44-599: Internet of Things Syllabus

Contact Information
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Description
44-599 is a special topics course dedicated to the study of Internet of Things.

Prerequisites
Data Structures (44-242) or the equivalent

Instructional Objectives
After successfully completing this course, students will be able to:
• explain what is meant by IoT
• explain how basic electronic components work
• read and create schematics
• build and program prototype IoT devices
• write Node-based web services to communicate with IoT devices
• explain how to move from a breadboard prototype to a PCB
• utilize technologies not taught in this course with greater confidence and efficiency ("learn how to learn") explain, from experience, how to work well with others on a team
• make compelling, professional presentations

Instructor Responsibilities
Your instructor will help you attain those objectives by:
• explaining the material in as clear a manner as possible
• guiding your reading
• maintaining numerous office hours, both during the day and (virtually) during the evening
• monitoring your progress via periodic assignments, quizzes and other assessments
• soliciting feedback

Resources
• particle.io
• hackster.io
• nodejs.org
• sparkfun.com
• polleverywhere.com
• resources listed at the end of each set of lecture notes
Expectations

- Attend all classes
- Ask questions during class. If you are confused, chances are your neighbors are too, and will appreciate your inquiry.
- Explore and experiment! Try new things and learn from both your successes and failures. Computer Science is a science.
- Keep up with the readings.
- Collaborate when appropriate. Do group assignments in groups; do individual assignments individually.

Assessments

<table>
<thead>
<tr>
<th>Category</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>25</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>15</td>
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<tr>
<td>Lab Exam / Hackathon <em>(possibly in pairs, TBD)</em></td>
<td>5</td>
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<tr>
<td>Midterm Project</td>
<td>10</td>
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<tr>
<td>Final Project</td>
<td>15</td>
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<tr>
<td>Attendance</td>
<td>5</td>
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<td>Kit Management</td>
<td>5</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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A: [90.0,100]; B: [80.0,90.0); C: [70.0,80.0); D: [60.0,70.0); F: [0.0,60.0)

Course Philosophy and Policies

1. Feedback: Your instructor thrives on feedback and pertinent conversation during class: if you have a question, ask. There are no stupid questions, only stupid answers (and I promise to keep the number of those to a minimum 😆)

2. A Special Topics Caveat: This class is a special topics course, and while your instructor has some experience in the area, these are somewhat uncharted waters, i.e., an opportunity. In whatever computing-related career you end up in, your employer will care as much about your ability to learn as what you currently know. In this course, you will be learning how to assimilate new technologies, how to problem-solve and troubleshoot, and how to communicate: all highly coveted skills that will serve you in good stead throughout your career.

3. Grades will be posted on the canvas website, assuming we can figure out how to do so 😱

4. Quizzes and Exams will be administered during class.

5. Final Exam: This is scheduled for Tuesday, 13 December, 4:10 - 6:10 PM.
6. **Academic Honesty**: The [academic honesty policy](#) stated in the Northwest Missouri State University Undergraduate (or Graduate, as appropriate) Academic Catalog will be followed. In addition, the document entitled [Academic Integrity in CSIS Classes](#), posted on the course website, clearly explains those types of behavior that would be considered academic dishonesty. You are responsible for reading both, and abiding by the guidelines described therein.

1. Plagiarism includes, but is not limited to, failure to give credit for help received on a homework assignment. Also note that all assignments are to be done individually, unless specified otherwise. You may talk to classmates and other students about an assignment, but you must do all the work yourself from beginning to end. Two or more students may sit down together and discuss an assignment as they are working on it, but each student must do his/her own work in completing the assignment. You cannot copy another person's code or written work. You cannot copy database objects or any portion of a database from another student's files. Failure to follow these guidelines and the remaining guidelines described in the [CSIS Academic Integrity Policy](#) will be subject to the penalties described in the catalog.

2. No sharing of any materials (pens, pencils, erasers, paper, textbooks, etc.) is permitted during exams and quizzes. Doing so, or talking during exams and quizzes, will be interpreted as cheating. Should that happen, a) you will receive an F for the entire course (for an exam: a 10% decrease in final grade for cheating on a quiz), b) the Director will be notified, and c) you will subsequently be unemployable within the department.

3. A few students, under the stress of an exam, mistakenly overestimate the importance of a question on their overall GPA (it is virtually nothing, less than 0.5%), and underestimate the cost of cheating (10% on a quiz: 100% on an exam)

4. **Computer Programming and Breadboarding are not Spectator Sports**: You only benefit when you are the one getting the exercise. So, as noted in 6.1, while you may discuss assignments in general terms with your fellow students, the final product must be your own work. If you do seek help (from the instructor, TA, GA, or fellow student), acknowledge the fact in some very obvious location (e.g., the comment block at the start of your code)

1. Programs may be run through [moss](#). If you are caught collaborating on a programming problem, you will get a 0 for the assignment, and the Director will be notified.

8. **Assignment Due Dates**: All assignments must be uploaded by the due date. *Submissions by email will not be accepted*. Late submissions will incur a 10% penalty per 24 hour period, and will not be accepted once the assignment has been discussed in class.

9. **Graduate Student Extras**: Graduate students will be held to a higher standard when it comes to grading exams and quizzes, and will be expected to complete one more project than the undergraduates.

10. **Coding Guidelines**: Projects must adhere to coding guidelines as specified in class.

11. **Class Attendance**: Class attendance will be taken, and students who are not in their seats by the start of class will lose points.

12. **Grade Concerns**: Any concerns about a grade must be raised within 5 days after the grade has been posted.

13. **Quiet in the Court!**: Please silence all cellphones, etc., before class. Any time a student's cellphone rings during class, the recipient will lose 1% in the Class Attendance category. If the instructor's cellphone rings during class, all students will receive an extra 1% in the Class Attendance category (unless it comes from somebody in the class, in which case the two cancel each other out).
14. **Dress Code:** On those days when your instructor comes to class wearing a t-shirt, he or she will donate $10 to Northwest. [Note that this policy will vary by instructor.]

15. **Accommodations Statement:** Students in this course who need disability accommodations/modifications should present a copy of their official Northwest accommodation letter from the LAP/S Committee to the instructor during private office hours as early in the term as possible. Additional information can be found online at [www.nwmissouri.edu/swd](http://www.nwmissouri.edu/swd).

16. **Fine Print** (based on CITE Office recommendations): This syllabus is not a contract and is subject to change at the discretion of the instructor to accommodate instructional and/or student needs. Changes to the syllabus will be announced in class, but it is the sole responsibility of the student to maintain an updated course syllabus.

**FAQ**

1. Why do you test us over things that you didn't explicitly teach in class?
   - Tests are designed to see if you remember and understand; but also to see if you can apply, analyze, evaluate, and create. The "things that were not explicitly taught" type questions are really an attempt to see if you can put together disparate subjects. You might not, and that's OK.

2. Why don't we learn how to do x (where x represents some new technology)?
   - Unfortunately, we do not have the time in this course to make you into an expert on all things iOS.

**Projects**

Students, working in teams of 2-3 (the exact number will depend on enrollment), will be expected to design 2 IoT projects — one at midterm, the other at final — to solve some pressing problem. The first project will be presented during week 8, the second during week 15. The projects are expected to be novel, and the selection of a suitable problem is the most important aspect of this project. Students may use any resources that they need to solve this problem. If extra electronic components are required, and the students can justify their purchase to the "investors" (that would be the instructor), they will be acquired.

The final project is expected to be more sophisticated than the midterm project.

Students are invited to begin looking at suitable IoT projects now, and [hackster.io](http://hackster.io) is an fine place to start. Consult with other faculty and your peers to come up with ideas.

**Getting Help**

Help is available from your instructor. I have copious office hours, please take advantage of them. In addition, our TA will be providing assistance during office hours, which will be posted during the first week.