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# Computation: Minds & Machines

FSEM 100TT, Fall 2018  
Time: MWF 10:00 – 10:50  
Location: Trinkle 138

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## Contact Information

Instructor: Ian Finlayson, Ph.D.  
Email: ifinlay@umw.edu  
Office: Trinkle B18  
Office Hours: MWF 11-12, TR 9-11, or by appointment

## Course Description

From IBM's Watson computer which can beat human players at "Jeopardy!" to Apple's Siri personal assistant to Google's self-driving cars, artificial intelligence is quickly moving from science fiction to reality. This course will look at how some of these systems work and contrast it with how human minds process information and reach decisions. The course will consider questions such as the following: Is the construction of truly intelligent machines possible? What defines "true" intelligence? Would there be a qualitative difference between such a machine and a human mind? What are the limits of intelligence? What would the philosophical implications of intelligent machines be? What might society look like if humans are no longer the most intelligent beings on Earth?

Readings for this course will include the history of automated computation, from the first computers through early work in artificial intelligence to recent successes. We will study various mathematical models of computation and talk about what kinds of things can be computed with them. We will also look at how computation happens in our own minds and in other natural systems. Other readings and discussions will cover futurologists' predictions on the future of artificial intelligence, and its possible effects on the world.

## Course Goals and Objectives

The goal of this course is to satisfy the general education curriculum's freshman seminar requirement. This course will accomplish that by being a discussion-based seminar course, and by including writing and speaking assignments. Readings for this course will cover the history, current state and possible future of artificial intelligence. In-class discussions, writing assignments, and presentations will give students the skills necessary to communicate effectively and to succeed in college coursework.

Upon successful completion of an FSEM, students will:

- utilize a variety of research techniques to retrieve information efficiently, evaluate retrieved information, and synthesize information effectively to support their messages or arguments;

- improve development and organization of written arguments;
- demonstrate the ability to edit and revise in the writing process;
- apply the basic theories and principles of oral communication; and
- communicate effectively in a variety of settings, including public speaking and group discussion.

## **Required Materials**

All course readings will be made available online.

## **Course Policies**

### **General Expectations**

- You are expected to attend each class meeting. If you miss a class, you are responsible for the material covered.
- You are responsible for having completed all readings and assignments before class begins. The exception to this rule is the online homework modules which must be turned in by midnight on the day they are due.
- You are responsible for arriving to class on time.

### **Make-Up and Late Work Policy**

- If you miss an important in-class activity, such as a presentation day, or discussion, you are required to provide legitimate documentation of an emergency for your absence to be able to make up the activity.
- If you can't attend an in-class activity for a non-emergency reason, you must let me know one week ahead of time, so we can make suitable arrangements.
- Late work will not be accepted in this course. It is crucial that you advise me of any problems that will impede your ability to complete assignments on time.

### **Classroom Etiquette**

- Laptops and other devices must be used for displaying readings or taking notes only.
- You are expected to be respectful of other students during class discussions.

### **Canvas and Email**

- You are responsible for being able to access Canvas where your grades and readings will be posted.

- Course communication will take place over email. You are responsible for checking your UMW email account regularly so that you don't miss important announcements. If you prefer to use a different email account, you are responsible for forwarding your UMW mail.

## Grading Policy

Your grade for this course will be determined as follows:

- 50% Discussions, reading outlines, and in-class participation
- 15% Midterm paper
- 5% Midterm presentation
- 20% Final paper
- 5% Final presentation
- 5% Canvas Homework modules

The grading scale for this class is as follows:

A	94 – 100
A-	90 – 93
B+	87 – 89
B	84 – 86
B-	80 – 83
C+	77 – 79
C	72 – 76
C-	70 – 71
D+	66 – 69
D	60 – 65
F	0 – 59

Late assignments will not be accepted. Final grades will not be rounded up, and no extra credit opportunities will be given on an individual basis.

## Course Discussions

Many of our class meetings will involve class discussion of assigned readings. All students **must** make a detailed outline for each of their assigned readings. The outlines will serve as a reminder on the content of the reading, and will include questions you have about it. Also, two students will serve as discussion leaders who will be called upon to lead the discussion of the assigned readings. Discussion leaders will be assigned the course meeting prior to a reading.

Your role as a discussion leader is to:

- Concisely summarize the article or book chapter you are given;
- Draw connections between the assigned readings;
- Critically analyze the article or book chapter and pose discussion questions for the class;
- Serve as the leader in this discussion.

Your role as a discussion leader, in addition to your in-class participation, is the most important component of your final grade. Therefore, detailed outlines and notes made from your readings are strongly recommended, as they will facilitate fruitful discussions of the assigned readings. I will also periodically collect student outlines so students are expected to bring their printed or handwritten outlines to every class meeting. The collection of outlines will be unannounced so be prepared every time we meet. Outlines and notes will also come in handy for your final research paper!

You will have two or three opportunities to serve as a discussion leader over the course of the semester. Your grade will depend on the clarity of your article or book chapter summary, the connections you draw between the assigned readings, and your critical analysis of the material. Your grade also depends on your facilitation of the class discussion, to include listening carefully to your classmates and asking follow-up questions when appropriate. Keep in mind, the class discussion is meant to be a conversation rather than simply a series of yes or no questions.

As a class, we will devise a grading rubric which will be posted to our Canvas website.

## **Research Papers and Presentations**

You will have two research papers and presentations over the course of the semester. The first paper and presentation are due shortly before Fall break, and the second is due at the end of the semester.

The midterm paper should be between 3 – 5 pages and cover some way that artificial intelligence is currently being used in the world. The final paper should be between 6 – 8 pages, and should cover any topic of your choosing related to the course topics. You will need to propose a specific topic for each of these papers. More detailed descriptions of both of these assignments will be handed out in class and posted on our Canvas site.

For each of these papers, you will turn in a rough draft before the final version is due. You will get feedback from your classmates during an in-class peer-review workshop on your draft. I will also provide feedback on your drafts. Note that a rough draft is a version of your paper which is essentially complete, but may need editing work. It is not an outline, and should not have sections missing. A good rough draft is generally a little *longer* than the finished paper.

You will also give 8 – 10 minute presentations of each of these papers in class. For the presentations, you will need to illustrate the main points of your argument and use the references you have consulted to support your claims. You should also be prepared to take questions from the class on your ideas. Your grade for this project will depend on the clarity of your presentation, the kinds of supporting materials you provide, and the facility with which you respond to your classmate's questions.

## **Honor Code Policy**

Students are expected to conduct themselves in a manner consistent with the letter and spirit of the UMW Honor Constitution. In particular for this course, papers that are handed in for a grade are expected to be your own work. You must cite any references that you use in your work appropriately. You are also expected to include the UMW pledge on your work.

If you have any questions or need clarification regarding the honor code and how it applies to this course, please don't hesitate to contact me!

## Disability Statement

The Office of Disability Services has been designated by the University as the primary office to guide, counsel, and assist students with disabilities. If you already receive services through the Office of Disability Services and require accommodations for this class, make an appointment with me as soon as possible to discuss your accommodations needs. Please bring your accommodation letter with you to the appointment. I will hold any information you share with me in the strictest confidence. If you have not contacted the Office of Disability Services and need accommodations, I will be happy to refer you. The office will require appropriate documentation of disability. Their phone number is 540-654-1266. The office is located in Lee Hall, Room 401.

## Title IX Statement

The University of Mary Washington faculty are committed to supporting students and upholding the University's Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence. Under Title IX and this Policy, discrimination based upon sex or gender is prohibited. If you experience an incident of sex or gender based discrimination, we encourage you to report it. **While you may talk to me, understand that as a "Responsible Employee" of the University, I must report to UMW's Title IX Coordinator what you share.** If you wish to speak to someone confidentially, please contact the below confidential resources. They can connect you with support services and help you explore your options. You may also seek assistance from UMW's Title IX Coordinator. Please visit <http://diversity.umw.edu/title-ix/> to view UMW's Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence and to find further information on support and resources.

## Statement on Class Recordings

In this class, students may not make audio or video recordings of any course activity unless the student has an approved accommodation from the Office of Disability Resources permitting the recording class meetings. In such cases, the accommodation letter must be presented to the instructor in advance of any recording being done and all students in the course will be notified whenever recording will be taking place. Students who are permitted to record classes are not permitted to redistribute audio or video recordings of statements or comments from the course to individuals who are not students in the course without the express permission of the faculty member and of any students who are recorded. Distribution without permission is a violation of educational privacy law. This policy is consistent with UMW's Policy on Recording Class and Distribution of Course Materials.

## Course Schedule

This schedule is liable to change as needed over the course of the semester. Any changes will be discussed in class. If you are absent, it is your responsibility to ask a classmate if there have been any changes to the schedule.

Reading lists indicate the date for which you should have read, outlined, and prepared a discussion for the given reading. Listed assignments, such as proposals, drafts and papers, are due at the beginning of the class period for which they are listed.

Online homework modules are due at the end of the day they are listed for.

Date	Topic	Reading / Assignment Due
<b>Week 1</b>		
Monday 8/27	Syllabus and Introduction	Discuss Syllabus
Wednesday 8/29	Syllabus and Introduction	Discuss Discussions and Outlines <b>Homework: Communication Apprehension Module</b>
Friday 8/31	Syllabus and Introduction	Discuss Reading Strategies <b>Homework: Class Discussion Module</b> <i>Last day to add a course by 5:00 PM</i>

<b>Week 2</b>		
Monday 9/3	<b>Labor Day – No Class</b>	
Wednesday 9/5	Course Introduction	<b>Reading 1: The AI Revolution, Part 1, [1 – 25]</b>
Friday 9/7	Course Introduction	<b>Reading 2: The AI Revolution, Part 2, [26 – 77]</b> <b>Homework: Communication Theory Module</b>

<b>Week 3</b>		
Monday 9/10	Writing	Visit from Academic Services Discuss AI Today Paper <b>Homework: Writing Process Module</b>
Wednesday 9/12	AI Overview	<b>Reading 3: Norvig’s Introduction to AI, [78 – 106]</b>
Friday 9/14		Hurricane Day! <i>Last day to drop a course without W</i>

<b>Week 4</b>		
Monday 9/17	Writing	Meet in Library room 225B, Bring Laptop <i>Registration advising for Spring 2018 begins</i>
Wednesday 9/19	Advising	Visit from Academic Services
Friday 9/21	The Turing Test	<b>Reading 4: Computing Machinery and Intelligence, [107 – 128]</b> <b>Homework: Introductory, Concluding Paragraphs Module</b>

<b>Week 5</b>		
Monday 9/24	The Turing Test	<b>Reading 5: Can a Machine Think?, [129 – 153]</b>
Wednesday 9/26	The Turing Test	Activity: The Turing Test
Friday 9/28	AI and Public Policy	<b>Reading 6: How the Enlightenment Ends, The Question with AI..., AI will Transform the Economy... [155 – 175]</b> <b>AI Today Rough Drafts Due</b> <b>Homework: Editing and Revision Module</b>

<b>Week 6</b>		
Monday 10/1	Writing	Peer Review Workshop
Wednesday 10/3	Presenting	Discuss AI Today Presentations
Friday 10/5	AI and the Economy	<b>Reading 7: Automation Wave, Transforming Higher Education..., [176 – 207]</b> <b>AI Today Papers Due</b>

<b>Week 7</b>		
Monday 10/8	<b>AI Today Presentations</b>	
Wednesday 10/10		
Friday 10/12		

<b>Week 8</b>		
Monday 10/15	<b>Fall break, no class this week</b>	
Wednesday 10/17		
Friday 10/19		

<b>Week 9</b>		
Monday 10/22	Writing	Discuss Final Research Paper <b>Homework: Finding a Topic Module</b>
Wednesday 10/24	The Chinese Room	<b>Reading 8: Minds, Brains, and Programs, [208 – 221]</b>
Friday 10/26	Turing Machines	Lecture: Turing Machines <b>Homework: What to Type in Search Boxes Module</b> <i>Last day to withdraw without an F, or switch to pass/fail.</i>

<b>Week 10</b>		
Monday 10/29	The Chinese Room	<b>Reading 9: Curious Case of the Chinese Room, [227 – 245]</b> <i>Spring registration begins</i>
Wednesday 10/31	Deep Learning	<b>Reading 10: The Dark Secret..., Racist Sexist AI..., Why is Google..., Fooling Google..., [246 – 270]</b>
Friday 11/2	Writing	Small Group Workshop <b>Research paper outline and references due</b>

<b>Week 11</b>		
Monday 11/5	The Impact of AI	<b>Reading 11: The Singularity is Near, part 1, [271 – 290]</b> <b>Homework: Checking for CRAPP Module</b>
Wednesday 11/7	The Impact of AI	<b>Reading 12: The Singularity is Near, part 2, [291 – 315]</b>
Friday 11/9	<b>No Class</b>	

<b>Week 12</b>		
Monday 11/12	The Impact of AI	<b>Reading 13: Superintelligence, part 1, [316 – 342]</b>
Wednesday 11/14	The Impact of AI	<b>Reading 14: Superintelligence, part 2, [343 – 366]</b>
Friday 11/16	Writing	Peer Review Workshop <b>Research paper first drafts due</b>

<b>Week 13</b>		
Monday 11/19	The Impact of AI	<b>Reading 15: Superintelligence, part 3, [367 – 395]</b> <b>Homework: Effective Visual Aids Module</b>
Wednesday 11/21	<b>Thanksgiving break</b>	
Friday 11/23		

<b>Week 14</b>		
Monday 11/26	AI and the Economy	<b>Reading 16: Toward New Economic Paradigm, [396 – 422]</b>
Wednesday 11/28	Writing	Discuss research presentations
Friday 11/30	Are we computers?	<b>Reading 17: Are We Computers?, Are you Living in a Computer Simulation?, [423 – 463]</b>

<b>Week 15</b>		
Monday 12/3	<b>Research Presentations</b>	
Wednesday 12/5		
Friday 12/7		

**There will be no final examination for this course. We will meet to turn in and discuss our final research papers on Friday, December 14 from 8:30 – 11:00.**