

## Quantitative Methods in FRE - Spring 2022

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Period 4, Monday, Wednesday & Friday 10:40 am – 11:30 am

Classroom: Psychology Building (PSY) 0130

### Instructor and Contact Information

Fei He, Food and Resource Economics.

Office: McCarty Hall B 1105

Office Hours: Mondays from 2:00 - 3:00 pm

Thursdays from 10:30 -11:30 am

or by appointment

Email: [he.fei@ufl.edu](mailto:he.fei@ufl.edu)

**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.

**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).

**Communication:** E-mail (either to my email address or via Canvas messaging) is the best way to reach me. Any issues that require action **MUST** be handled by email so that there is a written record of need. Phone calls and after class conversations are not likely to result in action.

Class cancellations, 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.

**Undergraduate Coordinator:** Dr. Misti Sharp 1189 McCarty Hall A; (352)-294-7632

E-mail: [mistisharp@ufl.edu](mailto:mistisharp@ufl.edu)

**Undergraduate Advisor:** Ms. Danielle Shu; 1170B McCarty Hall A; (352)-294-7640

Email: [dshu@ufl.edu](mailto:dshu@ufl.edu)

Office Hours: daily – 9:am -12:30pm and 1:30pm - 4:30pm

**FRE Technology Assistance:** Dave Depatie; 1197 McCarty Hall A; (352) 394-7641

E-mail: [ddepatie@ufl.edu](mailto:ddepatie@ufl.edu)

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

- Specify 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.

**Course Topics:** This course includes two main sections: linear algebra and calculus. The course is cumulative in that the material builds on each other. While students are expected to have seen most material introduced in this course in previous courses, this course focuses on mastery of quantitative concepts and applications of quantitative concepts to the study of business and economic models. If at any point you do not understand the material, 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.

**Required Course Materials:**

- **Text:** *Mathematical Methods for Business and Economics*, Schaum's Outlines, by Edward T. Dowling. McGraw Hill/Irwin Publishers. 2009. ISBN: 0071635327.
- **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](mailto:helpdes@ufl.edu).
- **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.

**Class Structure:** This is a traditional lecture class. All material will be posted on e-learning so as to provide equal access to all students but the only way to be sure you have all material and information is to attend class daily.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

**Course Assignments:**

*Individual Readiness Assurance Test (IRAT) (best 8 of 10):* This IRAT will include 5 multiple choice questions and should take students between 5 - 10 minutes to complete. You must be on time as extra time will not be given to students who are tardy. Each IRAT will be weighted equally, although some RATs will contain more content and difficulty varies significantly from subject to subject. The tested material will build on itself although the IRATs will not be *explicitly* cumulative. If you miss an IRAT for an excused absence, you may make up the IRAT in office hours. It is in your best interest to do all IRATs as it affects your performance AND group dynamics.

*Team Readiness Assurance Test (TRAT) (best 8 of 10):* These will be the same assessment as the IRAT but they will be completed/discussed as a group. You will be scored based on the group performance on the TRAT. If you do not show up for class, you will receive a zero on your TRAT for that day. If you have an excused absence, your IRAT score will count as your TRAT score.

*4S Problem Solving Activity (best 8 of 10):* In addition to the TRAT there will be a 4S Problem Solving prompt to be completed as a group. This is meant to be an opportunity to apply what you have learned in the module to a real-world significant problem with each team coming to and defending a specific choice under simultaneous report. The grade you receive on this will be based on the quality of your team’s contribution to the discussion

*Application projects (3):* There will be three assignments that will require the use of excel to apply mathematical methods to economic problems. These should be typed and thorough. These are individual assignments and you must submit both your excel and word document online for full credit. Late submissions will be penalized 10 points per day late.

*Exams (3):* Each exam will include multiple choice and long-answer questions related to assignments, readings and lectures.

**Composition of Final Score**

<b>Course Assignments</b>	<b>Total Points</b>	<b>% of Total Grade</b>
IRATs (best 8)	40 points (5 points each)	6.67%
TRATs (best 8)	40 points (5 points each)	6.67%
Problem solving (best 8)	40 points (5 points each)	6.67%
Application projects (3)	180 points (60 points each)	30%
Exams (3)	300 points (100 points each)	50%
<b>Total</b>	<b>600 points</b>	<b>100%</b>

**Student Evaluation:** Grades will be assigned as follows

Grade	Percentage	Total points	Grade Points
A	93% or more	≥ 558	4.00
A-	90.0 – 92.9%	540 - 557	3.67
B+	86.0 – 89.9%	516 - 539	3.33
B	83.0 – 85.9%	498 - 515	3.00
B-	80.0 – 82.9%	480 - 497	2.67
C+	76.0 – 79.9%	456 - 479	2.33
C	73.0 – 75.9%	438 - 455	2.00
C-	70.0 – 72.9%	420 - 437	1.67
D+	66.0 – 69.9%	396 - 419	1.33
D	63.0 – 65.9%	378 - 398	1.00
D-	60.0 – 62.9%	360 - 377	0.67
E	59.9% or less	≤ 359	0.00

***\*\*Please note that grades are not ‘rounded’ or ‘adjusted’ at the end of the term. The professor has the right to change this point structure at any point so long as it improves the student’s final score.***

**Grades and Grade Points:** For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

**Academic Honesty:** As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.”* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."* It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <https://sccr.dso.ufl.edu/process/student-conduct-code/>

**Examples of cheating:** copying the quiz of a peer, copying and pasting from a source without quotations and source attribution, paying someone else to do your quiz/project/exam, dividing work amongst you and your peers and then all submitting the same document, giving or receiving material from peers...

**Attendance and Make-Up Work:** Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>. In general, you are expected to be in class each day and submit all work on time on e-Learning.

### **Academic Performance:**

Your grade on e-learning throughout the semester may not reflect your true performance in the course. You will have regular assignments that may require quick turnaround in this class and it is crucial that you do not “check-out” at any point in the semester. If you fall behind, you **MUST** communicate with me when you realize this is happening. Do **NOT** wait until the end of the semester as there is nothing I can do to help at that point. 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 scheduled meetings. Please note that I cannot communicate grade information over email. All grades are posted in e-learning in a timely fashion; please let the instructor know if this is not the case.
- 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.

### **Students Requiring Accommodations**

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the [Disability Resource Center](#). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

### **Course Evaluation**

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students are notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

### **In-Class Recording**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled.

The only allowable purposes are: (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

### **University Honesty Policy**

UF students are bound by The Honor Pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. [Click here to read the Conduct Code.](#) If you have any questions or concerns, please consult with the instructor or TAs in this class.

### **Software Use**

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

### **Student Privacy**

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the [Notification to Students of FERPA Rights](#).

### **Campus Resources:**

#### **Health and Wellness**

*U Matter, We Care:* If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

*Counseling and Wellness Center:* [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

*Student Health Care Center:* Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).

*University Police Department:* [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

*UF Health Shands Emergency Room / Trauma Center:* For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

#### **Academic Resources**

*E-learning technical support:* Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

*Career Connections Center:* Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

*Library Support:* Various ways to receive assistance with respect to using the libraries or finding resources.

*Teaching Center:* Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

*Writing Studio:* 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

*Student Complaints On-Campus:* [Visit the Student Honor Code and Student Conduct Code webpage for more information](#).

*On-Line Students Complaints:* [View the Distance Learning Student Complaint Process](#).

**Lauren's Promise: I will listen and believe you if someone is threatening you.**

Lauren McCluskey, a 21-year old honors student athlete, was murdered on October 22, 2018, by a man she briefly dated on the University of Utah Campus. We must all take actions to ensure this never happens again. Any form of sexual harassment or violence will not be excused or tolerated at the University of Florida.

If you are experiencing sexual assault, relationship violence, or stalking, you can take the following actions:

- If you are in immediate danger, call 911.
- Report it to me, and I will connect you to resources.
- Seek confidential sources of support and help:
  - [UFPD Office of Victim Services](#): 51 Museum Road, 352-392-5648
  - [Sexual Assault Recovery Services \(SARS\)](#): Infirmary Building, 352-392-1161
  - Alachua County Rape Crisis Center (confidential): 352-264-6760

**Diversity, Equity, and Inclusion:** The University of Florida's College of Agricultural and Life Sciences (CALs) supports the University of Florida's commitment to diversity, equity, and inclusion. By fostering a sense of belonging for students, staff, and faculty, while leveraging the uniqueness of the people who study and work at the university, we believe our campus community is enriched and enhanced by diversity, including but not limited to, race, ethnicity, national origin, gender, gender identity, sexuality, class, and religion. This course will support an understanding of the diversity of our distance and campus communities as well as our agricultural and natural resource communities, locally and globally.

This course will strive to create a learning environment for students that supports a diversity of thoughts, perspectives, and experiences while honoring your identities. In this class we will take the following approaches to help achieve this:

- All course participants will use the names and pronouns provided by students for use in class. If these differ from those that appear in official university records, you can [change your Display Name at One.UF](#).
- If your performance in this course is being impacted by your experiences inside and/or outside the classroom, do not hesitate to contact the instructor and/or teaching assistant (TA). Instructors in CALs are a great resource for you and you may provide feedback anonymously. Feedback may result in general announcements to the class, if necessary, or reporting to appropriate UF personnel to address your concerns.
- CALs instructors and TAs like many people, are still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that makes you feel uncomfortable, please discuss with your instructor or TA or contact the CALs Dean's Office ([cals-dean@ufl.edu](mailto:cals-dean@ufl.edu)).

Course Syllabus: AEB 3510

**Course Schedule:**

*Weekly Schedule*

Week	Chapter	Topic	Assignments
1	2	Equations and Graphs	
2	3	Functions	
3	4	System of Equations	
4	5	Matrix Algebra	
5	6	Solving Linear Equations	
6	2-6	Exam 1 review	Exam 1
7	Handout	Economy-wide Modeling & Application Project1	
8	7	Linear Programming	
9	9	Differential Calculus	Project 1
10		Spring Break	
11	10	Differential Calculus	
12	7,9,10	Exam 2 review	Exam 2
13	11	Exponential and Logarithmic Function & Application Project 2	
14	13	Calculus of Multivariable functions	Project 2
15	13	Calculus of Multivariable functions	
16	11, 13	Exam 3 review & Application Project 3	Project 3
		Exam 3: 4/28/2022 @ 3 PM - 5 PM	Exam 3
**These schedules are entirely preliminary and are subject to change!!**			

*Note: The instructor 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.*

**\*\*\*By enrolling in this course, you are agreeing to the terms outlined in this syllabus!!\*\*\***

## Course Syllabus: AEB 3510

### *Daily Schedule*

Date	Week	Topic	Assignments
1/5/22	1	Syllabus and Introductions	
1/7/22	1	Ch 2, part 1	
1/10/22	2	Ch 2, part 2	
1/12/22	2	Ch 3, part 1	
1/14/22	2	TBL session	RAT 1, PS 1
1/17/22	3	MLK Day	
1/19/22	3	Ch 4, part 1	
1/21/22	3	Ch 4, part 2	
1/24/22	4	TBL session	RAT 2, PS 2
1/26/22	4	Ch 5, part 1	
1/28/22	4	Ch 5, part 2	
1/31/22	5	TBL session	RAT 3, PS 3
2/2/22	5	Ch 6, part 1	
2/4/22	5	Ch 6, part 2	
2/7/22	6	TBL session	RAT 4, PS 4
2/9/22	6	Review for Exam 1	
2/11/22	6	Exam 1	Exam 1
2/14/22	7	Economic – wide modeling	
2/16/22	7	Project 1	
2/18/22	7	Ch 7, part 1	Project 1
2/21/22	8	Ch 7, part 2	
2/23/22	8	TBL session	RAT 5, PS 5
2/25/22	8	Ch 9, part 1	
2/28/22	9	Ch 9, part 2	
3/2/22	9	TBL session	RAT 6, PS 6
3/4/22	9	Ch 10, part 1	
3/7/22	10	Spring break	
3/9/22	10	Spring break	
3/11/22	10	Spring break	
3/14/22	11	Ch 10, part 2	
3/16/22	11	TBL session	RAT 7, PS 7
3/18/22	11	Review for Exam 2	
3/21/22	12	Exam 2	Exam 2
3/23/22	12	Ch 11	
3/25/22	12	Project 2	
3/28/22	13	Ch 13, part 1	Project 2
3/30/22	13	Ch 13, part 2	
4/1/22	13	TBL session	RAT 8, PS 8
4/4/22	14	Ch 13, part 3	
4/6/22	14	Ch 13, part 4	
4/8/22	14	TBL session	RAT 9, PS 9
4/11/22	15	Ch 13, part 5	
4/13/22	15	Ch 13, part 6	
4/15/22	15	TBL session	RAT 10, PS 10
4/18/22	16	Project 3	
4/20/22	16	Review for Exam 3	Project 3
4/28/22		Final exam: 3 pm – 5 pm	Exam 3