ISM 647: Cognitive Computing and Artificial Intelligence Applications
Spring 2020
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CATALOG DESCRIPTION:
Cognitive Computing and Artificial Intelligence based applications are increasingly employed by businesses to generate insight 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. Prepare and formulate data collection, sampling, preprocessing for such systems
4. Describe Cognitive computing and Artificial Intelligence Applications based techniques and models
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, final project and a final exam.

- Required 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.

- Other Teaching Material:
  Other teaching material, assignments, supplemental readings and other learning resources 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.

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 4. You will be responsible to constitute your own team. I will assist you with the 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 PROJECT AND REPORT**
This final project is also done in teams. For this project, your team should develop a final research proposal and a final report on a topic of approved by the instructor. This project topic must be related to one or more aspect(s) of topics discussed in the course, where you will be developing and/or examining the impact of Cognitive Computing methods and models in a business environment. This project will have two parts. The first part is a report where you propose and describe your final project topic, its importance and a proposed methodology. The second part is the actual project implementation and write up. I will describe this project further as we go along in the course.

**FINAL EXAM**
A timed on-line final exam is required for the course. The exam will test your knowledge of Cognitive Computing topics and the use of software. Details of the exam will be forthcoming during the course. Final exam should be completed on your own. No team work is allowed on this exam.

**CLASS DISCUSSION BOARD AND PARTICIPATION IN WebEx SESSIONS**
Each student is required to regularly participate in all on-line WebEx session and discuss online with the instructor. 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.

**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 and Participation in WebEx sessions: 50
- Assignments: 450
- Final Project and Report: 200
- Final Exams: 300
- Total: 1000

Letter Grades and Points

**ATTENDANCE POLICY:**
Since this is an online class, no physical class-room attendance is required. However, I will hold weekly WebEx 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 on Mondays 5:15-6:30 PM. 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 Machine Learning
Introduction to Cognitive Computing
Required Reading: CCBD Chapters 1, 2 and 8 and Canvas articles

Week 3
Machine Learning Techniques, Theories and Applications
Required Reading: CCBD Chapters 1, 2 and Canvas articles

Week 4
Descriptive, Predictive and Prescriptive Analytics Modeling Techniques and Applications Review
Required Reading: CCBD Chapter 4 and Canvas articles

Week 5
Cognitive Computing Application Development
Required Reading: CCBD Chapters 6, 10, 11, 12 and Canvas articles
Final Project Part 1 Due.

Week 6
Artificial Neural Networks Theories and Applications
Required Reading: Canvas articles
Assignment 1 Due

Week 7
Deep learning Theories and Applications
Required Reading: Canvas articles

Week 8
Knowledge Engineering and Rule Based Expert Systems
Required Reading: CCBD Chapters 5 and Canvas articles

Week 9
Spring Break

Week 10
Rule Based Expert Systems and Expert System Applications
Required Reading: CCBD Chapters 5 and Canvas articles
Assignment 2 Due

Week 11
Natural Language processing and Speech Recognition
Required Reading: CCBD Chapters 3 and Canvas articles

Week 12
Computer Vision Theories and Applications
Required Reading: Canvas articles

Week 13
Social Networking and Social Network Analytics
Assignment 3 Due

Weeks 14
Work on Final Projects/ Prepare for Final Exam
Final Project Due.
Final Exam Due