JOHN JAY COLLEGE OF CRIMINAL JUSTICE
The City University of New York
524 West 59th Street, New York, NY, 10019

Syllabus for: MAT 301, Introduction to Applied Probability and Statistics
Professor's name: Nicholas Petraco
Laboratory: 5.64 New Building
Contact hours: Tuesdays and Thursdays 3:05pm-4:20pm (Honors Section 1) and Zoom
Tuesdays and Thursdays 4:30pm-5:45pm (Section 1) and Zoom

E-mail address: npetraco@gmail.com
Course website: https://npetraco.github.io/MAT301/

Course Description:

Physical and digital evidence comparison has been "put under the microscope" since the 2009 publication of the National Academy of Sciences report "Strengthening Forensic Science in the United Stated: A Path Forward". The implementation of more quantitative/data driven techniques and standard operating procedures is a foregone conclusion. Forensic scientists not familiar with statistical methods of data analysis will be at a severe disadvantage. The purpose of this hands-on course is to acquaint forensic science undergraduate students with statistical methods that are applicable to evidence they will encounter, as well as, issues and pitfalls to be aware of when applying these methods.

It is not adequate to simply learn the "theory" behind the methodology encountered in this course. It must be applied on real data of practical interest to the forensic science. As such this course will build expertise in the general scientific/statistical computing environment R (http://www.r-project.org/). The course assumes minimal knowledge of computers and statistical procedures. It is designed to build the student's skill set and confidence in both of these areas. Topics covered will include a basic data descriptive tools, graphing, probability theory, discrete/continuous distributions, estimation and hypothesis testing.

Course materials will be posed on the following website:
https://npetraco.github.io/MAT301/

Learning outcomes:

By the end of the course students will be able to:

1. Choose an appropriate probability or statistical model for a particular problem.
2. Know what conditions are typically required for the use of particular probability and statistical models and be able to assess whether those conditions are reasonably met.
3. Interpret calculated solutions of particular statistical models.
4. Make appropriate inferences using the chosen statistical models.

5. Use the R software system to handle datasets, display datasets graphically, and do probability computations, statistical analyses, and computer simulation.

Requirements / course policies

Unethical/unprofessional conduct which includes cheating will result in a failing grade and referral for additional action. *Attendance in lecture and exams is mandatory*. More than five unexcused absences from lecture will result in an automatic failing grade. Unexcused lateness or early departure will count as ½ an absence, up to 30 minutes. After 30 minutes you will be marked absent.

No make up exams will be given. Failure to take a scheduled examination without a valid and independently supported official documentation from a medical provider at least 48 hours in advance (unless the emergency is induced by god(s) of your choice, subsequent to the 48 hour cutoff, where in a valid and independently supported official documentation from a medical provider is still required) will result in a zero grade for that examination.

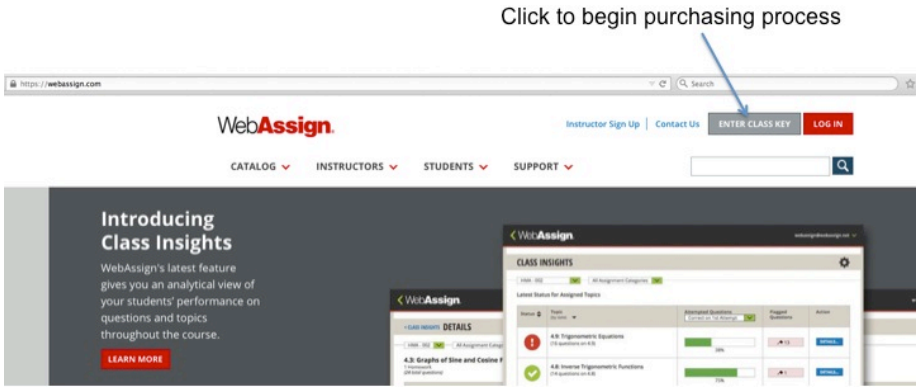
Required Electronic Text and Resources:

Probability and Statistics for Engineering and the Sciences - 8e
J. L. Devore

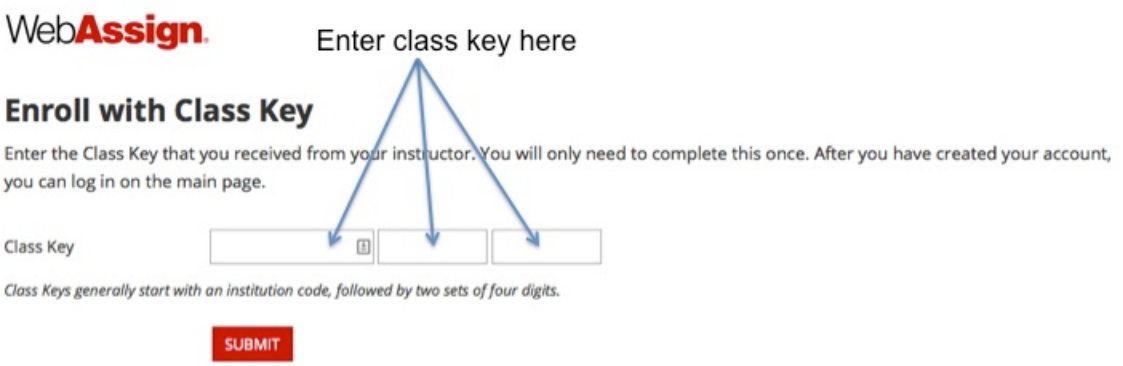
- The Assignments/Electronic Text can be purchased at:

  https://webassign.com/

- In order to purchase click on "Enter Class Key":



- You should see a place to enter the class key:

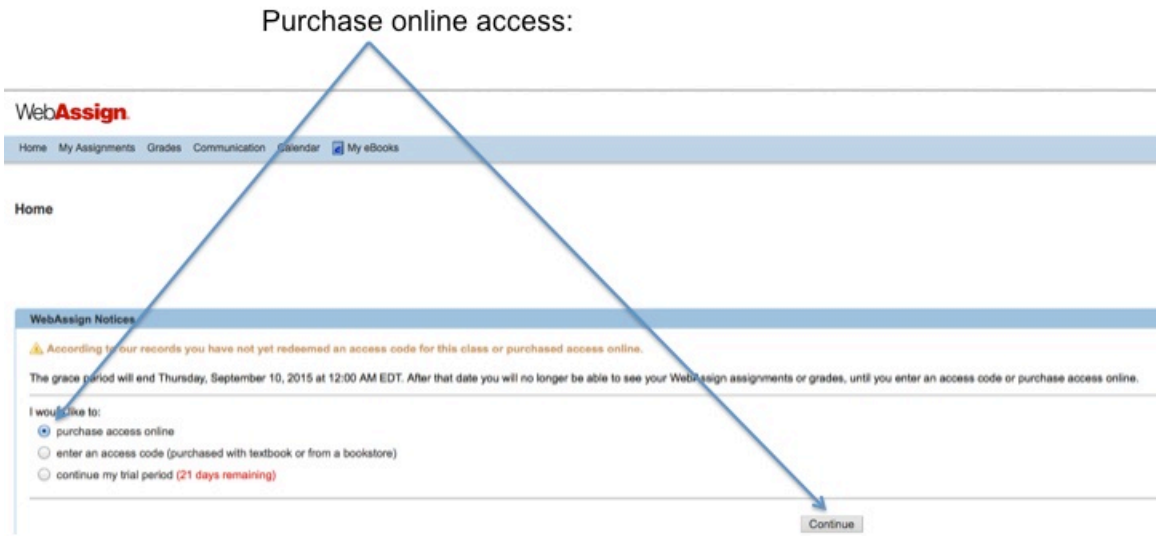


CAREFUL: NOTE YOUR SECTION!!!!!!!

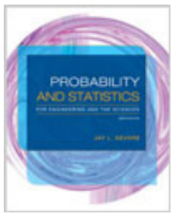
- Students Registered for **3:05pm-4:20pm** Petraco MAT 301H section 1:
  - Class Key: **jjay.cuny 7349 7080**

- Students Registered for **4:30pm-5:45pm** Petraco MAT 301 section 1:
  - Class Key: **jjay.cuny 3184 3345**

- After logging in/creating-account, eventually the website will prompt you to purchase the materials for the class:



- Purchase “Probability and Statistics for Engineering and the Sciences – 9/e by Devore”, which should be ~$90.00:



Probability and Statistics for Engineering and the Sciences - 9e
Devore
Published By Cengage Learning
2681 Questions Available
$90.00

Suggest supplementary text (NOT REQUIRED):
Statistics: An introduction using R, 2nd ed.
Crawley
ISBN-10: 1118941098

Grading:

The grades for this course are based on home works (25%), two exams (50%) and a final (25%).

Course lecture/laboratory calendar:

Lecture	Date	Topic
1	Jan 28	Introduction, Terminology, Basic Graphing
2	Jan 30	Introduction, To R
3	Feb 4	Summarizing Data, Probability
4	Feb 6	Discrete Distributions
	Feb 11	Discrete Distributions
5	Feb 13	Continuous Distributions
6	Feb 18	*R Exercises A
7	Feb 20	*R Exercises B
8	Feb 25	Sampling Distributions for Important Summary Statistics
	Feb 27	Sampling Distributions for Important Summary Statistics
9	Mar 3	Point Estimation
10	Mar 5	Point Estimation
11	Mar 10	Point Estimation
12	Mar 12	***No class Instructional Recess and Planning***
13	Mar 17	***No class Instructional Recess and Planning***
14	Mar 19	**Exam 1** 11am-8pm
15	Mar 24	Interval Estimation
16	Mar 26	Interval Estimation
17	Mar 31	***No class Recalibration Day***
18	Apr 2	Interval Estimation
19	Apr 7	Interval Estimation
20	Apr 9	Single Sample Hypothesis Tests
21	Apr 14	Single Sample Hypothesis Tests
22	Apr 16	Single Sample Hypothesis Tests
24	Apr 21	Two Sample Hypothesis Tests
	Apr 23	Two Sample Hypothesis Tests
25	Apr 28	One-Way Analysis of Variance
26	Apr 30	One-Way Analysis of Variance
27	May 5	One-Way Analysis of Variance
28	May 7	**Exam 2** 11am-8pm
29	May 12,14	Regression
	May 18	Review 12pm
Final!	**May 21**	**Final (Exam 3)** 11am-8pm **ALL SECTIONS**

College wide policies for undergraduate courses *(*see the *Undergraduate Bulletin*, Chapter IV Academic Standards, and CUNY Flexible Grading Policy for Spring 2020)

A. **Incomplete Grade Policy**

B. **Extra Work During the Semester**

C. **Americans with Disabilities Act (ADA) Policies**

"Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office of Accessibility Services (OAS). Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility from the OAS which is located at L66 in the new building (212-237-8031). It is the student's responsibility to initiate contact with the office and to follow the established procedures for having the accommodation notice sent to the instructor."

> Source: *Reasonable Accommodations: A Faculty Guide to Teaching College Students with Disabilities*, 4th ed., City University of New York, p.3. (http://www.jjay.cuny.edu/studentlife/Reasonable_Accommodations.pdf)

Statement of the College Policy on Plagiarism

Plagiarism is the presentation of someone else's ideas, words, or artistic, scientific, or technical work as one's own creation. Using the ideas or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations require citations to the original source.

Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism.

It is the student's responsibility to recognize the difference between statements that are common knowledge (which do not require documentation) and restatements of the ideas of others. Paraphrase, summary, and direct quotation are acceptable forms of restatement, as long as the source is cited.

Students who are unsure how and when to provide documentation are advised to consult with their instructors. The Library has free guides designed to help students with problems of documentation. *(John Jay College of Criminal Justice Undergraduate Bulletin,* http://www.jjay.cuny.edu/academics/654.php , see Chapter IV Academic Standards)