

## INSTRUCTOR DATA.

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## COURSE DATA.

Prerequisites: ST701 & ST702  
Textbook: None required (see website for recommendations)  
Software: We will occasionally use R (<http://cran.r-project.org>)  
Lectures: Tue & Thu 11:45am–1:00pm in SAS Hall 5270  
Office hours: see the course website  
URL: <https://wordpress-courses2223.wolfware.ncsu.edu/st-790-001-fall-2022/>

**COURSE OBJECTIVES.** Probability theory plays an important role in statistics, machine learning, and data science more generally, as the language commonly used to describe uncertainty. But probability theory can't satisfactorily describe all kinds of uncertainty, even the kinds we face in statistics applications. Fortunately, there is a well-developed theory of imprecise probability, a generalization of ordinary/precise probability that is sufficiently rich to accommodate the kinds uncertainty encountered in applications. Unfortunately, the important connection between imprecise probability and statistics/data science is (arguably) yet to be fully understood and appreciated. This course aims to help close this gap between imprecise probability and statistics in two ways:

- introduce the essentials of imprecise probability to a (mostly) statistical audience
- expose some of the opportunities for imprecise-probabilistic insights and techniques to positively impact statistics, machine learning, and data science.

**ASSESSMENTS.** There will be occasional homework assignments and a course project. Details about each will be provided on the course website in due time. Roughly, however, the project will consist of students (individually or in pairs) identifying a topic of interest related to the course material, read some relevant literature, reproduce key results, identify opportunities for future research, and write a summary; the instructor will be available to make suggestions and offer guidance. There will be no exams.

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<sup>1</sup>Title: *Imprecise-Probabilistic Foundations of Statistics & Data Science*

GRADES. Homework and “participation” is worth 50% and the course project is worth 50%. Grades will be assigned based on the rule:

$$\begin{aligned}A+ &\geq 96 > A \geq 93 > A- \geq 90 \\B+ &\geq 86 > B \geq 83 > B- \geq 80 \\C+ &\geq 76 > C \geq 73 > C- \geq 70 \\D+ &\geq 66 > D \geq 63 > D- \geq 60 > F.\end{aligned}$$

The instructor reserves the right to make adjustments to the overall grading policy, but the letter grade cutoffs will be no stricter than those advertised above.

#### MISCELLANY.

- Attendance is expected at all lectures.
- No late homework assignments will be accepted.
- Students may discuss homework with others. However, each student must submit his/her own write-up. *Copying someone else’s work—including on-line resources—and claiming it as your own is unacceptable and may result in disciplinary action.* The instructor is committed to upholding the university’s policy on academic integrity, as described in the Code of Student Conduct.<sup>2</sup>
- Reasonable accommodations will be made for students with verifiable disabilities. Students must register with Disability Services for Students<sup>34</sup> to set this up.
- Students are responsible for reading, understanding, and adhering to the university’s policies, regulations, and rules.<sup>5</sup>
- Pandemic-related items:
  - Students must adhere to the university’s guidelines on face coverings, social distancing, etc.<sup>6</sup>
  - The instructor reserves the right to modify the advertised course schedule, the plan for how instructional material is delivered, etc. if necessary.

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<sup>2</sup><http://policies.ncsu.edu/policy/pol-11-35-01>

<sup>3</sup>[http://www.ncsu.edu/provost/offices/affirm\\_action/dss/](http://www.ncsu.edu/provost/offices/affirm_action/dss/)

<sup>4</sup><https://policies.ncsu.edu/regulation/reg-02-20-01>

<sup>5</sup><https://policies.ncsu.edu>

<sup>6</sup><https://www.ncsu.edu/coronavirus/>