Course description: This class will cover the mathematics you need to succeed in Intermediate Macroeconomics, Intermediate Microeconomics, and upper level electives in Economics. We start with the basics: algebra, solving equations, and graphing. Other topics include differentiation, functions and financial mathematics. We will make extensive use of examples in Economics to solidify the concepts. These include equilibrium, marginal concepts, and elasticities as well as constrained and unconstrained optimization. Class meetings will consist of lectures as well as working together on sample problems.

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

1. Show fluency in the basic concepts, models and tools of microeconomics and macroeconomics.

2. Recognize the applicability of particular tools to particular problems in microeconomics and macroeconomics.

3. Recognize the multiple approaches – algebraic, graphic and intuitive – to understanding the solution to a problem in microeconomics and macroeconomics.

4. Work cooperatively with others to solve problems in microeconomics and macroeconomics.

Course prerequisites and sequencing: There are no prerequisites for this class. This course focuses on preparation for Intermediate Microeconomics, BC 3035. Therefore, you may not take this course if you have already taken BC 3035, or its equivalent. The material covered will be repetitive for you.

Class meetings: This class will meet Mondays and Wednesdays from 9:10-10:25 am.

Contact Information: My office is in Room 10, Lehman Hall and my phone number there is 854-3333. You can also reach me by e-mail at sh411@columbia.edu.

Courseworks: Homework assignments, important announcements, and other information will be posted throughout the semester on the courseworks page for this class (go to https://courseworks.columbia.edu/).

Office Hours: Monday 10:30 am-12:30 pm; Tuesday 1-3 pm.
**Textbook:** The required text for this class is: *Essential Mathematics for Economics and Business*, third edition, by Teresa Bradley. It is available at the Columbia University Book Store.

**Evaluation:** Your grade in this class will depend on your performance on: 1 midterm exam (35%), a non-cumulative final exam (35%), bi-weekly quizzes (20%), and class participation (10%). I will drop your lowest quiz grade. Quizzes and class participation are explained in more detail on the last page. The date of the midterm is Wednesday, October 26. The final exam will be on the date determined by the official schedule. There will be no make-up exams given. Please note that after I submit final grades, I will not respond to emails regarding them.

**Teaching assistant:** Your teaching assistant is Mariann Micsinai. Her email address is mmicsina@barnard.edu. She will hold weekly recitation sections and office hours. Times and places will be decided during the first week of class. She will also be responsible for grading your quizzes; and she will discuss her policies with you during the first week of recitation sections. Please email her, not me, with any issues regarding grading of quizzes.

**Honor code:** I value Barnard’s Honor Code for the integrity it fosters. All exams and assignments in this class are to be completed in accordance with the Barnard Honor Code. Columbia students commit themselves to the Honor Code upon registering for a Barnard course. The codes says, in part:

“We consider it dishonest to ask for, give, or receive help in examinations or quizzes, to use any papers or books not authorized by the instructor in examinations, or to present oral work or written work that is not entirely our own, unless otherwise approved by the instructor. We consider it dishonest to remove without authorization, alter, or deface library and other academic materials.”

**(Rough) Schedule of Topics to be Covered**

(Chapter numbers in (. ) )

(Check coursework intro page regularly for updates)

**WEEK 1:** Sept 7:

- Preliminaries (1)
  - Arithmetic operations and fractions
  - Solving equations
  - Working with percentages
WEEK 2: Sept 12, 14:

- Graphing Linear Equations (2)
  - The equation of the line
  - Graphs
  - Applications: supply and demand

- Simultaneous equations (3)
  - Two equations in two unknowns
  - Three equations in three unknowns
  - Applications: equilibrium and its implications

WEEK 3: Sept 19, 21:

- Non-linear equations (4)
  - Polynomial, exponential and logarithmic functions
  - Applications: demand and supply, growth

WEEK 4: Sept 26, 28:

- Differentiation (6)
  - Definition and rules

WEEK 5: Oct 3, 5

- Applications of Derivatives (6)
  - Marginal and average functions

WEEK 6: Oct 10, 12:

- Applications of Derivatives cont’d (6)
  - Optimization
  - Maximums and minimums: profits and costs
WEEK 7: Oct 17, 19:

- Applications of Derivatives cont’d (6)
  - Curvature and second derivatives: profits and costs

WEEK 8: Oct 24, 26:

- October 26: Midterm Exam
- Applications of Derivatives cont’d (6)
  - Derivatives of functions

WEEK 9: Oct 31, Nov 2:

- Applications of Derivatives cont’d (6)
  - More rules

WEEK 10: Nov 7, 9:

- November 7: Election Day Holiday
- Functions of several variables (7)
  - Partial derivatives

WEEK 11: Nov 14, 16:

- Functions of several variables cont’d (7)
  - Applications: marginal values, returns to scale

WEEK 12: Nov 21, 23:

- Functions of several variables cont’d (7)
  - Unconstrained optimization
    - Applications: profit and revenue

WEEK 13: Nov 28, 30:

- Functions of several variables cont’d (7)
  - Constrained optimization
    - Applications: utility, cost, budget constraint
    - Elasticities
WEEK 14: Dec 5, 7

- Financial Mathematics (5)
  - Arithmetic and geometric series
  - Simple and compound interest
  - APR

WEEK 15: Dec 12:

- Catch-up and Review

Quizzes:

Will be roughly every other Wednesday. Here is the tentative schedule, which is subject to change if necessary.

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<td>September 21</td>
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<td>October 5</td>
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<td>November 2</td>
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<td>December 7</td>
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Class participation:

Will be measured by the taking of attendance. A sign-in sheet will be passed around at about 1/3 of the class meetings.