

|   |   |  |   |  |
|---|---|--|---|--|
| <br><b>FLORIDA ATLANTIC UNIVERSITY</b>                           | <b>NEW COURSE PROPOSAL</b><br><b>Graduate Programs</b>  |  | UGPC Approval _____<br>UFS Approval _____<br>SCNS Submittal _____<br>Confirmed _____<br>Banner _____<br>Catalog _____ |  |
|   | <b>Department</b><br><br><b>College</b><br><i>(To obtain a course number, contact <a href="mailto:erudolph@fau.edu">erudolph@fau.edu</a>)</i> |  |   |  |
| <b>Prefix</b><br><br><b>Number</b>  | <i>(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)</i><br><b>Lab Code</b>  | <b>Type of Course</b>  | <b>Course Title</b>   |  |
| <b>Credits</b> <i>(Review Provost Memorandum)</i>   | <b>Grading</b> <i>(Select One Option)</i><br><br><b>Regular</b><br><br><b>Sat/UnSat</b>   | <b>Course Description</b> <i>(Syllabus must be attached; see <a href="#">Guidelines</a>)</i>   |   |  |
| <b>Effective Date</b> <i>(TERM &amp; YEAR)</i>  |   |  |   |  |
| <b>Prerequisites</b><br><br><br><br><br><br><i>Prerequisites, Corequisites and Registration Controls are enforced for all sections of course.</i> |   | <b>Academic Service Learning (ASL) course</b><br><br>Academic Service Learning statement must be indicated in syllabus and approval attached to this form. |   |  |
|   |   | <b>Corequisites</b>  | <b>Registration Controls</b> <i>(For example, Major, College, Level)</i>  |  |
| <b>Minimum qualifications needed to teach course:</b><br>Faculty with a Ph.D. in Economics  |   | <b>List textbook information in syllabus or here</b>   |   |  |
| <b>Faculty Contact/Email/Phone</b>  |   | <b>List/Attach comments from departments affected by new course</b>  |   |  |

|   |  |
|---|--|
| <b>Approved by</b><br>Department Chair <u>Monica Escaleras</u><br>College Curriculum Chair <u>Robert Pinsker</u><br>College Dean <u>Marc Rhorer</u><br>UGPC Chair _____<br>UGC Chair _____<br>Graduate College Dean _____<br>UFS President _____<br>Provost _____ | <b>Date</b><br><u>8/28/25</u><br><u>9/17/2025</u><br><u>9/17/2025</u><br>_____<br>_____<br>_____<br>_____<br>_____ |
|---|--|

Email this form and syllabus to [UGPC@fau.edu](mailto:UGPC@fau.edu) 10 days before the UGPC meeting.



**FLORIDA ATLANTIC  
UNIVERSITY**

---

**ECO 6445**  
**AI and Machine Learning for**  
**Economics and Business**  
**Decision-Making**

**Date: TBA Building: TBA**

**3 Credit(s)**  
**Spring 2026 - 1 Full Term**

## **Instructor Information**

---

**Name:** Long Liu

**Email:** [liul@fau.edu](mailto:liul@fau.edu)

**Office Hours:** TBA

**Phone:** 561-297-3222

## **Course Description**

---

This course explores how big data, artificial intelligence (AI), and machine learning (ML) are transforming economics and business decision-making. Students will learn how economics provides a framework for applying these tools in business decision-making and policy analysis, while gaining hands-on experience with AI tools such as ChatGPT and software like Stata to produce reproducible, project-based work. By the end of the course, students will be prepared to apply economic reasoning and data-driven tools to strengthen decision-making in today's technology-driven business environment.

*"AI is the destination, and ML is a crucial roadmap or vehicle to get there." ---ChatGPT*

## Instructional Method

---

### In-Person w/Live Remote Option

In-person class. Instructor will live stream the class for remote synchronous attendance. In-person attendance not required.

## Required Textbooks

---

- Microeconometrics Using Stata Volume II: Nonlinear Models and Causal Inference Methods  
**ISBN:** 9781597183628  
**Authors:** A. Colin Cameron, Pravin K. Trivedi  
**Publisher:** Stata Press  
**Edition:** 2nd edition  
**Publication Date:** 2022
- Econometrics with Machine Learning  
**ISBN:** 9783031151514  
**Editors:** Chan, F., & Mátyás, L.  
**Publisher:** Springer  
**Edition:** 1st edition  
**Publication Date:** 2022

## Suggested Textbooks

---

- Artificial Intelligence: Economic Perspectives and Models  
**ISBN:** 9781009483117  
**Authors:** Naudé, W., Gries, T., & Dimitri, N.  
**Publisher:** Cambridge University Press  
**Publication Date:** 2024
- The Economics of Artificial Intelligence: An Agenda  
**ISBN:** 978-0-226-61333-8 (cloth); 978-0-226-61347-5 (electronic)  
**Editors:** Ajay Agrawal, Joshua Gans, and Avi Goldfarb  
**Publisher:** University of Chicago Press  
**Publication Date:** May 2019

## Suggested Articles

---

- Varian, H. R. (2014). Big data: New tricks for econometrics. *Journal of Economic Perspectives*, 28(2), 3-28.
- Mullainathan, S., & Spiess, J. (2017). Machine learning: an applied econometric approach. *Journal of Economic Perspectives*, 31(2), 87-106.
- Athey, S., & Imbens, G. W. (2019). Machine learning methods that economists should know about. *Annual Review of Economics*, 11(1), 685-725.
- Kühn, N., Schemmer, M., Goutier, M., & Satzger, G. (2022). Artificial intelligence and machine learning. *Electronic Markets*, 32(4), 2235-2244.

- Korinek, A. (2023). Generative AI for economic research: Use cases and implications for economists. *Journal of Economic Literature*, 61(4), 1281-1317.
- Dell, M. (2025). Deep Learning for Economists. *Journal of Economic Literature*, 63(1), 5-58.
- Haghighi, M., Joseph, A., Kapetanios, G., Kurz, C., Lenza, M., & Marcucci, J. (2025). Machine Learning for Economic Policy, *Journal of Econometrics*, 249, Part C, 105970.

## **Course Objectives/Student Learning Outcomes**

---

- **CO:01** Develop a solid foundation in big data, artificial intelligence (AI), machine learning (ML), and Stata as tools for economics and business decision making.
- **CO:02** Learn modern prediction and inference methods (e.g., LASSO, ridge, elastic net) to forecast markets, analyze consumer behavior, and guide strategic decisions.
- **CO:03** Apply data reduction and clustering techniques (e.g., PCA, K-Means) to uncover patterns, identify key drivers, and segment markets for competitive advantage.
- **CO:04** Evaluate the impact of business initiatives and policies using advanced methods such as model averaging and synthetic controls.
- **CO:05** Harness machine learning for text analysis to extract insights from reports, news, and digital content that drive business and economic decisions.

### **At the end of the course, students will be able to:**

- Apply AI/ML and econometric tools to analyze markets, consumer behavior, and policy outcomes.
- Extract and interpret insights from big data, clustering methods, and text analysis for business and economic applications.
- Integrate economic reasoning with data-driven methods to enhance decision-making in business and policy contexts.

## Course Topical Outline

This course will be taught in 8 weeks:

---

| Week | Lecture Topics  | Assignment   |
|------|---|--------------|
| 1    | Introduction to big data, AI, ML and Stata  |              |
| 2    | Prediction using LASSO, ridge and elastic net regressions<br>Microeconometrics Using Stata, Chapter 28.2—28.7 Econometrics with Machine Learning, Chapter 4 | Assignment 1 |
| 3    | Double debiased LASSO for regression inference<br>Microeconometrics Using Stata, Chapter 28.8—28.9 Econometrics with Machine Learning, Chapter 1            | Assignment 2 |
| 4    | Treatment effects by using model averaging, synthetic control<br>Econometrics with Machine Learning, Chapter 5  | Assignment 3 |
| 5    | Spatial regression and networks with Machine Learning<br>Microeconometrics Using Stata, Chapter 26<br>Econometrics with Machine Learning, Chapter 6         | Assignment 4 |
| 6    | K-Means clustering and principal component analysis<br>The Economics of Artificial Intelligence: An Agenda, Chapter 21                                      | Assignment 5 |
| 7    | ML text analysis<br>The Economics of Artificial Intelligence: An Agenda, Chapter 2  | Assignment 6 |
| 8    | Review for the Final Exam   | Final Exam   |

## Faculty Rights and Responsibilities

---

Florida Atlantic University respects the rights of instructors to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede their exercise. To ensure these rights, faculty members have the prerogative to:

- Establish and implement academic standards.
- Establish and enforce reasonable behavior standards in each class.
- Recommend disciplinary action for students whose behavior may be judged as disruptive under the

Student Code of Conduct [University Regulation 4.007](#).

## Disability Policy

---

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at

[www.fau.edu/sas/](http://www.fau.edu/sas/).

## Course Evaluation Method

---

Your course grade will be determined by the following parts:

-- Exams: There will be a final exam, which will count for 30% of the course grade. There will be no make-up or alternate exams. Mark your calendar and make sure you can take the exams.

-- Assignments: There will be 6 homework assignments. These homework assignments will be posted on Canvas. All homework assignments together will count for 60% of the course grade. Students must finish all the assignments independently. Late submissions will result in a 1% penalty for each day the assignment is late.

-- Project: Each student needs to conduct a project and present it in class if time allows, which will count for 10% of the course grade. Students are encouraged to use techniques learned in this course to analyze a data set.

The graded course components and the maximum available points are the follows.

|              |            |
|--------------|------------|
| Exam         | 30         |
| Homework     | 60         |
| Project      | 10         |
| <b>Total</b> | <b>100</b> |

## Code of Academic Integrity

---

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see

[University Regulation 4.001](#).

## **Attendance Policy Statement**

---

Students are expected to attend all their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations, or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances, and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

## **Religious Accommodation Policy Statement**

---

In accordance with the rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices and beliefs regarding admissions, registration, class attendance, and the scheduling of examinations and work assignments. University Regulation 2.007, Religious Observances, sets forth this policy for FAU and

may be accessed on the FAU website at [www.fau.edu/regulations](http://www.fau.edu/regulations).

Any student who feels aggrieved regarding religious accommodations may present a grievance to the executive director of The Office of Civil Rights and Title IX. Any such grievances will follow Florida Atlantic University's established grievance procedure regarding alleged discrimination.

## **Time Commitment Per Credit Hour**

---

For traditionally delivered courses, not less than one (1) hour of classroom or direct faculty instruction each week for fifteen (15) weeks per Fall or Spring semester, and a minimum of two (2) hours of out- of-class student work for each credit hour. Equivalent time and effort are required for Summer Semesters, which usually have a shortened timeframe. Fully Online courses, hybrid, shortened, intensive format courses, and other non-traditional modes of delivery will demonstrate equivalent time and effort.

## Course Grading Scale

---

| Letter Grade | Percentage |
|--------------|------------|
| A            | 100 - 93%  |
| A-           | < 92 - 90% |
| B+           | < 89 - 87% |
| B            | < 86 - 83% |
| B-           | < 82 - 80% |
| C+           | < 79 - 77% |
| C            | < 76 - 73% |
| C-           | < 72 - 70% |
| D+           | < 69 - 67% |
| D            | < 67 - 60% |
| F            | < 60 - 0%  |

## Grade Appeal Process

You may request a review of the final course grade when you believe that one of the following conditions apply:

- There was a computational or recording error in the grading.
- The grading process used non-academic criteria.
- There was a gross violation of the instructor's own grading system.

[University Regulation 4.002](#) of the University Regulations contains information on the grade appeals process

## Policy on Make-up Tests, Late work, and Incompletes

---

Any late assignments (except for medical reasons – doctor's note required) will be given partial credit (70% of the grade).

Discussions will NOT be accepted late (except for medical reasons – doctor's note required).

No exams/assessments may be taken late or as a "make up" except for approved reasons (i.e., illness or extreme emergency, university-approved absences, or religious accommodations).



## Special Course Requirements

---

### Required technological skills:

- Basic Skills in computer use
- Access to the internet
- Basic Canvas LMS skills
- Basic Skills for Office programs (word processing and presentation programs)

### Required Software:

- Microsoft 365 Suite [Link to download](#)
- Reliable web browser (recommended Chrome or Firefox)
- Java – [Link to download](#) and/or [Link to verify Java](#) on your
- computer [Adobe Flash Player: Link to download](#)
- Mobile App: Instructions on how to download the Canvas App on an iOS device ([Link for iOS Instructions](#)) or Android device ([Link for Android instructions](#)).
- NOTE: Power BI works on Windows laptop/desktop ONLY. Please plan to use Windows system for the Power BI assignments.

### Internet Connection:

- Recommended: Broadband (high-speed) Internet connection with a speed of 4 Mbps or higher
- To function properly, Canvas requires a high-speed Internet connection (cable modem, DSL, satellite broadband, T1, etc.). The minimum Internet connection speed to access Canvas is a consistent 1.5 Mbps (megabits per second) or higher.
- To check your Internet speed, [click here](#).

### Minimum Technical Skills Requirements:

The general and course-specific technical skills a student must have to succeed in the course include but are not limited to:

1. Accessing the Internet.
2. Using Canvas (including taking tests, attaching documents).
3. Using email with attachments.
4. Creating and submitting files in commonly used word processing program formats such as Microsoft Office Tools.
5. Copying and pasting functions.
6. Downloading and installing software.

7. Using presentation, graphics, and other programs.
8. Posting and commenting in an online discussion.
9. Searching the FAU library and websites.

**Computer Requirements:**

Basic computer specifications for Canvas Link to

Specifications Operating System

- A computer that can run Mac OSX or Win 7.0 or higher.

Peripherals

- A backup option should be available to minimize the loss of work, such as an external hard drive, a USB drive, cloud storage, or your folder on the FAU servers.

Software

- Once logged in to Canvas, make sure your Internet browser is compatible.
- Other software may be required for specific learning modules. If so, the necessary links to download and install will be provided within the applicable module.

## **Policy on the Recording of Lectures**

---

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject.

Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited.

Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

## Artificial Intelligence Preamble

---

FAU recognizes the value of generative AI in facilitating learning. However, output generated by artificial intelligence (AI), such as written words, computations, code, artwork, images, music, etc., for example, is drawn from previously published materials and is not your own original work.

FAU students are not permitted to use AI for any course work unless explicitly allowed to do so by the instructor of the class for a specific assignment. [\[Policy 12.16 Artificial Intelligence\]](#)

Class policies related to AI use are decided by the individual faculty. Some faculty may permit the use of AI in some assignments but not others, and some faculty may prohibit the use of AI in their course entirely. In the case that an instructor permits the use of AI for some assignments, the assignment instructions will indicate when and how the use of AI is permitted in that specific assignment. It is the student's responsibility to comply with the instructor's expectations for each assignment in each course. When AI is authorized, the student is also responsible and accountable for the content of the work. AI may generate inaccurate, false, or exaggerated information. Users should approach any generated content with skepticism and review any information generated by AI before using generated content as-is.

If you are unclear about whether or not the use of AI is permitted, ask your instructor before starting the assignment.

Failure to comply with the requirements related to the use of AI may constitute a violation of the

[Florida Atlantic Code of Academic Integrity, Regulation 4.001.](#)

Proper Citation: If the use of AI is permitted for a specific assignment, then use of the AI tool must be properly documented and cited. For more information on how to properly cite the use of AI tools, visit

<https://fau.edu/ai/citation>

## Counseling and Psychological Services (CAPS) Center

---

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual therapy, group therapy, and crisis services, to name a few - offered to help improve and maintain emotional well-being. For more information, go

to <http://www.fau.edu/counseling/>

## Student Support Services and Online Resources

---

- [Center for Learning and Student Success](#)
- [\(CLASS\) Counseling and Psychological Services \(CAPS\)](#)
- [FAU Libraries](#)
- [Math Learning Center](#)
- [Office of Information Technology](#)
- [Helpdesk Center for Global Engagement](#)
- [Office of Undergraduate Research and Inquiry \(OURI\)](#)
- [Science Learning](#)
- [Center Speaking Center](#)
- [Student Accessibility Services](#)
- [Student Athlete Success Center](#)
- [\(SASC\) Testing and Certification](#)
- [Test Preparation](#)
- [University Academic Advising Services](#)
- [University Center for Excellence in Writing](#)
- [\(UCEW\) Writing Across the Curriculum \(WAC\)](#)

## Title IX Statement

---

In any case involving allegations of sexual misconduct, you are encouraged to report the matter to the University Title IX Coordinator in the Office of Civil Rights and Title IX (OCR9). If University faculty become aware of an allegation of sexual misconduct, they are expected to report it to OCR9. If a report is made, someone from OCR9 and/or Campus Victim Services will contact you to make you aware of available resources including support services, supportive measures, and the University's grievance procedures. More information, including contact information for OCR9, is available at

<https://www.fau.edu/ocr9/title-ix/>. You may also contact Victim Services at [victimservices@fau.edu](mailto:victimservices@fau.edu) or 561-297-0500 (ask to speak to an Advocate) or schedule an appointment with a counselor at Counseling and Psychological Services (CAPS) by calling 561-297- CAPS.