MET CS546B HA: Quantitative Methods for Information Systems

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Office Hours: By Appointment
Class Room: Ed Center, Room G

Blackboard Link: **onlinecampus.bu.edu**
Class Hours: Wednesdays, 6-8:45 pm

Course Description

The first part of this course lays down the mathematical foundation for the study of probability theory and statistics. It will cover functions, combinatorial mathematics, and differentiation and integration fundamentals. The second part of the course concentrates on the study of discrete and continuous distributions.

The following are some of the topics covered in this course:

- Elements of discrete mathematics (sets, one-to-one and onto functions, graphs of functions)
- Elements of calculus (limit of sequences, continuous functions, derivatives of functions, antiderivatives, and definite integrals)
- Elements of combinatorics (permutations and combinations)
- Elements of the probability theory and statistics (discrete and continuous distributions, binomial, Poisson, geometric, normal distributions, expectations and variances, Strong Law of Large Numbers, The Central Limit Theorem)

Required Materials

There are no required materials for this course, but there is a recommended text (not available through the BU Bookstore) for help with calculus: Bleau, B. L. (2001), *Forgotten calculus - 3rd Edition*, Hauppauge, NY: Barron's Educational Series (ISBN-13: 978-0764119989, ISBN-10: 0764119982). Class material will be distributed to you via the course Blackboard site.

Prerequisites/Corequisites

The only prerequisite for this course is college algebra.

Course Objectives

Upon successful completion of this course, you will be able to:

- Differentiate functions, take antiderivatives, and find areas under curves.
- Apply combinatorial methods to analyzing problems.
- Apply methods from the Probability Theory and Statistics to analyze events of random nature.

Course Structure

Class Structure

Each class meeting will be comprised of mostly lecture, with the possibility of group work. Please feel free to ask any and all questions you may have during the lectures.

Weekly Assignments

There will be weekly homework assignments for this course covering the material taught the previous week. The assignments will be posted on each class day (except the first and last classes) and will be due the following week in class.

Assessments

There will be two exams in this course, one midterm and one final exam, both during class. The midterm will be on all material covered through (and including) the previous week's lecture, and the final exam will be cumulative and cover everything in the course. The midterm will be during the second half of the class period on 3/4, and the final exam will be during the full class period on 5/6 (the exam will be designed to take two hours, but you will have the entirety of class time if you need it).

Weekly Discussions

There will be weekly online discussion prompts on the Blackboard site for this course. To receive full credit for each weekly discussion, you must at least do the following: make your own post on the topic of the week, and comment on one other student's post (as well as responding to any comments on your post).

Grading Policy

The BU grading scale will be used:

93-100	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
60-69	D
Below 60	F

Your course grade will be calculated in the following manner:

- **40%** of your grade will be determined by weekly homework assignments.
- **30%** of your grade will be determined by your final exam score.
- **20%** of your grade will be determined by your midterm exam score.
- **10%** of your grade will be determined by weekly discussions.

Course Policies

During Class

Please be respectful of the instructor and your classmates during the class time. Computers are allowed if you wish to take class notes on them or do activities relating to the class. Eating and drinking are allowed in class but please refrain from it affecting the course. We will take a 15-minute break halfway through the class period, around 7:15 pm each lecture.

Policies on Late Assignments

Late assignments will be accepted for no penalty if a valid excuse is communicated to the instructor before the deadline. After the deadline, no late assignments will be accepted unless there are extenuating circumstances. Since some of you may have TDYs during this course, you will be allowed extensions on assignments or makeup exams if necessary.

Academic Integrity and Honesty

Cheating and plagiarism will not be tolerated in any Metropolitan College course. They will result in no credit for the assignment or examination and may lead to disciplinary actions. Please take the time to review the Student Academic Conduct Code: **http://www.bu.edu/met/metropolitan_college_people/student/resources/conduct/code.html**. This should not be understood as a discouragement for discussing the material or your particular approach to a problem with other students in the class. On the contrary, you should share your thoughts, questions and solutions. Naturally, if you choose to work in a group, you will be expected to come up with more than one and highly original solutions rather than the same mistakes.

Course Schedule

The schedule is tentative and subject to change. Each exam will test on the material that was taught up until 1 week prior to the exam.

Week 01, 01/22: Functions and Limits

Week 02, 01/29: Differentiation, Maxima/Minima, and Graphs

- Homework 1 Due

Week 03, 02/05: Asymptotes, Inflection Points, Graphs cont.

- Homework 2 Due

Week 04, 02/12: Antiderivatives and Integration

- Homework 3 Due

Week 05, 02/19: Combinatorics

- Homework 4 Due

Week 06, 02/26: Intro to Probability and Events

- Homework 5 Due

Week 07, 03/04: **Midterm Exam** and Discrete Random Variables

- Homework 6 Due

Week 08, 03/11: **No Class**

- Spring Recess

Week 09, 03/18: Binomial Distribution and its approximation

- Homework 7 Due

Week 10, 03/25: Geometric Distribution, Expectation and Variance

- Homework 8 Due

Week 11, 04/01: Distribution Functions and their properties

- Homework 9 Due

Week 12, 04/08: Continuous Distributions/Distribution Functions

- Homework 10 Due

Week 13, 04/15: The Normal Distribution

- Homework 11 Due

Week 14, 04/22: No Class

- Monday Schedule

Week 15, 04/29: Final Exam Review

- Homework 12 Due

Week 16, 05/06: Final Exam