

ISM 647: Artificial Intelligence and Machine Learning Applications

Spring 2023

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CATALOG DESCRIPTION:

Cognitive Computing and Artificial Intelligence based applications are increasingly employed by businesses to generate insights from data. Students are introduced to principles, techniques, and models for developing these systems.

STUDENT LEARNING OUTCOMES (SLOs):

Upon completion of this course, students will demonstrate a broad knowledge and clear understanding of critical concepts, practices and issues in Cognitive Computing and Artificial Intelligence and Machine Learning Applications.

Specific course outcomes are:

1. Identify how Artificial Intelligence, Machine Learning and Cognitive Computing are related together and are used for application development
2. Identify, design, and assess Cognitive Computing and Artificial Intelligence Applications use and requirements
3. Describe Cognitive computing, Machine Learning and Artificial Intelligence Applications based techniques and models.
4. Prepare and formulate data collection, sampling, preprocessing for such systems
5. Explore the technical and managerial issues in developing and using applications based on cognitive computing and Artificial Intelligence Applications techniques.
6. Apply and assess Cognitive Computing, Machine Learning and Artificial Intelligence Applications in an organizational setting.

COURSE ATTENDENCE:

This course is **Web based** and delivered **on-line in an asynchronous mode**. The course blends online asynchronous lecture presentations, assignments, an exam, and discussions to achieve its learning objectives. We will have weekly live streamed zoom lectures and office hours. Please note that this time slot, **Thursdays starting at 5:30 PM est**. You can join these live streamed lectures via Zoom link available on Canvas. These lectures and discussions will be recorded and can be viewed at your convenience. Although attendance is not required, I strongly urge you to attend these lectures. Whether you attend these classes synchronously or view them later, you are responsible for topics discussed in course.

COURSE MATERIAL

- **Teaching Material:**

Teaching material, assignments, supplemental readings, and other learning recourses needed for this course are available electronically at the course Canvas site. It is your responsibility to read the assigned readings. Please sign into Canvas to gain access to the material and come back frequently, as I upload new content throughout the semester.

- **Optional Textbook:**

Cognitive Computing and Big Data Analytics, By: Judith Hurwitz, Marcia Kaufman, Adrian Bowles. Publisher: John Wiley & Sons P&T. Print ISBN: 9781118896624, 1118896629. eText ISBN: 9781118896785, 1118896785. This book is available in ebook and print format. I will refer to this text as CCBD.

COURSE ASSIGNMENTS

You will have 3 topical assignments each one dealing with specific topic in AI or Cognitive Computing. These assignments must be done in teams of NOT MORE THAN 4 persons. You will be responsible to constitute your own team. I will assist you with team construction if you are unable to create your own team. If you prefer to do your assignments individually, please notify me. The assignments use a variety of different software that may include Corvid Expert System and Microsoft Azure or IBM Watson. Assignments details and due dates will be forthcoming during the course. Assignments turned in late will be assessed a grading penalty. Assignments submitted after the due date may not be accepted but, if they are based on valid excuse, there will be a minimum of a 20% reduction for each day late. Also, any assignment that requires rework will be assessed at least 20% penalty.

FINAL EXAM

An on-line final exam is required for the course and will be administered during the last week of spring term. The exam will test your knowledge of Cognitive Computing topics discussed during the course. Details of the exam will be forthcoming during the course. Final exam should be completed on your own. No teamwork is allowed on this exam.

CLASS DISCUSSION BOARD AND PARTICIPATION IN ON-LINE SESSIONS

Each student is required to regularly participate in on-line discuss forums. I have posted questions to the discussion board under “What Do You Think?” threat and ask you to comment on them. Your answers will be graded and counted toward your final grade. Additionally, you are required to post feedback on two of your peer’s answers.

EVALUATION AND GRADING:

The course will be letter graded. A student’s final grade will depend on the quality of the project components.

Contribution to class discussion board	200
Assignments	550
Final Exams	<u>250</u>
Total	1000

Letter Grades and Points

931-1000 = A, 900-930 = A-, 860-899 = B+, 830-859 = B, 800-829 = B-, 760-799 = C+, 730-759 = C, 700-729 = C-, 690 and below =F

Course Outline

Please note that this schedule is tentative, and changes may be required during the semester.

Weeks 1 and 2	Introduction to the Course Introduction to Artificial Intelligence and Machine Learning Introduction to Cognitive Computing Readings: Canvas articles and CCBD Chapters 1, 2 and 8
Week 3	Artificial Intelligence and Machine Learning Techniques, Theories and Applications Readings: CCBD Chapters 1, 2 and Canvas articles
Week 4	Machine Learning (Descriptive, Predictive and Prescriptive Analytics Modeling Techniques and Applications) Readings: CCBD Chapter 4 and Canvas articles
Week 5	Cognitive Computing Application Development Readings: CCBD Chapters 6, 10, 11, 12 and Canvas articles
Week 6	Knowledge Based Cognitive Computing and Knowledge Engineering Readings: CCBD Chapters 5 and Canvas articles Assignment 1 Due
Week 7	Rule Based Cognitive Systems and Expert System Applications Readings: CCBD Chapters 5 and Canvas articles
Week 8	Artificial Neural Networks Theories and Applications Readings: Canvas articles
Week 9	Deep learning Theories and Applications Readings: Canvas articles
Week 10	Natural Language processing and Speech Recognition Readings: CCBD Chapters 3 and Canvas articles Assignment 2 Due
Week 11	Computer Vision Theories and Applications Readings: Canvas articles
Week 12	Social Networking for Cognitive Computing and Social Network Analytics Readings: Canvas articles
Weeks 13-14	Work on Assignment 3 and Prepare for Final Exam Assignment 3 Due Final Exam Due