



University
of Victoria

Faculty of Science | Department of Mathematics and Statistics
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Course Outline

STAT 454/556 A01: Robust Statistics

Instructor

Lecturer Prof. Julie Zhou, PhD

Research Area Optimal design of experiments, robust statistics, statistical computing, multivariate analysis, applied statistics

Email jzhou@uvic.ca

Note: Due to the large number of students that I teach and many research and committee meetings that I have, it is often impossible to answer every email quickly. For this reason, if you use email to make an appointment with me, please give me at least 24 hours to respond. It is also very hard to use email for math and stats technical questions. Please use my office hours for technical questions and R programming problems. I will do my best to help you.

Phone 250-721-7470

Office David Turpin Building A439

General Course Information

Number of Units 1.5

Pre-requisites STAT 350 and 353

Office Hours and Assistance

Tuesday 1:00 – 2:30pm, DTB A439

By appointment (send email to book one)

Math Club Students in Undergraduate Mathematics and Statistics (SUMS) was founded in 2014 as the reincarnation of a previous undergraduate course union that had been inactive for a few years. Please see <http://www.uvic.ca/science/math-statistics/current-students/undergraduate/sums/index.php> for more information.

Learning Objectives

- Students will develop an understanding of the theories of robust statistics.
- Students will apply robust statistics to identify outliers and analyze data in software R.
- Students will learn research, presentation and writing skills through course projects.

Course Materials and Online Resources

Textbook Robust Statistics, 2ed edition
by P. J. Huber and E. M. Ronchetti

CourseSpace <https://coursespaces.uvic.ca/>

Course materials, assignments and grades are posted in the CourseSpace.

Calculator If a calculator is allowed in tests and examinations in a course offered by the Department, then the only acceptable calculator is the Sharp EL-510, EL-510RN or EL-510RNB models. It may be purchased at the UVic Bookstore or elsewhere for about \$12. A calculator is permitted in this course.

Class Meetings

Monday and Thursday: 1:00 – 2:20pm, MAC D281

First day of lecture is January 7 (Monday).

Specific Topics

Influence function, breakdown point, efficiency, L-, M- and R-estimators, robust location and scale estimators, robust covariance matrix, robust multivariate analysis, robust regression, robust estimation of generalized linear models, robust tests, robust regression designs, programming and simulation in software R, and selected research papers.

Evaluation and Grading

Your final percentage grade will be computed according to the following scheme.

Homework Assignments	Participation	Project I	Project II
		TBA	TBA
10% x 3 = 30%	10%	30%	30%

The assignments will be announced in class. If you work together on these assignments, everyone must write up his/her solution independently. Late assignments or projects will not be accepted for marking.

If you are unable to hand in an assignment or a project on time for a valid reason, please contact me (preferably before the assignment or the project is due) to make arrangements. Any missing work will be marked zero.

The assignments and course work will be returned in class, or can be claimed during office hours. Any term work that is not collected by the end of the final exam period will be recycled. If you have a question or concern about an assigned mark, you need to bring it to my attention within seven calendar days of the date when it is returned in class.

Accessibility Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (CAL) as soon as possible. The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations <http://uvic.ca/cal>. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Grading Percentage scores will be converted to letter grades according to the university-wide standard table

Undergraduate: <http://web.uvic.ca/calendar/undergrad/info/regulations/grading.html>

Graduate: <http://web.uvic.ca/calendar/grad/academic-regulations/grading.html>

Final Examination Off-schedule final examinations (i.e., deferred examinations) are given only in accordance with the university policy as outlined in the Calendar. If you are unable to write a final examination due to illness, accident or family affliction, please refer to the following webpages for detailed instructions how to proceed:

Undergraduate: <http://web.uvic.ca/calendar/undergrad/info/regulations/concessions.html>

Graduate: <http://web.uvic.ca/calendar/grad/registration/concessions.html>

Students are strongly advised not to make plans for travel or employment during the final examination period as special arrangements will not be made for examinations that conflict with such plans.

Supplemental Examinations. The Department of Mathematics and Statistics does not award 'E' grades or offer Supplemental Examinations in any of its courses.

Policies and Ethics

Attendance The University Calendar states 'Students are expected to attend all classes in which they are enrolled.' Our courses are conducted on that basis. If you miss an announcement (information concerning midterms, corrections to assignment, etc.) because you did not attend class, you must accept the consequences of not having learned of the change.

Undergraduate: <http://web.uvic.ca/calendar/undergrad/info/regulations/attendance.html>

Graduate: <http://web.uvic.ca/calendar/grad/academic-regulations/attendance.html#>

Guidelines on Religious Observances Where classes or examinations are scheduled on the holy days of a religion, students may notify their instructors, at least two weeks in advance, of their intention to observe the holy day(s) by absenting themselves from classes or examinations. Instructors will provide reasonable opportunities for such students to make up work or missed examinations.

Academic Integrity Academic integrity is intellectual honesty and responsibility for academic work that you submit individual or group work. It involves commitment to the values of honesty, trust, and responsibility. It is expected that students will respect these ethical values in all activities related to learning, teaching, research, and service. Therefore, plagiarism and other acts against academic integrity are serious academic offenses.

The responsibility of the institution

Instructors and academic units have the responsibility to ensure that standards of academic honesty are met. By doing so, the institution recognizes students for their hard work and assures them that other students do not have an unfair advantage through cheating on essays, exams, and projects.

The responsibility of the student

Plagiarism sometimes occurs due to a misunderstanding regarding the rules of academic integrity, but it is the responsibility of the student to know them. If you are unsure about the standards for citations or for referencing your sources, ask your instructor. Depending on the severity of the case, penalties include a warning, a failing grade, a record on the students transcript, or a suspension.

It is your responsibility to understand the University's policy on academic integrity:

Undergraduate: <http://web.uvic.ca/calendar/undergrad/info/regulations/academic-integrity.html>

Graduate: <http://web.uvic.ca/calendar/grad/academic-regulations/academic-integrity.html>

Course Experience Survey

I value your feedback on this course. Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete an anonymous survey regarding your learning experience (CES). The survey is vital to providing feedback to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. When it is time for you to complete the survey you will receive an email inviting you to do so. You will need to use your UVic netlink ID to access the survey, which can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more detailed information nearer the time but please be thinking about this important activity during the course. The link for CES is: <http://www.ltc.uvic.ca/initiatives/CES.php>

How to Succeed in This Course

It is important to attend all classes, read the course material, and do the exercises/homework to succeed!