



## **ISM 647: Cognitive Computing and Artificial Intelligence Applications**

**Spring 2019**

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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. All teaching material including text books, assignments, handouts 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. The assignments use a variety of different software that may include Corvid Expert System and Microsoft Azure. 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**

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 PROJECT AND REPORT**

You must join a group of NOT MORE THAN 4 to 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.

## **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	<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 it is an online class, no physical class-room attendance is required. However, I will have weekly WebEx on-line sessions that you are required to attend. Typically, these sessions will be on **Thursday 5:30-6:30 PM**, It is the student’s responsibility to stay on track with readings and assignments to be successful in the course.

## **NETIQUETTE:**

The same guidelines that apply to traditional classes should be observed in the virtual classroom environment. Please use proper netiquette when interacting with class members and the professor.

## **POLICY ON SERVER UNAVAILABILITY OR OTHER TECHNICAL DIFFICULTIES**

The university is committed to providing a reliable online course system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will extend the time windows and provide

## **ELECTRONIC MAIL AND ACCOUNTS:**

You should check your UNCG email and Canvas Course link regularly as I may send email updates or add new info on BB on an ongoing basis. You will be responsible for any information or announcements contained in the email messages or updates on Canvas.

## **ACADEMIC INTEGRITY, ETHICAL ISSUES AND THE HONOR CODE POLICIES:**

Students are responsible for becoming familiar with the Academic Integrity Policy in all its aspects and for indicating their knowledge and acceptance of the Policy by signing the Academic Integrity pledge on all major work submitted for the course. All individual assignments must be done by only you. Individuals should not

work on assignments together. A single failure to follow this policy will result in a grade of 0 on that assignment; subsequent violations of this policy will result in a grade of F for the course. University students are expected to conduct themselves in accordance with the highest standards of academic honesty. I will pursue cheating as far as the university allows me. Specific information on the Academic Integrity Policy may be found on the UNCG web site at <http://academicintegrity.uncg.edu>

## **STATEMENT OF STUDENTS' RIGHTS AND RESPONSIBILITIES**

### **You have the right to expect:**

1. Your professor to be prepared for each class, to start class promptly at the designated time and to end class at the designated time.
2. Your professor to teach all scheduled classes or arrange for a qualified substitute if it is necessary to miss class because of illness or University approved commitments.
3. Clear statements of course expectations, policies, testing and grading practices and student performance.
4. Your professor to hold a reasonable number of office hours to discuss assignments or to assist you with course matters.
5. Your professor to read and respond to student emails in a timely fashion – weekdays within 24 hours and weekends within 48 hours.
6. Knowledgeable assistance from your professor regarding class assignments and course content.
7. Professional behaviors reflecting equitable treatment, ethical practices and respect for your rights.
8. Opportunities to challenge ideas and defend your beliefs in a professional manner.
9. To be challenged to grow both academically and professionally. This means I may openly disagree with some responses or comments. Use such exchanges to grow intellectually.
10. Information regarding career opportunities related to ISM programs.
11. Your professor to abide by University policies.
12. Fairness and clarity in evaluation of your performance.
13. Adequate opportunity to appeal any perceived violations of the above rights.

### **You have specific responsibilities to:**

1. Read your UNCG email at least once each 24 hours;
2. Read all posted announcements in the course management system;
3. Keep track of your class grades all the time and report any grading immediately;
4. Commit yourself to grow academically and professionally;
5. Plan your study and work schedule appropriately to allow sufficient time to do quality work in the course (Review “Suggested Academic Workload Guidelines” for the Bryan School of Business and Economics published in the UNCG Undergraduate Bulletin);
6. Complete all assignments in a professional manner;
7. Strictly adhere to the posted deadlines. Otherwise, accept the penalty based on the policies specified by the instructor;
8. Practice ethical behaviors and display respect to the rights of others;
9. Timely contact your instructor and discuss circumstances that may prevent you from achieving acceptable performance;
10. Understand and follow the school and course policies, including the UNCG Academic Integrity Policy (<http://sa.uncg.edu/dean/academic-integrity/>), and report observed violations of these policies.

# Course Outline

This schedule is tentative, and changes may be required during the semester.

<b>Weeks 1 and 2</b>	<b>Introduction to the Course Introduction to Machine Learning Introduction to Cognitive Computing</b>
<b>Week 3</b>	<b>Machine Learning Techniques, Theories and Applications</b>
<b>Week 4</b>	<b>Descriptive, Predictive and Prescriptive Analytics Modeling Techniques and Applications Review</b>
<b>Week 5</b>	<b>Cognitive Computing Application Development Final Project Part 1 Due.</b>
<b>Week 6</b>	<b>Artificial Neural Networks Theories and Applications Assignment 1 Due</b>
<b>Week 7</b>	<b>Deep learning Theories and Applications</b>
<b>Week 8</b>	<b>Computer Vision Theories and Applications</b>
<b>Week 9</b>	<b>Fall Break</b>
<b>Week 10</b>	<b>Knowledge Engineering and Rule Based Expert Systems Assignment 2 Due</b>
<b>Week 11</b>	<b>Rule Based Expert Systems and Expert System Applications</b>
<b>Week 12</b>	<b>Natural Language processing and Speech Recognition</b>
<b>Week 13</b>	<b>Social Networking and Social Network Analytics Assignment 3 Due</b>
<b>Weeks 14</b>	<b>Work on Final Projects/ Prepare for Final Exam Final Project Due. Final Exam Due</b>

## Course Routine and Schedule

To provide some structure to each week of study, we will follow the routine described below:

- On each **Monday to Wednesday** of a particular week, check the Canvas for that week. You should look for the online of topics for the week, and download and start reading the week's reading and plan on viewing the multimedia files, etc.
- By **Thursday or Friday** of each week, you should have completed the readings and tutorial and start working on any assignments. In those days, you should look on Canvas a couple of times a day for Discussion Board questions, Blogs and Wikis to read and enter into the interactive exchanges with other students and the instructor. You should post your comments about the week's readings, assignments or any other questions.
- On **Saturday or Sunday** of the week, you should be wrapping up your reading and get ready for next week and get ready to submit any deliverables
- On **Monday**, of starting the second week of the course, you should upload your assignment, if any, to Canvas' and start over.
- I will respond to emails within 24 hours. I will read and post comments when appropriate in the discussion forums each week between Thursday and Sunday midnight. I will check course statistics each Sunday. The Grade book will be updated each Monday at 8 AM. You may access your grade.

### What you need to take this course:

1. Your reading list and individual articles and readings in that list.
2. You must have access to a computer that connects to the Internet. The course materials are only accessible online by logging in to Canvas your student identification number is required. If you do not own a computer, the computer labs on campus will be open during this semester.
3. You must have a working e-mail account. Your first assignment will be to update your e-mail address on the course Web site. Instructions are online at - you must log in to see the course materials.
4. Because of e-mail viruses, Prof. Nemati does not accept e-mail from unknown sources. Therefore, you must use the subject ISM 647 and your full name typed in the message, or the e-mail may be ignored.
5. It's impossible for Prof. Nemati to be familiar with every e-mail software application on the market, so please don't ask for technical assistance.
6. You must check your e-mail account regularly throughout the semester. Official announcements will be made by e-mail, and on the course Web site.
7. You are responsible for saving all assignments correctly, so you can turn them in electronically. You should be comfortable using word processing software and have reasonable keyboarding skills. All assignments will REQUIRE you to use word processing or text editing software. No assignments will be accepted in handwritten form.
8. Supplies: Although you will be publishing (uploading) your assignments, it's a good idea to keep copies of everything.

## A note about you and this course

Students learn best in quite different ways. One of the advantages of the online format of the course is that it allows students to approach the course in ways that suit their personal styles and preferences. In classrooms, instructors are inclined to teach either as they themselves were taught, or as they think "the average student" prefers. Online, all of the instructor-presented class material is laid out at once, and students can do with it whatever they prefer in order to learn in as personal and unique a fashion as possible.

To understand how *you* might learn best and how you might approach the course, it's suggested that you complete a **learning style inventory**, use the information given to figure and interpret your score, and plan your learning strategy accordingly. Another couple of online tools of this sort are the **Keirsey Temperament Questionnaire** (<http://www.keirsey.com/sorter/register.aspx>) and the **Keirsey Character Questionnaire** (<http://www.keirsey.com/>).

This course by design specifically accommodates different learning styles by involving a variety of components, including text, video clips, self-check quizzes, reference lists, online discussion, blogs and wikis. Since you are probably used to learning more or less as prescribed or required by a classroom teacher and are not used to designing your own learning strategy, it might take a little time to do that and to settle into a comfortable routine. I think you'll find that as you figure out on your own (and with the help of the online questionnaires mentioned) how to learn the material, everything will fall into place. Online learning, you will find, is quite different than classroom learning. It requires different attitudes, responsibilities, and communication skills.

### Emails:

- Always include a subject line.
- Remember without facial expressions some comments may be taken the wrong way. Be careful in wording your emails. Use of emoticons might be helpful in some cases.
- Use standard fonts.
- Do not send large attachments without permission.
- Special formatting such as centering, audio messages, tables, html, etc. should be avoided unless necessary to complete an assignment or other communication.
- Respect the privacy of other class members

### Discussion Groups:

- Review the discussion threads thoroughly before entering the discussion. Be a lurker then a discussant.
- Try to maintain threads by using the "Reply" button rather starting a new topic.
- Do not make insulting or inflammatory statements to other members of the discussion group. Be respectful of other's ideas.
- Be patient and read the comments of other group members thoroughly before entering your remarks.
- Be cooperative with group leaders in completing assigned tasks.
- Be positive and constructive in group discussions.
- Respond in a thoughtful and timely manner.

### Chat:

- Introduce yourself to the other learners in the chat session.
- Be polite. Choose your words carefully. Do not use derogatory statements.
- Be concise in responding to others in the chat session.
- Be prepared to open the chat session at the scheduled time.
- Be constructive in your comments and suggestion

## **Statement of Students' Rights and Responsibilities**

**Note: See the Student Section of the Bryan School website for additional information about "Faculty and Student Guidelines".** [http://www.uncg.edu/bae/faculty\\_student\\_guidelines.pdf](http://www.uncg.edu/bae/faculty_student_guidelines.pdf)

Although many items in the above guidelines pertain to face-to-face classes, there are some common items that are true for any class. As a student in my class you have explicit rights and responsibilities. Your full understanding and acceptance of the following rights and responsibilities can lead to more effective learning and more productive use of our time together.

### **You have the right to expect:**

1. Clear statements of course expectations, policies, testing and grading practices and student performance.
2. Your professor to be accessible to discuss assignments or to assist you with course matters.
3. Knowledgeable assistance from your professor regarding class assignments and course content.
4. Professional behaviors reflecting equitable treatment, ethical practices and respect for your rights.
5. Opportunities to challenge ideas and defend your beliefs in a professional manner.
6. To be challenged to grow both academically and professionally. This means I may openly disagree with some responses or comments. Use such exchanges to grow intellectually.
7. Information regarding career opportunities related to ISM programs.
8. Your professor to abide by University policies.
9. Fairness and clarity in evaluation of your performance.
10. Adequate opportunity to appeal any perceived violations of the above rights.

### **You, as a serious learner, have specific responsibilities to:**

1. Plan your study and work schedule appropriately to allow sufficient time to do quality class work. (Please review "Suggested Academic Workload Guidelines" for the Bryan School of Business and Economics published in the UNCG Undergraduate Bulletin and available online.) I suggest you devote about 6-8 hours per week to this course.
2. Complete your assignments by due dates and submit quality work.
3. Understand and follow course in the syllabus.
4. Commit yourself to grow both academically and professionally.
5. Practice ethical behaviors and display respect for rights of others.
6. Contact your instructor and discuss circumstances which may prevent acceptable performance and to make such contact on a timely basis. Contact me by phone if there is an emergency...do so promptly.
7. Fully understand and abide by the UNCG Academic Integrity Policy and other University policies relating to student conduct.
8. Report observed violations of the UNCG Academic Integrity Policy.