

HRM 702: INTRODUCTION TO BIOSTATISTICS

Beginning in Fall 2020, the course was adapted for online delivery in response to pandemic restrictions, using a blend of asynchronous video modules and synchronous online discussion sessions and tutorials. Many of these blended elements have been preserved with the reintroduction of in-person instruction. Every student is expected to be available for some in-person instruction and we offer online elements where they have been shown to be effective.

Time and Place

Recorded lectures and other material are provided online. In-person or synchronous online large group discussion sessions, followed by in-person small group tutorials are scheduled Thursday mornings 9:15 am to 12 pm. See consult the schedule for details.

General Objectives:

When you are successful in the course, you will understand statistical thinking and the basis of foundational statistical methods, knowing when and how to apply different approaches. You will correctly interpret the results of these analyses to answer scientific and clinical questions. You will communicate these results effectively.

Course Schedule

The schedule of lecture topics, required reading, tutorial assignments, and test and assignment dates is posted on Avenue to Learn. Please review it carefully, paying special attention to the dates for tests and assignments.

Online Course Management

The McMaster online learning portal “Avenue to Learn” is the home and main point of contact for the course. All course materials and assignments are made available there and course news is routinely posted there rather than email. Please get in the habit of checking the Avenue page frequently.

Format and Process:

Each weekly module consists of video eLearning presentations and accompanying slides, required textbook readings, and tutorial problems. Weekly online meetings include a large group discussion session to review the eLearning videos, followed by small group problem-based tutorials, led by a faculty tutor. Your faculty tutor will work with your group for the whole term.

1. Before the weekly sessions:

- a. View the eLearning videos, pausing often and taking notes as you go. Most students will download the slides and make notes directly on them. The video content and accompanying slides are your most important guide to the material you are expected to know.
- b. Read the assigned textbook chapters (or something equivalent). The readings offer an alternate presentation of the material with additional detail. Try to

- identify the important points of correspondence between the video and textbook presentation, both to clarify your questions and cement your understanding.
- c. Complete the assigned tutorial problems. Most often you will use statistical analysis software of your choice to complete the assigned analyses, learning to interpret the resulting output. You are expected to arrive to the online tutorial having attempted the problems. Tutorial problems are the basis of discussion, and no write-up is required.
2. *Large group discussion and Q&A:*
Weekly large group discussion and Q&A sessions build on the recorded lectures. These sessions are primarily intended as an opportunity for you to review and ask questions about the eLearning video and accompanying slides. All students are expected to attend the first session, and thereafter, these are optional.
 3. *Tutorials:*
Following the large group discussion, you are expected to attend the required small group tutorial. You will work with your group all term, led by a faculty tutor. Tutorial participation is required for all students, and participation is graded. Tutors also grade your written assignments. More details are given below:

Required Text:

You may use either:

Fundamentals of Biostatistics, 8th Edition. Bernard Rosner, Brooks Cole; (8TH ED) (Aug. 3 2015)

or

Principles of Biostatistics, 2nd Edition. Marcello Pagano & Kimberlee Gauvreau, Taylor & Francis ISBN 9781138593145

There are many introductory texts that you might use instead, but we assume you have access to one of the above.

Student Evaluation:

3 Online Quizzes	@ 10% ea. = 30%
Written Assignment 1	@15%
Written Assignment 2 (proposal and preliminary project analysis)	@ 5%
Written Assignment 3 (analysis project)	@ 40%
Tutorial participation	@ 10%

Please check the course schedule posted on Avenue for the dates of quizzes and assignments.

1. *Quizzes:*

Quizzes are delivered online, outside of the scheduled class time. During the quiz week, you may complete the quiz any time during the window indicated on the schedule. Once you begin the quiz, a time limit applies, and you must complete it. You are expected to complete the quiz *alone* and it is an academic misconduct for you to collaborate with others in completing the quiz.

2. *Written Assignments*

These are described on A2L. The final assignment involves the brief and focused analysis of a data set of your own so you should start thinking about some data that you have access to for this purpose. If you cannot obtain a data set, one can be provided to you. As a learning experience, it is best if you can obtain your own data for this purpose. Please see the policy for due dates and the submission of late work.

3. *Tutorials and Participation:*

Small group, problem-based learning is key element of the educational experience in HRM 702. The successful learner will demonstrate the ability to use statistical concepts and methods in collaboration with their colleagues to solve research problems. Tutorials provide a forum for discussing the application of concepts and for students to help each other with difficult topics from the lectures. Attendance at all tutorials is required and a grade for participation is assigned by the Tutors. The tutorials have a semi-structured format that allows all students to participate effectively. At the discretion of the tutorial leader, a student may be assigned to lead the discussion each week. The participation grade is meant to reflect the expectations for good participation, as outlined below. It is not credit for mere attendance.

All students should:

- Complete suggested readings in advance.
- Attempt the assigned tutorial problems and be prepared to discuss the solution.
- Contribute to discussion of the topic, problem, or lecture material.
- Be prepared to raise at least one interesting or difficult point from the lecture material.
- Stay on topic, encourage other students to contribute, be willing to help other students, be willing to ask for help.

Student tutorial leaders should:

- Lead discussion of the tutorial problems.
- Lead discussion on any difficult methodological problems or concepts from the lecture or text.
- Bring 1 to 2 additional discussion topics relevant to the week's material. Some suggestions include:
 - A recently published paper in your field that deals with relevant topics covered in the session.
 - A question about how to approach a particular analysis problem or particular research design.
 - Data analysis problems from the textbook.
 - Discuss the interpretation of statistical output.

- A comparison of software programs.
- Discuss the applications of a more advanced extension of the basic method being discussed.
- Any other topic you like, as long as it is relevant to the material for that week.

Computing and Software:

You must have access to software for the statistical analysis of data. You are free to use any software you choose. A course is often a good time to start learning software that you will rely on as a professional, which means it should do more than descriptive statistics and graphing. A spreadsheet such as Excel will not be suitable for the range of analyses required during the course or for professional use after the course. It is typical for professional scientists to use more than one analysis software.

Some popular choices are:

SPSS is easy to use, covers a range of methods, and available via the campus bookstore as a downloadable yearly site license. Because it is quick to learn, this has been the most popular choice for use during HRM 702 in the last several years.

SAS is powerful and popular with professionals, and a full version is currently available free of charge to HRM and MPH students through an agreement we have with SAS Canada. Contact the HRM program office. A free university edition of SAS and other student resources are available freely online at SAS Canada.

STATA is powerful and popular with professionals. It is available via the campus bookstore as a downloadable yearly site license.

R is a statistical programming language. It is powerful and popular with professional biostatisticians. However, it requires a significant time commitment to learn, which makes it challenging for use during the course. It is freely available at <https://www.r-project.org/>

SPSS, SAS, and STATA are available for use on the computers in the HEI student room in the HSC 2C area. SPSS is available for use on some computers in the Health Sciences Library.

We do not provide training in specific software and you will need to make the time to learn how to get data into the software of your choice and to conduct appropriate data manipulation and analysis. There are many excellent tutorials available online for the software of your choice, and a list of recommended resources is available on Avenue. Please feel free to forward any other resources you discover so we can add them to the list!

COURSE POLICIES

Attendance

Regarding the tutorials, we adhere to the HRM policy on absenteeism, which is reprinted below. With online tutorial sessions, there will be very few acceptable reasons not to attend the scheduled sessions. If you anticipate missing a session or test, please contact the course coordinator and your tutor.

HRM Program Attendance Policy

1. Any absence must be due to a reasonable excuse that is exceptional and out of the control to some extent of the student (illness, death in family, special exams etc).
2. One absence from a tutorial with a legitimate excuse is reasonable, 2 may be acceptable at the discretion of the instructor, but if you miss 3 or more tutorials you will not obtain credit for the course. You will be required to withdraw from the course before the last drop deadline or you will receive an 'F' in the course.
3. Attendance is considered in the assignment of participation grades. In cases where participation is credited for each session, you will normally receive 0 for participation for any day you are absent.

Due Dates and the Late Submission of Work

Written work must be submitted to A2L by 9:00 am on the due date. Work submitted late without the permission of the grading instructor is accepted at the discretion of the instructor and penalized at the rate of 10% per day.

Academic Integrity Policy

The McMaster University Academic Integrity Policy and related procedures are available at <http://www.mcmaster.ca/academicintegrity/>

It is important to be familiar with the policy, with the guidelines for acceptable work, and to complete the Integrity Training (SGS 101) required by the School of Graduate Studies. When in doubt about the limits of collaborative work, consult the course coordinator.

Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the McMaster University [Code of Student Rights & Responsibilities](#) (the “Code”) and in the [Professional Code of Conduct for Graduate Learners in Health Sciences](#). 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.

Academic Accommodation Of Students With Disabilities

Students with disabilities who require academic accommodation must contact [Student Accessibility Services](#) (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University’s [Academic Accommodation of Students with Disabilities](#) 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](#) 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.

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.

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.