Internet of Things (IoT) Design
EEL 5934 (Special Topics)
Class: 23303, Section 0001 | Class: 7510, Section: IOT1 | Class: 27511, Section: IOT2
Class Periods: M,W,F | Period 5 (11:45 AM - 12:35 PM)
Location: Online (100%)
Academic Term: Fall 2020

Instructor:
Dr. Janise McNair
Email Address: Use Canvas Mail Tool for class-related emails
Office Phone Number: 352-392-2629
Office Hours: MWF 12:30PM-1:30PM

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
- No teaching assistant

Course Description
This course focuses on IoT solutions for multi-discipline topics selected by science and engineering student teams. The teams will develop solutions using IoT design methods. The course will consist of lectures on the fundamental building blocks and protocols in IoT. Then the course will run as a hands-on, multi-discipline project-oriented course, with project discussions, presentations and demonstrations led by the student teams. (3 credits)

Course Pre-Requisites / Co-Requisites
Graduate-level standing. Graduate students from all engineering and science disciplines are encouraged to take this course

Course Objectives
The main objective of this course is to teach the fundamentals of the Internet of Things as a paradigm and to help students become developers in this realm. Then the course will run as a hands-on, project-oriented course, with project discussions, presentations and demonstrations led by student teams.

Materials and Supply Fees
None

Required Textbooks and Software
- Title: Internet of Things: A Hands on Approach,
  Author: A. Bahga and V. Madisetti
  ISBN: 0996025510
  URL: http://www.internet-of-things-book.com/
- Course lecture notes from instructor
- Selected journal and conference papers

Recommended Materials
- Various suggested textbooks will be available online through UF Library.
  See the course reserves link in Canvas site

Course Schedule
Week 1:   Class Overview / Introduction to IoT
Week 2:   IoT Design Methodology
Week 3:   Sensors and Actuators
Week 4:   IoT Layered Networks, Project Proposal Presentations
Week 5:   Project Proposal Presentations
Week 6:   IoT Communications Basics
Week 7:   IoT Energy Consumption

Week 8:   Review and Exam (Evening Exam)
Week 9:   Protocols and Devices: Zigbee, Bluetooth, RFID
Week 10:   Protocols and Devices: WiFi, Raspberry PI
Week 11:   Internet and Transport Layer Protocols (DTLS, 6LowPAN, LoRaWan)
Week 12:   Application Layer Protocols (MQTT, Cloud integration)
Week 13:   IoT Security
Week 14:   Thanksgiving Holiday
Week 15:   Demo Week
Fridays will be used for team demos and presentations

Online Course Recording

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Class Policies
- *Zoom Classroom Policy*
  - Class lectures, office hours, and demos will be online using Zoom. This requires the student to have access to a working webcam and stable internet connection.
  - During student presentations, the presenters must keep their camera on so that we can see you as we would during a normal face-to-face class. At other times, it is fine to leave your camera off.
- *Class Participation Policy*
  - Class participation will be judged by relevant questions entered in the chat window during lecture, scores on in-class quizzes and group participation surveys.
  - Perfect class attendance is not required, but regular *real-time* participation is required
  - It is the student's responsibility to independently obtain missed material and information from lectures. Check Canvas for materials and watch course lectures that you may have missed.
  - Excused absences must be in compliance with university policies in the Graduate Catalog (http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance) and require appropriate documentation.
- *Assignment and Exam Submission Policy*
  - Electronic submission of assignments is required. Upload to Canvas as PDF, MS Word, or Text
  - Access to a computer programming or simulation tool is required.
  - Open source software will be used for simulator/emulator assignments.
  - Exams may be taken online using Honorlock, which will require certain computer controls to be enabled for the exam proctor.
- *Late and Make-up Policy*
  - Late assignments may be accepted, *before solutions are posted*, with a 10% penalty per day applied.
  - No make-up assignments/exams except for excused absences (excused absence is defined above)
- *Class Communications Policy*
  - All announcements and updates will be sent by Canvas mail tool. To receive messages, you can set Canvas to send to your gatorlink email and/or you can check Canvas Mail daily.
  - All emails to Dr. McNair should be sent using the Canvas mail tool.

Evaluation of Grades

Assignment	Percentage of Final Grade
Participation (in class and in group)	10%
Proposal Presentation	10%
Midterm Exam	30%
Paper Review Report	20%
Demos	20%
Final Project Report	10%
	100%

Grading Policy

Percent	Grade	Grade Points
90.0 - 100.0	A	4.00
89.0 - 89.9	A-	3.67
87.0 - 88.9	B+	3.33
80.0 – 86.9	B	3.00
79.0 - 79.9	B-	2.67
77.0 - 78.9	C+	2.33
70.0 – 76.9	C	2.00
69.0 - 69.9	C-	1.67
67.0 - 68.9	D+	1.33
60.0 - 66.9	D	1.00
59.0 - 59.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades

Students Requiring Accommodations
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate Program Coordinator
• Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:
<u>*Health and Wellness*</u>

> **U Matter, We Care:**
> Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.
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> **Counseling and Wellness Center:** http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.
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> **Sexual Discrimination, Harassment, Assault, or Violence**
> If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu
>
> **Sexual Assault Recovery Services (SARS)**
> Student Health Care Center, 392-1161.
>
> **University Police Department** at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall*, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://care.dso.ufl.edu.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.