The University of Iowa
The College of Liberal Arts and Sciences
Fall, 2025

STAT 4540:001 Statistical Learning
1:30 p.m. – 2:20 p.m. Mondays, Wednesdays, and Fridays in 140 SH

Title of Course:	STAT 4540:001 Statistical Learning
Course meeting time and place:	1:30 p.m. – 2:20 p.m. MWF in 140 SH
Department of Statistics and Actuarial Science:	`https://stat.uiowa.edu`
Course ICON site:	`https://uiowa.instructure.com/courses/254187`
Course Home:	`https://clas.uiowa.edu`

Instructor: Sanvesh Srivastava

Office location: 219 SH
Student drop-in (office) hours: Mondays, Wednesdays, and Fridays 12:30 p.m. to 1:30 p.m. Students are invited to drop by during these hours to discuss questions about the course material or concerns. I am also available by appointment if you are unable to attend my drop-in hours.
Phone: 319-335-0824
E-mail: `sanvesh-srivastava@uiowa.edu`
DEO: Kung-Sik Chan, 241 SH, and `kung-sik-chan@uiowa.edu`)

Student Complaints

Students with a complaint about a grade or a related matter should first discuss the situation with the instructor and/or the course supervisor (if applicable), and finally with the DEO (Chair) of the department, school or program offering the course. Sometimes students will be referred to the department or program's Director of Undergraduate Studies (DUS) or Director of Graduate Studies (DGS).

Undergraduate students should contact CLAS Undergraduate Programs for support when the matter is not resolved at the previous level. Graduate students should contact the CLAS Graduate Affairs Manager when additional support is needed.

Course's College (Administrative Home)

The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the policies and procedures for its courses. Graduate students, however, must adhere to the academic deadlines set by the Graduate College.

Drop Deadline for this Course

You may drop an individual course before the drop deadline; after this deadline you will need collegiate approval. You can look up the drop deadline for this course here. When you drop a course, a "W" will appear on your transcript. The mark of "W" is a neutral mark that does not affect your GPA. To discuss how dropping (or staying in) a course might affect your academic goals, please contact your Academic Advisor. Directions for adding or dropping a course and other registration changes can be found on the Registrar's website. Graduate students should adhere to the academic deadlines and policies set by the Graduate College.

UI Email

Students are responsible for all official correspondences sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community. For the privacy and the protection of student records, UI faculty and staff can only correspond with UI email addresses.

Textbook and course materials

The required textbook for this course is:

- Title: *An Introduction to Statistical Learning, with applications in R*
- Authors: *G. James, D. Witten, T. Hastie, and R. Tibshirani*
- Publisher: *Springer*
- Edition: *Second*

The website accompanying the book is `https://www.statlearning.com/`. This website is an excellent resource for many materials that we will use throughout this course, including a pdf copy of the book.

The instructor will post announcements, homework problems, lecture notes, and other course information in ICON.

Course ICON Site

To access the course site, log into Iowa Courses Online (ICON) using your Hawk ID and password.

Exams

- A **midterm exam** will be held in class on **Wednesday, October 22, lasting 50 minutes**.
- A **final exam** will take place during the university-assigned final exam period. The exact date, time, and location will be announced once available.

Both exams are **closed-book**, but you may bring a handwritten **A4-sized cheat sheet** to each exam. You are allowed to reuse your cheat sheet from the midterm for the final exam; that is, you may bring **one sheet to the midterm** and **two sheets to the final**.

There are **no quizzes** in this course. The **final exam is cumulative**, covering material from the entire semester, with greater emphasis on content introduced after the midterm.

Lectures

Course lectures will primarily cover material from the textbook as outlined in the syllabus; however, the specific topics discussed may vary by class session. Additional examples and content not found in the textbook may also be presented.

Homework

Written assignments are an *essential* component of the course. Homework will be usually assigned every other week on Fridays and will be due two weeks later on Friday. Homework submission will be online. Any exceptions will be announced in class or in ICON. Your work must be legible and include your name at the top to receive credit. Due to time constraints, the grader may grade only some of the assigned questions, but you are responsible for understanding all questions.

All homeworks will contribute towards your final grade. Unless prior arrangements are made well in advance, for reasons judged to be acceptable by the instructor, late homework will receive a score no higher than 50% credit as solutions will be posted soon after the homework is due. The instructor is more than willing to provide homework help during office hours and/or to give hints/guidance by email at any time.

Attendance

Attendance at lectures and participation in discussions are expected. The instructor won't take attendance, but failure to attend class regularly will adversely affect your grade.

Grading System

Your grade will consist of homeworks (50%), one midterm (20%), and one final exam (30%). At the end of the semester, homework, midterm, and final grades are normalized within each category in order to calculate the final course grade. Scores on homeworks and exams will be entered into a gradebook on the course ICON site, which you can log into using your Hawk ID and password.

A plus-minus grading system will be used. Here is a *tentative grading scale:* A,A-: 88%–100%, B+,B,B-: 70%–88%, C+,C,C-: 60%–70%, D: 50%–60%, F:<50%. A+ will be given only in exceptional cases. The instructor reserves the right to change the grade distribution by 10% so that it suits the diversity of students in the class.

Course Learning Objectives

The course is an introduction to supervised and unsupervised statistical learning, with a focus on regression, classification, and clustering. Methods will be applied to real data using appropriate

software. Supervised learning topics include: linear and non-linear (e.g., logistic) regression; linear discriminant analysis; cross-validation, bootstrapping, model selection, and regularization methods (e.g., ridge and lasso); generalized additive and spline models; and support-vector machines. Unsupervised learning topics include: principal components and clustering.

The students will develop an understanding of various statistical learning methods and will learn the computational skills to apply these methods to real-world data sets, to pursue a career in applied statistics, and to pursue research in statistical sciences and other data sciences.

It is expected that students will read the book, work on problems as required to master the material, and spend time applying the statistical learning methods to real-world data sets. You are expected to put in 6-8 hours of work outside of class. A few of you will do well with less time than this, and a few of you will need more.

Pre-requisites

An introductory statistics course and a regression course. Prior exposure to programming and/or software, such as R or Python is recommended.

Office hours

The instructor *is available for in-person office hours* every Monday, Wednesday, and Friday from 12:30 p.m. to 1:30 p.m in SH 219.

The instructor *is available for office hours via Zoom*. A student is required to email the instructor about scheduling the meetings and give the instructor sufficient time to respond. *A student can also schedule the meeting before or after the lecture but not during the lecture*. If you are unable during these times, then you should email the instructor for an appointment and suggest a set of time slots that suit you. *You should email early enough so that the instructor has enough time to schedule a meeting.*

Tentative Course Schedule

Chapters	Week	HW (Assigned)	Deadlines
1-2	08/25 – 08/29	1	
2-3	09/01 – 09/05		HW 1
3	09/08 – 09/12	2	
3-4	09/15 – 09/19		HW 2
4	09/22 – 09/26	3	
4-5	09/29 – 10/03		HW 3
5-6	10/06 – 10/10	4	
6	10/13 – 10/17		HW 4
6	10/20 – 10/24		Midterm (Chapters 1–5)
7	10/27 – 10/31	5	
7	11/03 – 11/07		
12	11/10 – 11/14		HW 5
12	11/17 – 11/21	6	
Break	11/24 – 11/28		–
9	12/01 – 12/05		
9	12/08 – 12/12		HW 6
	12/15 – 12/19		Final Exam

Artificial Intelligence (AI) Policy

Students are encouraged to make thoughtful use of generative AI tools, such as GitHub Copilot or ChatGPT, to support their learning; however, any use of such tools must be clearly acknowledged and properly cited, in accordance with academic integrity guidelines. AI tools will not be available for use on exams.

Academic Honesty and Misconduct

All students in CLAS courses are expected to abide by the college's standards of academic honesty. Undergraduate academic misconduct must be reported by instructors to CLAS according to these procedures. Graduate academic misconduct must be reported to the Graduate College according to Section F of the Graduate College Manual.

See the CLAS Code of Academic Honesty for more information.

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook.

Accommodations for Students with Disabilities

The University of Iowa is committed to providing an educational experience that is accessible to all students. A student may request academic accommodations for a disability (which include but are not limited to mental health, attention, learning, vision, and physical or health-related conditions). A student seeking academic accommodations should first register with Student Disability Services and then meet with the course instructor privately in the instructor's office to make particular arrangements. Reasonable accommodations are established through an interactive process between the student, instructor, and SDS.

See `http://sds.studentlife.uiowa.edu/` for more information.

Absences from Class

University regulations require that students be allowed to make up examinations which have been missed due to illness, religious holy days, military service obligations, including service-related medical appointments, jury duty, or other unavoidable circumstances or other university-sponsored activities. Students should work with their instructors regarding making up other missed work, such as assignments, quizzes, and classroom attendance.

Absences for Religious Holy Days

The university is prepared to make reasonable accommodations for students whose religious holy days coincide with their classroom assignments, test schedules, and classroom attendance expectations. Students must notify their instructors in writing of any such religious holy day conflicts

or absences within the first few days of the semester or session, and no later than the third week of the semester. If the conflict or absence will occur within the first three weeks of the semester, the student should notify the instructor as soon as possible. See Policy Manual 8.2 Absences for Religious Holy Days for additional information.

Absences for Military Service Obligations

Students absent from class or class-related requirements due to U.S. veteran or U.S. military service obligations (including military service–related medical appointments, military orders, and National Guard Service obligations) shall be excused without any grading adjustment or other penalty. Instructors shall make reasonable accommodations to allow students to make up, without penalty, tests and assignments they missed because of veteran or military service obligations. Reasonable accommodations may include making up missed work following the service obligation; completing work in advance; completing an equivalent assignment; or waiver of the assignment without penalty. In all instances, students bear the responsibility to communicate with their instructors about such veteran or military service obligations, to meet course expectations and requirements.

Free Speech and Expression

The University of Iowa supports and upholds the First Amendment protection of freedom of speech and the principles of academic and artistic freedom. We are committed to open inquiry, vigorous debate, and creative expression inside and outside of the classroom. Visit the Free Speech at Iowa website for more information on the university's policies on free speech and academic freedom.

Non-discrimination Statement

The University of Iowa prohibits discrimination in employment, educational programs, and activities on the basis of race, creed, color, religion, national origin, age, sex, pregnancy (including childbirth and related conditions), disability, genetic information, status as a U.S. veteran, service in the U.S. military, sexual orientation, gender identity, or associational preferences. The university also affirms its commitment to providing equal opportunities and equal access to university facilities. For additional information on nondiscrimination policies, contact the Senior Director, Office of Civil Rights Compliance, the University of Iowa, 202 Jessup Hall, Iowa City, IA 52242-1316, 319-335-0705, ui-ocrc@uiowa.edu. Although not required, students have the option to share their pronouns and chosen/preferred names in class and through MyUI. Instructors and advisors can find information about a student's chosen/preferred name in MyUI.

Classroom Expectations

Students are expected to comply with University policies regarding appropriate classroom behavior as outlined in the Code of Student Life. While students have the right to express themselves and participate freely in class, it is expected that students will behave with the same level of courtesy and respect in the virtual class setting (whether asynchronous or synchronous) as they would in an in-person classroom. Failure to follow behavior expectations as outlined in the Code of Student Life may be addressed by the instructor and may also result in discipline under the Code of

Student Life policies governing E.5 Disruptive Behavior or E.6 Failure to Comply with University Directive.

For the UI policy regarding severe weather, see https://opsmanual.uiowa.edu/community-policies/extreme-weather-protocol.

For policies on sexual harassment and other items, see https://provost.uiowa.edu/student-course-policies.