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| **1. Course title/number, number of credit hours** |
|  Mobile App Projects CAP 4110 |  3 credit hours |
| **2. Course prerequisites, co requisites, and where the course fits in the program of study** |
| Internet Programming and/or microprocessor experience. Background by topic: CDA 3331C - Intro to Microprocessor systems and/or COP 3813 – Intro to Internet Computing (or equivalent). Teams will bring together students with complementary backgrounds in software and hardware.  |
| **3. Course logistics** |
| *Term*: Fall 2017Students will develop apps that can be run across all mobile platforms (Android, iOS, Microsoft, and others) and interface with hardware and the Internet. JavaScript is an easy to learn language that is very popular and powerful and is useful for this integration. The text book uses an app-centric development methodology using HTML5, JavaScript, jQuery, jQuery Mobile, NoSQL/SQL databases, Node.js, and JSON. Our Apps will come from science, engineering, health, and education. Amazon Web Services (AWS) and/or FAU’s LAMP server will be used for server implementation. The instructor will show how to interface to sensors, embedded boards and the cloud. Nexus 7 Tablet and e-health/ Arduino shields are the hardware used in designing and prototyping. Projects during a semester will focus on interfacing various medical and non-medical sensors to the tablet, cloud computing, and/or data analytics, with the overall goal for personal empowerment. We have documented our previous student apps on healthcare content, interfacing to e-health shield, and cloud-based database systems at Github sites such as: . <https://github.com/HealthCareApps> , <https://github.com/FAUMobileWeb> and <https://github.com/RaspberryPIApps>  |
| **4. Instructor contact information** |
| *Instructors’ names**Office address**Office Hours* *Contact telephone number**Email addresses* | Dr. R. Shankar, Professor Engineering East (EG-96) Bldg., Room 513MWF 12 to 1 PM,561-297-3470shankar@fau.edu, mcafee@fau.edu |
| **5. TA contact information: NA** |
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| **6. Course description** |
| The course will help students develop platform independent applications for smart phones, and build an ecosystem around it to connect sensors to the cloud for data analytics.  |
| **7. Course objectives/student learning outcomes/program outcomes** |
| *Course objectives* | This course is designed to combine Internet programming with hardware and cloud. Since students come with either CS or CE background, they will work in teams with complementary strengths to build systems that span both the fields. Systems targeted will have real-world significance, such as healthcare, education, and environment.  |
| *Student learning outcomes**& relationship to ABET a-k objectives:**We believe that our course addresses all of the ABET sub-criteria a-k, but for the following: h and j. .*  | (a) an ability to apply knowledge of mathematics, science, and engineering(b) an ability to design and conduct experiments, as well as to analyze and interpret data(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability(d) an ability to function on multidisciplinary teams(e) an ability to identify, formulate, and solve engineering problems(f) an understanding of professional and ethical responsibility(g) an ability to communicate effectively(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context(i) a recognition of the need for, and an ability to engage in life-long learning(j) a knowledge of contemporary issues(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. |
| **8. Course evaluation method** |
| Three Project Assignments at GitHub: 35% (5, 10, 20); Quizzes (6): 30%; One mid-term exam: 10% ; Final team presentation (with live demo and demo video): 15%; Project report and demo video: 10% ; and Android community service (**bonus**): 10%. Your assignments and quizzes will relate to your app chosen/assigned at semester start. All assignments are geared to ensure that you are successful in your project and understanding of the course content and tools used. Team Assignments are to be submitted on behalf of the team. You will work in groups. The project assignments will help you document progress in your App and convey that to FAU advisors. An updated and cumulative report is due three days after the course is over, posted at the GitHub site. You will use Canvas, LinkedIn, and GitHub for interaction and documentation. Individual team member’s grades may differ dependent on input from other teammates. | *Note*: The minimum grade required to pass the course is C. |
| **9. Course grading scale** |
| Grading Scale: It will not be based on a curve. Expected distribution is given below:90 and above: “A”, 85-89: “A-“, 80-84: “B+”, 75-79: “B”, 70-74 : “B-“, 65-69: “C+”, 60-64: “C”, 55-59: “C-“, 50-54: “D+”, 45-49: “D”, 40-44: “D-“, 39 and below: “F.” |
| **10. Policy on makeup tests, late work, and incompletes** |
| *A grace period of 2 days is allowed for submission of assignments. Students are expected to be in attendance during all the class hours.* *Incomplete grades* are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given. |
| **11. Special course requirements** |
| Students are expected to use their own laptops. Zer0 clients used in our computer labs are also useful for project development.  |
| **12. Classroom etiquette policy** |
| Students have to use laptops in the class to conduct tool installation, training, programming, etc . Also, classes will be more problem solving oriented – you will be asked to read and try out tutorials ahead of time. There will be significant interaction among the students and the professor/ teaching assistants, during the class room, on a basis to solve problems and gain deeper insight. Have your laptop ready and be prepared to use it during the lectures. Here is a site with Net Etiquette rules: <http://www.albion.com/netiquette/corerules.html> - please familiarize yourself with it.  |
| **13. Disability policy statement** |
| In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS)—in Boca Raton, SU 133 (561-297-3880); in Davie, LA 203 (954-236-1222); or in Jupiter, SR 110 (561-799-8585) —and follow all SAS procedures. More at <http://www.fau.edu/sas/>. |
| **14. Honor code policy** |
| Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at [www.fau.edu/regulations/chapter4/4.001\_Code\_of\_Academic\_Integrity.pdf](http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf)We will use mostly open source tools. Much code, tutorial, etc., are freely available at many sites on line, including our own GitHub repositories and others. . The students will use open source tools and standard languages such as JavaScript, JQuery, JMobile Query, HTML, and CSS, in developing their project. All of the open source community believes in free sharing of their intellectual contributions. We encourage the same of all our students. Document your project fully at GitHub and find ways to help each other. Acknowledge any help you received from your colleagues and on-line resources.  |
| **15. Required texts/reading**Building Cross-Platform Mobile and Web Apps for Engineers and Scientists, by Pawan Lingras, 2015. ISBN: 978-1-305-10596-6.  |
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| **16. Supplementary/recommended readings**‘Exploring Raspberry Pi: Interfacing to the Real World with Embedded Linux’, by Derek Molloy, 2016, ISBN: 1119188687‘Android Studio 2 Development Essentials’, by Neil Smyth, 2016, ISBN:1532853319 |
| **17. Course topical outline, including dates for exams/quizzes, papers, completion of reading** |
| 1. Refresher on HTML5 and CSS3.
2. JavaScript to make web apps interactive and functional; Local storage of persistent data
3. Role of JQuery, JQuery Mobile, and Express for mobile responsive apps.
4. e-Health Shields: Arduino/Rasperry-Pi based systems for interfacing sensors
5. Graphics with HTML5 canvas
6. Server and Node.js for sharing and storing information on the cloud
7. Amazon Web Service (AWS) and FAU’s LAMP server
8. MongoDB, a NoSQL database for cloud storage of data
9. Maps, Locations, and Multimedia databases
10. Cross-platform and native app development and testing
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| **18.** Technical Resolution Policy - You will be using Canvas tools for some of the submissions. On the Welcome page, once you log in, you have the option to Submit a Ticket (see on the left hand side) to the Online Support Center. They may also be reached at 561-297-3999. However, they will not be able to help you with the installation and use of the tool suite used in the class. There are excellent online at sites such as http://www.w3schools.com. First try these things and if you still have difficulties, feel free to contact Dr. Shankar. |
| **19. Test Policy – (1)** Project and Team assignments will help you develop your app in stages. Sufficient examples from previous semesters will be made available. These are group oriented assignments. The project presentation will last 10-20 minutes per team. **(2)**  Documentation is expected for all the work accomplished (slides, assets, code, test suites, marketing video, demo, etc.,) so we have all the material to improve upon it. These are due on the Monday after the course ends.  All of these will be uploaded to Github on that day (only link for the video). The final paper of the documentation and any other missing info must be uploaded to the Github site by the following Monday.  |
| **20. Other Important Information -** This is a course with strong emphasis on projects. You will be developing a state-of-the-art smart phone App. We have much experience in this area, having taught 600+ students during the past 4+ years.    |
|  **21. Technology Requirements:** Each team should have a laptop for their use. Each team will be given a Nexus 7 smart phone/tablet for use during the course, if needed. We expect that you will be able to use your own Android smart phone (such as Samsung) or iPhone. Most of the development work is platform independent and you may be able to use an iPhone or Android exclusively. If Android, you should have Java 1.7+ installed. You will be using Android Studio, along with Android SDK Download. Instructions will be provided in Week 1. Bring your laptop to the class. If iPhone, you need to have an iPhone. Appropriate development hardware and software will be made available. For Android, supported Operating Systems * Windows XP (32-bit) or Vista (32- or 64-bit) or Windows 7 and 8. Win 10 not tested yet.
* Mac OS X 10.4.8 or later (x86 only)
* Linux (tested on Linux Ubuntu Hardy Heron)
	+ 64-bit distributions must be capable of running 32-bit applications. For information about how to add support for 32-bit applications, see the [Ubuntu Linux installation notes](http://developer.android.com/sdk/installing.html#troublehooting).

For iPhone, appropriate development hardware and software will be made available. But have your own iPhone for use.  |
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