University of Florida - College of Agricultural and Life Sciences
Food and Resource Economics

AEB3510 Quantitative Methods in Food and Resource Economics
Fall 2020
3 Credit Hours – Online Format

Professor Information

Instructor:	Luis Moisés Peña Lévano, Ph.D.
Communication:	Canvas Email (*Luis Pena-Levano*)
Laboratory Review:	4:30 – 5:45 pm
	Days: *Sept. 14 & 23, Oct. 7 & 21, Nov. 8 & 23*
Office hours:	*Online* - Day of Lab. Review (4 – 4:30 pm) only by appointment.

Teaching Assistant:	Mr. Julio Cruz
TA Office Hours:	MW 4 pm – 5pm. **Zoom meeting:** https://ufl.zoom.us/j/3713380025

Course Description: AEB3510 is intended to develop the student's understanding of finite mathematical tools used in economics and business decision-making. Topics include linear equations, matrix algebra, linear programming and calculus. Lectures and problems will show how these are used to examine economic, financial and managerial problems. AEB3510 is an applied mathematics course. Up to this point, most mathematics courses you have taken have focused on computational mathematics. This course, however, will emphasize mathematical reasoning and methodology applied in economic problems.

Prerequisites: MAC2233 or MAC2311 (or the equivalent). AEB3510 is taught with the assumption that all students are comfortable with quantitative reasoning, analytical methods, derivatives, graphs, and algebra. It is further assumed that all students have had at least one economics course (i.e., either ECO2013, ECO2023, AEB3103 or the equivalent).

Software: This class requires the use of **Microsoft Excel**. It is expected familiarity with the basic commands.

Objectives: After the successful completion of this course, students should
1. Be able to use calculus and algebra in economic optimization
2. Understand the mathematical principles required to maximize consumers satisfaction
3. Be able to analyze the impact of changes of external variables in an optimization problem
4. Be able to use linear programming to optimize firms' goals
5. Have a strong foundation necessary to succeed in the FRE major

Required Textbooks: You will need a copy of these two books
- *Mathematical Methods for Business and Economics*, Schaum's Outlines, by Edward T. Dowling. McGraw Hill/Irwin Publishers. 1993. ISBN: 0-07-017697-3.
- *Schaum's Outlines of Introduction to Mathematical Economics*, by Edward T. Dowling. 3rd Edition. McGraw-Hill Publishers. 2012. ISBN: 978-0-07-161015-5

Recommended Textbooks: These three books are strongly recommended and provide deeper understanding of theory:
- *University Calculus, Early Transcendental*, by Hass, Heil, Bockagi, Weir, Thomas. Pearson. 2020.
- *Vector Calculus*, by Marsden and Tromba. 6th Edition. M. 2012. ISBN: 978-1-4292-1508-4
- *Fundamental Methods of Mathematical Economics*, by Chiang and Wainwright. McGraw Hill/Irwin Publishers. 2005.

Grading system: is *online* through Canvas which is mostly graded through an automatic/systematic Canvas process. Thus, the purpose of the professor and TA in this class is to **instruct you**, not to directly grade you. Thus, you are entirely your responsible of submitting your assignments on time.

Communication: must be only via Canvas email during business hours (*Monday to Friday from 9 am to 4:30 pm*). Emails must be concise and clearly state your concerns including *AEB3510* in the title, always **with copy to the TA of the course** (**Mr. Julio Cruz**). If you are stuck on a procedure, please send the picture of the problem and where you are specifically having the issue. This will help to answer efficiently any doubts. If you do not show effort, we will not provide hints in how to solve it – **Courteous and professional** e-mails may expect a prompt reply. Emails outside business hours will be answered the next business day.

The professors reserve the right to change the terms and dates stated in this Syllabus. Any changes will be communicated on E-Learning Canvas. It is solely the student's responsibility to stay informed and review the announcements.

General Course Information

Brief Course Outline: The material in AEB3510 is divided in twelve chapters

Unit	Material/Notes	Recommended Reading before Class
1	System of Equations	**MMBE CH2,4**, IME CH2, Chiang CH3
2	Functions	**MMBE CH1,3,11**, IME CH1, 7-8, Hass CH1, Chiang CH2, 10
3	Matrix Algebra	**MMBE CH5-6**, IME CH10-12, Marsden CH1, Chiang CH4-5
4	Foundation of derivatives	**MMBE CH9,11**, IME CH3, 9, Hass CH2-3, Marsden CH2, Chiang CH6-7
5	Derivative applications	**MMBE CH10**, IME CH4, Hass CH4, Marsden CH2, Chiang CH9
6	Partial derivatives	**MMBE CH13**, IME CH5-6, Hass CH13, Marsden CH2, Chiang CH11
7	Constrained optimization	**MMBE CH13**, IME CH5-6, Hass CH13, Marsden CH3, Chiang CH12
8	Sequences and series	Hass CH9, Marsden CH3
9	Linear Programming (LP)	**MMBE CH8**
10	LP Modeling and Sensitivity Analysis	**MMBE CH9**
11	Integral Calculus	**MMBE CH12-13**, IME CH14-15, Hass CH5-8, Chiang CH13
12	Special matrices	**MMBE CH2** , IME CH12, Marsden CH2, Chiang CH7

<u>Code References</u>:
- **IME:** *Mathematical Methods for Business and Economics*, Schaum's Outlines, by Edward T. Dowling. McGraw Hill/Irwin Publishers. 1993. ISBN: 0-07-017697-3.
- **MMBE:** *Schaum's Outlines of Introduction to Mathematical Economics*, by Edward T. Dowling. 3rd Edition. McGraw-Hill Publishers. 2012. ISBN: 978-0-07-161015-5
- **HASS:** *University Calculus, Early Transcendental*, by Hass, Heil, Bockagi, Weir, Thomas. Pearson. 2020.
- **MARSDEN:** *Vector Calculus*, by Marsden and Tromba. 6th Edition. M. 2012. ISBN: 978-1-4292-1508-4
- **CHIANG:** *Fundamental Methods of Mathematical Economics*, by Chiang and Wainwright. McGraw Hill/Irwin Publishers. 2005.

Assignments distribution and calendar

Tasks of this course are described below, including their respective deadlines

Unit	Description	Pre-lab	Quiz	Homework
1	System of equations	Sep 3 [R]	Sep 8 [T]	Sep 14 [M]
2	Functions			
3	Matrix Algebra	Sep 10 [R]	Sep 15 [T]	
3.A	*Input Output table*		Sep 22 [T]	Sep 21 [M]
4	Foundation of Derivatives	Sep 17 [R]		
	EXAM MIDTERM 1		**Sep 24 [R]**	
5	Derivative applications	Sep 29 [T]	Oct 8 [R]	Oct 9 [F]
6	Partial Derivatives	Oct 6 [T]		
7	Constrained Optimization	Oct 13 [T]	Oct 22 [R]	Oct 23 [F]
8	Sequences and series	Oct 20 [T]		
	EXAM MIDTERM 2		**Oct 27 [T]**	
9	Linear Programming	Nov 3 [T]	Nov 12 [R]	Nov 13 [F]
10	LP model and sensivitity analysis	Nov 10 [T]		
10.B	Linear Programming Application			
11	Integral Calculus	Nov 19 [R]	Nov 24 [T]	Nov 30 [M]
	EXAM MIDTERM 3		**Dec 3 [R]**	
12	Special Matrices	Dec 7 [M]	Dec 8 [T]	
	FINAL PRACTICE		**Dec 14 [M]**	
*	Syllabus	Sep 8 [T]		

Modification may occur due to unexpected weather events, and to help flexibility on the schedule

Evaluation of Performance and Grading

Grades: Based on **1000** points throughout the semester. Final scores are **not** '*rounded*' or '*adjusted*' at the end of the term. You have **2 business days** after any grade has been posted for reevaluation, afterwards is final. The scores are composed by:

DESCRIPTION	AMOUNT	VALUE	TOTAL
Prelabs	10	15	150
Quiz	7	25	175
Homework	6	50	300
Midterms	3	100	300
Final Practice	1	75	75
TOTAL			1000

1. **Pre-lab Activities:** are based on the video lectures and book in order to motivate review the online material thoroughly. It is your task to follow step by step and use your own words and understanding to present the material. **Copy and paste from the video/book is not permitted**. Students are required to show the reasoning on the topics. Pre-lab assignments are expected to be submitted by **11:59 pm of the due date**. *After* that time, the points earned is **zero [0] points**.

2. **Quizzes:** There are seven short open-book quiz through Canvas, due generally at 11:59 pm. The syllabus also contains a quiz which is the first Friday of the class.

3. **Assignments:** are also due Fridays at 11:59 pm. Solutions must be meticulously and clearly written. Solutions are posted the next day. Late homework submissions are **no accepted** and there are **no make-up opportunities** given. For benefit of the class, questions regarding assignments must be posted through the **Discussion Board** during business hours. Please read the instructions carefully for each homework. You may talk to your colleagues, **COPYING EVEN PARTIAL PORTIONS OF ASSIGNMENTS FROM COLLEAGUES INVALIDATE YOUR WORK AND YOUR COLLEAGUE'S WORK.**

4. **Midterms:** There are three midterms (set the date shown in the outline). Each midterm is worthy 100 points. The time to take the exam is the day at **6:00 pm** signing through *Honorlock*. You are allowed one A4-cheat sheet that must be posted the day before the exam at 11:59 pm to be approved by your instructor and/or TA, failing to upload it on time will automatically make you lose the privilege of having a cheat sheet. **Scientific calculators are not allowed** in midterms, but you may use a basic calculator and Excel for computations. You may also use three empty scratch papers per exam, you must show through Honorlock that they are empty before starting your exam and destroy them afterwards. You must also delete any record or Excel file you used to compute any procedure showing this through Honorlock. The professor and/or TA of the class will review that this procedure is strictly followed. *Failing to destroy the scratch paper or sharing or receiving information from the exam is a violation of the UF Honor Code, invalidating your midterm and automatically assigns a zero.* So please keep confidential all questions of the exams and follow the guidelines. **There are no makeup midterms.** Please plan accordingly.

Final Grade	Minimum Score
A	925
A-	890
B+	865
B	830
B-	800
C+	770
C	730
C-	700
D+	670
D	630
D-	600
E	0

5. **Final practice:** A **comprehensive** Final Practice is given on **December 14th** which acts a final assessment and covers all units of this class.

6. **Bonus Points and make-up opportunities:**
    Individually
    (1) Active participation in the lab sessions by Dr. *Luis*. During the lab day, the professor will provide one '*Bonus Question*' of **4 points**. The total bonus points that you can earn through this method is **20 bonus points**.
    (2) Active participation in the TA office hours will receive **1 bonus point** for every visit (with a maximum of **15 bonus points**)
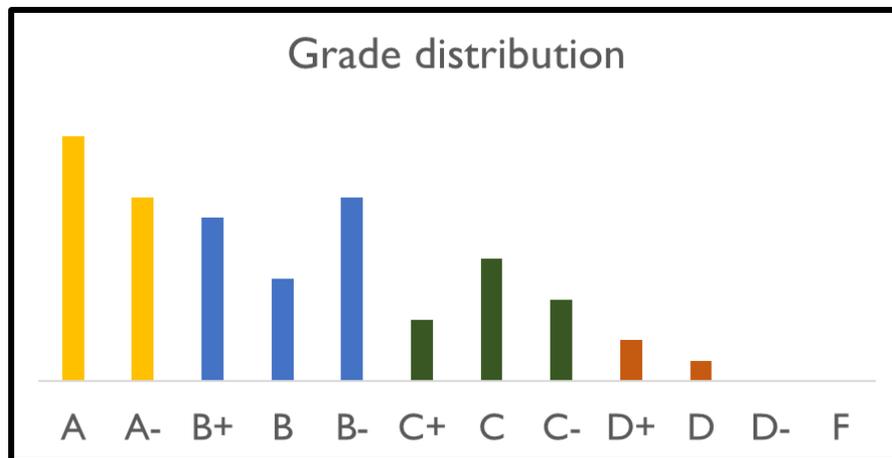
    Collectively
    (3) There is a **mid-semester** survey. If 90% of the class fills out the survey, this will unlock **one bonus question** for Midterm 2 (worthy **5 bonus points**).
    (4) If **90%** of the students fills out the **end-of-semester faculty evaluation** by August **10th** there are the following incentives:
    1. This will make unlock a bonus question in midterm 03 worthy **5 bonus points**.
    2. Quiz 08 (Special Matrices) will *replace* the lowest quiz.
    3. Quiz 00 (Syllabus quiz) would replace the lowest pre-lab.
    4. If a student is over **890** points, *the final practice is waived, receiving automatically an A.*
    Thus, encourage your classmates to fill out the surveys and faculty-class evaluation! It is for the benefit of everyone!
    NOTE: The 90% participation is feasible and has previously been achieved by all of the predecessor classes.

Special incentive: To motivate students to do their best, the top-5 students of the class will receive my endorsement (letter of recommendation) that may be requested during their undergraduate studies.

Previous Grades distribution: The right figure provides the previous grade distribution (of all students have taken my class combined).

Grade distribution

A A- B+ B B- C+ C C- D+ D D- F

Relevant Information

UF Grading Policy: For the grade points scale please click link to the university grades and grading policies.

Make-Up Exams: Make-up exams **are not given** in this class unless extenuating circumstances. This policy applies for any missing mid-term, as you have a complete day to take them. Should you miss any midterm for any reason, you will need to talk to Dr. Luis Peña-Lévano to evaluate the situation according to the university rules. If the absence is justified under UF Honor Code, the points of the missing midterm will be added to the last midterm.

Extenuating Circumstances: Exceptions to the Missed Assignment Policy that fall under the ***very serious nature*** are referred to as "Extenuating circumstances" and require formal letter-head documentation from (1) a physician/hospital, (2) UF faculty/academic advisor **and** (3) email from the UF Dean of Students Office sent to the instructor's UF email address, as soon as this circumstances have occurred. A health-clinic note on the day an assignment is due **does not count** as extenuating circumstances and will be considered as "Missed Assignment". In case of missing a midterm, the final practice will count as 150 points.

Student Responsibility for Online Submissions: Students are responsible for ensuring and verifying that all of their assignment files are uploaded successfully into Canvas. The instructor cannot be responsible for internet connections or failures. Students are strongly advised against using wireless connections to complete quizzes or upload assignments. Wireless connections have been problematic in previous semesters with students losing all points due to upload failure. A hard -wired connection can be located at any UF computer lab on campus or any public library to submit graded assignments. TO REPEAT, wireless connections are problematic, and quizzes or assignment uploads may not be saved (without any warning) and therefore locating a hard-wired connection is recommended to submit any graded assignments.

Exam day policy: Please have your UF-ID fifteen minutes early before the start of the exam so you configure your device. Have also a camera ready so you can start your exam through *Honorlock*.

Online course evaluation is offered at the end of the semester, students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Click here for guidance on how to give feedback in a professional and respectful manner. Students will be 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 ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students here.

Other Information

Students are responsible for all deadlines/critical dates and policies set forth by the University of Florida. Deadlines/critical dates are published on the University of Florida Office of the University Registrar's web-site, http://www.registrar.ufl.edu/

Current academic policies are presented in the University of Florida Undergraduate Catalog, https://catalog.ufl.edu/ugrad/current/Pages/home.aspx Please familiarize yourself with this information.

Students Requesting Classroom Accommodation: Students with disabilities requesting accommodations should register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor. Students with disabilities should follow this procedure and present it the **first two days of classes** at the latest.

UF Counseling Services: The life of a college student can sometimes be overwhelming. Resources are available on-campus to help students manage personal issues or gain insight into career and academic goals. Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's various counseling resources:

- For general student affairs: Dean of Students Office, 392-1261 (after hours, please call 392-1111);
- For mental health consultations: Counseling & Wellness Center, 392-1575 (24/7 phone access);
- For students experiencing distress: U Matter, We Care, 294-2273, www.umatter.ufl.edu;
- For physical health consultations: Student Health Care Center, 392-1161;
- For victims of sexual assault: Office of Victim Services, 392-5648 (after hours, please call 392-1111);

Software Use: All faculty, staff, and students of the University of Florida 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.

Academic Honesty: In 1995 the UF student body enacted an honor code and voluntarily committed itself to the highest standards of honesty and integrity. By enrolling to this class, you commit to the **UF Honor Code:** recognize that academic honesty and integrity are fundamental values of the university community. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

> *The Honor 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.*

On all work submitted for credit by students at the university, the following pledge is either required or implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."** The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior.

Student Responsibility: Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court.

Faculty Responsibility: Faculty members have a duty to promote honest behavior and to avoid practices and environments that foster cheating in their classes. Teachers should encourage students to bring negative conditions or incidents of dishonesty to their attention. In their own work, teachers should practice the same high standards they expect from their students.

Online recording clause: In case that is needed, our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live, especially under unexpected events. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

<u>**Administration Responsibility**</u>: As highly visible members of our academic community, administrators should be ever vigilant to promote academic honesty and conduct their lives in an ethically exemplary manner. This policy will be vigorously upheld at all times in this course.

This policy will be vigorously upheld at all times in this course.

Any instances of academic dishonesty will be reported to Student Judicial Affairs.

<u>**Student complaints:**</u> The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

- For a residential course, please read the following link: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf
- For an online course, please follow this link:

  http://www.distance.ufl.edu/student-complaint-process

By enrolling in this course, you are agreeing to the terms outlined in this syllabus.

I wish everyone a rewarding and productive semester ☺