial, blocked factorial, and fractional factorial designs will be discussed.

Experiments with Random factors

Two factor factorial – random effects models, mixed effects models

Split Plot Designs

Split plot designs will be discussed as an example of restricted randomization in the design of experiments.

Response Surface Methods

Response surfaces of first and second orders - method of steepest ascent, construction of the designs, and analyses

5.   Course Books

5.1 Required

- Taback, N. (2022). Design and Analysis of Experiments and Observational Studies using R: A Volume in the Chapman & Hall/CRC Texts in Statistical Science Series. Link: http://designexptr.org/index.html

- Design and Analysis of Experiments, 10th Edition, by Douglas C. Montgomery (John Wiley, 2020).
  UofT Bookstore - Powered by Verba (verbacollect.com)[https://utoronto.verbacollect.com/courses/540881497]

5.2 Optional

1. Statistics for Experimenters: Design, Innovation, and Discovery. Box, G.E.P., Hunter, J.S.,Hunter, W.G. Wiley 2nd Ed. 2005

2. Design and Analysis of Experiments. Dean, A., and Voss, D. Springer. 1999. UofT link toelectronic copy: http://go.utlib.ca/cat/2573215 (http://go.utlib.ca/cat/2573215)

3. Design of Observational Studies. Rosenbaum, P. R. Springer 2010. UofT link to electroniccopy: http://go.utlib.ca/cat/7890274 (http://go.utlib.ca/cat/7890274)

4. Experiments: planning, analysis, and optimization. Wu, C.F.J., Hamada, M.S. Wiley, 2009, 2nd ed.

5. Design and Analysis of Experiments: Volume 2- Advanced Experimental Design, K. Hinkelmann and O. Kempthorne (2005), John Wiley & Sons, Inc., Hoboken, New Jersey.

6. Causal inference for statistics, social, and biomedical sciences. Imbens and Rubin.Cambridge University Press, 2015. http://go.utlib.ca/cat/10127748 (http://go.utlib.ca/cat/10127748)

    NB: Textbooks 2,3, 6 are available electronically through the UofT library (i.e., electronic copies of both these textbooks are available at no extra cost)

6.   Course Materials, including lecture notes

All course materials are copyrighted. If they are from the textbook, the copyright belongs to the textbook publisher. If they are provided by an instructor (for example, lecture notes, computer code, assignments, tests, solutions) the copyright belongs to the instructor. Distributing materials online or sharing them in any way is a copyright violation and, in some situations, an academic offence. Course materials are provided for the exclusive use of enrolled students. Do not share them with others. I do not want to discover that a student has put any of my materials into the public domain, has sold my materials, or has given my materials to a person or company that is using them to earn money. The University will support me in asserting and pursuing my rights, and my copyrights, in such matters.

7.   Assessments

7.1 Grading scheme and Assessment Environment

Students will be evaluated according to the following marking scheme.

	Assessment	Weight (undergraduates)	Section 0101 (2024) Date/Time/Day	Section 0201 (2024) Date/Time/Day	Assessment Formats/platform
1	Homework (HW) (3 × 5%)	15%	HW1 (Jan 26), HW2 (Feb 16), HW3 (Mar 22) Fridays (due dates)		SA questions on Crowdmark
2	Mid-term Test[$]	30%[a] (35%)[b]	Feb 28, 11:20 am -12:50 pm, Wednesday	Feb 29, 1:20 – 2:50 pm, Thursday	In-person (in classroom)
3	Project Report	10%	April 5, Friday		Crowdmark & Quercus
4	Final Exam[$]	45%[a] (40%)[b]	Scheduled by the Faculty		In-person (by FAS)

[$]The marking scheme will use the higher of the combined marks for course resulting from the options (a) and (b) in above.

Minimum passing requirement
In addition to the U of T grading policy, students must complete the final assessment to pass the course.

7.2 Assessment Formats/Platforms, Missed Assessments and Marking Concerns

7.2.1 Homework assignments

The homework assignments are short-answer questions distributed to the students via Crowdmark. Students will upload their answer on the Crowdmark platform.

Late Penalty for Homework Assignments

A **25% per day** penalty will be applied to assignments that are submitted late. For example, this means that if an assignment is due at 17:00 ET, and is submitted at 17:01 ET, then it will incur a 25% late penalty. If it is submitted at 17:01 ET the following day, then it will incur a 50% late penalty.

Missed Homework Assignments (due to valid reasons)

If a homework is missed for a valid reason (e.g., illness or personal emergency), then within one week following the assessment you must, clearly indicating the assessment (e.g., HW1 due 26Jan2024), declare your absence using one of the following recognized forms of documentation for student absence:

> 1. Absence declaration via the Absence Declaration Tool in ACORN with verification email sent to the instructor.
> 2. UofT Verification of Illness or Injury Form
> 3. College Registrar's letter
> 4. Letter of Academic Accommodation from Accessibility Services

For more information, see the link: https://www.artsci.utoronto.ca/current/academics/student-absences.

Students who properly follow all the steps outlined above will have the weight of the assignment transferred to another assessment. For each such missed assignment, for undergraduates, 50% of the total weight (5%) for that homework assignment will be shifted to the other homework assignments (i.e., 2.5% weight will be shifted to other homework assignments) and the remaining to the final assessment (i.e., 2.5% weight shifted to the final). Otherwise, a missed homework will be assigned a grade of zero.

7.2.2 Midterm test

The midterm test will be **in-person** test during class time on the test day. The test will have short-answer questions including computations and proofs. Short answers may require you to interpret R output and use them to answer. You will need to know R syntax to complete for homework but will not be tested for R syntax on the test and exam. However, you will need to know how to interpret output from R.

The **in-person** exams cannot be submitted **late**.

Missed Midterm Test

If the midterm test is missed for a valid reason (e.g., illness or personal emergency), then within one week following the assessment you must, clearly indicating the assessment (e.g., Midterm held 2Nov2023), declare your absence using one of the following recognized forms of documentation for absence:

> 1. Absence declaration via the Absence Declaration Tool in ACORN with verification email sent to the instructor.
> 2. UofT Verification of Illness or Injury Form
> 3. College Registrar's letter
> 4. Letter of Academic Accommodation from Accessibility Services

For more information, see the link: https://www.artsci.utoronto.ca/current/academics/student-absences.

Students who properly follow all the steps outlined above will have the weight of the assignment transferred to another assessment. If the midterm test is missed for a valid reason, then the full weight of the midterm test will be shifted to the final exam. In this case, the final exam will be 75% for undergraduates, and 50% for the graduates (see table in item # 7.1).

7.2.3 Project work

The project work requires development of a report based on a well-designed study incorporating experimental

design, collected/simulated data, analysis, R/Rmd codes, results and discussion and a video presentation following the guidelines issued by the instructor.

Late Project Submission

If the project report is submitted after the due date, then a late penalty of **20% per day** (i.e., for every 24 hour interval) will be applied to the component of the project handed in late. For example, if the project-report PDF file component is submitted after 5 days (including weekend days) then you will receive a grade of zero for the project-report PDF file component.

Missed Project Submission

If the Project work is missed for a valid reason (e.g., illness or personal emergency), then within one week following the assessment and before the final exam, you must, clearly indicating the assessment (e.g., Project due 6Dec2023), declare your absence using one of the following recognized forms of documentation for student absence:

1. Absence declaration via the Absence Declaration Tool in ACORN with verification email sent to the instructor.
2. UofT Verification of Illness or Injury Form
3. College Registrar's letter
4. Letter of Academic Accommodation from Accessibility Services

For more information, see the link: https://www.artsci.utoronto.ca/current/academics/student-absences.

Students who properly follow all the steps outlined above will have the weight of the assignment transferred to another assessment. If the Project work is missed for a valid reason, then the full weight of the Project will be shifted to the final exam.

7.2.4 Final Exam

The final exam will be **in-person** during the time, date, and place decided by the Faculty of Arts and Science (FAS). The exam will have short-answer questions including computations and proofs. Short answers may require you to interpret R output and use them to answer. You will not be tested for R syntax on the exam, but you will need to know how to interpret output from R.

The **in-person** exams cannot be submitted **late**.

Students who are eligible for **special test accommodations** will be facilitated through the university's **Accommodated Testing Services (ATS)**.

Final Exam Absences or Exemptions

If a student misses the final exam for any reason, then they should contact their College Registrar's office or work through Accessibility Services if it is a matter of accommodation.

7.3 Marking concerns

- Any requests to have marked work re-evaluated must be made in writing to the instructor within one week of the date the work was returned. The request must contain a justification for consideration.

8.   Computing

R

We will use R for all examples. R is freely available for download at http://cran.r-project.org (http://cran.r-project.org) for Windows, Mac, and Linux operating systems. For the tests and exam, you will need to know how to interpret output from R.

RStudio

RStudio is a fantastic integrated development environment (IDE) for R. It is freely available at https://www.rstudio.com/products/rstudio/ (https://www.rstudio.com/products/rstudio/)

I am assuming that students have never used R before. I will provide you with the R syntax for all examples in lecture, which should be sufficient for you to complete the practice problems.

Jupyter Notebook

The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations, and narrative text (https://jupyter.org)

R can be run in a Jupyter notebook in any web browser by logging into https://utoronto.syzygy.ca (https://utoronto.syzygy.ca) with your UTORid.

To get started using R in a Jupyter notebook, see this page (jupyterstarter.html). Additionally, you can also use R Studio through the U of T Jupyterhub, by selecting the RStudio option and logging in with your utorID and password, available here: https://jupyter.utoronto.ca.

Calculators

You will need a calculator in this course. Any calculator that has logarithmic functions will be sufficient. Calculators on phones or other devices equipped to communicate with the outside world (for example, through the internet or cellular or satellite phone networks) will not be permitted during the term tests or final exam.

9.   Getting Help

9.1 Online Discussion Board

This term you will have the option to use Piazza for class discussion. If you decide not to use Piazza, it will not disadvantage you in any way, and will not affect official University outcomes (e.g., grades and learning opportunities). If you choose not to opt-into Piazza, then you can ask questions or discuss course material with the instructor or Teaching Assistants (TAs) during office hours.

Be sure to read Piazza's Privacy Policy (https://piazza.com/legal/privacy) and Terms of Use (https://piazza.com/legal/terms) carefully. Take time to understand and be comfortable with what they say. They provide for substantial sharing and disclosure of your personal information held by Piazza, which affects your privacy. If you decide to participate in Piazza, only provide content that you are comfortable sharing under the terms of the Privacy Policy and Terms of Use.

The Piazza system is highly catered to getting you help fast and efficiently from classmates, the TA, and the lecturers. Rather than emailing questions to the teaching staff, we encourage you to post your questions on Piazza. To sign up for the discussion forum click on the link for your section:

   https://piazza.com/utoronto.ca/winter2024/sta305h11ec0101_l0201/home

9.2 Additional help

Need extra help with the coursework? Here are some options:

- For continued class discussion and questions outside of class, try posting on the discussion forums. The instructor and TAs will be monitoring them regularly.

- You can visit your instructor or the teaching assistants during their office hours.

E-mail should only be used for personal emergencies or personal matters.

9.3 How to communicate with your instructor

Questions about course material such as:
- How do I do Question 3.7 in the textbook?
- What is standard deviation?
- When is the midterm?

Should be posted on the discussion forums. Questions can be posted anonymously (so that the author is anonymous to other students but not to the instructors), if desired.

Before emailing your instructor, please:
1. re-read **this syllabus** to see if the answer is here,
2. check FAS student FAQs
3. check the announcement/discussion/FAQ posts on Quercus,
4. ask your TA,
5. post your question to the appropriate discussion board on Quercus.
6. go to office hours

If your question is not answered after looking through these resources, or for private communication, such as: I missed the test because I was ill, then e-mail your instructor. If you refer to the contents of other emails, then be sure to provide the contents being referred to altogether in a single email message. **When emailing your instructor, please use the subject line: STA305 – LEC0101 or STA305 – LEC0201**. Here, STA305 is your course code and LEC0101/L0201 is your section (same as on ACORN). **If this subject is not included, we may miss your email**.

Use your utoronto.ca e-mail account to ensure that your message does not automatically go to a Junk folder and include your full name and student number.

10.   Accommodations

10.1 Religious Accommodation

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of cultural and religious traditions. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity (such as a test or in-class assignment) due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements. More information: https://www.viceprovoststudents.utoronto.ca/policies-guidelines/accommodation-religious/ .

10.2 Students with Disabilities or Accommodation Requirements

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the beginning of the academic

year by visiting http://www.studentlife.utoronto.ca/as/new-registration (http://www.studentlife.utoronto.ca/as/new-registration). Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition with any instructor, and your instructors will not reveal that you are registered with AS.

10.3 Specific Medical Circumstances

If you become ill and it affects your ability to do your academic work, consult me right away. Normally, I will ask you for medical documentation in support of your specific medical circumstances. The University's Verification of Student Illness or Injury (VOI) form is recommended because it indicates the impact and severity of the illness, while protecting your privacy about the details of the nature of the illness. You can submit a different form (like a letter from a doctor), as long as it is an original document, and it contains the same information as the VOI. For more information, please see http://www.illnessverification.utoronto.ca (http://www.illnessverification.utoronto.ca) If you get a concussion, break your hand, or suffer some other acute injury, you should register with Accessibility Services as soon as possible.

10.4 Accommodation for Personal Reasons

There may be times when you are unable to complete course work on time due to non-medical reasons. If you have concerns, speak to me or to an advisor in your College Registrar's office; they can help you to decide if you want to request an extension or accommodation. They may be able to provide you with a College Registrar's letter of support to give to your instructors, and importantly, connect you with other resources on campus for help with your situation.

11.   Academic Integrity

All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments, collaborating with fellow students, and writing tests and exams. Ensure that the work you submit for grading represents your own honest efforts. Plagiarism—representing someone else's work as your own or submitting work that you have previously submitted for marks in another class or program—is a serious offence that can result in sanctions. Speak to me or your TA for advice on anything that you find unclear. To learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at http://www.writing.utoronto.ca (http://www.writing.utoronto.ca). Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic- integrity (https://www.artsci.utoronto.ca/current/academic-advising-and-support/student- academic-integrity) and http://academicintegrity.utoronto.ca (http://academicintegrity.utoronto.ca)
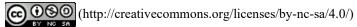
AI tools such as ChatGPT

- Students may use an AI tool such as ChatGPT for enhancing their learning objectives, however, they must not share the course materials and assessments as all content entered may become part of the tool's dataset and may inadvertently resurface in response to other prompts.

- The use of generative artificial intelligence tools or apps for assignments in this course, including tools like ChatGPT and other AI writing or coding assistants, is prohibited. Students may not copy or paraphrase from any generative artificial intelligence applications, including ChatGPT and other AI writing and coding assistants, for

the purpose of completing assignments in this course.

12. Your responsibilities

The classroom sessions for this class are designed to actively engage you in the course material. We hope you will find them interesting, challenging, and fun, and an excellent opportunity to truly learn the material.

13. Weekly Lecture Schedule

Tentative Weekly Lecture Schedule

For the exact dates of homework, term tests and the final, please keep visiting the Course page on Quercus. A homework is assigned in advance; if topics related to some questions are not covered by one day before the due date, an announcement will be made to withdraw such questions.

Section L0101: Monday (M) & Wednesday (W); Section L0201: Tuesday (Tu) & Thursday (Th)

Week (2024) L0101/L0201	Topics
1. (Week 1) Jan 8 M/ 9 Tu	**Welcome and Course Design and implementation overview** Prof. Nathan Taback textbook: • Introduction to Observational Studies and Designed Studies/Experiments. • Simple Comparative Experiments- Overview of common statistical concepts. L1*.pdf: Lecture notes presented in the class and files posted on Quercus.
Jan 10 W/ 11 Th	• Review of Mathematical Statistics (Focus: R codes). Discuss homework (L2*.pdf)
2. Jan 15 M/ 16 Tu	• Comparing Two Treatments in Completely Randomized Designs (including randomization p-values, without/with Monte Carlo sampling) L3*.pdf [Chapter 3: NT2022]
Jan 17 W/ 18 Th	• Power and sample size for testing hypotheses on means and proportions (derivations, R codes: exact and simulated distributions) (L4*.pdf, L5*.pdf) [Chapter 4: NT2022]
3. Jan 22 M/ 23 Tu	• (continued) Power via simulation; via randomization distribution (nonparametric procedures) (L5*.pdf)
Jan 24 W/ 25 Th	• Introduction to causal inference in randomized experiments (L6*.pdf) **Homework 1.** Due **Friday 26/1/2024** (Coverage: Weeks 1 – 3, up to "via randomization distribution (nonparametric procedures)"
4. Jan 29 M/ 30 Tu Jan 31 W/ Feb 1 Th	• Design of observational studies and propensity scores (L7*.pdf) • (Continued) Design of observational studies and propensity scores (L8*.pdf)

5. Feb 5 M/ 6 Tu Feb 7 W/ 8 Th	Prof. DC Montgomery textbook: • **Experiments with a single factor in CRD:** Randomized Plan, Analysis of Variance, Example • Model Adequacy Checking, Determining the Sample Size L9-12*.pdf
6. Feb 12 M/ 13 Tu Feb 14 W/ 15 Th	• (CRD continued) Random model, Estimation and testing using regression approach. • Comparing more than two groups, multiple comparisons, Nonparametric Methods in the Analysis of Variance, The Kruskal–Wallis Test L9-12*.pdf **Homework 2. Due Friday Feb 16, 2024** (Coverage: Weeks 4 - 6)

<div align="center">

Feb 19, 2024: Closed for Family Day. Feb 19 – 23, 2024: Reading Week (no classes)

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7. Feb 26 M/ 27 Tu Feb 28 W/ 29 Th	• Randomized Complete Block Designs (L13-14-15*.pdf) **L0101: Mid-term Test: Feb 28, Wednesday, 11:20 am - 12:50 pm (Topics covered: Weeks 1 – 6)** **L0201: Mid-term Test: Feb 29, Thursday, 1:20 – 2:50 pm (Topics covered: Weeks 1 – 6)**
8. Mar 4 M/ 5 Tu Mar 6 W/ 7 Th	• Latin Squares, Balanced Incomplete Block Designs, Square lattices, Rectangular lattices. (L13-14-15*.pdf)
9. Mar 11 M/ 12 Tu Mar 13 W/ 14 Th	• Introduction to Factorial Experiments • Factorial designs at two levels • Blocking in factorial designs of type 2^k (L16-17-18-19*.pdf)

10.
Mar 18 M/ 19 Tu
Mar 20 W/ 21 Th
	• (continued) Blocking in factorial designs of type 2^k
	• Fractional factorial designs of type 2^{k-p}
	    (L16-17-18-19*.pdf)
	• Chapter 9 (3^k, 3^2, 3^3; AB, ABC interaction partitioning)
	• Blocking/confounding, and fractional 3^k (examples), 3^{k-p} Examples
	    (L16-17-18-19*.pdf)
	Homework 3. Due Friday, Mar 22, 2024 (Coverage: Weeks 7 - 10)

11. Mar 25 M/ 26 Tu Mar 27 W/ 28 Th	• The Two-Factor Factorial with Random Factor-effects • Two-Factor Factorial Mixed Factor-effects L20*.pdf • Restricted randomization and split-plot designs (L21*.pdf)
12. Apr 1 M/ 2 Tu Apr 3 W/ 4 Th	**Response Surface Methodology** • Introduction to Response Surface Methodology, The Method of Steepest Ascent (L22-23*.pdf) • Analysis of a Second-Order Response Surface, CCD, and Box - Behnken designs examples; Mixture experiments (introduction) (L22-23*.pdf) **Project Report: Due Friday, April 5, 2024.** April 5: Classes end in S & Y-term courses.

2024 Winter Term (S)

Date	Activity
January 8	Lectures begin in S-term courses and resume in Y-term courses for A&S. Lectures begin in U of T Engineering S-term courses and resume in Y courses.
January 15	Last day students can transfer out of Engineering Science (first-year students) to Track One or a Core 8 engineering program.
January 15	Lectures begin for T-program courses.
January 16	Last day students can waitlist S-term courses.
January 21	Last day students can add or substitute S-term courses. PEY Co-op Program: Last day second-year students can enrol. Deadline to change an Extra S-term course to a for credit course.
February 19	Last day students can drop Y-term courses without academic penalty.* Note: a student taking a Y-term course will not be allowed to drop this course in the Winter Term if a recalculation of their Fall Term load shows that dropping the course will reduce the F-term course load to fewer than 2.5 credits. Deadline to change a for credit Y course to an Extra course.
February 19	Family Day holiday: University closed.
February 19 to February 23	Reading Week: No lectures, tutorials or practicals. Reserved for special deferred exams from the December 2023 examination period.
February 28	Examination timetable for S- and Y-term courses posted (tentative).
March 11	Last day students can drop S-term courses without academic penalty, including S-term courses taken in Arts & Science.* Last day students can transfer to part-time studies.* Last day students can withdraw from S-term without academic penalty.* Deadline to change a for credit S-term course to an Extra course. Last day students can apply to re-enrol for the 2024 Fall Term.*
March 29	Good Friday holiday: University closed.
April 5	End of classes for Arts & Science S- and Y-term courses.
April 10 to April 30	S- and Y-term exam period for A&S courses.
April 12	Last day of U of T Engineering lectures in S- and Y-term courses; all term work should be submitted by this date.
April 15	Winter study day. Exam Jam.
April 16 to April 30	S- and Y- term exams. Note: Exams for courses offered by other faculties may be held outside of this period.
April	PEY Co-op Program: Recruitment cycle closes for 2024 Summer work terms. Engineering Career Centre will inform participants of date.
May 1	Winter emergency exam day.
May 15	Application deadline for transfers between engineering programs.