CSCI 575-01E, 82476,
Cyber-physical Systems and IOT
COURSE SYLLABUS: Fall 2019

INSTRUCTOR INFORMATION

Instructor: Dr. Tanik, Assistant Professor
Office Location: 210A
Office Hours: T 315-5pm; F 1-2pm/440-5pm, M-F 11-7pm by appt
Office Phone: 903-886-5419
University Email Address: john.tanik@tamuc.edu
Preferred Form of Communication: email
Communication Response Time: 1 day

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Textbook(s) Required:

Edward A. Lee and Sanjit A. Seshia, Introduction to Embedded Systems, A Cyber-
42740-2, 2015, http://leeseshia.org/ (overview:
http://www.eecs.berkeley.edu/~sseshia/pubdir/IntroducingCPS.pdf)

IBM Rational Unified Process, Best Practices for Software Development Teams:
https://www.ibm.com/developerworks/rational/library/content/03July/1000/1251/1251_be
stpractices_TP026B.pdf

Software Engineering Body of Knowledge (SWEBOK) & IEEE/ACM/NICE standards

Software Required: Microsoft Office products and Institute for Human Machine
Cognition (IHMC) cmaptools.

The syllabus/schedule are subject to change.
Recommended References
CPS/IOT/IEEE/SWEBOK/NICE and related material online to assist:
https://jtanik.wixsite.com/cps-1

http://www.eecs.berkeley.edu/~sseshia/pubdir/IntroducingCPS.pdf)


Guide to the Software Engineering Body of Knowledge (SWEBOKv3)
http://www.computer.org/web/swebok/v3


Course Description

This project-based course introduces the fundamental and practical concepts of cyber-physical systems analysis, design, and modeling in context of the Internet of Things (IoT). Students learn how to apply course topics to their career to develop a project as a team with IEEE documentation including presentations, homework, and quizzes to support activity managed from a career website.

Upon completion of the course, the student will be able to:
1. Understand theory and practice of Cyber-physical (CPS) systems in context of IoT.
2. Learn research methodology to survey emerging CPS applications

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3. Conduct CPS design, analysis, and modeling patterns in relation to IOT and Big Data
4. Prototype trustworthy systems requirement specifications utilizing software and standards
5. Demonstrate a project in CPS/IOT advancing student career interests

**COURSE REQUIREMENTS**

**Minimal Technical Skills Needed**
Students will be using D2L learning management system, Microsoft Word and PowerPoint, using presentation and graphics/organization programs. Research, organizational, design, and related CS skills required for best results.

**Instructional Methods**

**Homework Assignments**

The course will consist mainly of lectures, discussions, teamwork, and student presentations. Students are expected to contribute to each class in the form of discussion and questions. Therefore, it is necessary to do any required reading before class. Homework will consist of individual work that includes reading/writing assignments, reviews of other students’ literature surveys and projects, refereeing a technical paper, and leading class discussions. HW/Quizzes may be given anytime.

**Project Information:**

A significant component of the course consists of selecting a semester group project, designing then implementing it. Each student is expected to work in groups of three-four on this project and should submit a project proposal to be discussed by the instructor within the first 2 weeks of class (v1) and approved within the first 3 weeks of class (v2). The instructor will provide a list of possible ideas for a project, but it is preferable for students to come up with a research topic of their own. All projects must be approved by the instructor. HW/Quizzes support project work and can be given anytime.

Students must submit the following on time (see ecollege) or be docked up to 20% per late day (or Zero as stated in D2L):
- Project proposals where the project and its scope are precisely described
- Phase 1/2/3/4 includes preliminary research based on RUP
- Midterm presentations of the project proposal and the research papers used as references
- Project prototype
- Project documentation (IEEE format for SRS/SDD/PMP)
- Final paper describing the entire work and the results obtained (in IEEE format)
- Final presentation

The *syllabus/schedule are subject to change.*
Student Responsibilities or Tips for Success in the Course

Homework is generally given weekly, while quizzes can be given anytime online to check your regular attendance as needed (however you will be given at least a day to complete). Expect to log on briefly every day at noon to check for any announcements or possible quizzes given as needed.

COMMUNICATION:
All announcements and updates about the course will be posted on course D2L site. Students will also find chapter presentations, quizzes, assignments and/or exams on this portal. For any question, students can contact via email (or office) during weekdays and I will respond quickly. Each student is responsible for the content/instructions of email communications.

Late Submissions Policy
All work submitted electronically must be submitted by midnight of the due date, unless otherwise noted. To encourage good habits after graduation, late work will be automatic zero.

GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%
B = 80%-89%
C = 70%-79%
D = 60%-69%
F = 59% or Below

- Homework/quizzes: 20% of grade
- Project proposal (v1/v2): 10% of grade
- Project phase 1/2 (Midterm in class): 10% of grade
- Midterm presentation: 10% of grade
- Project phase 3/4 (Final Exam in class): 20% of grade
- Final written Paper (IEEE format): 20% of grade
- Final Presentation: 10% of grade

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Assessments

Methods of Instruction

This syllabus contains an overview of what will be covered in class; for specific information, students are referred to the class web page maintained on eCollege course management system. Information on D2L will be updated frequently so it is a good idea to check it regularly M-F. Assignments are posted on D2L/course wix site and should be submitted through eCollege in dropbox.

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:
https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

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COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

Feedback will be provided weekly with grades as needed to encourage timely submission of work. Students will be notified if your work is incorrect, including feedback and grades by D2L and email. Students may make an appointment by phone or office for further clarification anytime.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

University rules apply for tardiness and attendance.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook, http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuid ebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:
https://www.britannica.com/topic/netiquette

TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

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Academic Integrity
Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

Students with Disabilities-- ADA Statement
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library- Room 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services
http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice
Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

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Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url: http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

COURSE OUTLINE / CALENDAR

Meets 8/26/2019 through 12/13/2019
M 10:15a-12:55p Location: JOUR104
The course pace will be adjusted according to class needs.

<table>
<thead>
<tr>
<th>Week</th>
<th>Content</th>
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<tbody>
<tr>
<td>1</td>
<td>CPS/IOT: Introduction to Research &amp; Project Ideas</td>
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<tr>
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<td>(1/14/19)</td>
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<tr>
<td>2</td>
<td>CPS/IOT: Introduction to Research &amp; Project Ideas</td>
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<tr>
<td>3</td>
<td>CPS/IOT: Literature &amp; Peer-review (Project Proposal-v1 due)</td>
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<tr>
<td>4</td>
<td>CPS/IOT: Writing Research (Project Proposal-v2 due)</td>
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<tr>
<td>5</td>
<td>CPS/IOT: Writing Research</td>
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<tr>
<td>6</td>
<td>Midterm presentations</td>
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<tr>
<td>7</td>
<td>Midterm exam (Phase 1 and 2 done)</td>
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<tr>
<td>8</td>
<td>CPS/IOT: Project Update and Feedback</td>
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<tr>
<td>9</td>
<td>CPS/IOT: Project Update and Feedback</td>
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<tr>
<td>10</td>
<td>CPS/IOT: Project Update and Feedback</td>
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<td>11</td>
<td>CPS/IOT: Project prototype documentation</td>
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<td>CPS/IOT: Project prototype documentation</td>
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<td>13</td>
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<tr>
<td>14</td>
<td>CPS/IOT: Project report (Paper v1 due)</td>
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<td>15</td>
<td>Final Presentations &amp; Final Paper due (Phase 3 and 4 done)</td>
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<td>5/10/2019</td>
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