*We recognize and acknowledge that McMaster University meets and learns on the traditional territories of the Mississauga and Haudenosaunee nations, and within the lands protected by the “Dish With One Spoon” wampum, an agreement amongst all allied Nations to peaceably share and care for the resources around the Great Lakes.*

**STATS 3D03– MATHEMATICAL STATISTICS**

**2020 Fall Term**

**Instructor:** Dr. Fred M. Hoppe **| E-mail:** [hoppe@mcmaster.ca](mailto:hoppe@mcmaster.ca)

**Office:** HH/205, (905) 525-9140 Ext. 24688. **| Office Hours:** TBA

**COURSE DESCRIPTION**

Multivariate distributions; distributions related to normal inference; point estimation; sampling distributions; consistency and limiting distributions; interval estimation; single parameter maximum likelihood methods; Rao-Cramer Lower Bound and efficiency. Three lectures; one term.

***Prerequisite(s):*** STATS 2D03 and one of ISCI 2A18 A/B, MATH 2A03, 2L03, 2Q04, 2X03, 2ZZ3

**COURSE AND LEARNING OBJECTIVES**

The objectives of this course are to develop a rigorous approach to the theory of probability and statistical inference in order to analyze data and make justifiable decisions when faced with uncertainty, variation, or randomness in observations, with particular emphasis on distributions, estimation, and maximum likelihood.

**MATERIALS & FEES**

***Required Materials/ Resources***

* Introduction to Mathematical Statistics, 8th Edition, by Hogg, McKean, and Craig, Pearson Education, Inc., 2019. Tentative coverage includes much of chapters 1 - 7. Depending on time limitations, some of the following sections may not be covered: 3.4, 3.5.2 - 3.5.3, 3.7, 4.3 - 4.4, 4.8 - 4.10, 5.4, 6.6, 7.6.

***Calculator***

* McMaster University endorses a “standard” calculator (Casio fx991MS or Casio fx991 MS PLUS). This is the only calculator permitted on tests and final exam.

**VIRTUAL COURSE DELIVERY**

**To follow and participate in virtual classes it is expected that you have reliable access to the following:**

* A computer that meets performance requirements [found here](https://cto.mcmaster.ca/technology-resources-for-mcmaster-students/#tab-content-device-recommendations).
* An internet connection that is fast enough to stream video.
* Computer accessories that enable class participation, such as a microphone, speakers and webcam when needed.

If you think that you will not be able to meet these requirements, please contact [uts@mcmaster.ca](mailto:uts@mcmaster.ca) as soon as you can. Please visit the [Technology Resources for Students page](https://cto.mcmaster.ca/technology-resources-for-mcmaster-students/#tab-content-device-recommendations) for detailed requirements. If you use assistive technology or believe that our platforms might be a barrier to participating, please contact [Student Accessibility Services](https://sas.mcmaster.ca/), [sas@mcmaster.ca](mailto:sas@mcmaster.ca), for support.

**COURSE OVERVIEW AND ASSESSMENT**

***Virtual Lectures***

* Tues., Thurs., and Fri., 2:30pm - 3:20pm. It is expected that these will be delivered via the app called Zoom. Students are strongly advised to familiarize themselves with Zoom prior to the first class.

***Course Website***

* Avenue to Learn (A2L, http://avenue.mcmaster.ca). Students are expected to check regularly for important and updated information.

**EVALUATION**

|  |  |
| --- | --- |
| **Item** | **Weight** |
| Midterm | 50% |
| Final Exam | 50% |

***Assessment***

Tentatively the final percent will be based on one midterm examination (50%) and a final examination (50%). The letter grade will then be determined from the final percent using the grade equivalence chart in the Undergraduate Calendar. The instructor reserves the right to modify elements of the course during the term and to change the weight of any portion of the grading scheme in such a way that if changes are made, each student’s grade, where feasible, will be the higher of the original weightings, if applicable, and the new weightings. At the end of the course the grades may be adjusted but this can only increase the grades and will be done uniformly. It is the responsibility of all students to check their McMaster email and A2L prior to each class to note any changes.

**REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK**

[McMaster Student Absence Form (MSAF):](https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/msaf-mcmaster-student-absence-form/) In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

***Late Withdrawal***

McMaster University provides a Late Withdrawal option to assist students who have become irretrievably behind in a course. Students who have fallen behind with assignments and/or are not prepared to write final examinations (or equivalent) in one or more courses are encouraged to make use of this option and must contact their Academic Advisor in the Faculty/Program Office. Students will work with their Academic Advisor to discuss the situation and what steps they can take to prevent a recurrence. The maximum number of units for which students may request a Late Withdrawal is 18 units throughout their undergraduate degree.

Students may request a Late Withdrawal, without petition, no later than the last day of classes in the relevant Term. However, it is important to note that:

* Requests for Late Withdrawal cannot be made in courses for which the final exam (or equivalent) has been attempted or completed. This also includes courses where a final grade has been assigned (e.g. clinical courses).
* Such requests will be cancelled or revoked if it is determined that the student attempted or completed the final exam (or equivalent).
* Students cannot use the Late Withdrawal option for courses in which they are under investigation or for which they have been found guilty of academic dishonesty.

Course(s) approved for Late Withdrawal will be:

* Assigned a non-numeric grade of LWD, in lieu of an alpha/numerical grade
* Excluded from the calculation of the GPA
* Ineligible for tuition refund
* Approval of a late withdrawal is final, and requests to be re-enrolled in the withdrawn course(s) will not be considered. A withdrawal will not preclude students from enrolling in the course(s) in a subsequent term.

**ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES**

Students with disabilities who require academic accommodation must contact [Student Accessibility Services (SAS](https://sas.mcmaster.ca/)) at 905-525-9140 ext. 28652 or [sas@mcmaster.ca](mailto:sas@mcmaster.ca) to make arrangements with a Program Coordinator. For further information, consult McMaster University’s [*Academic Accommodation of Students with Disabilities*](https://secretariat.mcmaster.ca/app/uploads/Academic-Accommodations-Policy.pdf) policy.

**ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)**

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the [RISO](https://secretariat.mcmaster.ca/app/uploads/2019/02/Academic-Accommodation-for-Religious-Indigenous-and-Spiritual-Observances-Policy-on.pdf) policy. Students should submit their request to their Faculty Office ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

**COURSES WITH AN ON-LINE ELEMENT**

***Some courses may*** use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, Zoom, Crowdmark, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

**ONLINE PROCTORING**

**Some courses may** use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

**ACADEMIC INTEGRITY**

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

**It is your responsibility to understand what constitutes academic dishonesty.**

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”),

and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the [*Academic Integrity Policy*](https://secretariat.mcmaster.ca/app/uploads/Academic-Integrity-Policy-1-1.pdf)*,* located at [https://secretariat.mcmaster.ca/university-policies-procedures- guidelines/](https://secretariat.mcmaster.ca/university-policies-procedures-%20guidelines/)

**The following illustrates only three forms of academic dishonesty:**

* plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained.
* improper collaboration in group work.
* copying or using unauthorized aids in tests and examinations.

**AUTHENTICITY / PLAGIARISM DETECTION**

***Some courses may*** use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster’s use of Turnitin.com please go to [www.mcmaster.ca/academicintegrity.](http://www.mcmaster.ca/academicintegrity)

**CONDUCT EXPECTATIONS**

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all our living, learning and working communities. These expectations are described in the [*Code of Student Rights & Responsibilities* (the “Code”).](https://secretariat.mcmaster.ca/app/uploads/Code-of-Student-Rights-and-Responsibilities.pdf) All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students’ access to these platforms.

**COPYRIGHT AND RECORDING**

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

**RESEARCH ETHICS** - NA

**EXTREME CIRCUMSTANCES**

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.