

BUA 302: Predictive and Prescriptive Business Analytics

Tuesdays/Thursdays 1.30 PM – 3 PM

Lewis Center 103

This syllabus is subject to change at the instructor's discretion. Instructor will post changes on the Desire2Learn (D2L) class site.

Instructor Information

Instructor: Dr. Soroosh Azizi

Email: s.azizi@depaul.edu

all email messages.

Note: Please put BUA 302: at the beginning of the subject line of

Office: DePaul Center 6203

Office hours: Mondays and Wednesdays 3 to 5; T, Th by appointment

This course introduces students to predictive and prescriptive business analytics. Students will learn how to apply a supervised learning workflow to predict outcomes. This includes learning how to apply supervised learning methods such as elastic nets and ensemble trees, tuning hyperparameters of these methods, training these algorithms on training data, and evaluating trained algorithms on testing data. By the end of the course, students will feel prepared to apply their predictive and prescriptive analytics knowledge and skills to perform fundamental business analytics work tasks.

Learning Goals

After successful completion of this course, students will be able to:

- Understand the differences and similarities between predictive and prescriptive analytics
- Learn the supervised learning workflow with elastic nets
- Execute the elements of a predictive analytics workflow
 - Separate data into training and testing data
 - Create repeated v-fold cross-validation on training data
 - Preprocess data for supervised learning algorithms
 - Tune hyperparameters for supervised learning algorithms
 - Estimate algorithms on training data and evaluate accuracy metrics
 - Evaluate the performance of trained algorithms on testing data
- Calculate accuracy metrics
 - Regression (i.e., continuous outcomes) accuracy metrics
 - Classification (i.e., categorical outcomes) accuracy metrics

Course Prerequisites

- BUA 301

Course Materials and Technology

- No textbook

- Free online textbooks and web resources:

An Introduction to Statistical Learning with Applications in Python. You can access the book from here: <https://www.statlearning.com/>

- Python

Assessment

The final grade in this course will be calculated as follows:

A	93%-100%	C+	77-79%	F	0-59%
A-	90-92%	C	73-76%		
B+	87-89%	C-	70-72%		
B	83-86%	D+	67-69%		
B-	80-82%	D	60-66%		

This grade comes from the weighted average of the following assignments:

Activity	% of Grade
Attendance	5
5 Assignments	25
Midterm	20
Group Project	25
Final Exam	25

Course Calendar

Week	Topics	Due
1	Introduction to Course Introduction to Python	
2	Chapter 2: Statistical Learning	HW 1
3	Chapter 3: Linear Regression	
4	Chapter 4: Classification	HW2
5	Midterm Review and Midterm Exam (May 07 th , in class)	HW3
6	Chapter 5: Resampling Methods	
7	Chapter 6: Linear Model Selection and Regularization	
8	Chapter 7: Moving Beyond Linearity	HW4
9	Chapter 8: Tree-Based Methods	
10	Conclusion and Final Exam review and	HW5
	Group project Due	Final Exam
	Final Exam: Thursday, June 13 th 11.30 AM	

Professionalism

- Only use your official DePaul email addresses for communication with me. I usually delete or disregard any emails outside depaul.edu domain
- Please start with Dear Dr. Azizi or Hello Dr. Azizi or anything that shows I am the main audience of the email. In the subject write Bus 202 + your concern
- Being disrespectful toward your instructor might result in being removed from the course or getting "F" in the course.
- **Using cell phone and earbuds are forbidden. No exceptions.**
- Students are responsible for having access to laptops and internet access. Using laptops are permitted only for course related activities.
- Students with disability will have extended time (based on the disability center recommendation), but the due date will be the same for them.

Academic Integrity

This course adheres to the University's policies on plagiarism as stated in the current DePaul University Undergraduate Bulletin and Student Handbook.

To ensure the best possible learning outcomes in this course, you need to understand the appropriate and inappropriate uses of ChatGPT and other generative AI tools. In this class, cite all uses of ChatGPT and other generative AI tools as you would other sources. Please consult with me to determine the most effective ways to incorporate these tools into your learning experience.

Student Evaluations

At the end of this course, you will have an opportunity to evaluate this course. Course evaluations provide valuable feedback that can improve teaching and learning. The greater the level of participation, the more useful the results. Isolated comments from students and instructors' peers may also be helpful, but evaluation results based on high response rates may be statistically reliable (believable). As you experience this course and material, think about how your learning is impacted.

Your honest opinions about your experience in and commitment to the course and your learning may help improve some components of the course for the next group of students. Positive comments also show the department chairs and college deans the commitment of instructors to the university and teaching evaluation results are one component used in annual performance reviews (including salary raises and promotion/tenure). The evaluation of the instructor and course provides you an opportunity to make your voice heard on an important issue – the quality of teaching at DePaul.

Respect

This course is designed for learning, which is best achieved by asking questions, thinking things through, and even making mistakes. Please treat your professor and your classmates with respect – we are all on our own journey of learning. If anyone has concerns about the behavior of other people in the class, please let me know right away.

Dean of Students

The Dean of Students Office (DOS) helps students in navigating the university, particularly during difficult situations, such as personal, financial, medical, and/or family crises, Absence Notifications to faculty, Late Withdrawals, and Community Resource Referrals to support students both in and outside of the classroom. Additionally, the office has resources and programs to support health and wellness, violence prevention, substance abuse and drug prevention, and LGBTQ student services. Please feel free to contact the office at <http://studentaffairs.depaul.edu/dos>.

Student Mental Health Support

Your mental health and well-being are of utmost importance to me. As we navigate through the course material, I encourage you to reach out if you ever feel overwhelmed or need additional support. Whether it's related to the course content or any personal challenges, I am here to listen and provide guidance. Additionally, I value open communication and mutual respect within the class, promoting a safe space for constructive discussions and learning from one another.

If you find yourself facing any mental health concerns, remember that seeking help is a sign of strength, not weakness. There are campus resources available, such as [university counseling](#), [mental health support groups](#), and [wellness programs](#). I will work with you to ensure that your mental health needs are accommodated while maintaining your privacy and confidentiality.

Gender Equity/Title IX

DePaul University does not discriminate on the basis of sex, which includes gender, gender identity, sexual orientation, marital status, pregnancy, parental status and family relationship status, in its education programs and activities and admissions. Title IX of the Education Amendments of 1972, and certain other federal and state laws, prohibit discrimination on the basis of sex in employment, as well as in all education programs and activities operated by the university (both on and off campus). The protection against discrimination on the basis of sex includes sexual harassment, sexual misconduct, sexual violence and gender based dating and domestic violence and stalking. For more information or to report, please visit the [Gender Equity/Title IX website](#).

Accommodations

Disability

Students seeking disability-related accommodations should register with DePaul's Center for Students with Disabilities (CSD) enabling you to access accommodations and support services to assist your success. They have two office locations:

Loop Campus - Lewis Center #1420 - (312) 362-8002

Lincoln Park Campus - Student Center #370 - (773) 325-1677

You may also contact me privately to discuss your challenges and how I may assist in facilitating the accommodations you use in this course. This is best done early in the term, and all conversations remain confidential.

Additional Accommodations

This course may include instructional content delivered via audio and video. If you have any concerns about your ability to access and/or understand this material in its default format, please notify me within the first week of the course so accommodations can be made.

Assistance with Writing – The Writing Center

Consider contacting or visiting the [Writing Center](#) to discuss your writing assignments for this course or any others. You may schedule appointments (30 or 50 minutes) on an as-needed or weekly basis, scheduling up to 3 hours' worth of appointments per week. Online services include Feedback-by-Email and IM conferencing (with or without a webcam). All writing center services are free.

Schedule your appointments with enough time to think about and use the feedback you'll receive. Bring your assignment handout and other relevant materials to your appointments.