DIGITAL ART AND SCIENCES CONVERGENCE

INSTRUCTOR: Markus Santoso
CLASS LOCATION: SAGE
SEMESTER/YEAR: FALL B 2018
CLASS MEETING TIMES: M & W, P 3 - 4
Office location/Hours: CSE 436 TBD
Contact phone: (352) 294-2000
Credit Hours: 2.0
COURSE NUMBER: DIG6850
CONTACT EMAIL: MARKUS.SANTOSO@UFL.EDU
COURSE COMMUNICATION: UF E-LEARNING

COURSE DESCRIPTION
The goal of this class is to introduce the theory and the practical application of the theory in building an Augmented Reality (AR) experience. The course covers the following: an introduction to AR, overview of the key enabled technologies, interaction techniques and practical knowledge of current Software Development Kit (SDK) to build a fully immersive virtual experience.

PREREQUISITE KNOWLEDGE AND SKILLS
Admission to MiDAS program or instructor’s consent.

PURPOSE OF COURSE
The purpose of this course is to introduce the basic theory of AR such as definition, important milestones, key-enabled technologies and others. This class will cover the practical knowledge to build an AR experience as well and the student will learn how to develop a marker-based and markerless AR experience.

COURSE GOALS AND/OR OBJECTIVES:
By the end of this course, students will be able to:
1. Define AR technology
2. Understand the important milestones of AR
3. Understand the key-enabled technologies behind AR
4. Develop an AR project with the latest SDK
5. Understand the AR experience development pipeline

COURSE SCHEDULE:
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 https://registrar.ufl.edu/soc/

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Assignments/Quizzes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Class Introduction, AR Introduction</td>
<td></td>
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<tr>
<td>2</td>
<td>AR Key-enabled Technologies, AR Tracking</td>
<td>Class Exercise: learning about feature extraction and stitching technique through panoramic image</td>
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<tr>
<td>3</td>
<td>Feature Extraction</td>
<td>Project 1: 3D Scanner</td>
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<tr>
<td>Experiment</td>
<td>Assignment</td>
<td></td>
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<td>---------------------------------------------------------------------------</td>
<td>------------------------------------------------------</td>
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<tr>
<td>4 Vuforia Image Target</td>
<td>Project 2: AR Experience development using image target</td>
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<tr>
<td>5 Vuforia Multi-target</td>
<td>Project 3: AR Experience development using multi-image target</td>
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<tr>
<td>6 3D Object Target</td>
<td>Project 4: AR Experience development using 3D Object target</td>
<td></td>
</tr>
<tr>
<td>7 Markerless AR (ARCore/ARKit)</td>
<td>Project 5: markerless AR experience development</td>
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<tr>
<td>8 Final Project</td>
<td>Final Test</td>
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**REQUIRED TEXTBOOKS AND SOFTWARE**

1. Unity3D
2. Vuforia
3. ARKit / ARCore

**RECOMMENDED MATERIALS**

1. Emerging Technologies of Augmented Reality: Interfaces and Design. Michael Haller and Bruce Thomas
2. A Survey of Augmented Reality. Mark Billinghurst and Adrian Clark
3. Augmented Reality: an emerging technologies guide to AR. By Greg Kipper and Joseph Rampolla

**COURSE FEES**

Course 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 course fee for this class is $5.50.

The total course fee for each course is listed on the UF Schedule of Courses. [https://registrar.ufl.edu/soc/](https://registrar.ufl.edu/soc/).

**EVALUATION OF GRADES**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Total Points</th>
<th>Percentage of Grade</th>
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<tbody>
<tr>
<td>In-class Projects</td>
<td>50</td>
<td>50%</td>
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</table>
Final Test                         45               45%
Participation – Students are expected to actively participate in class discussions  5               5%

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>% Equivalency</th>
<th>GPA Equivalency</th>
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<tbody>
<tr>
<td>A</td>
<td>94 – 100%</td>
<td>4.0</td>
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<tr>
<td>A-</td>
<td>90 – 93%</td>
<td>3.67</td>
</tr>
<tr>
<td>B+</td>
<td>87 – 89%</td>
<td>3.33</td>
</tr>
<tr>
<td>B</td>
<td>84 – 86%</td>
<td>3.00</td>
</tr>
<tr>
<td>B-</td>
<td>80 – 83%</td>
<td>2.67</td>
</tr>
<tr>
<td>C+</td>
<td>77 – 79%</td>
<td>2.33</td>
</tr>
<tr>
<td>C</td>
<td>74 – 76%</td>
<td>2.00</td>
</tr>
<tr>
<td>C-</td>
<td>70 – 73%</td>
<td>1.67</td>
</tr>
<tr>
<td>D+</td>
<td>67 – 69%</td>
<td>1.33</td>
</tr>
<tr>
<td>D</td>
<td>64 – 66%</td>
<td>1.00</td>
</tr>
<tr>
<td>D-</td>
<td>60 – 63%</td>
<td>.67</td>
</tr>
<tr>
<td>E, I, NG, S-U, WF</td>
<td>0 – 59%</td>
<td>0.00</td>
</tr>
</tbody>
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More information on grades and grading policies is here: [https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx](https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx)

COURSE POLICIES

PARTICIPATION / ATTENDANCE POLICY
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 will class participation be measured and graded.

MAKE-UP POLICY
a. At the sole discretion of the instructor, Exams may or may not be taken late. Documented Emergencies or medical situations may be the only accepted reasons for an excused absence on the day of an exam.
b. Any assignment turned in past the due date may lose up to 10% of the total point value of the assignment for each class day it is late.

ASSIGNMENT POLICY
a. At the sole discretion of the instructor, late work may be penalized according to the late policy.
b. Any assignment turned in past the due date may lose up to 10% of the total point value of the assignment for each class day it is late.
COURSE COMMUNICATIONS
Students can communicate directly with the Instructor regarding the course material through UF e-Learning. http://elearning.ufl.edu/

COURSE TECHNOLOGY
The students are required to bring their own laptop (Windows, OSX) during classes. The University of Florida and Digital Worlds requires that students have access to and on-going use of a laptop/mobile computer for DIG courses in order to be able to function in the current learning environment. Students are required to access electronic forms of information, submit assignments and communicate with other students and faculty electronically.

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

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

For support related to account services, technical consulting, mobile device services, software services, administrative support, application support center, and learning support services, please contact the UF Computer Help Desk available 24 hours a day, 7 days a week at 352-392-4357 or helpdesk@ufl.edu.

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 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://iss.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/


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.