



ARTIFICIAL INTELLIGENCE CS-617-BO

Spring 2023

Course & Instructor Information

	Information
Instructor Name	Professor Maria Wofford
Instructor Email	woffordj@sacredheart.edu
Office Hours	By Appointment (Calendar on Teams)
Course Format	Synchronous, Live Lecture capture in Teams (However, it is expected that you will attend all classes live)
Course Location	Online (Blackboard, Teams)
Meeting Times	Thurs 6:30pm – 9:30pm starting January 5, 2023

Course Prerequisites: CS-504 OR BUAN-651

Course Description and Purpose

This course will introduce you to various forms of artificial intelligence (AI). Taking a look at how we interact with AI as consumers in applications such as chatbots and recommendation engines. You'll see how AI in business provides analytics and consider industries that may be transformed or even disrupted by AI implementations. We will look at how computers can "learn" using artificial neural networks and various forms of machine learning, by reviewing techniques and algorithms used in AI, such as search, decision-making, and machine learning. We will also discuss ethics and the social impact of AI, including issues related to bias, privacy, and the potential for AI to impact jobs and society

This course provides a theoretical and a practical understanding of the fundamentals of Artificial intelligence, from a computer science perspective.

We will be covering the mathematical concepts that support machine learning to understand what makes artificial intelligence the popular field of study of our time. We will use chapters from the textbooks as a weekly learning resource, and the use of relevant online tools and resources to supplement what is provided in class will also be considered. You will be responsible for participating in active discussions and submitting writing assignments on various subjects pertaining to material presented. It is expected that all materials submitted follow the standards for graduate level academic submissions.

In this course, we will:

- Study fundamentals of Artificial Intelligence
- Learn about several common mathematical principles of popular AI approaches
- Understand the difference categorizations of Artificial Intelligence
- Design, and implement a prototype an AI solution

As with most technical courses, it takes time to learn and master the subject. Expect to spend an average of 5 to 8 hours a week for this course; some of you may spend more time, some less time.

Learning Objectives

1. Understand what constitutes “Artificial” Intelligence and how to identify systems with Artificial Intelligence
2. Understand the limitations of current Artificial Intelligence techniques
3. Familiarity with Artificial Intelligence techniques, such as Neural Networks and Machine Learning
4. Recognize how Artificial Intelligence enables capabilities that are beyond conventional technology, for example, prediction and classification, self-driving cars, robotics
5. Ability to apply Artificial Intelligence methods and engineering techniques for solving narrowly defined problems

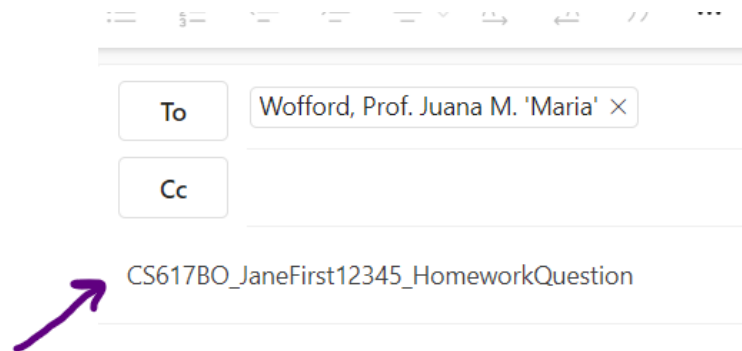
Important Information

- Instructor Availability: By appointment , Calendar located in Teams
- Communication: All course-related communication should be posted on Blackboard Discussion section, so that all other students can benefit from relevant discussions. There are two exceptions: (i) no personal matters should be posted (ii) do not post requests about getting help with your individual work. When in doubt, feel free to send an email to the instructor asking where to post. You should all access Blackboard for updates on assignments and examples as frequently as possible. Please read over the Academic Integrity Policy carefully.
- Attendance: Attendance is required. You must have your camera on during class, unless otherwise instructed. If you can't attend class, you need to inform your instructor. Students are expected to review the posted online lectures, the week before class. Each class missed beyond one will result in 5-point reduction of your FINAL grade. NO EXCUSES...NOT NEGOTIABLE.
- ALL TESTS MUST BE TAKEN ON TIME. MAKE-UP EXAMS GIVEN ONLY IF EXTREME CIRCUMSTANCES EXITS.
- All homework must be submitted ON TIME electronically through Blackboard.
- Submitting your work electronically: Designated electronic submission boxes on Blackboard for each student to submit their work. Such boxes automatically have expiring timers on them. It is strongly advised NOT to wait until the last minute to submit your work. It is the students' responsibility to have access to a reliable, working connection to the

Internet to submit their work. The only exception will be unexpected downtime on the submission system (i.e. Blackboard). Please Note: If your laptop is not available for any reason, you need to inform your instructor. Unavailability of your personal laptop is no excuse for late assignments

- Emailing the instructor: You must include the Course ID, Your Name and Student ID and the subject of the email. If you fail to format your email in this manner it may be overlooked.

Example:



- Changes to the Syllabus: This syllabus and course outline is subject to change by the instructor during the course of the term. Changes may be necessary because of student's specific interests, the general class progression and emerging topic of interest. If such changes are implemented, they will be announced in class and posted to Blackboard.
- Data for Research Disclosure: Any and all results of in-class and out-of-class assignments and examinations are data sources for research and may be used in published research .All such use will always be anonymous.
- Key Assignments and Important Dates will be available on Blackboard.
- Prior programming experience and the knowledge or ability to learn Python are assumed.
- Students will be greatly assisted by familiarity and experience with basic algorithms and data structures, as well as a grounding in probability

Course Materials

Textbook and Recommended Materials:

Textbook: Data-Driven Science and Engineering, Machine Learning, Dynamical Systems and Control 2nd Edition, Steven L. Brunton, J. Nathan Kutz

Recommended References: (Note: Additional resources located on Blackboard you are expected to familiarize yourself with all resources listed)

1. Elements of Statistical Learning, by Trevor Hastie, Robert Tibshirani, and Jerome Friedman
2. Artificial Intelligence: A Modern Approach by Stuart Russell and Peter Norvig
3. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, by Wes McKinney, 3E
4. Python: 3.11.x
5. Anaconda: (IDE)

Grades

Please read this section carefully.

You will be learning and practicing many aspects of artificial intelligence. What you get out of the course will depend on what you put into it! In order to give you a fair grade at the end of the semester, keep in mind, you will be evaluated on the work you submit.

- Online Grade Summary: Blackboard has a grade book that I use to store all of your grades. It is your responsibility to verify that the grade on Blackboard is correct. If an error is found, notify me and I will correct Blackboard.
- Due dates: The due dates within each assignment are posted. It is your responsibility to make sure you submit assignments on time.

Final grades will be determined by student performance according to the following:

Assignment/Assessment	Available Points	
Weekly Class Discussion Participation	10	Participation in class discussion on Blackboard each week; Each student is expected to initiate a discussion each week, and also participate in at least two other posts by other students for that same week. The following Rubik applies: -Minimal response to the week discussion : 1pt -Responds to the weekly discussion and stimulates discussion: 2pts.
Weekly Assignments	20	You will be learning several new concepts on Artificial Intelligence each week. You will complete a learning activity related to the weekly covered materials.
Homework	20	Homework assigned each week; you must submit before the due date for credit. Late assignments may not be accepted, if they are accepted a penalty of 2 points will be automatically deducted. No exceptions.
Research and Implementation Project	50	You will research an AI topic (We will review a list in class). Your evaluation will be composed of an initial abstract summary, a mid-term related progress report, and an end of term video presentation.
Total	100	

Letter Grade Rubric:

Following rubric provides a basis for letter grades in this course.

Total Points	95 -	90 -	87 -	83 -	80 -	77 -	70 -	Below 70
Letter Grade	A	A-	B+	B	B-	C+	C	F

Student Expectations

Academic Misconduct

The following set of rules will help keep us all on the same page all semester and help to ensure fair treatment for all students.

- Academic misconduct hurts everyone but particularly the student who does not learn the material. All work submitted for an individual grade must be the work of that single individual. Your project code and writeups must be written exclusively by you. Use of any downloaded code or code taken from a book (whether documented or undocumented) is considered academic misconduct and will be treated as such.
- The outside world allows collaboration and so do we, but there are rules to follow to ensure that you learn the material.
 - Help cannot consist of copying code or solutions. If someone offers to help you this way, they are not helping you to learn the material!
 - For the projects, you may discuss ideas with other students, but you cannot share code or specific solutions.
 - For any homework assignments, you may form study groups for help at the concept level, but each homework must be in your own words, and you must write your study partners' names on your homework when you turn it in. If you do not write your study partners' names on your homework and they are similar, we will charge you with academic misconduct.
 - Do not show another student a copy of your projects or homework before the submission deadline. The penalties for permitting your work to be copied are the same as the penalties for copying someone else's work.
 - Make sure that your computer account is properly protected. Use a good password, and do not give your friends access to your account or your computer system. Do not leave printouts or mobile drives where others might access them.
 - Upon the **first documented occurrence of academic misconduct**, I will report it to the **Office of Academic Integrity**. Please make sure to read and submit the Students Guide to Academic Integrity is available here:

Academic Integrity

All university programs and courses adhere fully to the University Policy on Academic Integrity, as stated in the [Undergraduate and Graduate Catalogs](#) and on the [Academic Integrity Web Page](#). Academic dishonesty (e.g., cheating, plagiarism, and other unethical behavior) will result in a grade of F for the course.

Fostering our Classroom Community

Please read the document named: **Guidelines for Classroom Civility and Respect** on Blackboard

Policy on Syllabus Changes and Contractual Obligations

This syllabus and course outline is subject to change by the instructor during the semester. Changes may be necessary because of students' specific interest(s), the general class progression,

and class cancellations. If such changes are implemented, they will be announced in class and posted online. This syllabus and any addendums attached shall not be construed by the student as a contract, implied or expressed, between the student and/or the professor and the University.

How We Support Your Learning at SHU

Support from Your Instructor

I am ready and eager to support your learning in this course. Weekly office hours are a dedicated time where I am available to meet with you to discuss course content, answer your questions, and provide feedback on assignments. If you have a scheduling conflict with office hours, please email me to schedule an appointment. I look forward to talking with you!

Our Commitment to Inclusive Excellence

Inclusive Excellence is the recognition that our institution's success is dependent on how well we value, engage, and include the rich diversity of students, staff, faculty, administrators, alums, and surrounding community. It is a mastery of inclusion that fosters a consistent sense of belonging. Inclusive Excellence is aspirational and is the pillar that guides the mission, vision, and function of [Inclusive Excellence](#).

Sacred Heart affirms and strives to make available for every student a learning environment that is welcoming, equitable, culturally sensitive, and is supported by curricula that celebrate diverse perspectives, fosters agency, and encourages the capacity for self-advocacy. Although we at SHU know there is much work to be done, we will do what is needed to advance the cause of social justice on our campus and in the community as we learn together and from each other.

To achieve Inclusive Excellence, our personal and organizational responsibilities are to:

- Actively promote a collegial environment and consciously apply our mission and values to create a culture of inclusion and belonging; a safe space where all may thrive and succeed.
- Participate in educational and developmental activities to increase awareness and competencies of issues related to diversity, equity, inclusion, and belonging; apply that understanding to guide your approach to all aspects of your student role and to the community as a whole.
- Demonstrate that we are "Stronger Together" as described in the [Office for Inclusive Excellence statements](#).

If you have any ideas about ways to enhance your success from the perspective of Inclusive Excellence, please contact inclusiveexcellence@sacredheart.edu. If you feel that you have witnessed or experienced bias, discrimination, or harassment in any way, you are encouraged to submit a [Bias Incident Report](#) or contact inclusiveexcellence@sacredheart.edu.

If you are experiencing challenges relating to access to food, housing, technology, or other resources that may affect your performance in this course, you are urged to contact the dean of students, Larry Wielk at wielkl@sacredheart.edu.

The Center for Teaching and Learning

The Center for Teaching and Learning (CTL) offers the following services free of charge to all SHU students: 1-on-1 tutoring with professional and peer tutors; group study sessions and office hours led by Classroom Learning Assistants (CLAs); specialized Learning Labs in math, biology, and genetics; writing support through the Writing Center and online writing lab (OWL). The University encourages all students to proactively seek academic support.

The CTL is located on West Campus in suite W-223B. Students can schedule tutoring appointments on the tutoring portal. For more information, please contact Lisa Henderson, Coordinator of Learning Support Services, at hendersonl3@sacredheart.edu, or visit our [learning support services webpage](#).

Academic Accommodations & The Office of Student Accessibility

Sacred Heart University provides equal educational opportunities for all students regardless of disability status. Students requesting accommodations should contact the [Office of Student Accessibility](#). Students must be registered with the Office of Student Accessibility and submit appropriate documentation to be granted accommodations. For further information about requesting accommodations, please contact Kathy Radziunas, Director of the Office of Student Accessibility, radziunask@sacredheart.edu, or Laurie Scinicariello, Assistant Director of the Office of Student Accessibility, scinicariello@sacredheart.edu.

Video and Audio Recording

"To the extent permitted by federal and state copyright laws, the class lectures and materials provided by the professor are copyrighted. By participating in the class lectures, students consent to the video and audio recording of said lectures. As part of the requirements of the course, students are required to participate, whether in person or via electronic communications. At the professor's discretion, he or she may require students to leave their audio and video devices on during the class lectures."

Statement regarding recording and distribution of course sessions

Students who wish to make an auditory or visual recording of any portion of the class must obtain the instructor's consent ahead of time. Any such recording is for personal use only. It may not be shared, copied, uploaded to the Internet, and/or distributed without written permission from the instructor as well as any student who appears or is heard in the recording. For further information, please refer to the Academic Catalog. Violation of this policy may subject a student to disciplinary action.

Statement on Diversity, Equity, and Inclusion

Sacred Heart affirms and strives to make available for every student a learning environment that is welcoming, equitable, and culturally sensitive and is supported by a curriculum that celebrates diverse voices, fosters agency, and encourages the capacity for self-advocacy. Although we at SHU know there is much work to be done, we will do what is needed to advance the cause of social justice on our campus and in the community as we learn together and from each other. To read more, visit the You Belong at SHU web page.

If you have any ideas about ways to enhance your success, please reach out to me. If you feel that you have been mistreated in any way, you should contact the SHU Bias Response Team. If you are experiencing challenges relating to access to food, housing, technology, or other resources that might affect your performance in this course, you are urged to contact the Dean of students, Larry Wielk.

Disability Services

Sacred Heart University provides equal educational opportunities for all students regardless of disability status. Students requesting accommodations should contact the Office of Student Accessibility, (<https://www.sacredheart.edu/offices--departments-directory/student-success-center/office-of-student-accessibility/accommodations-process/>). Students must be registered with the Office of Student Accessibility and submit appropriate documentation to be granted accommodations. For further information about requesting accommodations, please contact Kathy Radziunas, Director of the Office of Student Accessibility, radziunask@sacredheart.edu, or Laurie Scinicariello, Assistant Director of the Office of Student Accessibility, scinicariello@sacredheart.edu.