

STAT 4100 (CRN: 11517)
STATISTICAL INFERENCE
FALL 2021

Course Calendar Description: Rigorous treatment of inferential methods associated with point estimation, confidence intervals and hypothesis testing, including large sample techniques. May not be held with the former STAT 4140.

Prerequisites: [one of STAT 2800, the former STAT 3400, or the former STAT 3500] and [one of STAT 3100, the former STAT 3600, or the former STAT 3800].

Minimum technological requirements:

1. A computing device where one can create and edit documents,
2. A stable and secure internet connection capable of streaming videos and downloading software, and
3. Access to a webcam and microphone.

Lectures: Monday, Wednesday and Friday, 1:30 pm -- 2:20 pm, held over Cisco WebEx

Tutorials: Tuesday, 4:30 pm – 6:00 pm, held over Cisco WebEx and TA-ed by Jervis Gallanosa (e-mail: gallanoj@myumanitoba.ca)

Office Hours: Monday, 2:30 pm – 4:00 pm, booked and held over Cisco WebEx

Note: Live lectures, tutorials and office hours will be conducted over Cisco WebEx (can be accessed from the course UM Learn webpage). The instructions on how to use Cisco WebEx, in particular on how to book office hours, can be found under Support in your UM Learn account.

Instructor: Dr. Yuliya V. Martsynyuk
E-mail: Yuliya.Martsynyuk@UManitoba.CA

References: The course notes are posted on the course UM Learn webpage. The following textbooks are recommended, but not required.

- Hogg, R.V., McKean, J.W. and Craig, A.T. *Introduction to Mathematical Statistics*. 6th ed. Pearson, 2005.
- Casella, G. and Berger, R.L. *Statistical Inference*. 2nd ed. Duxbury, 2002.

Homework: Selected practice problems will be assigned as no-credit homework.

Term Tests: Three live 50-minute closed-book paper-and-pencil term tests will be held and invigilated over Cisco WebEx during the regular tutorial time. The tentative date of the first test is October 5, 2021. The test problems will be related to the homework and the problems solved in the lectures and tutorials. There are no early and deferred term tests in this course.

Evaluation: Final grade is based on:

- Term Work (60%): term tests 1, 2 and 3 (equally weighted)
- Final Exam (40%): live two-hour closed-book paper-and-pencil test based on the whole term, held and invigilated over Cisco WebEx

Course Topics:

- Sampling from the Normal Distribution (Review)
- Methods of Finding and Evaluating Point Estimators, Asymptotic Properties of Point Estimators
- Sufficiency
- Elements of Statistical Decision Theory, Bayes Estimation
- Interval Estimation
- Large-Sample Confidence Intervals
- Bayes Interval Estimation
- Testing Statistical Hypotheses
- Large-Sample Tests of Statistical Hypotheses
- Bayesian Tests of Statistical Hypotheses
- Other Topics as Time Permits

Note: This course outline is subject to change. If any changes become necessary, the students will be given as much notice as possible.

Voluntary Withdrawal Deadline: November 23, 2021

Academic Dishonesty: It is important that you understand what constitutes academic dishonesty and that you are familiar with the very serious consequences. Links to resources that describe academic dishonesty (including plagiarism, cheating, inappropriate collaboration and examination impersonation, as well as typical penalties) can be found at:

<http://umanitoba.ca/science/undergrad/resources/webdisciplinedocuments.html>

Copyrighted Material: All course notes, assignments, tests, exams, and solutions are the intellectual property of your instructor or the Department of Statistics. Reproduction or distribution of these materials is strictly forbidden without their consent.

Recording of Class Lectures: Your instructor and the University of Manitoba hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission of Yuliya V. Martsynuk.

Use of Electronics in the Classroom: It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. A student may use technology in the classroom setting only for educational purposes approved by the instructor and/or the University of Manitoba Accessibility Services. Students should not engage in electronic messaging/posting activities (e-mail, texting, video or voice chat, social networking) or electronic gaming during scheduled class time. Cell phones should be turned off at the beginning of class. If a student is on call for emergencies, their cell phone should be on vibrate and the student should leave the classroom before using it.

Class Communication: The University requires all students to activate an official University email account. Please note that all communication between your instructor and you as a student must comply with the Electronic Communication with Students Policy. Please see

http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html

You are required to obtain and use your U of M email account for all communication between yourself and the university.

Student Accessibility Services: If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

<http://umanitoba.ca/student/saa/accessibility/>

ROASS Schedule A: Schedule A of the Responsibilities of Academic Staff with regards to Students (ROASS) policies of the University of Manitoba lists resources and policies for students. It is important that you familiarize yourself with these resources and policies. Schedule A is posted on the Department of Statistics webpage.