

# 3D GEOSPATIAL URBAN MODELING & VISUALIZATION

URP4230

3 Credit Hours

FALL 2020

## INSTRUCTOR

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## OFFICE HOURS

- Campus: TBD

**COURSE TA/COORDINATOR:** TBD

## 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  
*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.
- 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 these software accordingly. The detailed instruction will be available at “Getting Started” section of the Canvas.

- ArcGIS Pro (Windows only): Establish UF VPN connection and download program from [https://software.geoplan.ufl.edu/download/ArcGIS\\_Pro/agg2.5/ArcGISPro\\_25\\_172639.exe](https://software.geoplan.ufl.edu/download/ArcGIS_Pro/agg2.5/ArcGISPro_25_172639.exe)
- CityEngine (Windows and Mac): Establish UF VPN connection and go to <https://software.geoplan.ufl.edu/download/CityEngine/>
- 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 Tutorial: <http://desktop.arcgis.com/en/cityengine/latest/tutorials/introduction-to-the-cityengine-tutorials.htm>

#### *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 other applications. 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:** URP4273 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 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 / presentation. 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 <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 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.

### 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 Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. [Click here to read the Honor Code](#). 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.

### 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](mailto: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.

### Health and Wellness

If you are experiencing COVID-19 symptoms ([Click here for guidance from the CDC on symptoms of coronavirus](#)), please use the UF Health screening system and follow the instructions on whether you are able to attend class. [Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms](#).

Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. [Find more information in the university attendance policies](#).

- *U Matter, We Care*: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.
- *Counseling and Wellness Center*: [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.
- *Student Health Care Center*: Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).
- *University Police Department*: [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).
- *UF Health Shands Emergency Room / Trauma Center*: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road,
- Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

### Academic Resources

- *Career Connections Center*: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- *Library Support*: Various ways to receive assistance with respect to using the libraries or finding resources.
- *Teaching Center*: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring.
- *Writing Studio*: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

- *Student Complaints On-Campus:* [Visit the Student Honor Code and Student Conduct Code webpage for more information.](#)
- *On-Line Students Complaints:* [View the Distance Learning 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	Withdraw
U	Unsatisfactory
H	Deferred
N	No grade reported
I	Incomplete

#### **Failing Grades (counted in GPA)**

E	Failure
WF	Withdraw failing
NG	No grade reported
I	Incomplete

Grades will be determined from the assignments (60% of total) and final project presentation (40% 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, 2, 3, 4, 5, & 6): 10% / Each assignment
- Final project: 40%  
(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 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 at <https://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

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