

**PST 1707: Quant IV: Mathematical Statistics**

**Fall 2017**

**General Course Information**

*Meeting Times and Locations***:** Wednesdays 2:30pm-5:30pm

 AAC 242

*Instructor Information:* Sam Woolford

 Morison 376/x2086/swoolford@bentley.edu

*Office Hours:* Mondays 2:00-3:30pm

 Wednesdays 6:00-7:30pm

 By appointment

*Blackboard Site:* PST 1707

*Required Textbook:* *Introduction to Mathematical Statistics, 7th ed.,* by R.V. Hogg, J.W. McKean and A.T. Craig, (2013) (published by Pearson)

*Course Materials:* Copies of all handouts and other course materials, data sets for homework problems and any announcements will be available on the PST 1706 BlackBoard site.

**Course Description and Objectives:**

The objective of this reading course is to ensure a solid foundation in the principles of probability and mathematical statistics, on a par with that received by beginning PhD/Mature MS candidates. The intent is to link the theory of statistics to applied methodology to better understand the theoretical underpinnings of applied methods. This course will provide a rigorous and traditional approach to the development of statistical methodology to better understand how mathematical statistics integrates with applied statistics. Attention will be given to the fact that our graduates are likely to be teaching this material if they should pursue an academic career. The intent

The course will involve studying chapters from the book by Hogg, McKean and Craig and presenting them to the class each week, thereby gaining focused teaching experience. Feedback of the style and techniques used to present the material will be a part of each class so that each presenter can apply the feedback to improve their teaching over the course of the semester. Presenters will assign selected problems on the material they present to the other students, develop grading rubrics and grade the assignments to ensure understanding of the material in each chapter.

The output for the course will consist of a portfolio of prepared presentations and homework problems demonstrating an understanding of the topics covered.

**Learning Objectives**

**Knowledge:** For each of the topics discussed, students should:

* Develop a basic understanding of the key topics of mathematical statistics.
* Understand the theoretical underpinnings of commonly used applied statistical methodologies.
* Be able to use the course material to understand the theoretical basis for applied statistical methodologies.

**Skills:** Students will be able to:

* Become comfortable with mathematical statistical terms and notation
* Be able to prepare and deliver lectures on mathematical statistical topics
	+ Be able to extract material and present in a personalized manner appropriate for the audience
	+ Prepare class examples
	+ Prepare and grade appropriate homework assignments

**Perspectives:** Students will develop:

* Mathematical statistical foundations as an intellectual framework for problem solving.
* Recognition of the theoretical underpinnings of applied statistical methodologies
* Be able to assess the theory behind new applied statistical methods

**Course Logistics and Evaluation**

Topics in the course will be assigned to each student who will be responsible for preparing and delivering a lecture(s) from the material in the book and leading the class discussion around the topic. For each topic, the student preparing the lecture will identify and assign 2-3 problems on the topic from the book which will be handed in the following week and graded by the student presenting the topic.

All students will read the material from the book on each topic prior to the lecture covering the topic.

The course grade will be determined from the following components:.

* Presentations 40%
* Assignments 40%
* Class participation 20%

**Academic integrity**

This class will be conducted in full accordance with Bentley’s policies about academic integrity and the Bentley Honor Code. These can be found at:

<http://www.bentley.edu/shandbook/integrity/>

<http://www.bentley.edu/shandbook/Integrity/The_Bentley_Honor_Code.cfm>

The written homework is meant to be an individual exercise. Students will, naturally and appropriately, talk about the problems (this is encouraged) but the final write up of a solution **must be a student’s own work in its entirety.** This includes all calculations. If two students submit homework problems that have identical and highly unlikely calculation errors, this is evidence that the students did not work the problems individually. **If you have a question about whether your level of collaboration is appropriate, ask Prof. Woolford!** **The exams, including any take home portions, differ from the homework in that all work, not just the final write up, should be done without any collaboration with any person other than Prof. Woolford. Students should not ask for help from other students and, if a student is asked, they should decline to help.** Establishing a solid ethical foundation is an important part of your Bentley education and will enhance the value of your degree.