

Quantitative Methods in Food and Resource Economics

Spring 2017

Period 7, Monday, Wednesday & Friday 1:55 pm – 2:45 pm

Classroom: Monday and Wednesday meet in NEB 202, Friday meet in CSE E231

Instructor and Contact Information

Lecturer: Misti Sharp
Office: 1193 McCarty Hall A
Office Hours: Monday and Wednesday:
10:30-12:30, and Tuesday, Thursday
and Friday by appointment
Email: mistisharp@ufl.edu (preferred)
Phone: 352-294-7633

Teaching Assistant: Zahra Tayebi
Office: 1171 McCarty Hall A
Office Hours: Friday from 3:00-3:50
And by appointment

Email: ztayebi@ufl.edu

Communication:

Changes in office hours, meeting locations and the syllabus will be announced on e-learning. Be sure that you receive those notifications in a timely manner (controlled in your e-learning settings). Appointments are not necessary during office hours. Groups of students are welcome.

Course Description:

Mathematical theory and concepts related to linear, non-linear and logarithmic functions, calculus, optimization and matrix algebra will be introduced. These mathematical tools will then be applied to common economic models such as market equilibrium and welfare, resource management, constrained optimization, etc.

Expected Student Learning Outcomes: After the successful completion of AEB 3510, a typical student should be able to:

- Demonstrate an understanding of basic mathematical concepts, including algebra, functions, differentiation, integration and multivariate calculus;
- Apply mathematical tools in a variety of economic decision making contexts;
- Conceptualize and solve economic problems using quantitative and analytical models and frameworks;
- Communicate the result of the application of mathematical tools in non-mathematical, professional terms;
- Have basic knowledge of how to develop mathematical models for economic problems using excel;
- Succeed in the senior-level coursework in the Food and Resource Economics Curriculum as they will have acquired the necessary mathematical background and foundations.

Prerequisites: MAC 2233 or MAC 2311 or the equivalent. It is further assumed that all students have had at least one economics course (either ECO 2013, ECO 2023 or the equivalent).

Required Course Materials:

- **E-learning:** There is an E-Learning Canvas webpage for this course. E-learning can be accessed via <http://elearning.ufl.edu> using your Gatorlink username and password. If you are having difficulties accessing E-learning, please contact the UF Computing Help Desk by calling (352)-392-HELP or via email helpdes@ufl.edu.
- **Text:** *Mathematical Methods for Business and Economics*, Schaum’s Outlines, by Edward T. Dowling. McGraw Hill/Irwin Publishers. 2009. ISBN: 0071635327.
- **REEF polling:** You can use i>clickers or REEF polling on your smart phone based on your own preferences and budget constraints. I>clickers cost about ~\$50, REEF is ~\$20 for a 6 month subscription.
- **Other:** This course combines mathematical concepts with practical application and as such, students are required to have a basic knowledge of rudimentary applications of both. If you feel like you do not have an adequate background in math or the use of excel, please use resources such as Kahn Academy (<https://www.khanacademy.org/>) or Lynda.com (available from <http://elearning.ufl.edu>) to supplement the classroom materials.

Resources for disabled students:

If you have a documented disability and wish to discuss academic accommodations, please contact me as soon as possible to set up the appropriate arrangements. Please do not wait until the day before an exam to request accommodations. Further information can be found at <http://www.dso.ufl.edu/drc/>.

Student counseling and support:

Several resources are available on campus for students (<http://www.umatter.ufl.edu/>)

Service	Location	Phone
Dean of students (http://www.dso.ufl.edu)	P202 Peabody Hall	392-1261
Counseling and wellness center (http://www.counseling.ufl.edu/cwc/)	2190 Radio Road	392-1575
Student health care center (http://shcc.ufl.edu)	Infirmery Building	392-1161
Career Resource Center (http://www.crc.ufl.edu)	1 st Floor, Reitz Union	392-1601
FRE Undergraduate Staff (http://fred.ifas.ufl.edu/undergrad/)	1170 McCarty A	294-7640

Academic Integrity: <https://www.dso.ufl.edu/sccr/honorcodes/conductcode.php>

This course will adhere to the Academic Integrity Honor Code of the University of Florida: *We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.* I expect all work that you do in the course to be your own. Violations of the Academic Honesty Guidelines will result in judicial action.

Expectations and feedback:

I expect students to attend every class having done the assigned readings and assignments so that you are prepared to contribute. It is also my expectation that you will be open-minded and considerate of the thoughts and ideas of all of your fellow classmates. Clickers will be used and in-class participation will count towards your final grade. I will do my best to conduct organized and insightful class sessions and to treat your intellectual work with fairness and impartiality.

It is your choice to succeed or not succeed in my class and “success” means different things to different students. From my perspective, successful students are those who 1) do the readings, 2) do the assignments including non-graded assignments, 3) attend class and participate in application Fridays, and 4) study for exams. If you begin to struggle, it is your responsibility to come see me to determine which of these four items you are struggling with and what steps should be taken on your part to ensure your success in the class.

Class Structure: My intention is to lecture on Monday and Wednesday and reserve Fridays for application. You are expected to read the textbook, work through study problems, and complete assignments PRIOR to Friday of each week.

Course Assignments:

Weekly assignments (best 10 of 12): Each week with the exception of exam weeks, there will be review problems and exercises related to the course material that will be due on Friday. These may be written or typed. These assignments must be uploaded into e-learning before the time they are due. Late submissions will receive a grade of 0.

Application projects: There will be 3 assignments that will require the use of excel to apply mathematical methods to economic problems. These should be typed and thorough. Late submissions will be penalized.

Midterm exams (best 2 out of 3): Each exam will include multiple choice, short answer and mathematical application questions related to assignments, readings and lectures. There will be no makeup exams offered. The lowest midterm exam will be dropped.

Final Exam: A cumulative final will be given on Thursday, April 27th at 12:30 in the regular classroom.

Composition of Final Score

Course Assignments	Total Points	% of Total Grade
Weekly assignments (best 10 of 12)	100 points (10 points each)	20%
Application project(s)	150 points (50 points each)	30%
Midterm exams (best 2 of 3)	150 (75 points each)	30%
Final Exam (comprehensive)	100 points	20%
Total	500 points	100%

Student Evaluation: Grades will be assigned as follows (note no minuses will be awarded)

Grade	Percentage	Total Points	Grade Points
A	90.0% or more	≥ 450	4.00
B+	86.0 – 89.9%	430 – 449	3.33
B	80.0 – 85.9%	400 – 429	3.00
C+	76.0 – 79.9%	380 – 399	2.33
C	70.0 – 75.9%	350 – 379	2.00
D+	66.0 – 69.9%	330 – 349	1.33
D	60.0 – 65.9%	300 – 329	1.00
E	≤ 59.9%	≤ 299	0.00

Your final letter grade will be posted on e-learning after the final exam. The professor has the right to change this point structure at any point so long as it improves the student’s final score.

Academic Performance:

Your grade on e-learning throughout the semester may not reflect your true performance in the course. You will earn points for correct assignments and exams throughout the semester and it is up to you to determine your progress in the course. It is my goal to teach students and not to “give grades” as I believe grades are earned. As such, consider the following guidelines when you have questions about your grade or class performance:

- If you have any questions about your score at any point, you may come to the professor during office hours to clarify the number of points you have and what points will be required to achieve your desired grade.
- Do NOT ask for clarification of your grade in class or after class. This type of discussion is reserved for office hours or email correspondence.
- Do NOT email me or come to office hours expecting to change your score on a given assignment unless an egregious error has been made in entering your grade into canvas (i.e. you failed to get credit for a completed assignment or an exam grade was entered incorrectly).
- Do NOT ask for additional points throughout the semester. It may be the case that bonus opportunities to gain additional points will be available; however, this is determined solely by the professor based on an assessment of the relevance of additional activities to course materials and learning objectives.

Course Topics:

This course is broken into 3 main sections: review of mathematical concepts, matrix algebra and calculus. The course is cumulative in that the material builds on each other. The first section of class will focus on describing an economic system with equations. The second section will discuss techniques used to solve a system of economic equations. Finally, calculus as a tool for solving economic problems will be introduced with the expectation that students can set up an economic system (part I) and solve that economic system using quantitative techniques (part II). If at any point you do not understand a section of the course, you must seek additional help from the instructor, teaching assistant or a tutor as mastery of the material at each section is required to move on to the next section.

Course Schedule:

Topic	Week	Dates	Lecture Material
Part I: Review of Mathematical Concepts			
Equations and Graphs	1	Jan 4, 6	Dowling: Ch. 2
Functions	2	Jan 9, 11, 13	Dowling: Ch. 3
System of Equations	3	Jan 18, 20	Dowling: Ch. 4
Equilibrium	4	Jan 23, 25*, 27	Catch-up
Part II: Matrix Algebra			
Elimination and Substitution	5	Jan 30, Feb 1, 3	Dowling: Ch. 4
Matrix Algebra	6	Feb 6, 8, 10	Dowling: Ch. 5
Solving Linear Equations	7	Feb 20, 22, 24	Dowling: Ch. 6
Economy-wide Modeling	8	Feb 27, Mar 1*, 3	Catch-up
Spring break	9	Mar 4-12	
Part III: Calculus			
Differential Calculus	10	Mar 13, 15, 17	Dowling: Ch. 9
Uses of the Derivative	11	Mar 20, 22, 23	Dowling: Ch. 10
Multivariate Calculus	12	Mar 27, 29, 31	Dowling: Ch. 13
Optimization	13	Apr 3, 5, 7	Dowling: Ch. 13
Constrained Optimization	14	Apr 10, 12, 14	Dowling: Ch. 13
Inequality Constraints	15	Apr 17*, 19	Catch-up
Final		Final exam April 27th, 12:30 – 2:30	

**Indicates a likely exam day*

Mrs. Sharp reserves the right to change the terms and dates stated in this course syllabus at any time. Any changes will be communicated in class, via the Gatorlink e-mail listserv, and posted on E-Learning. It is the student's responsibility to stay informed of any changes.