

1 Course Information

1.1 Meetings and Instructors
Monday, Wednesday, 2:30 – 3:45 PM
Location: Performing Arts and Humanities, 132
https://www.csee.umbc.edu/courses/graduate/678/spring18/

Prerequisites CMSC 471 or 671; or instructor permission

Name          E-Contact         Office Hours
Prof. Francis Ferraro ferraro@umbc.edu ITE 358
                Monday, 3:45 - 4:30
                Tuesday, 11:00 - 11:30
                by appointment

TA Vamshi Krishna Sai Nagabandi nvamshil@umbc.edu ITE 349F
                Wednesday, 1:00 - 2:00
                Thursday, 2:30 - 3:30
1.2 Texts, Readings, and Discussion

The readings will be primarily from three advanced books. Though they are all excellent books, I recognize the potential cost burden. All three are available online (courtesy of the authors):


Additional readings will come from publicly available sources and papers. This class will use the Piazza discussion forum


where general announcements and extracurricular questions and discussions can happen. For any sensitive issue, please email me (ferraro@umbc.edu).

1.3 Topics

The topics covered will include, but are not limited to: perceptrons; logistic regression; linear discriminant analysis; linear and non-linear regression; support vector machines; neural networks; naive Bayes, Bayesian networks and probabilistic graphical models; clustering; evaluation methodologies; and experiment design.

1.4 Goals

After taking this course, you will:

1. be introduced to some of the core problems and solutions of ML;
2. learn different ways that success and progress can be measured in ML;
3. be exposed to how these problems relate to those in statistics, artificial intelligence, and specialized areas of ML (such as natural language processing and computer vision);
4. have experience implementing a number of ML programs;
5. read and analyze research papers;
6. practice your (written) communication skills.
2 Coursework and Evaluation

The course consists of four assignments, two exams, and a course project. The overall evaluation is:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>40%</td>
</tr>
<tr>
<td>Project</td>
<td>40%</td>
</tr>
<tr>
<td>Two Exams</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Intracompont Weighting** A component’s score will be the maximum between the macro-average and the micro-average of the individual assessments within that component. If your assignment scores are 65/90, 95/100, 95/110, and 100/110, then the micro-average is

\[
\frac{65 + 95 + 95 + 100}{90 + 100 + 110 + 110} = \frac{355}{410} \approx 86.585\%,
\]

while the macro-average (averaging them individually) is

\[
\frac{1}{4} \left( \frac{65}{90} + \frac{95}{100} + \frac{95}{110} + \frac{100}{110} \right) \approx 86.124\%.
\]

Because the micro-average is higher, the assignment score contribution would be 86.585%. (The four example scores above do not indicate the total value of the assignments.)

**Grading Scale:** The following grading scale is used on the normalized final percentages, after standard rounding:

<table>
<thead>
<tr>
<th>If you get at least a/an...</th>
<th>you are guaranteed a/an... or higher.</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>A-</td>
</tr>
<tr>
<td>80</td>
<td>B-</td>
</tr>
<tr>
<td>70</td>
<td>C-</td>
</tr>
<tr>
<td>65</td>
<td>D</td>
</tr>
<tr>
<td>0</td>
<td>F</td>
</tr>
</tbody>
</table>

2.1 How to Submit Work

All assignments and project components will be submitted via the online form at

[https://www.csee.umbc.edu/courses/graduate/678/spring18/submit](https://www.csee.umbc.edu/courses/graduate/678/spring18/submit)

This is a very simple page that redirects to a UMBC-Google form [https://goo.gl/forms/kxqcNmiZfHyaFc5x2](https://goo.gl/forms/kxqcNmiZfHyaFc5x2). The form allows multiple submissions of an assignment and edits to a previous submission. All submissions are subject to the late policy (§3.2).

3 Dates and Deadlines

Please talk to me if you will have an extended absence.
3.1 Important Dates

The following is a summary of the important deadlines for the course.

<table>
<thead>
<tr>
<th>Date</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday, 2/7</td>
<td>Assignment 1</td>
</tr>
<tr>
<td>Monday, 3/5</td>
<td>Assignment 2</td>
</tr>
<tr>
<td>Monday, 3/12</td>
<td>Project Proposal</td>
</tr>
<tr>
<td>Wednesday, 3/14</td>
<td>In-class: Exam 1</td>
</tr>
<tr>
<td>Monday, 4/2</td>
<td>Assignment 3</td>
</tr>
<tr>
<td>Monday, 4/9</td>
<td>Project Update</td>
</tr>
<tr>
<td>Monday, 5/14</td>
<td>Assignment 4</td>
</tr>
<tr>
<td>Friday, 5/18 (Final Exam Block)</td>
<td>Exam 2</td>
</tr>
<tr>
<td>Wednesday, 5/23</td>
<td>Course Project</td>
</tr>
</tbody>
</table>

Unless stated otherwise, items are due by 11:59 AM (UMBC time) of the specified day.

3.2 Extensions and Late Policy

Personal or one-off extensions will not be granted. Instead, everyone in this course has ten (10) late days to use as needed throughout the course. These are meant for personal reasons and emergencies; do not use them as an excuse to procrastinate. There is a hard cutoff of the final exam block: late days cannot be used beyond this time.

Late days are measured in 24 hour blocks after a deadline. They are not fractional: an assignment turned in between 1 minute and 23 hours, 59 minutes (1,439 minutes) after the deadline uses one late day, an assignment turned in between 24 hours and 47 hours, 59 minutes (2879) after the deadline uses two late days, etc.

The number of late days remaining has no bearing on assignments you turn in by the deadline; they only affect assignments you turn in after the deadline. It is your responsibility to keep track of your used late days. If you run out of late days and do not turn an assignment in on time, please still complete and turn in the assignments. Though late assignments after late days have been exhausted will be recorded as a 0, they will still be marked and returned to you. Moreover, they could count in your favor in borderline cases.

I reserve the right to issue class-wide extensions.

4 Academic Honesty

**Summary** I take academic honesty seriously. Do not cheat, plagiarize, or deceive. Doing so may result in lost credit, course failure, or suspension. Instances of suspected dishonesty will be handled through the proper administrative procedures.

This course follows the academic honesty policy from the Office of Undergraduate Education, available from [http://oue.umbc.edu/ai/](http://oue.umbc.edu/ai/). The following is a concise summary of the policies adopted:

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyones academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal.
Especially for computer science classes, there are generally questions about what is and is not allowed. You are encouraged to discuss the subject matter and assignments with others. The Piazza discussion board provides a great forum for this. However, you may not write or complete assignments for another student; allow another student to write or complete your assignments; pair program; copy someone else’s work; or allow your work to be copied. This list is not inclusive.

As part of discussing the assignments, you may plan with other students; be careful when dealing with pseudocode. A good general rule is that if anything is written down when discussing the assignments with others, you must actually implement it separately and you must not look at your discussion notes.

You are free to use online references like Stack Overflow for questions that are not the primary aspect of the course. If, for example, you’re having an issue with unicode in Python, or are getting a weird compilation error, then sites like Stack Overflow are a great resource. Don’t get stuck fighting your tools. You may generally use external libraries (and even parts of standard libraries), provided what you use does not actually implement what you are directed to implement. Be sure to properly acknowledge whatever external help—be it from students, third party libraries, or other readings—you receive.

If you have any questions about what is or is not acceptable, ask first.

5 Students with Accomodations

The office of Student Disability Services (SDS, [https://sds.umbc.edu](https://sds.umbc.edu)) works to ensure that students can access and take advantage of UMBC’s educational environment, regardless of disability. From the SDS, UMBC is committed to eliminating discriminatory obstacles that may disadvantage students based on disability. Services for students with disabilities are provided for all students qualified under the Americans with Disabilities Act (ADA) of 1990, the ADAAA of 2009, and Section 504 of the Rehabilitation Act who request and are eligible for accommodations. The Office of Student Disability Services (SDS) is the UMBC department designated to coordinate accommodations that would allow students to have equal access and inclusion in all courses, programs, and activities at the University.

If you have a documented disability and need to request academic accommodations, please refer to the SDS website at [sds.umbc.edu](sds.umbc.edu) for registration information and to begin the process, or alternatively you may visit the SDS office in the Math/Psychology Building, Room 212. For questions or concerns, you may contact us through email at disAbility@umbc.edu or phone (410) 455-2459.

If you require accommodations for this class, make an appointment to meet with me to discuss your SDS-approved accommodations.

6 Inclusion

University life and graduate school is be stressful. Don’t add to that stress by engaging in harassing or hostile behaviors. They are not welcome in the classroom and are completely inappropriate.

More and more organizations are dealing with hostile behavior. One such organization in the NLP community (NAACL, the North American Association for Computational Linguists) has a good [explanation of the behaviors that are not welcome](https://sds.umbc.edu) (replace “conference,” “event” or “ACL” with “class”):

[Harassment and hostile behavior include]: speech or behavior that intimidates, creates discomfort, or interferes with a person’s participation or opportunity for participation in a conference or an event. We aim for ACL-related activities to be an environment where harassment in any
form does not happen, including but not limited to: harassment based on race, gender, religion, age, color, appearance, national origin, ancestry, disability, sexual orientation, or gender identity. Harassment includes degrading verbal comments, deliberate intimidation, stalking, harassing photography or recording, inappropriate physical contact, and unwelcome sexual attention. The policy is not intended to inhibit challenging scientific debate, but rather to promote it through ensuring that all are welcome to participate in shared spirit of scientific inquiry.

7 Version Changes

1.1 1/31/18: Added TA office hours location
1.0 1/28/18: Initial version