Syllabus 2023 Spring A

Course Information:

Course Number: MSBA 5505/Lecture/1 - HY

Course Title: Machine Learning for Business

Units: 3

Department Name: Barowsky School of Business

Semester Offered: 2023 Spring A

Course Meeting Days: Saturday 1/14, TUESDAY 1/17, Monday 1/23, Saturday 1/28, Monday 1/30, Monday 2/6, Saturday 2/11, Monday 2/13, Monday 2/20, Saturday 2/25

Course Meeting Time: M, T 7:00 PM - 9:40 PM; Dominican University, Virtual, Room ONLINE
S 8:00 AM - 12:30 PM; Dominican University, Science Building, Room 231

Course Meeting Place or Zoom Link: Virtual, Room ONLINE; Science Building, Room 231

Online Course Meeting/Access Information (if applicable): Online: Zoom Link Available on Moodle

Prerequisites: Knowledge of Python Programming Language

Instructor Information:

Name and pronouns: Rao Mikkilineni (He/Him)

Office Phone: (408)679 1956

Email Address: rmikkilineni@ggu.edu

Office Location: Zoom link available on Moodle

Office Hours: On appointment

Librarian: louis.knecht@dominican.edu

Library Support
Phone: 415-485-3251
Email: ref@dominican.edu

Section: Course Details

1. Course Description: General Content of the Course

a) **Machine Learning for Business**: Machine learning is the process of developing, testing, and applying predictive algorithms to predict future outcomes. This course will teach students how to use machine learning to achieve business goals. Students will be trained to formulate ML solutions to real-world problems, carry a project through various ML phases such as training, evaluation, and deployment, and perform AI responsibly to avoid reinforcing existing bias. They will measure, monitor, and predict the evolution of key enterprise variables and performance indicators and present them in the form of usable information for business decision-making. Topics include supervised and unsupervised learning, data mining, text mining, and big data strategies.

b) **Student Learning Outcomes**: As a result of taking this course, students are expected to be able to demonstrate the following:

i. Apply Machine Learning to manage business-related issues and opportunities in an enterprise.
ii. Design and apply Machine Learning-based solutions to solve business problems.
iii. Explain how subject matter expertise is leveraged using domain models.
iv. Express how emerging information technologies are being explored to improve efficiency, and resiliency using Machine Learning solutions at scale.
v. Appraise the role of data analysts and data scientists.
vi. Apply various learnings from the class to a business problem and present a paper at the end of the term.

2. Texts and Resources

a) Machine Learning for Absolute Beginners: A Plain English Introduction, Third Edition, Oliver Theobald, ISBN: 9798558098426, (2021) https://www.scatterplotpress.com/

b) Klosterman, Stephen. Data Science Projects with Python: A case study approach to successful data science projects using Python, pandas, and Scikit-learn. Packt Publishing. Kindle Edition (2019). ISBN: 978-1-83855-102-5

c) Reference Books: The course will use the following book as a reference from which material will be used and the book will be available in the library. They are also available in Kindle edition and O'Reilly publishing online (available through the library)

d) Machine Learning Engineering, Andriy Burkov, True Positiv Inc., ISBN 978-1-9995795-7-9.

e) Online Resources: The course will use the following online resources:

f) The Future of Analytics: The New Landscape of Artificial Intelligence and Machine Learning Applications, by Dan Darnell, Rafael Coss, and Patrick Hall, O'Reilly.

g) GitHub - TrainingByPackt/Data-Science-Projects-with-Python : A Case Study Approach to Successful Data Science Projects Using Python, Pandas, and Scikit-Learn

h) For a deeper understanding of the theory and practice, see Machine Learning | Coursera

Online Components of the Course

a) Moodle

Recording Policy

- **Classes may be recorded and attendance will be considered consent. Class session recordings are for learning purposes in this course only. Neither the instructor nor the students may share or use class session recordings for any purpose outside of the class.**
- ***Instructor will delete all versions of the recording upon completion of the course.***

3. Assessments

DESCRIPTION	POINTS
Class Attendance and Participation	10
Quizzes and Homework assignments (Each 5 points)	30
1 Student presentation on a selected topic related to AI and ML	10
Mid-Term Exam	10
Final Project – Individual (Paper and PowerPoint Presentation)	30
Final Exam	10
Total	**100**

4. Grading

Points	Letter Grade	Points	Letter Grade
94 - 100	A	73.0 - 76.9	C
90.0 - 93.9	A-	70.0 - 72.9	C-
87.0 - 89.9	B+	67.0 - 69.9	D+
83.0 - 86.9	B	63.0 - 66.9	D
80.0 - 82.9	B-	60.0 - 62.9	D-
77.0 - 79.9	C+	< 60.0	F

5. Expectations for Students

Participants are expected to show evidence of mastery of the assigned reading and to take part in verbal discussions each session. Participation must also be demonstrated via the in-class computer-based assignments that follow several lectures throughout the course.

Attendance at the first session of each course is important; if circumstances demand that a student miss the first session of a course, the student must contact the professor immediately. Attendance information for the first two weeks of course meetings will be shared with the University administration in order to ensure compliance with federal financial aid regulations, which require that the University establish evidence of student participation or absence before disbursing aid funds. Unexcused absences beyond three sessions are not allowed and will result in a penalty of 5% of the total course grade for each additional session. Unexcused absences for two or more consecutive weeks without the express permission of the professor may result in administrative withdrawal.

On the exams, quizzes, essays, and other assignments, please make sure to provide the source of the article. You will get no extra points for being verbose. Clear, concise, and to the point should be your mantra.

All assignments must be turned in on the due date. Late assignments will have a Penalty.

Zoom Expectations

Please log in with your Dominican email address. Use your first and last name as your screen name. Your attention should be focused on the class, not any other distractions. Therefore, students are asked to have their video on. If you feel uncomfortable with your video on, please let the instructor know. If you would like to ask or answer a question, please use the "Raise Hand" icon. Additionally, please keep your microphone muted unless you are speaking. This will help to limit distracting background noises. Remember to unmute when it is your turn to speak. Students may also use the group Chat feature, but note that it is visible to everyone, and your comments will appear in the session archive.

Quizzes and Homework

Quizzes and homework assignments are intended to give students feedback concerning their mastery of essential instructional objectives. It is given to students to encourage students to read the textbooks, and class lectures to study the material in a timely fashion. The questions included on the quizzes and homework are carefully selected to represent only those outcomes that are regarded as basic.

Mid Term Exam: The mid-term exam is in the form of a quiz with short answers and is intended to assist in the reflection of the concepts learned in the class.

Final Exam: The final exam will cover the basic concepts learned in the course, also in the form of a quiz with short answers, and is intended to assist in the reflection of the concepts learned in the class.

Final Project (Individual)
Each student picks a project assigned at the beginning of the course and will prepare a case study on a chosen topic. There are two tracks for the project. Student, based on personal interest will chose one of the two tracks. The project output at the end of the course will be a paper describing the case prepared and a presentation to the class.

Business Application Track: In this track, the student plays a role of a business consultant addressing a serious business issue and presents a solution that addresses the issue using Machine Learning. The student will choose one out of three choice business problems given during the beginning of the course. The student will apply the learnings from the course supplemented by research to analyze the problem and provide a recommendation that addresses it using Machine Learning.

Machine Learning Implementation Track: In this track, the student choses an implementation of a Machine Learning algorithm and uses the tools discussed in the class.

Student Presentations: Each student chooses a personal topic of interest related to AI and Machine Learning and presents an executive briefing on the topic to the class.

Students Who Require Accommodations
Include: Dominican University of California is committed to equal access for all students in accordance with the Americans with Disabilities Act of 1990. Students who feel they may need accommodations based on the impact of a disability should contact the Office of Accessibility and Disability Services at 415-257-1388 or email accessibility@dominican.edu as soon as possible to discuss specific accommodations. Please submit the subsequent paperwork to the instructor right away.

Student Course Evaluations
The Dominican University of California is committed to an ongoing evaluation of its programs and courses through a culture of constructive dialogue and feedback. It is expected that students will complete the course evaluation either in class or outside of class. The instructor will determine the time for the course evaluation to be completed. A link to the course evaluation will be sent to all the students enrolled in the class by the IT Department. The evaluation may be completed on a laptop, tablet, or mobile device. A laptop can be checked out from the library if needed.

University Policies Section

6. Academic Honesty Honor Code

Students are expected to adhere to the Academic Honesty Honor Code stated in the catalog.

Students should practice academic integrity in all of its forms, including abstaining from plagiarism, cheating, and other forms of academic misconduct. The University reserves the right to determine in any given instance what action constitutes a violation of academic honesty and integrity.

Plagiarism is a very serious matter. Plagiarism, like cheating on an assignment or exam, is a violation of the University Honor Code. The policy on plagiarism can be found here.

7. Diversity, Equity, and Inclusion

Specifically indicate how diversity will be integrated into the course curriculum in terms of content, pedagogy, and learning outcomes. The Office of Diversity, Equity, and Inclusion has developed Diversity Guidelines for Faculty and resources to assist in the preparation of curricula and syllabi that meet the diversity requirements for academic program reviews and support the University's Diversity Declaration.

University Resources Section

8. Library Support

The Alemany Library is an active partner in your academic success. The library provides one-to-one research help, academic resources, technology, and quiet individual and group study spaces. Students may book an appointment and refer to the library website.

9. Students Who Require Accommodations:

The Dominican University of California is committed to equal access for all students in accordance with the Americans with Disabilities Act of 1990. Students who feel they may need accommodations based on the impact of a disability should contact the Office of Accessibility and Disability Services at 415-257-1388 or email accessibility@dominican.edu as soon as possible to discuss specific accommodations. Please submit the subsequent paperwork to the instructor right away.

10. Student Support

Visit the student portal for information and resources (including Tutoring & Learning Center, CARE Team, Counseling Services, Integrative Coaching, & more). The Student Success Center may also be reached at (415) 485-3296, or sscstu@dominican.edu

11. Course Evaluations

The Dominican University of California is committed to an ongoing evaluation of its programs and courses through a culture of constructive dialogue and feedback. It is expected that students will complete the course evaluation either in class or outside of class. The instructor will determine time for the course evaluation to be completed. A link to the course evaluation will be sent to all the students enrolled in the class by the IT Department. The evaluation may be completed on a laptop, tablet, or mobile device.

12. Title IX

As instructors, one of our responsibilities is to help create a safe learning environment for our students and for the campus as a whole. As part of our commitment to students' wellbeing, we have the responsibility to report any instances of sexual harassment, sexual violence, relationship violence, or stalking to our Title IX Coordinator, so they can inform students about their reporting options and the various support resources available. Student privacy is a priority for us and will be maintained to the extent permissible by law and policy. For more information about your rights and reporting options, including confidential and anonymous reporting, please visit Sexual Misconduct, Title IX, and Discrimination. Email: titleix@dominican.edu.

13. Student Conduct (University Wide)

Visit the Student Handbook and Code of Conduct Section 5 Code of Conduct

14. Course Schedule

Course Schedule

Date	Day	Class Activity	Assignment Due

Jan 14	Sat	• Introductions & what to expect
		• Syllabus Review
		• Lecture & Discussions
		  ○ What is Machine Learning?
		  ○ The Data Science Mindset
		  ○ Machine Learning Categories
		  ○ Machine Learning Tools
		• Class project discussion
		• Assessment quiz discussion
			• N/A

Jan 17	Tue	• Lecture & Discussions
		  ○ Data Management
		  ○ Applications of Regression Analysis & Discussion
		• Assignment 1 (textbook excercizes)
			• Assessment Quiz (Not Graded) due
			• Class Project Selection due

Jan 23	Mon	• Lecture & Discussions
		  ○ Clustering
		  ○ Bias, Variance and Fitting
		  ○ Examples
		• Student Presentation topics discussion
		• Assignment 2 (Regression)
			• Assignment 1 Due

Jan 28	Sat	• Lecture & Discussions
		  ○ Rule-Based Learning – Decision Trees
		  ○ Examples
		  ○ Machine Learning in Fraud detection
		  ○ Student Presentations & Discussion
		  ○ Project discussion
			• Assignment 2 due
			• Student Presentation topic assignment posted. Submit your presentation after you have given the presentation in class.

		• Assignment 3 (Machine Learning Model Evaluation Exercises) • Assignment 4 (final project Paper Outline)	

Jan 30	Mon	• Lecture & Discussions
		  ○ Anatomy of an End-to-End Machine Learning Project
		  ○ Machine Learning application in Contract Management
		  ○ Student Presentations & Discussion
		  ○ Project discussion
		• Mid Term Exam (Take Home)
			• Student presentations Batch 1

Feb 06	Mon	• Lecture & Discussions
		  ○ Instance-Based Learning – Support Vector Machines
		  ○ Student Presentations
		  ○ Project discussion
			• Mid Term Exam Due
			• Student presentations Batch 2
			• Assignment 3 Due

Feb 11	Sat	• Lecture & Discussions
		  ○ Machine Learning application to detect Insider Threats
		  ○ Introduction to Deep Learning
		• Assignment 5
			• Assignment 4 due
			• Student presentations Batch 3

Feb 13	Mon	• Lecture & Discussions
		  ○ Machine Learning application in healthcare
		  ○ Application of Deep Learning
		• Assignment 6
			• Assignment 5 Due

Feb 20	Mon	• Review of the course learnings • Final Exam (Take Home)	• Assignment 6 due • Final Project Presentations
Feb 25	Sat	• Final Project Presentations in class	• Final Paper and Presentations Due (Moodle) • Final Exam due

BSB Graduate Speakers Series

DATE: TBD (2/28 or 3/1)

Link to the Conference

Assessment Quiz

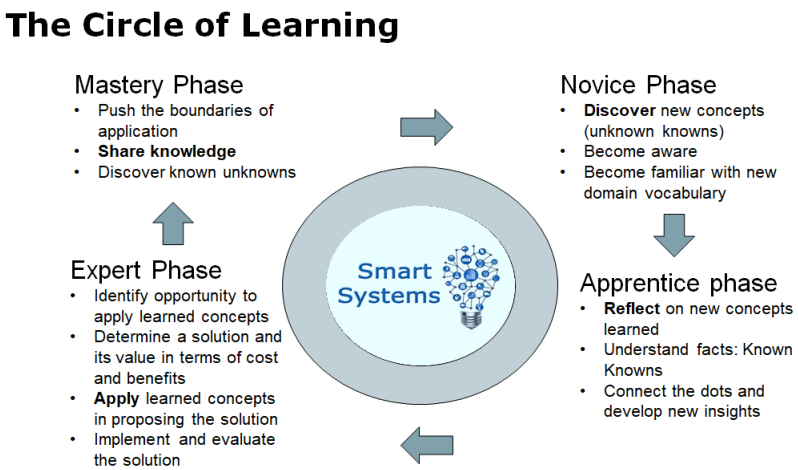
An assessment quiz at the beginning of the course (which is not graded) is used provide an understanding of prerequisites and to set goals and objectives.

Process of Learning in this Class

Learning a new subject and developing mastery is a process. One starts the process with discovery of concepts as a novice, reflects on the concepts in an apprentice phase with guidance from others, starts applying the concepts learned to develop expertise. Practice provides the

experience required to develop mastery and a master shares the concepts mastered to other novices and in the process discovers new concepts and the journey continues.

This course uses the Discover – Reflect – Apply – Share Knowledge, process.



15. Disclaimer

This syllabus is subject to modification. The instructor will inform students of any changes. Please see Moodle Course online for deliverable due dates and assignments.