

# EE 4980

## Modern Electronic Systems

### Spring 2021 - Modified

## Syllabus

### JUST THE FACTS

**Class website:**

<https://faculty-web.msoe.edu/johnsontimoj/EE4980/index-ee4980.html>

Or search “Johnson MSOE”, it will be the first result in Google  
Notes, Handouts and readings will be available on the website

**Grading:**

- Homework
- Tests
- Final Project

**Final Taken**

40%  
40%  
20%

No late homework assignments will be accepted.

Grade scale: 60 – 70 – 80 – 90 – 100  
F | D | C | B | A

Final scores in the lower 15% of each range and the upper 15% of the subsequent range will receive a mixed grade of AB, BC, or CD.

On each Test you will receive a “raw score”. This will reflect your un-weighted performance. Your “raw score” will be shifted with respect to the upper percentile of the class to obtain a “weighted score”. It is these weighted scores that will be used in your “overall score” calculation.

For example, if the top student has a raw score of 93%, everyone’s raw score will be multiplied by 1.075 (1.00/0.93) to obtain their corresponding weighted score.

**Help:**

MSOE is a student-centered educational institution. If you need help – **ASK!**

**Don’t Cheat!**

## **COURSE DESCRIPTION, GOALS, and OUTCOMES**

### **Course Description**

Analysis of contemporary electronic systems: Desktop, laptop, tablet computers, smart phones, MP3 players, TVs, Internet, and embedded systems. Emphasis on components such as on chip busses, memory, displays, I/O, touch screens, USB, HDMI, WiFi, BT, and GPS.

### **Prerequisites & Notes**

Senior Standing

### **Primary Goal:**

Provide a breadth of knowledge in electrical engineering areas commonly encountered by entry level engineers.

### **Course Outline:**

The course will work its way out from the internals of modern processors through widely used communications systems, to common system peripherals

### **ABET Outcomes:**

- a – Covered by most topics
- b – Communications protocol interpretation
- c – Communication system, memory system and storage system design
- d – N/A
- e – Covered by most topics
- f – N/A
- g – Project reports
- h – N/A
- i – Ability to tackle new concepts outside traditional EE classes
- j – Covered by most topics
- k – Covered by most topics

## COURSE MECHANICS

### **Class Details**

Room - Online  
Days - Monday, Tuesday, Thursday  
Time - 11:00 – 11:50

### **Instructor:**

Dr. Johnson  
Office: S-336  
Email: johnsontimoj@msoe.edu  
preferred method of contact  
(prepend all email subjects with EE4980 - subject...)  
Website – <https://faculty-web.msoe.edu/johnsontimoj>  
Office phone - (414) 277-2682  
Office hours: See web page

### **Text Book - none**

### **Class website:**

<https://faculty-web.msoe.edu/johnsontimoj/EE4980/index-ee4980.html>

Notes, Handouts and readings will be available on the website

### **Support Outside of Class:**

If you are struggling it is ALWAYS better to ask for help early since concepts build upon each other. In addition, office hours will be more crowded prior to the test and you may not get the kind of time needed to clarify your understanding.

### **Student Accessibility Services (SAS)**

For students with documented disabilities, chronic medication conditions and mental health concerns; MSOE provides services to make reasonable accommodations available. If you are a student who requires or anticipates the need for accommodations, please contact Student Accessibility Services Office at 414-277-7281, by email at [moureau@msoe.edu](mailto:moureau@msoe.edu), or in person at K250 to discuss appropriate accommodations and eligibility requirements.

Your success as a student is of utmost importance to me. If you have a disability or any other special circumstance that may have some impact on your work in this class, and for which you may require special accommodations, please contact me early in the semester so that accommodations can be made in a timely manner.

### **Class Notes / Additional Readings:**

I will make every attempt to put the class notes and additional readings on the web page two weeks in advance of the lecture but worse case these will be available one week in advance of class. It is critical that you read these over before class. They are not intended

to include all the class material but will jump start the learning process. In addition, all the material in the notes may not be covered in class – but you are still responsible for it. See the notes on *Effective Learning Concepts*.

**HW Assignments:**

The web page will be used for scheduling and distributing assignments. Canvas will be used for announcements and grades. Assignments will be submitted via OneNote. All assignments will be due by 4:00pm on the assigned day. **No late assignments are accepted.**

**Project:**

Will be due as indicated in the HW assignments web page.

**Tests:**

Test schedules are outlined on the web page.

## COURSE POLICIES and PROCEDURES

### Class Attendance:

This is a senior level course and will move pretty quickly. While you may be able to learn the material on your own, if you fail to attend class you will not:

- be exposed to the subtlety of the concepts
- learn the details “between the lines”
- know what points I consider important
- learn from the questions of other students
- get the benefit of the doubt on any borderline decisions

### In Class Behavior:

You are young professionals and I expect you to act accordingly. Disruptive behavior of any kind will be referred to the appropriate administrative office.

I expect your focus in class to be on the course material. Cell phones, MP3 players, laptops, tablets, ... are not allowed in my class. If you must use one of these devices you are welcome to leave the room. Research shows that taking notes on a laptop or tablet is less effective than taking them long-hand, so please do not ask for an exception.

No video or audio recording is allowed in class. Failure to follow this rule will be treated as academic dishonesty and dealt with accordingly.

### Professionalism and Academic Honesty:

***A professional does not take credit for the work of someone else.***

All students are expected to conform to the **Policy on Student Integrity** outlined in the MSOE Undergraduate Academic Catalog.

Working collaboratively on homework assignments is allowed and encouraged (sharing ideas and approaches). **The work you turn in however must be your own.** (code, problem solutions, calculations).

**Any** documented case of “cheating” will result in a **FAILING GRADE** as well as possible disciplinary action. All cases of academic dishonesty will be reported to the EECS Chair as well as to the Dean of Students.

Examples of Cheating include **(but are not limited to)** the following:

Testing

- copying the work of another student (past or present) during a test
- providing test information to students who have not yet taken it
- obtaining information about a test prior to taking it
- having someone else take a test for you
- bringing “cheat sheets” in any form with you to a test
- using a cell phone or other electronic device during a test

### Homework / Labs

- modifying a graded lab or homework paper and submitting it for reevaluation
- turning in work that was done by someone else
- using another student's (past or present) homework files
- posting solutions to homework problems or lab experiments

## LEARNING OUTCOME ASSESSMENT

### Assessment Overview:

The goal of this course is to ensure students learn the concepts identified in the *Learning Outcomes and Objectives* section. In order to meet this goal, students must be assessed in order to determine if they have in fact learned these concepts. To that end there will be four assessment components in this course:

	Final Taken
• Homework Assignments	40%
• Tests	40%
• Final Project	20%
• Participation	<1% only used on borderline cases

### Homework:

Homework will serve three primary purposes in this class.

It will be used to ensure the students are keeping current with the content of the class.

It will be used as feedback to the instructor on teaching/learning progress.

It will be used to assess student understanding of the material.

**No late HW assignments will be accepted.**

### Tests:

Tests will serve two primary purposes in this class.

They will be used as feedback to the instructor on teaching/learning progress.

They will be used to assess student understanding of the material.

### Makeup Tests:

If you have an excused absence from a scheduled test based on documented participation in a University-related activity (e.g., band trip), you must make arrangements **in advance** to take your test during an alternate time during the week the test is being administered.

If absence during a scheduled test period is excused (due to illness or family emergency, which must be verified *in writing*), you will be given the opportunity to make up the missed test upon your return.

### Final Project:

The final project is intended to ensure you can research an unknown system and document its operation.

### Participation:

Participation in class is valuable to the student, the instructor, and others in the class.

Students must learn to ask questions when they don't understand, provide input where they believe it adds to the discussion, and become comfortable speaking in various settings. An engineer who is not able to provide appropriate input in a meeting or group discussion is a waste of a seat.

Most instructors know their course material very well. The key to conveying that information is constant feedback. The pace, approach and content can usually be modified to enhance the student's learning process, IF, the students provide feedback. Where the opportunity to change the lesson has passed, consider your feedback as a form of "paying it forward" to future students.

When someone asks a question there are almost always others with a similar question. In some cases the question or answer may clarify the concept for a student who thought they understood but now realize they did not.

Participation will not be officially graded. I reserve the right to use participation as the "borderline" determining factor as outlined in the *Grading* section.

### **Grading:**

On each Test you will receive a "raw score". This will reflect your un-weighted performance. Your "raw score" will be shifted with respect to the upper percentile of the class to obtain a "weighted score". It is these weighted scores that will be used in your "overall score" calculation.

For example, if the top student has a raw score of 93%, everyone's raw score will be multiplied by 1.075 ( $1.00/0.93$ ) to obtain their corresponding weighted score.

### **Grade scale:**

For the final grade, equal-width cutoffs will be applied based on a cutoff width of 10 (i.e., the nominal cutoffs for A-B-C-D will be 90-80-70-60, respectively). Final scores in the lower 15% of each range and the upper 15% of the subsequent range will receive a mixed grade of AB, BC, or CD.

A "borderline" is officially defined as an overall score within 0.5% of a cutoff when the final grade calculation is performed. Before course grades are assigned, the instructor will carefully examine all such cases and determine if the next higher grade is warranted.

**Primary factors will be participation and recognition of one bad test/hw/lab.**

### **Reporting of Grades:**

The official grades will be kept in Canvas and updated on a regular basis. Any errors in grading must be brought to the attention of the instructor within one week of posting to Canvas.



## EFFECTIVE LEARNING CONCEPTS

As an engineer you most likely consider yourself a scientist also. A critical piece of being a scientist is believing in the scientific method and not ignoring the results. Here are some key learning and learning behavior results.

- Multi-tasking reduces competency in each task undertaken
- <5% of the population can multi-task and the odds are high that you are not one of them
- Repetition is a key factor in long term retention
- Your brain tosses out anything it thinks is irrelevant each night – review material the same day to help make it relevant to your brain
- Sleep is not an option – it is critical to learning (7 hours min – no exceptions)
- Connect new concepts to concepts you already know
- Taking notes by hand increases understanding – not true for typing
- Study as you go and review in the days before the test – then sleep the night before
- Hear – Do – Teach Teaching others solidifies learning
- Cramming has no long term learning value
- Cramming works for a few hours – if you do it – do it the morning of the test

### **Seven Things you can do to be a better learner:**

1. Make connections. Use analogies or mnemonic devices to build upon your existing knowledge. Not only do these help you remember – but the act of creating these helps you learn.
2. Never read anything without a purpose and stop once you have accomplished it.
3. When you read – stop after every major section or chapter and write down a few key notes. Review the summary within 24hrs to help transition it from short term to long term memory.
4. 20-30 min maximum at any task – then take a short stretch break (30-60sec) and get the blood flowing – review what you have been doing in your mind.
5. 2 hours total without a long break (10 - 15 minutes). Do something that stimulates other parts of your brain – music, exercise, food – when you return – review your short notes from earlier.
6. Plan your time – keep a record – modify your schedule accordingly – Stress reduces learning and being overloaded with no time left is very stressful.
7. Ask – when you don't get it, and have tried a few times - ASK

**Always remember – your goal is not to accomplish a task – it is to learn something in the process.**

## **COURSE SCHEDULE**

SUBJECT TO CHANGE – depending on overall class progress and any unforeseen natural phenomena.

Please check the website for the current schedule