



COURSE SYLLABUS

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|------------------------|---|----------------------|--------------------|
| COURSE TITLE: | CHEP 898.1: R Software for Health Research | | |
| COURSE CODE: | CRN # 90411 | TERM: | Fall 2025 |
| COURSE CREDITS: | 1 CU | DELIVERY: | Lecture, In-person |
| CLASS SECTION: | (05) | START DATE: | November 17, 2025 |
| CLASS LOCATION: | Murray Library – Room 161 | LAB LOCATION: | November 21, 2025 |
| CLASS TIME: | 1pm-4pm | LAB TIME: | November 24, 2025 |
| WEBSITE: | | | |

Course Description

Graduate students in the health sciences, community health, and epidemiology will learn to use R, a statistical software frequently used in health sciences research. This course provides an overview on data entry, data management and manipulation, and visualization using R and also covers basic statistical applications, including linear regression, and logistic regression. To demonstrate proficiency, students will be given a dataset with steps to follow and analyze based on the learning outcomes.

This class is expected to help students build capacity with R and the research process. They can begin to consider how to use R to apply their biostatistics knowledge to their graduate thesis or other research.

Add/Drop Deadline

The add/drop date for this course is November 22st, 2025.

Land Acknowledgement

As we engage in Teaching and Learning, I would like to acknowledge that the Saskatoon campus of the University of Saskatchewan is on Treaty Six Territory and the Homeland of the Métis. We pay our respect to the First Nation and Métis ancestors of this place and reaffirm our relationship with one another. I would also like to recognize that some may be attending this course from other traditional Indigenous lands. I ask that you take a moment to make your own Land Acknowledgement to the peoples of those lands. In doing so, we are actively participating in reconciliation as we navigate our time in this course, learning and supporting each other.

Prerequisites

Students are expected to have knowledge in introductory statistics to register for this course. Students may have some familiarity with R, but this is not required.

Learning Outcomes

By the completion of this course, students will be expected to:

1. Be familiar with R windows/terminal.
2. Enter/import data into R.
3. Manipulate R data and create new variables.
4. Understand R data and procedures/steps.
5. Be able to correct common errors in R code.

6. Use common procedures to analyze data.
7. Successfully perform common procedures and analyze data of a given dataset

Information on literal descriptors for grading at the University of Saskatchewan can be found at: <https://students.usask.ca/academics/grading/grading-system.php#GradingSystem> Please note: There are different literal descriptors for undergraduate and graduate students.

More information on the Academic Courses Policy on course delivery, examinations and assessment of student learning can be found at:

<http://policies.usask.ca/policies/academic-affairs/academic-courses.php>

The University of Saskatchewan Learning Charter is intended to define aspirations about the learning experience that the University aims to provide, and the roles to be played in realizing these aspirations by students, instructors and the institution. A copy of the Learning Charter can be found at: http://www.usask.ca/university_secretary/LearningCharter.pdf

Artificial Intelligence

The University has developed high level guidance based on the European Network for Academic Integrity (ENAI) recommendations. They are summarized below:

1. Acknowledge AI tools: “All persons, sources, and tools that influence the ideas or generate the content should be properly acknowledged” (p. 3). Acknowledgement may be done in different ways, according to context and discipline, and should include the input to the tool.
2. Do not list AI tools as authors: Authors must take responsibility and be accountable for content and an AI tool cannot do so.
3. Recognize limits and biases of AI tools: Inaccuracies, errors, and bias are reproduced in AI tools in part because of the human produced materials used for training.

AI Rules for this course

In general, my opinion is that you should exploring these tools, what they can do, and how you can integrate them into your work. These tools are great for editing, formatting, generating ideas, and writing very basic code. Not sure where to start, here is a list of tools <https://www.futurepedia.io/>. It's critical that when you use these tools you are very aware of bias and that you intervene to correct the text. Here are my general rules for AI in this course.

1. Can use AI tools for any or all parts of the work.
 - If you do you must cite your work (as above).
 - If you do you must include a 200 word reflective essay about the experience as part of your self-evaluation.
2. Be very careful with reference. Many of these tools just make up random references. I will not use tools like GPTZero to detect whether you have used AI tools or not. We are making a agreement to be honest with each other here. This is small class. We have that luxury.

University of Saskatchewan Grading System (for graduate courses)

At the end of the academic term, the instructor confirms that students have successfully completed the *R Software for Health Research* course. A pass/fail grade will then be recorded on the student's transcript.

Program Requirements

- The *R Software for Health Research* course consists of 13 hours (workshop in the computer lab and final project completion). Students must attend all three workshop sessions and successfully complete the final project.

Course Overview and Class Schedule

| Session | Module | Delivery Method |
|---------|---|--|
| 1 | <p>Session 1 covers the introduction to R environment including R windows (editor, log, output) as well as:</p> <ul style="list-style-type: none"> Navigating R temporary libraries, results from output window Writing program/R syntax Understanding R Steps Entering data into R editor Importing data from other sources (excel, access, SPSS, STATA), Creating permanent R data Correcting common errors in R code Familiarizing with basic R procedures [read.csv(), str(), head(), summary(), mean()] | <ul style="list-style-type: none"> PowerPoint presentation and lecture Hands on application and use of R software in the computer lab Students' participation through Q & A |
| 2 | <p>Session 2 focuses on</p> <ul style="list-style-type: none"> Data manipulation (Addition, subtraction, multiplication) Creating, renaming variables Being familiar with commonly used R function (abs(), exp(), log(), sqrt()) Working with date variable Data merging Data reshaping (from long data to wide data, from wide to long) Conditional statement (IF Then Else) Data visualization (scatter plot, bar diagram) | <ul style="list-style-type: none"> PowerPoint presentation and lecture Hands on application and use of R software in the computer lab Students' participation through Q & A |

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|---------------|--|--|
| | <ul style="list-style-type: none"> • Being familiar with basic R procedures (tidyr, forcats, ggplot2) | |
| 3 | <p>Session 3 focuses on performing statistical analysis using different procedures such as:</p> <ul style="list-style-type: none"> • t.test(), • cor(), • glm(), • anova(), • R Markdown for analysis documentation and sharing | <ul style="list-style-type: none"> • PowerPoint presentation and lecture • Hands on application and use of R software in the computer lab • Students' participation through Q & A |
| Final Project | Students will be given a dataset with steps to follow and analyze based on the learning outcomes | <ul style="list-style-type: none"> • Students are allowed to work at the computer lab or at home • Open notes • To be submitted by 4:30 p.m. December 9, 2024 |

Midterm and Final Examination Scheduling

No scheduling is required.

Instructor Information

Dr. Daniel Fuller

Associate Professor
University of Saskatchewan
Department of Community Health and Epidemiology
College of Medicine
1(306)966-8018

Office Hours

Required Resources

Readings/Textbooks

The textbook is NOT required to complete the course.

Other Required Materials

R software

Grading Scheme

This class is pass/fail. The instructor will use the rubric below to consider minimum acceptable grades for graduate students (MSc students to demonstrate at least 60%, PhD Students at least 70%): <https://cgps.usask.ca/policy-and-procedure//Academics/Coursework.php#58GRADESREQUIREDTOPASS>

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|---|------|
| Session Attendance and participation in Q & A | 20 |
| Hands on/practical application following steps using dataset | 20 |
| Perform statistical analysis using different procedures | 20 |
| Final Project – complete the steps from data entry to analysis using real world dataset | 40 |
| | |
| Total | 100% |

Evaluation Components

Attendance and Participation - As this is an experiential class, students are required to attend all sessions and participate during the question-and-answer activities

Hands on/practical application following steps using dataset provided during sessions – Students will be asked to follow examples and steps such as entering and importing data, exploring, managing data, and creating new variables in R

Perform statistical analysis using different procedures – Students will be asked to perform statistical analysis covered in the class using a dataset provided during sessions.

Final Project Submission – Using real world data provided, students will be asked to complete the steps from data entry to analysis based on the learning outcomes. Students will complete and submit by the due date, without assistance from other students but may contact the instructor if they need clarification while completing their assignment.

Integrity Defined (from the Office of the University Secretary)

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Website and avoid any behavior that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students should read and be familiar with the Regulations on Academic Student Misconduct (<https://secretariat.usask.ca/documents/student-conduct-appeals/StudentAcademicMisconduct.pdf>) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (<http://www.usask.ca/secretariat/student-conduct-appeals/StudentNon-AcademicMisconduct.pdf>)

For more information on what academic integrity means for students see the Student Conduct & Appeals section of the University Secretary Website at: <http://www.usask.ca/secretariat/student-conduct-appeals/index.php>

Examinations with Access and Equity Services (AES)

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Access and Equity Services (AES) if they have not already done so. Students who suspect they may have disabilities should contact AES for advice and referrals. In order to access AES programs and supports, students must follow AES policy and procedures. For more information, check www.students.usask.ca/aes, or contact AES at 306-966-7273 or aes@usask.ca.

Students registered with AES may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through AES by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by AES.

Student Supports

Student Learning Services

Student Learning Services (SLS) offers assistance to U of S undergrad and graduate students. For information on specific services, please see the SLS web site <http://library.usask.ca/studentlearning/>.

Student and Enrolment Services Division

The Student and Enrolment Services Division (SESD) focuses on providing developmental and support services and programs to students and the university community. For more information, see the students' web site <http://students.usask.ca>.

Financial Support

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact Student Central (<https://students.usask.ca/student-central.php>).

Aboriginal Students Centre

The Aboriginal Students Centre (ASC) is dedicated to supporting Aboriginal student academic and personal success. The centre offers personal, social, cultural and some academic supports to Métis, First Nations, and Inuit students. The centre is also dedicated to intercultural education, bringing Aboriginal and non-Aboriginal students together to learn from, with and about one another in a respectful, inclusive and safe environment. Students are encouraged to visit the ASC's Facebook page (<https://www.facebook.com/aboriginalstudentscentre/>) to learn more.

International Student and Study Abroad Centre

The International Student and Study Abroad Centre (ISSAC) supports student success in their international education experiences at the U of S and abroad. ISSAC is here to assist all international undergraduate, graduate, exchange and English as a Second Language students and their families in their transition to the U of S and Saskatoon. ISSAC offers advising and support on all matters that affect international students and their families and on all matters related to studying abroad. Please visit students.usask.ca more information.

Copyright

Every effort has been made to trace ownership of all copyrighted material and to secure permission from copyright holders. In the event of any question arising as to the use of any material, we will be pleased to make the necessary corrections. The University of Saskatchewan copyright policy is available at <http://www.usask.ca/copyright/>.

Acknowledgements

Meherun Nahar, MSc Student