

# Course Outline

## STAT 460/560: Bayesian Statistics

### Instructor(s)

**Lecturer** Farouk S. Nathoo, Associate Professor

**Research Area** Biostatistics, Neuroimaging Statistics, Bayesian Methods, High-Dimensional Data

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**Office** David Turpin Building A545

### General Course Information

**Number of Units** 1.5

**Pre-requisites** MATH 352 or STAT 350

### Office Hours and Assistance

**Wednesday** 4:30 pm to 5:30 pm, CLE A307

**Thursday** 4:30 pm to 5:30 pm, CLE A307

**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

- Introduce students to the Bayesian paradigm with an emphasis on decision-theoretic foundations
- Introduce students to various approaches for Bayesian calculations

## Course Materials and Online Resources

**Textbook** Bayesian Choice 2<sup>nd</sup> edition by Robert. The textbook is available online through the UVic library and for purchase at the bookstore (hard copy).

**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

- Mondays, 11:30 am - 12:50 pm, Cornett Building B145
- Thursdays, 11:30 am - 12:50 pm, Cornett Building B145

## Specific Topics

- Introduction to the Bayesian paradigm, prior distributions and posterior distributions
- Decision-theoretic foundations
- From prior information to prior distributions, conjugate priors, non-informative priors
- Bayesian point estimation
- Bayesian hypothesis testing
- Bayesian calculations
- Bayesian model choice

## Evaluation and Grading

There will be a maximum of six homework assignments consisting of 4-5 problems that will be handed out every two weeks of so. There is also one midterm and one final exam. The assignments will have additional questions and readings for graduate students enrolled in STAT 560.

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

Homework Assignments	Midterm Exam	Final Exam
Bi-weekly	Thurs. Oct. 18	TBA
50%	20%	30%

**Missing work** If you miss the midterm for a valid documented medical reason then the final will count 50%. No makeup midterm will be provided. Assignments are due in class on

the date specified in class. Late assignments are not accepted without valid reason.

**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>

## How to Succeed in This Course

Work hard and put a lot of effort into the assignments. Come to office hours to discuss the problems.

