

ISM 647: Cognitive Computing and Artificial Intelligence Applications



Spring 2021

Instructor: Dr. Hamid R. Nemati
Office: 425 Bryan Building
Voice Mail: 334-4993
E-Mail: nemati@uncg.edu

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 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 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 and Artificial Intelligence Applications in an organizational setting

COURSE MATERIAL

This course is **Web based** and delivered **on-line**. It blends assignments, online discussions, and a final exam.

- **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 Cognitive Computing. These assignments must be done in teams of NOT MORE THAN 3 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 sessions and discuss forums. It is your responsibility as a student to know what is going on in the course and “I did not know” is not an acceptable excuse for missing any deliverables. Periodically, I will post 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	100
Participation in on-line sessions	50
Assignments	550
Final Exams	<u>300</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

ATTENDANCE POLICY:

Since this is an online class, no physical class-room attendance is required. However, I will hold weekly Zoom on-line teaching sessions as needed. You are encouraged to attend these sessions, since they will cover various aspects of the course. Although you are not required to attend these sessions, it is highly recommended that you attend them synchronously. If you are not able to attend them in real time, you are required to view the recordings of these sessions asynchronously at your convenience. Typically, these sessions will be once a week. Please note that this time slot is carefully selected and coordinated as not to create a conflict with other MSITM courses. In either case, it is your responsibility to stay on track with readings and assignments to be successful in the course.

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