INTERDISCIPLINARY RESEARCH SEMINAR

COURSE NUMBER: DIG6840	**INSTRUCTOR:** ANGELOS BARMPOUTIS, PHD
SEMESTER/YEAR: SPRING 2019	**OFFICE LOCATION/HOURS:** CSE E428 / T &TH 11:30-12:30
CREDIT HOURS: 2.0	**CONTACT EMAIL:** ANGELOS@DIGITALWORLDS.UFL.EDU
CLASS LOCATION: CSE E413	**CONTACT PHONE:** (352) 294-2000
CLASS MEETING TIME(S): T&TH 9:30-11:30	**COURSE WEBSITE:** elearning.ufl.edu

COURSE DESCRIPTION

Interdisciplinary Research Seminar provides diverse presentations, hands-on research projects and interactive experiences that take full advantage of emergent computing technologies. Students will investigate a variety of research computing applications, including virtual environments for rehabilitation, big-data visualization, interactive museums, simulations for automobile safety, systems for computer assisted surgery, and others. The course will also provide an overview of 3D scanning technologies, sensors for natural user interaction, devices for haptic feedback, and will discuss the implications of virtual environments for human interaction, ethics and public policy in the near and long term.

PREREQUISITE KNOWLEDGE AND SKILLS

*   Admission to the MiDAS program or instructor's consent.

PURPOSE OF COURSE

During this course the students will be exposed to several funded research projects at the University of Florida in various areas of research computing, including data visualization, medical applications, natural human-computer interaction, digital humanities, automobile safety and others. The students will design their own virtual environments, they will work on processing and visualizing various forms of data, they will learn how to digitize real objects using state-of-the-art 3D scanning tools, they will collect motion data from various human-computer interaction devices (such as Microsoft's Kinect, and Haptic mouse) and use the acquired data in their individual as well as group research projects. As part of their final project the students will have to write a research paper using the standard guidelines and structure followed by popular research computing societies.

COURSE GOALS AND/OR OBJECTIVES: *By the end of this course, students will be able to:*

1. Form a research hypothesis.
2. Design a data collection study.
3. Write and IRB protocol.
4. Collect data and analyze them in the form of a research paper.

COURSE SCHEDULE:

This schedule is only a guide and is subject to change. Unless otherwise indicated, assignments and readings are

due the day they are listed on the syllabus, not the following day.

Week	Topic	Assignments
1	Introduction to Research protocols and forming hypothesis	
	Virtual Environments as research tools	Report Assignment 1
2	Digital Imaging Technologies: From 2D to 3D	
	3D Scanning Techniques	Implementation Assignment 1
3	Visualizing multi-dimensional spaces	
	Interacting in 3 dimensions, Natural User Interfaces	Report Assignment 2
4	Simulating Real Dynamic Environments	
	Haptic-Devices for Simulation and Interaction	Implementation Assignment 2
5	Human-Computer Interaction for Computed Assisted Surgery	
	Individual Project Presentations	**Individual Projects due**
6	Data Collection and Quantitative Analysis	
	Application: Virtual Environments for Rehabilitation	
7	Application: Digital Epigraphy and Archaeology	
	Application: Smart Sensors for Connected Vehicles	
8	Group Project Presentations	**Final Paper and Group Project due**

RECOMMENDED TEXTBOOKS AND SOFTWARE:

The instructor will provide you with several articles as well as useful on-line tutorials and resources.

Books

- Sherman, W.R., Craig, A.B. (2003) *Understanding Virtual Reality.* Morgan Kaufmann
- Bowman, D.A., Kruijff, E., Laviola, J.J., Poupyrev, I. (2005) *3D User Interfaces: Theory and Practice.* Addison-Wesley
- Earnshaw, R.A., Vince J. (1995) *Computer Graphics: Developments in Virtual Environments.* Academic Press
- Begault, D. R. (1994) *3D Sound for virtual reality and multmedia.* Academic Press, London
- Durlach, N.I., Mavor, A.S. (1995) *Virtual reality: scientific and technological challenges.* National Academy Press
- Stuart, R. (2001) *The Design of Virtual Environments.* Barricade Books

Articles

- Blackwell, M., Morgan, F., DiGioia, A. M. (1998) *Augmented reality and its future in orthopaedics.* Clinical Orthopaedics and Related Research 354, S. 111-122
- Bakker, N. H., Werkhoven, P. J., Passenier, P. O. (1999) *The effects of proprioceptive and visual feedback on geographical orientation in virtual environments.* Presence: Teleoperators and Virtual Environments 8, S. 36-53.
- Dawson, S. L., Kaufman, J. A. (1998) *The imperative for medical simulation.* Proceedings of the IEEE 86, S. 479-483.
- Glantz, K., Durlach, N. I., Barnett, R. C., Walter, A. A. (1997) *Virtual reality (VR) and psychotherapy: opportunities and challenges.* Presence: Teleoperators and Virtual Environments 6, S. 87-105.
- Padmos, P., Milders, M. V. (1992) *Quality criteria for simulator images: A literature review.* Human Factors 36, S. 727-748.
- Tang, S. L., Kwoh, C.K., Teo, M. Y., Sing, N. W., Ling, K. V. (1998) *Augmented reality systems for medical applications.* IEEE Engineering in Medicine and Biology Magazine 17, S. 49-58.

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 $0.00

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
Weekly Homework projects: The students will receive homework assignments related to the material covered in class. The students will have 1 week to work on each homework assignment. The assignments will be submitted through the course's learning management system.	30	30%
Individual Project –It is expected that in this assignment, students manifest their knowledge on forming a hypothesis and designing a research study.	25	25%
Participation – Students are expected to actively participate in class discussions, both in class as well as online by writing peer reviews.	10	10%

Group Project / Final Paper – Final Project is the final result of the semester long effort in learning. It is expected that in this final assignment, students manifest their knowledge on the matter, and successfully deploy this knowledge in the practical format of a group project.	35	35%

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
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.

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

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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 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
Students can communicate directly with the Instructor regarding the course material through the course management system (CANVAS). Electronic communication must demonstrate a formal tone and style and, unless absolutely urgent, will be responded to M-F from 9 AM to 5 PM.

VIDEO LECTURE CAPTURE
High-quality video lecture capture of this course is available only for enrolled students. These video captures are edited and posted within 24-48 hours of the class meeting for the benefit of the Your Own Time [YOT] students and to offer the potential for review by on-campus and Real Time [RT] online students. For the on-campus and RT students, watching lectures in lieu of attending and participating in class is NOT acceptable.

Your Instructor will provide you with this semester's login information during the first week of class. It is not permissible to share or distribute video login information to anyone other than officially enrolled students of this course. Lecture videos can be found at https://vimeo.com/digitalworlds.

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

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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.

PLAGIARISM
Plagiarism is a violation of the UF honor code. A student shall not represent as the student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:

"1. Quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution.

2. Submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student."

Students shall not use unauthorized materials or resources in an academic activity. Unauthorized materials or resources includes any paper or project authored by the student (or another student) "and presented by the student for the satisfaction of any academic requirement if the student previously submitted substantially the same paper or project to satisfy an academic requirement and did not receive express authorization to resubmit the paper or project."

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.
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> 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/
>
> 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.