

WEARABLE AND MOBILE APP DEVELOPMENT

Course Number: DIG4634	Credit Hours: 3
Semester/Year: Fall 2017	Class location: NRG 205
IOR: Professor James Oliverio	Class meeting time(s): T. 5-6th & Th. 6th period
TA: Naman Rajpal	Office location/Hours: TBA
	Contact email: namanrajpal16@ufl.edu
Contact phone: (352) 294-2000	Course Website: http://elearning.ufl.edu/

COURSE DESCRIPTION

This course will cover the software development protocols for wearable and mobile electronics such as head-mounted displays, watches and cell phones. Several embedded input/output interfaces will be studied including, position and orientation sensors, hand trackers, holographic and stereoscopic displays. The students will practice the covered material by developing prototype software applications for such devices.

PREREQUISITE KNOWLEDGE AND SKILLS

DIG3878 : Applied Digital Media Protocols

PURPOSE OF COURSE

Purpose of this course is to communicate practices that revolves around wearable and mobile computing to students by engaging them in interactive sessions/tutorials and giving them hands-on experience in designing for wearable and mobile technologies available in the market.

COURSE GOALS AND/OR OBJECTIVES:

At the conclusion of this course, students will be able to:

1. Obtain basic understand of the technologies used in contemporary wearable and mobile devices.
2. Understand the characteristics and design elements required for wearable devices and systems to be widely adopted by the mainstream population for use in everyday life.
3. Develop software development skills for wearable and mobile devices.

COURSE SCHEDULE:

We will be having 3 hours/sessions each week.

1. First two sessions will be mostly theoretical teaching.
2. Last session for each week will be In-Class lab guided exercise session.
3. Students will be provided hands-on assistance in completing exercises. These exercises will be part of Assignments.

The FINAL EXAM TIME SCHEDULED FOR THIS COURSE will be announced in advance of each semester by the University of Florida Registrar's Office at <http://www.registrar.ufl.edu/soc/>

Week	Topic	Assignments/Quizzes
1	Discussion of course structure, expectations History of augmented and mixed reality. Design Setup for Students	<ul style="list-style-type: none"> Read parts 1.1 and 1.3 from Dvorak
2	Principles of wearable and mobile interfaces. Unity- Brief Revision 1 In-class exercise (Graded).	<ul style="list-style-type: none"> Read part 4 from Dvorak
3	Application Programming Interfaces (APIs) for wearable and mobile devices. Unity- Brief Revision 2 In-class exercise (Graded)	<ul style="list-style-type: none"> Read chapter 1 from Ruiz and Goransson Assignment 1: Unity Revision In-Class Exercises submission.
4	Computer graphics generated stereoscopy Introduction to Prototyping & Invision.	<ul style="list-style-type: none"> Assignment 2 on drawing stereoscopic image using image editing / painting tools
5	Introduction to Virtual Reality. Design Principles and thinking for VR. In class Exercise : Introduction to Google Cardboard SDK.	
6	Position and orientation tracking Exercise: Google CardBoard Examples and Discussion.	<ul style="list-style-type: none"> Selected chapters from from Ruiz and Goransson Homework on accelerometer, gyroscope
7.	Making a VR application for Mobile.	Individual project proposal – Invision Prototypes

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8.	<p>Introduction to Augmented & Mixed Reality</p> <p>Wearable & Tools available. (Vuforia/ARKIT/Hololens)</p> <p>Exercise : Developing an AR app - part 1</p>	<p>Assignment 3: VR application submission.</p>
9	<p>Market Review and Existing Enterprise for AR/MR</p> <p>Devices and SDKs available in the market.</p> <p>Exercise: Development an AR app - part 2</p>	<p>Group project proposal due</p>
10	<p>Biometric feedback from wrist-based interfaces.</p> <p>Devices and SDKs available online.</p>	<ul style="list-style-type: none"> • Assignment 4: AR application submission.
11	<p>Individual project presentations and feedback.</p>	<ul style="list-style-type: none"> • Individual project submission
12	<p>Design Jam - Designing for Mixed Reality. How to Brainstorm</p>	
13	<p>Principles of natural user interfaces Mainstream wearable design</p> <p>Examples from LeapMotion</p>	<ul style="list-style-type: none"> • Read part 2 from Dvorak • Assignment 5 : Prototyping for Mixed Reality
14	<p>Review of wearable applications The future of wearable devices</p>	<ul style="list-style-type: none"> • Read part 1.2 from Dvorak • Read part 5 from Dvorak • Group project Final submission for Reviews and Presentation.
15	<p>Group project presentations</p>	
16	<p>Review and Final Remarks</p>	<ul style="list-style-type: none"> • Group project Final submission (Due 11:00PM EST, December 15th 2017)

REQUIRED TEXTBOOKS AND SOFTWARE:

1. Unity3D Free Version (Latest from unity.com)
2. Invision account Free account(www.invision.com)
3. Adobe Illustrator/Photoshop/ Gimp (Whatever suits you)

RECOMMENDED MATERIALS:

1. Joseph L. Dvorak (2008). "Moving Wearables into the Mainstream: Taming the Borg", Publisher: Springer. ISBN: 978-1441943392
2. David Cuartielles Ruiz and Andreas Goransson (2015). "Professional Android Wearables", Publisher: Wrox. ISBN: 978-1118986851

COURSE FEES:

Material and supply fees are assessed for certain courses to offset the cost of materials or supply items consumed in the course of instruction. A list of [approved courses and fees](#) is published in the Schedule of Courses each semester. (UF-3.0374 Regulations of the University of Florida)

Material and supply and equipment use fee information is available from the academic departments or from the schedule of courses (Florida Statutes 1009.24). The total M&S for this class is \$13.50. The total course fee for each course is listed on the UF Schedule of Courses. (<https://registrar.ufl.edu/soc/>).

EVALUATION OF GRADES

Assignment	Total Points	Percentage of Grade
Individual project (midterm): Towards the middle of the semester each student is expected to work on an individual project on mobile and/or wearable app development. The app developed by each student will be evaluated in terms of originality and complexity and demonstrated in class.	100	20%
In-class assignments: There will be occasional in-class assignments, in which the students will be asked to perform a small app development task, such as modify an existing sample code. Any development task/assignment done during class will be accompanied by materials and resources.	100	30%
Attendance, Participation & Brief Pop-Quizzes – Students are expected to actively participate in class. Read more about in the policies. <i>Please read attendance policy in the course policies section below.</i>	100	20%
Final project (group project): Final project is the final result of the semester long	100	30%

effort in learning. It is expected that in this final assignment, students organized in groups manifest their knowledge on the matter, and successfully deploy this knowledge in the practical format.		
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GRADING SCALE:

Letter Grade	% Equivalency	GPA Equivalency
A	94 – 100%	4.0
A-	90 – 93%	3.67
B+	87 – 89%	3.33
B	84 – 86%	3.00
B-	80 – 83%	2.67
C+	77 – 79%	2.33
C	74 – 76%	2.00
C-	70 – 73%	1.67
D+	67 – 69%	1.33
D	64 – 66%	1.00
D-	60 – 63%	.67
E, I, NG, S- U, WF		0.00

More information on grades and grading policies is here:
<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

COURSE POLICIES:

PARTICIPATION / ATTENDANCE POLICY -IMPORTANT

We value participation more than mere attendance. Each Instructor is responsible for communicating the specific details of what percentage of your grade (if any) will be assigned to participation, and how class participation will be measured and graded. Real Time [RT] interaction with your peers and the Instructor will empower you to greater achievement. Participation is worth 100 points for students. A spreadsheet will be maintained with names and points achieved. **Points will be gathered by students based on the following:**

- 1. Non-repeating productive questions (related to classwork) posted on Canvas discussions: 10 points.**
- 2. Answers to questions posted (by students and Instructors) on Canvas discussion: 10 points.**

Top 5 most participating students will get 5% bonus percentage of Grade at the end of semester.

MAKE-UP POLICY

Presentations may be presented late up to 2 days with deduction of 30% marks for each late day. Documented emergencies or medical situations may be the only accepted reasons for an excused absence on the day of a presentation.

Excuses should be emailed to the instructor within 2 days. All excuse emails should be according to course communication guidelines.

COURSE TECHNOLOGY

The students will be required to have access to, and use a personal computer with the access to the Internet. Word editing software will be required for written assignments.

COURSE COMMUNICATIONS - IMPORTANT

Students can communicate directly with the Instructor regarding the course material through the course management system (CANVAS).

Emails to instructor should follow the following conventions :

1. Subject should be framed like this : {CourseID} {Purpose}

(This will help me in filtering emails. Emails without course ID in the subject might get ignored.)

UF POLICIES:

UNIVERSITY HONESTY POLICY

UF students are bound by The Honor Pledge that 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](#) 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.

CLASS DEMEANOR

Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

STUDENTS REQUIRING ACCOMMODATIONS

Students with disabilities requesting accommodations should first register with the [Disability Resource Center](#) (352-392-8565) by providing appropriate documentation. Once registered, students will receive

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an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

NETIQUETTE COMMUNICATION COURTESY

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats, more information can be found at: <http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>

ONLINE COURSE EVALUATIONS

Students are expected to provide feedback on the quality of instruction in this course by completing [online evaluations](#). Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at [evaluation results](#).

CAMPUS RESOURCES

HEALTH AND WELLNESS

U Matter, We Care

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392- 1575 so that a team member can reach out to the student.

Counseling and Wellness Center

<http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department, 392-1111 (or 9-1-1 for emergencies). <http://www.police.ufl.edu/>

ACADEMIC RESOURCES

E-learning technical support, 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. <http://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. <http://teachingcenter.ufl.edu/>

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

Student Complaints Campus:
https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf

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

Disclaimer: This syllabus represents the instructor's current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.