

COURSE SYLLABUS

ESI 4611: Advanced Data Analytics

Spring 2025 | MWF | 05:10pm - 06:00pm (Period 10) | FLG 0245

Instructor: Dr. Murwan Siddig (msiddig@ufl.edu)

- **Office:** Weil Hall 380.
- **Phone:** (352) 294-7713.
- **Office Hours:** Mondays and Wednesdays between 4:10pm-5:00pm or by appointment.
<https://ufl.zoom.us/j/92921835620?pwd=cYhVazeTotLR7cF4XaqHRB1IamoQD0.1>
Meeting ID: 929 2183 5620
Passcode: 840224

Grader: Andres Espinosa (andresespinosa@ufl.edu).

- **Office Hours:** Fridays between 10:00am-11:00am via Zoom.
<https://ufl.zoom.us/j/94431041648?pwd=qNJQNejfChaaSbQ3Na69NG1cJTValK.1>
Meeting ID: 944 3104 1648
Passcode: 905430

Course Logistics: The course takes place on Mondays, Wednesdays and Fridays between 05:10pm - 06:00pm (Period 10) in FLG 0245. All course materials, information, and announcements will be communicated through the course website on Canvas via elearning.ufl.edu.

Course Description: Second course in the data analytics ISE sequence that focuses on how and why algorithms work using an application-oriented approach. Studies advanced analytical and learning models that enhance decision-making by converting data to information. Provides insights into how to choose the most effective tool for implementing a specific model. (3 credits).

Pre-Requisites / Co-Requisites: ESI 4610 (Introduction to Data Analytics) with a minimum grade of C. You should also have a good understanding of probability, statistics, linear algebra, and calculus.

Course Objectives: By the end of this course, you will have a solid understanding of a wide range of machine-learning methods that have proven to be successful and are widely used in practice. These include regression, classification, tree-based models, artificial neural networks, clustering, among others. The course will cover the basic ideas

and intuitions behind these methods, as well as their advantages and drawbacks. You will also gain hands-on experience implementing computer code to solve analytics problems using relevant input data.

Materials and Supply Fees: None.

Required Technology:

- You must have a laptop to sign up for this course. The laptop is necessary for in-class exercises, homework assignments, and exams. Please refer to the [University student computing requirement](#) for more information.

Recommended Materials:

- Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani, *An Introduction to Statistical Learning: With Applications in Python*, 2023. ISBN 978-3-031-38747-0. Free version: <https://www.statlearning.com>.
Repository with Python code: https://github.com/intro-stat-learning/ISLP_labs
- Christopher M. Bishop and Nasser M. Nasrabadi. *Pattern recognition and machine learning*, 2006. ISBN 978-0387-31073-2.
- Andreas Lindholm, Niklas Wahlström, Fredrik Lindsten, Thomas B. Schön, *Machine Learning: A First Course for Engineers and Scientists*, 2022. ISBN 9781108843607. Free version: <https://smlbook.org>.

Tentative Course Schedule:

- Regression (2 weeks)
- Classification (2 weeks)
- Overfitting and Regularization (2 week)
- Tree-based Models (1.5 weeks)
- Clustering (1 week)
- Recommendation Systems (1.5 week)
- Neural Networks (2 weeks)

Evaluation of Grades: The final grade will be based on the following distribution:

Homework	25%
Exam 1	25%
Exam 2	25%
Project	25%

Grading Policy: The (tentative) grading scale is:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-
[90, 100]	[87, 90)	[83, 87)	[80, 83)	[77, 80)	[73, 77)	[70, 73)	[67, 70)	[63, 67)	[60, 63)	[57, 60)

A grade of C is required to pass this class. A C- is not considered passing. The grades may or may not be curved, depending on the overall performance of the class. More information on UF grading policy may be found at: [UF Undergraduate Catalog](#) and [Grades and Grading Policies](#).

Homework assignments: All assignments should be submitted online through Canvas (paper submissions will not be accepted). All assignments are due when class begins on the assigned due date. Each student is allowed a budget of *FIVE FREE days* for late assignment submissions for the entire semester. A student who uses all their free days will have their grade reduced by 20% for each day delayed. No assignments will be accepted if more than FIVE days are overdue, regardless of whether free days are applied or not.

Collabration Policy: You are allowed to discuss assignment problems with other students in the class, but you *cannot* share complete answers, code, or simulation results before everyone involved in the discussion has submitted their work. Violation of this policy will be considered a violation of the [University Honesty Policy](#) and will be reported to the appropriate university authorities.

Online Resources Policy: You are allowed to refer to online resources, tools, and artificial intelligence (AI) software, such as [ChatGPT](#). However, you must obey the following rules:

- You must ensure the factual accuracy of the information you use from these sources.
- You must properly attribute your sources for each problem for which you use online resources. Below is an example of citing ChatGPT:

“How do I cite ChatGPT?” prompt. ChatGPT (version GPT-4o), 22 Aug. 2024. OpenAI, <https://chatgpt.com/>.

- You must write your own code and solutions. Copying and pasting code from online sources is not allowed.
- You must be prepared to explain your work to the instructor or Grader if asked.

Violation of this policy will be considered a violation of the [University Honesty Policy](#) and will be reported to the appropriate university authorities.

Other Policies and Information

Attendance: Attendance is expected but will not be directly recorded. Click [here](#) to read the university attendance policies. Excused absences must be consistent with university policies in the [Undergraduate Catalog](#) and require appropriate documentation. Additional information can be found here: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

Exams Make-Up Policy: If you are unable to take an exam due to a family or medical emergency, and you notify the instructor in advance of the exam, then a make-up exam will be organized as soon as it is feasible for both you and the instructor. Requests for make-up exams should be made at least a week before the exam date.

Regrade Policy: A student may request a regrade of their assignments and exams. Only one regrade will be considered per assignment/exam. The deadline for requesting a regrade is two weeks after the graded work is returned to the class, even if you were not present that day. Any grade dispute/inquiry after the specified period will not be considered. The request for regrading must be done in writing together with a detailed description of the reasons why you believe there was a mistake in your grade.

Class Materials: Any material that gets distributed to the class should be kept strictly within this class. Students are not allowed to share course materials with anyone outside the class.

Students Requiring Accommodations: Students who require accommodation should connect with the disability Resource Center. To connect with the Disability Resource Center go to: <https://disability.ufl.edu/students/get-started/>. The Disability Resource Center will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. 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 the website <https://gatorevals.aa.ufl.edu/students/>. 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 <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: All course participants must abide by the requirements and spirit of the University of Florida Student Honor Code, which states,

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 [Honor Code](#) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. Any honor code violations will be handled by the University’s [honor code process](#). If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment: The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our com-

munity and is committed to supporting the University's core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Program Coordinator
- HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@ufl.edu

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. 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](#) and visit registrar.ufl.edu/ferpa.

Land Acknowledgement: A [land acknowledgement](#) is a formal statement that recognizes and respects Indigenous Peoples as traditional stewards of this land, as well as their enduring relationship with it. Specifically, the University of Florida is located on the [traditional territory](#) of the [Potano](#) (part of the [Timucua](#) people) tribe, and later lived on by [Seminole](#) tribes. We are not only recognizing and reflecting on the context in which our (land grant) institution of higher learning exists, but also identifying an ongoing process of marginalization and colonialism. I encourage you to read the history of Indigenous Peoples and consider what you can do to support current indigenous populations. The significance of a land acknowledgment is summarized at nativegov.org/news/a-guide-to-indigenous-land-acknowledgment.

Campus Resources

Health and Wellness: Take care of yourself by paying attention and devoting time to your physical and mental wellbeing. Do not hesitate to reach out to me or a qualified professional if you are ever in need of support. Resources that are available to you include:

- **University Police Department** at 392-1111 (or 9-1-1 for emergencies)
<http://www.police.ufl.edu/>
- **U Matter, We Care:** Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to many other helping resources available including, but not limited to, [Victim Services](#), Housing Staff, and the [Counseling and Wellness Center](#). Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1. <https://umatter.ufl.edu>.
- **Student Health Care Center:** Visit the SHCC website or call 352-392-1161 for 24/7 information to help you find the care you need. <https://shcc.ufl.edu>
- **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. <https://ufhealth.org/uf-health-shands-emergency-room-trauma-center>
- **Sexual Discrimination, Harassment, Assault, or Violence:** If you or someone you know has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence, contact the [Office of Title IX Compliance](#), located at Yon Hall Room 427, 1908 Stadium Road, 352-273-1094, . <https://titleix.ufl.edu>
- **Sexual Assault Recovery Services:** Sexual assault counseling available through the [Student Health Care Center](#), 352-392-1161. <https://shcc.ufl.edu>

Academic Resources:

- **e-Learning Technical Support:** 352-392-4357 (option 2) or send an email to learning-support@ufl.edu
- **Career Resource Center:** Career assistance and counseling, Reitz Union, 352-392-1601.
- **Library Support:** Receive assistance with using the libraries or finding resources.
- **Teaching Center:** General study skills and tutoring, Broward Hall, 352-392-2010 or 352-392-6420.

- **Writing Studio:** Help brainstorming, formatting, and writing papers, 302 Tigert Hall, 352-846-1138.
- **The Care Area:** Address student complaints, create success plans and ongoing support for students in distress, and help students complete necessary medical petition paperwork for all courses or medical withdrawals from a course.
<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>.
- **Distance Learning Complaints:** Student complaints for online distance learning programs. <https://distance.ufl.edu/getting-help/student-complaint-process/>