3D GEOSPATIAL URBAN MODELING & VISUALIZATION

URP6280/URP4230
Campus: Section 18C8 - Class # 19328 (Graduate)
Section 23GA - Class # 19265 (Undergraduate)
Online: Section 18C7 - Class # 19327 (Graduate URP online degree)
Section 18DD - Class # 19329 (GIS certificate)

3 Credit Hours

INSTRUCTOR

Ilir Bejleri, Ph.D., Associate Professor,
Room 454 Architecture Building,
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352-294-1489

CLASS MEETING TIME & PLACE

- Campus: Friday from 8:30 PM to 11:30 PM at FAC 208
- Online: If needed on demand

OFFICE HOURS

- Campus: TBD
- Online: By appointment

COURSE TA/COORDINATOR

Cenqi Zhu, Ph.D. student,
Room 154 Architecture Building,
cenqizhu@ufl.edu

COURSE WEBSITE

All material will be posted on the Canvas, eLearning website. The Canvas could be accessed at: https://elearning.ufl.edu. For any assistance with eLearning website, contact UF Computing Help Desk (http://helpdesk.ufl.edu/).

COURSE COMMUNICATIONS

- Campus: in class, office hours, email communication through the Canvas.
- Online: office hours (by appointment), email communication through the Canvas.

All email communication should be through the Canvas. Use UF email address only if you have an emergency and/or are unable to access the Canvas email.

REQUIRED TEXT

No required text. However, readings will be recommended throughout the course of the semester.

(a) Law, M., & Collins, A. (2013). Getting to know ArcGIS for desktop. Redlands, Calif: ESRI Press.
(b) Kennedy, M. D. (2013). Introducing geographic information systems with ArcGIS: A workbook approach to learning GIS Wiley.
(c) Kennedy, H. (2010). Introduction to 3D data: Modeling with ArcGIS 3D analyst and google earth. Hoboken: Wiley-Blackwell.
(d) Tal, D. (2009). Google SketchUp for site design: A guide to modeling site plans, terrain, and architecture. Hoboken, N.J: John Wiley & Sons.
(e) Chopra, A. (2010), Google SketchUp 8 for dummies. US: Wiley Pub.

ADDITIONAL RESOURCES

Computer and Software

Each student is required to have a computer. Additionally, since this course uses a variety of 3D applications, each computer should meet or exceed the specification below.

- ***We recommend using Microsoft Windows OS due to compatibility issue of ArcGIS Pro.***
- System requirement for ArcGIS pro
- System requirement for CityEngine

The following software is expected to be used in this class for lectures, assignments, and final project. Please install theses software accordingly.

- ArcGIS Pro (Windows only) and CityEngine: Please visit and review "Getting Started" page in the Canvas website for further instructions.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Web Resources

UF Libraries and Labs (links and web addresses to facilitate your access)

- University of Florida (Library homepage): http://cms.uflib.ufl.edu/
- VPN connection (Off campus access): https://connect.ufl.edu/it/wiki/Pages/glvpn.aspx

ArcGIS Pro

- Resource Center: https://www.esri.com/en-us/arcgis/products/arcgis-pro/resources/arcgis-pro-resources
- Help: http://pro.arcgis.com/en/pro-app/help/main/welcome-to-the-arcgis-pro-app-help.htm

CityEngine

- CityEngine Overview: http://www.esri.com/software/cityengine
- CityEngine Ttutorial: http://desktop.arcgis.com/en/cityengine/latest/tutorials/introduction-to-the-cityengine-tutorials.htm

Suggested rendering program

- Lumion: https://lumion.com/educational-licenses.html

Game Engine

- Unity: https://unity.com/
- Unreal: https://www.unrealengine.com/en-US/

3D modeling software

- SketchUp: http://www.sketchup.com/
- SketchUp Resources: http://www.sketchupschool.com/

COURSE DESCRIPTION

This course aims to prepare students to be more effective in graphically communicating concepts and ideas pertaining to the planning and design of cities. To fulfill the objective of this course, the course consists of two parts: general instruction of methods and techniques for developing the skills to create high-quality 3-dimensional models and presentations and a final project. The first part of this course will engage students in a hands-on approach to physical design by developing a broad range of technical skills using a variety of software packages including ArcGIS Pro, CityEngine, and advanced rendering software.
The skills acquired through lecture, exercise, and assignments will then be utilized in a final project, whereby students will be required to propose an intervention strategy for redeveloping an urban setting and apply/extend the acquired skills.

PREREQUISITE KNOWLEDGE AND SKILLS: URP6270 or with Instructor's permission (GIS knowledge preferred)

PURPOSE OF COURSE

The purpose of the course is to teach students a variety of methods and techniques to interactively model and visualize physical urban environments in two, three and four dimensions through a hands-on approach using computer software. Students will acquire the skills to rapidly construct 3D models of urban settings in order to conduct analysis, generate conceptual plans and designs, and prepare high-quality renderings and presentations.

COURSE GOALS AND/OR OBJECTIVES

By the end of this course, students will:

- Learn how to effectively visualize real urban environments using various applications learned from the course.
- Demonstrate research and critical thinking skills reflecting comprehension with regard to the use of various 3D visualization tools in urban and regional planning.
- Apply 3D visualization skills to present/analyze research questions in urban and regional planning.
- Discuss professional conduct and the importance of developing efficient communication skills through a final project.

HOW THIS COURSE RELATES TO THE STUDENT LEARNING OUTCOMES IN THE DEPARTMENT OF URBAN AND REGIONAL PLANNING

Students taking this course will develop practical visualization skills necessary for support of research and professional practice through lectures, exercise, assignments, and a final project/presentation. Each student's work will be reviewed based upon the department's student learning outcomes as those relate to urban design theories.

TEACHING PHILOSOPHY

I expect all graduate students should be able to accomplish the basic requirements for the course and attain a minimum "B" grade. I will not hesitate to mark lower when a student does not meet that expectation and adequately display an understanding of the materials presented. In order to attain an "A" grade requires performance that displays quality work, depth of knowledge, and the ability to synthesize of ideas into actions or solutions. I will be happy to meet individually with any student during office hours or by appointment for additional discussion on concepts, techniques, or methodology presented in this course.

INSTRUCTIONAL METHODS

The course objectives will be achieved through lectures, in class exercise, assignments, and a final project/presentations. All assignments, including the final project will have a weight in the final grade. Submitted assignments are required to meet scheduled deadlines and delivery dates. The evaluation and grading of assignments will include clear identification and presence of all required modeling elements, development and depth of techniques used throughout the modeling task, and level of creativity utilized in the modeling task.

COURSE POLICIES

Attendance Policy

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies.

Make-up Policy

Student's with a valid reason will be allowed to present or submit assignments late. Students must present on the appointed time and must submit the assignments at the appointed time or a grade deduction will be enforced.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student
Honor Code and Student Conduct Code.

UF POLICIES

University Policy on Accommodating Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see:
http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html

The university's honesty policy

UF students are bound by The Honor Pledge which 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 Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Click here to read the Conduct Code. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Netiquette: Communication Courtesy

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. Please see http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf .

GETTING HELP

For issues with technical difficulties for the Canvas, please contact the UF Help Desk at:

- http://helpdesk.ufl.edu/
- helpdesk@ufl.edu
- (352) 392-HELP (4357) - select option 2

Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from helpdesk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

For online students, additional resources are available at http://www.distance.ufl.edu/getting-help .

- Online Computing Help Desk- e-Learning Support Services
- Online Library Help Desk
- Disability Resource Center
- Counseling and Wellness Center
- Dean of Students Office
- *On-Line Students Complaints*: View the Distance Learning Student Complaint Process.

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, and 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** at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

- **E-learning technical suppor***t*, 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. https://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. https://teachingcenter.ufl.edu/.
- **Writing Studio, 302 Tigert Hall***,* 846-1138. Help brainstorming, formatting, and writing papers. https://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.

GRADING POLICIES

University of Florida Grading Scale

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	WF	I	NG	S/U
Range	>93	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	<60				
Grade Point	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	.67	0	0	0	0	0

Non-Punitive Grades (not counted in GPA)

W	Withdrew
U	Unsatisfactory
H	Deferred
N	No grade reported
I	Incomplete

Failing Grades (counted in GPA)

E	Failure
WF	Withdrew failing
NG	No grade reported
I	Incomplete

- Information on current UF grading policies for assigning grade points.: link to the university grades and grading policies.

Grades will be determined from the assignments (55% of total) and final project presentation (45% of total). The assignments and the final project will be graded in a scale of 0 to 100 and will be weighted as follows:

- Assignment 1: Understand 3D urban modeling and visualization - 5%
- Assignment 2: Creating and Visualizing 3D GIS Data in ArcGIS Pro - 10%

- Assignment 3: Exploring LiDAR data and Application - 10%
- Assignment 4: 3D Analysis & Animation - 10%
- Assignment 5: Knowing the CityEngine - 10%
- Assignment 6: Complete Street in CityEngine -10%
- Final project: 45%

Late Submissions: *For assignments/project submitted late there will be a 10 points deduction for each day late for the first three days following the due date. The assignment will not be accepted after three days and a grade of 0 (zero) will be issued. Exceptions could be made for extraordinary circumstances consistent with university policies (See link under Attendance Policy above).*

COURSE EVALUATION

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available athttps://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

TENTATIVE COURSE SCHEDULE

Week	Lecture / Discussion Topic	Assignments Given	Assignments Due
1 **08/25**	Module 1: Introduction & Fundamental of 3D visualization	Assignment 1	
2 **09/1**	Module 2: 3D Visualization in ArcGIS Pro	Assignment 2	
3 **09/8**	Module 3: Terrain modeling in ArcGIS Pro	Assignment 3	Assignment 1
4 **09/15**	Module 4: 3D analysis in ArcGIS Pro	Assignment 4	Assignment 2
5 **09/22**	Module 5: CityEngine Introduction	Assignment 5	Assignment 3
6 **09/29**	Module 6: CityEngine: Complete Streets Optional Model: Writing Rules	Assignment 6	Assignment 4
7 **10/06**	Holiday		Assignment 5
8 **10/13**	Module7: Advanced Visualization and Rendering Final Project Introduction and assignments	Final Project Part 1: Site Analysis and Goal & Objectives Final Project Part 2: Concept Design	Assignment 6
9 **10/20**	Final Project site synthesis and goals review		
10 **10/27**	Final Project Concept design review	Final Project Part 3: Draft models Final Project Part 4: Presentation	Final Project: Part 1 Final Project: Part 2
11 **11/3**	Final Project work & Review (1)		
12 **11/10**	Holiday		
13 **11/17**	Final Project work & Review (2)		
14 **11/24**	Holiday		
14 **12/01**	Final Project work & Review (3)		
16 **12/08**	Holiday		Final Project Part 3
15 **12/15**	Final project presentations / submission		Final Project Part 4