

# Statistics 342 Syllabus

## Fall 2014

**Instructor:**

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**Course Web Page:** <http://www.public.iastate.edu/~vardeman/stat342/stat342.html>

**(Recommended Only) Texts:**

*Essentials of Statistical Inference* by Young and Smith  
*All of Statistics* by Wasserman  
*Mathematical Statistics with Applications* by Wackerly,  
Mendenhall, and Scheaffer

**Course Requirements:**

1. Class attendance and note-taking (there will be much material covered in class not found in the texts),
2. Three in-class hour exams (October 3, October 31, December 5),
3. One two-hour comprehensive final exam during finals week (9:45 AM Wednesday December 17), and
4. Regular homework typically due at the beginning of class on F (see below).

**Course Outcomes: By the end of the course you will**

1. understand and make simple applications of both classical and decision-theoretic approaches to modern probability-based prediction and parametric statistical inference problems (including Bayes analysis).
2. understand and apply some of the available methods (both analytical and simulation-based) for finding derived distributions in probability models (including simple ideas of limiting distributions, simulation for Bayesian posteriors, and bootstrap distributions).
3. apply some of the results in 2) to justify methods of elementary statistical inferences for means, standard deviations, and proportions.
4. understand and apply likelihood-based data reduction/feature selection and estimation results for parametric inference.
5. understand and apply statistical optimality theory for simple-versus-simple hypothesis testing and understand its relevance to modern machine learning and the "classification" problem.
6. understand and apply simple practical machine learning methods of classification.
7. understand and apply some of the theory of statistical linear models to inference in those models.
8. understand the relevance of the methods of 7) and other modern machine learning techniques to squared error loss prediction of a quantitative variable, and apply those methods.

## Homework Policy:

You may ask your instructor or TA for (limited) help with the assignments. And you may discuss the homework with fellow students. But each individual must **independently** write up his or her own assignments for turning in. **This is an integrity issue. Do not** copy what someone else has written and turn it in as your own. **Do not** use someone else's computing code. **You must use your own words, symbols, and code.** Each student will attach a cover sheet to his or her assignment with the following **written out, signed, and dated** in his or her own handwriting:

*I have neither given nor received unauthorized assistance on this assignment.*

**Grading System:** The following system will be used to determine course grades.

1. Examinations will be assigned +/- letter grades.
2. The best 4 out of 5 of the following grades will be averaged for each student:  
Exam 1, Exam 2, Exam 3, Final, Final
3. Homework performance will be taken into account in deciding how to round off the average grades from above.
  - a) The averages of students in the top 20% of the class on homework will be rounded up and 1/3 of a letter grade added (provided at least 66% of homework points have been earned). For example:

$$\left\{ \begin{array}{l} \text{Hour Exams C,B,B} \\ \text{Final Exam B-, (B-)} \end{array} \right\} \rightarrow \text{Average is B- /B}$$

$$\text{Course Grade is } B + \left( \frac{1}{3} \text{ of a letter grade} \right) = B +$$

- b) The averages of students not in the top 20% of the class on homework but with at least 66% of all possible homework points will be rounded up. For example:

$$\left\{ \begin{array}{l} \text{Hour Exams C,B,B} \\ \text{Final Exam B-, (B-)} \end{array} \right\} \rightarrow \text{Average is B- /B}$$

$$\text{Course Grade is } B$$

- c) The averages of students with 50%-66% of all homework points will be rounded down. For example:

$$\left\{ \begin{array}{l} \text{Hour Exams C,B,B} \\ \text{Final Exam B-, (B-)} \end{array} \right\} \rightarrow \text{Average is B- /B}$$

$$\text{Course Grade is } B -$$

- d) The averages of students with less than 50% of all homework points will be rounded down, and (at Prof. Vardeman's discretion) 1/3 of a letter grade may be subtracted in order to produce a course grade. For example, potentially:

$$\left\{ \begin{array}{l} \text{Hour Exams C,B,B} \\ \text{Final Exam B-, (B-)} \end{array} \right\} \rightarrow \text{Average is B- /B}$$

$$\text{Course Grade is } (B-) - \left( \frac{1}{3} \text{ of a letter grade} \right) = C +$$

**Academic Honesty:** Prof. Vardeman and his Departments expect that all students will be honest in their actions and communications. Individuals suspected of committing academic dishonesty will be reported to the Dean of Students Office per University policy. For more information regarding Academic Misconduct see <http://www.dso.iastate.edu/ja/academic/misconduct.html>

**Professionalism Statement:** Prof. Vardeman and his Departments expect that all students will behave in a professional manner during all interactions with fellow students, faculty, and staff. Treating others with respect and having constructive communications (including use of appropriate forms of address) are examples of being professional. Being prompt and considerate of your classmates and instructor in your coming and going are examples of being professional. Class is scheduled for 10:00-10:50. Prof. Vardeman will do his best to start and end promptly. Please do your part too. If you must (unavoidably) arrive late, please get in and into a seat with as little commotion as possible. If you are (unavoidably) going to have to leave early (even a couple minutes early), it is common courtesy to let your instructor know in advance, and then try to get out as unobtrusively as possible. A lecture (like a business meeting!) is *not* a salad bar where participants drift in and out as it suits them. We will practice civil/courteous/professional behavior in Stat 342.

**Texting** or surfing the Web or using electronic games or communication devices, reading newspapers, doing puzzles, and carrying on extra-curricular conversations during lectures are all examples of **unprofessional and completely unacceptable** classroom conduct. Prof. Vardeman WILL stop class, make a scene, and potentially ask you to leave if you engage in such behavior. PLEASE do not precipitate such unpleasantness by ignoring this expectation of civil/considerate behavior.

#### **Accommodation for Students with Disabilities:**

Iowa State University complies with the Americans with Disabilities Act and Sect 504 of the Rehabilitation Act. If you have a disability and anticipate needing accommodations in this course, please contact (instructor name) to set up a meeting within the first two weeks of the semester or as soon as you become aware of your need. Before meeting with (instructor name), you will need to obtain a SAAR form with recommendations for accommodations from the [Disability Resources Office](#), located in Room 1076 on the main floor of the Student Services Building. Their telephone number is 515-294-7220 or email [disabilityresources@iastate.edu](mailto:disabilityresources@iastate.edu) . Retroactive requests for accommodations will not be honored.

#### **Dead Week:**

This class follows the Iowa State University Dead Week guidelines as outlined in <http://catalog.iastate.edu/academiclife/#deadweek>

#### **Harassment and Discrimination:**

Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon race, ethnicity, sex (including sexual assault), pregnancy, color, religion, national origin, physical or mental disability, age, marital status, sexual orientation, gender identity, genetic information, or status as a U.S. veteran. Any student who has concerns about such behavior should contact his/her instructor, [Student Assistance](#) at 515-294-1020 or email [dso-sas@iastate.edu](mailto:dso-sas@iastate.edu), or the [Office of Equal Opportunity and Compliance](#) at 515-294-7612.

**Religious Accommodation:**

If an academic or work requirement conflicts with your religious practices and/or observances, you may request reasonable accommodations. Your request must be in writing, and your instructor or supervisor will review the request. You or your instructor may also seek assistance from the [Dean of Students Office](#) or the [Office of Equal Opportunity and Compliance](#).

**Contact Information:**

If you are experiencing, or have experienced, a problem with any of the above issues, email [academicissues@iastate.edu](mailto:academicissues@iastate.edu).