3D GEOSPATIAL URBAN MODELING & VISUALIZATION

URP6280

3 Credit Hours

FALL 2019

INSTRUCTOR

Ilir Bejleri, Ph.D.
Associate Professor,
Department of Urban and Regional Planning,
School of Landscape Architecture and Planning
Room 454 Architecture Building,
ilir@ufl.edu
352-294-1489

OFFICE HOURS

- Campus: TBD (listed on office door)
- Online: by appointment

COURSE TA/COORDINATOR: TBD, Dan Zhu (Online coordinator)

COURSE WEBSITE

All material will be posted on the Canvas, eLearning website. The Canvas could be accessed at:
https://lss.at.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, or UF email
- Online: office hours (by appointment), email communication through the Canvas, or UF email.
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 are 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 to use Microsoft Windows OS due to compatibility issue of ArcGIS Pro.
- CPU: 2 GHz dual-core CPU (minimum)
- RAM (Memory): 16GB
- Video/Graphics adapter
  - Nvidia—GeForce 600 and later / Quadro 600 and later
  - AMD—Radeon HD 7000 and later
  - Onboard—Intel-HD 4400 and later
  - Use the latest available drivers (OpenGL 4.1 or later)

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

- SketchUp Make (free version, not pro version): Downloads for free at http://www.sketchup.com/download/all
- ArcGIS Pro: Detailed instruction to install ArcGIS Pro will be posted "Getting Started" section of the Canvas (ArcGIS Pro can be installed on the same computer that ArcGIS 10.x is installed on).
- CityEngine: Download CityEngine Free trial for 30 days at http://www.esri.com/software/cityengine/free-trial
- Microsoft Office: Download for free at http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

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

SketchUp

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

SketchUp specific High-resolution photorealistic rendering

- SU Podium: http://www.suplugins.com/
- Indigo Renderer: http://www.indigorenderer.com/sketchup
- LightUp for SketchUp: http://www.light-up.co.uk/
- IRender nXt: http://renderplus.com/wp2/
- Shaderlight: http://www.artvps.com/
- Twilight Render: http://twilightrender.com/
- VRay (Windows only): http://www.vray.com/vray_for_sketchup/

General High-resolution photorealistic modeling and rendering
- Autodesk 3DS Max: http://www.autodesk.com/products/autodesk-3ds-max/overview
- Maya: http://www.autodesk.com/products/autodesk-maya/overview
- Revit: http://www.autodesk.com/products/autodesk-revit-family/overview
- 3DPaintBrush: http://www.3dpaintbrush.com/
- Artlantis: http://www.artlantis.com/
- Maxwell Render: http://www.nextlimit.com/maxwell/
- Kerkythea: http://www.kerkythea.net/cms/

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 SketchUp.
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, not required)

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 question 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

Class attendance is mandatory and should be respected. It's understandable that students may have to miss the class occasionally for various good reasons. In such cases, students must contact the instructor prior to the class to be excused from attendance. While in class, playing an active role during lectures and class discussions is encouraged.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Consult relevant graduate or undergraduate catalog respectively at http://gradcatalog.ufl.edu/content.php?catoid=11&navoid=2486#attendance or https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

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.

UF POLICIES

University Policy on Accommodating Students with Disabilities

Students requesting accommodation for disabilities must first register with the Dean of Students Office (http://www.dso.ufl.edu/drc/). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams.

Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

University Policy on Academic Misconduct

Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/.

Student Honor Code

In adopting this Honor Code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the University community. Students who enroll at the University commit to holding themselves and their peers to the high standard of honor required by the Honor Code. Any individual who becomes aware of a violation of the Honor Code is bound by honor to take corrective action. Student and faculty support are crucial to the success of the Honor Code. The quality of a University of Florida education is dependent upon the community acceptance and enforcement of the Honor Code.

The Honor Pledge
We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty 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."

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

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

Grades will be determined from the assignments (65% of total) and final project presentation (35% 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: 10%
- Assignment 2: 10%
- Assignment 3: 15%
- Assignment 4: 15%
- Assignment 5: 15%
- Final project: 35%
  (Total: 100%)

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 late 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 EVALUATIONS

Students in this class are participating in the pilot evaluation of the new course evaluation system called GatorEvals. The new evaluation system is designed to be more informative to instructors so that teaching effectiveness is enhanced and to be more seamlessly linked to UF's CANVAS learning management system. Students can complete their evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/.

Please note your other classes this semester may be evaluated in the current GatorRater online evaluation system at https://evaluations.ufl.edu. Thank you for serving as a partner in this important effort.

TYPICAL COURSE SCHEDULE

Week	Lecture / Discussion Topic	Assignments Given	Assignments Due
1	Module 1: Introduction & Fundamental of 3D visualization		
2	Module 2: 3D Modeling in SketchUp	Assignment 1	
3	Module 3: 3D Visualization in ArcGIS Pro	Assignment 2	
4	Module 4: Terrain modeling	Final project proposal	Assignment 1
5	Module 5: 3D analysis in ArcGIS Pro	Assignment 3	Assignment 2
6	Module 6: CityEngine Workshop – part1	Assignment 4	Final project proposal
7	Module 7: CityEngine Workshop – part2	Assignment 5	Assignment 3
8	Module 8: Final Project	Final Project	Assignment 4
9	Final Project work & Review (1)		Assignment 5
10	Final Project work & Review (2)		
11	Final Project work & Review (3)		
12	Final Project work & Review (4)		
13	Final Project work & Review (5)		
14	Final Project work & Review (6)		
15	Final project presentations / submission		Final Project: Finalize presentation