**Biostatistics 2081**
**Mathematical Methods for Statistics**
**Fall 2018**

**Description**: This is a refresher course in Calculus and Linear Algebra for those students who need to supplement their mathematical skills prior to (or concurrently with) taking the Introductory Statistical Theory courses.

**Course Objective**: Course objectives include: reviews of differentiation and integration of functions of several variables, infinite series and sequences and the basics of Matrix Algebra. Emphasis will be placed on applications to probability and statistics.

**Course Advisor**:
Ada O. Youk, Ph.D.
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**Course Instructors**:
Tao Sun
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**Text Books**: The texts are not required as the course notes are the main source of information in this class.

Searle, S.R. 1982. Matrix Algebra Useful for Statistics, John Wiley and Sons.

Stewart, J. 1999. Calculus, 4th ed. Brookes/Cole.

**Time**:
Tuesdays and Thursdays
12:00-1:25 pm
A719 Crabtree Hall

**Prerequisite**: Math 0230 (Introductory Calculus)

**Grading**:

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|---|---|
| 40% | Midterm (Calculus) |
| 40% | Final (Matrix Algebra) |
| 20% | Homework |

**Grading Scale**:

| | |
|---|---|
| 98-100: | A+ |
| 90-97: | A |
| 89: | A- |
| 85-88: | B+ |
| 80-84: | B |
| 79: | B- |
| 70-78: | C |
| <70 | F |

**Office Hours**: Tuesday and Thursday from 1:15-1:30 in A719, will be used as HW Q/A sessions if necessary. Other times by appointment

**Academic Integrity**:

All students are expected to comply with the University of Pittsburgh's Policy on Academic Integrity. Any student suspected of violating the policy for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an examination, including dictionaries and programmable calculators.

See http://www.publichealth.pitt.edu/interior.php?pageID=287 for more info on the University of Pittsburgh's and GSPH's policies regarding academic integrity.

**Accommodation for Students with Disabilities**:

If you have any disability for which you may require accommodations, you are encouraged to notify both your instructor and the Office of Disability Resources and Services, 140 William Pitt Union (412-648-7890) during the first two weeks of the term (http://www.studentaffairs.pitt.edu/drswelcome).

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**PLEASE NOTE:** There will be no class on Tuesday October 9. This day will be used for Monday classes that are missed due to the Fall Break given on October 8.

Tentative Schedule of Lecture Topics

| | |
|---|---|
| Aug 28 | Limits & Continuity (MT) |
| Aug 30 | Derivatives & Integration (MT) |
| Sept 4 | Integration Continued (TS) |
| Sept 6 | Integration Continued (TS) (**HW 1 due**) |
| Sept 11 | Integration Continued (TS) |
| Sept 13 | Sequences & Infinite Series (TS) |
| Sept 18 | Sequences & Infinite Series (TS) (**HW 2 due**) |
| Sept 20 | Sequences & Infinite Series (TS) |
| Sept 25 | Functions of Several Variables (TS) |
| Sept 27 | Partial Derivatives (MT) |
| Oct 2 | Partial Derivatives (MT) (**HW 3 due**) |
| Oct 4 | Multiple Integration (MT) |
| Oct 9 | **No Class – Fall Break Make Up Classes** |
| Oct 11 | Multiple Integration (MT) (**HW 4 due**) |
| Oct 16 | Change of Variables (MT) |
| Oct 18 | Change of Variables (MT) |
| Oct 23 | MIDTERM EXAM (**HW 5 due**) |
| Oct 25 | Matrix Basics and Matrix Operations (TS) |
| Oct 30 | Special Matrices (MT) |
| Nov 1 | Systems of Linear Equations (MT) |
| Nov 6 | Systems of Linear Equations (MT) |
| Nov 8 | Determinants (TS) (**HW 6 due**) |
| Nov 13 | Linear Combinations of Vectors (TS) |
| Nov 15 | Linear Combinations of Vectors (TS) (**HW 7 due**) |
| Nov 20 | Vector Spaces (MT) |
| Nov 22 | **No Class - Thanksgiving Holiday** |
| Nov 27 | Partitioned Matrices, Generalized Inverses (TS) (**HW 8 due**) |
| Nov 29 | Eigenvalues and Eigenvectors (MT) |
| Dec 4 | Spectral decomposition, Quadratic forms (TS) (**HW 9 due**) |
| Dec 11 | FINAL EXAM (**HW 10 due**) |
| Dec 18 | Grades Posted |