WEARABLE AND MOBILE APP DEVELOPMENT

COURSE NUMBER: DIG4634	CREDIT HOURS: 3
SEMESTER/YEAR: FALL 2019	CLASS LOCATION: NRG 0120
	CLASS MEETING TIME(S): M. 8-9 TH & W. 9 TH PERIOD
INSTRUCTOR: DR. ANGELOS BARMPOUTIS	OFFICE LOCATION/HOUR: CSE428 W 8 TH PERIOD
	CONTACT EMAIL: ANGELOS@DIGITALWORLDS.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 headmounted 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

The 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:

Week	Торіс	Sample Assignments/Quizzes		
1	History of augmented and mixed reality.	Read parts 1.1 and 1.3 from Dvorak		
2	Principles of wearable and mobile interfaces.	Read part 4 from Dvorak		
3	Application Programming Interfaces (APIs) for wearable and mobile devices.	Read chapter 1 from Ruiz and Goransson		
4	Computer graphics generated stereoscopy	 Homework on drawing stereoscopic image using image editing / painting tools 		

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5	Programming head-mounted displays	 Homework on Side-by-side, Cyan-Red, Fish eye rendering 		
6	Position and orientation tracking	 Selected chapters from from Ruiz and Goransson Homework on accelerometer, gyroscope Individual project proposal due 		
7	Real-time camera feedback and processing	Examples from Kinect		
8	Biometric feedback from wrist-based interfaces	•		
9	Individual project presentations	 Individual project submission 		
10	Developing augmented-reality applications	Group project proposal due		
11	Review of mobile applications	Homework on mobile app development		
12	Review of wearable applications	Read part 1.2 from Dvorak		
13	Principles of natural user interfaces Mainstream wearable design	 Read part 2 from Dvorak Examples from LeapMotion 		
14	The future of wearable devices	Read part 5 from Dvorak		
15	Group project presentations	Group project submission		
16	Review and Final Remarks			

REQUIRED TEXTBOOKS AND SOFTWARE:

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

RECOMMENDED MATERIALS:

- 1. Android Studio
- 2. Oculus GO / webVR resources
- 3. Unity + HTC VIVE, Unity + Oculus, Unity + Hololens

MATERIALS AND SUPPLIES 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 <u>approved courses and fees</u> is published in the Schedule of Courses each semester. (UF-3.0374 Regulations of the University of Florida)

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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

EVALUATION OF GRADES

Assignment	Total Points	Percentage of Grade
Individual project (midterm): Towards the middle of the	30	30%
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.		
Weekly assignments: There will be weekly or bi-weekly	30	30%
assignments, in which the students will be asked to		
perform an app development task, such as develop a small-		
scale app for a mobile device.		
Attendance and Participation – Students are expected to	10	10%
actively participate in class.		
Final project (group project): Final project is the final result	30	30%
of the semester long 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.		

GRADING SCALE:

Letter Grade	% Equivalency	GPA Equivalency
А	94 – 100%	4.0
A-	90 – 93%	3.67
B+	87 – 89%	3.33
В	84 – 86%	3.00
В-	80 – 83%	2.67
C+	77 – 79%	2.33
С	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-		0.00
U <i>,</i> WF		

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

COURSE POLICIES:

PARTICIPATION / ATTENDANCE

In our course, attendance for On-Campus and RT On-Line students is mandatory. Students are allowed **three unexcused absences**. If you miss more than **three classes** during the semester, each additional absence will lower your overall grade by **100 points**. If you miss more than **six classes**, you will fail the course. Exempt from this policy are only those absences involving university-sponsored events, such as athletics and band, and religious holidays, family emergencies, and health issues for which **you must provide appropriate documentation in advance of the absence**.

Additionally, tardiness will not be tolerated. If you are tardy for three class periods, you will receive an unexcused absence.

YOT On-Line students will be expected to stay in sync with the rest of the class, and to achieve their participation portion by recording/writing their responses to course material in advance of each lecture at least once a week.

MAKE-UP POLICY

Unless discussed at least 72 hours in advance of the deadline, late assignments will not be accepted. Excluded from this policy are any assignments missed due to medical emergencies.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

COURSE COMMUNICATIONS

Students can communicate directly with the Instructor regarding the course material through UF e-Learning. <u>http://elearning.ufl.edu/</u>

COURSE TECHNOLOGY SUPPORT:

The <u>Technology Support Center</u> provides computer support for Digital Worlds students who access Visimeet, lecture recordings, student equipment, facilities and other technology-based resources. <u>http://digitalworlds.ufl.edu/support</u>

For computer assistance related to Visimeet, lecture recordings, student equipment, and facilities request please <u>Submit a Help Ticket</u> or email <u>support@digitalworlds.ufl.edu</u>.

For support related to account services, technical consulting, mobile device services, software services, administrative support, application support center, and learning support services, please contact

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the <u>UF Computer Help Desk</u> available 24 hours a day, 7 days a week at 352-392-4357 or <u>helpdesk@ufl.edu</u>.

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 <u>Honor Code</u> 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 <u>Disability Resource</u> <u>Center</u> (352-392-8565) by providing appropriate documentation. Once registered, students will receive 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: <u>http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf</u>

ONLINE COURSE EVALUATIONS

Students are expected to provide feedback on the quality of instruction in this course by completing <u>online evaluations</u>. 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 <u>evaluation results</u>.

CAMPUS RESOURCES

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HEALTH AND WELLNESS

U Matter, We Care

If you or a friend is in distress, please contact <u>umatter@ufl.edu</u> 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 Learningsupport@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, <u>http://cms.uflib.ufl.edu/ask</u>. 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. <u>http://teachingcenter.ufl.edu/</u>

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

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

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

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 ex

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