UNIVERSITY OF FLORIDA
Department of Geography
GEO3930 Spatial Agent Based Modeling
SYLLABUS: Fall 2021

INSTRUCTOR INFORMATION:

Instructor:	Dr. Gabriela Hamerlinck Turlington 3122 | 352.294.9051
Office Hours:	Monday 3:00 pm – 4:00 pm Tuesday 11:00 am – 1:00 pm Wednesday 1:00 pm – 4:00 pm (or by appointment)
E-Mail:	ghamerlinck@ufl.edu

COURSE INFORMATION:

Time:	MWF 4 (10:40 pm – 11:30 am)
Location:	Anderson Hall 0032

COURSE DESCRIPTION: This course will introduce the spatial, environmental, and computational science to use agent based modeling (ABM) techniques as a means of modeling human-environmental interactions. Emphasis will be placed on spatial processes as we apply ABMs in areas such as agriculture, forestry, biodiversity, habitat degradation, interactions between human populations and nonhuman species, urban models, and civil violence. Students will use NetLogo to develop their own ABMs.

COURSE OBJECTIVES/STUDENT LEARNING OUTCOMES:

After completing this course students should be able to:

1. Summarize and implement the ODD protocol for ABMs.
2. Evaluate strategies for designing and analyzing ABMs.
3. Write, modify, and design ABMs using NetLogo to observe, test, control, and analyze their models.

REQUIRED TEXTS:
Required: Heppenstall, A. J., Crooks, A. T., See, L. M., & Batty, M. (Eds.). (2011). *Agent-based models of geographical systems*. Springer Science & Business Media.
    *Freely available through the UF Libraries in digital form.
Recommended: Railsback, S. F., & Grimm, V. (2019). *Agent-based and individual-based modeling: a practical introduction*. Princeton university press. 2nd edition.
    *Available through UF Course Reserves at Marston Science Library. Dr. Hamerlinck also has 2 copies available for classroom use.

GRADE DISTRIBUTION:
  1. Homework (4 assignments: 2x20 pts, 2x30 pts=100 points)
  Students will complete 4 homework assignments to facilitate their understanding of NetLogo and the required readings. These assignments are to be completed and submitted via Canvas.
  2. ODD Summaries for Example and Expand activities (3x50 pts=150 points)
  There are three "Example and Expand" activities during the semester where we will use class time to replicate and explore a published model. Students will then expand the model to include a spatial component using NetLogo. Each student will complete the ODD protocol to summarize their expansion.

3. Final Presentation (200 points)

Students will compose a short presentation on their final project where they will succinctly describe the ABM they have developed. Topic approval by the instructor is required. A rubric and in-class work time will be provided. (100 pts for the presentation, 50 pts for model code, 50 pts for ODD summary).

CLASSROOM POLICIES:

- **Attendance & makeup policy**: Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.
- **Late Policy**: A class roll will be passed around at the beginning of class. If a student is late, he or she will have to sign the roll after class. Such lateness distracts other students and the instructor and will affect the student's final participation grade. Students will lose 1% from their final grade each time they arrive late.
- **Cell phone and texting policy**: Students are expected to be actively engaged with class. It is expected that all students will silence their cell phones during all class periods.
- **Grade Disputes**: Should a student wish to dispute any grade received in this class (other than simple addition errors), the dispute must be in writing and be submitted to the instructor within a week of receiving the grade. The dispute should set out very clearly, the grade that the student believes the assignment should have received as well as why he or she believes that he or she should have received such a grade.

Grading Scale (& GPA equivalent):

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
100-93	92-90	89-87	86-83	82-80	79-77	76-73	72-70	69-67	63-66	62-60	59-
(4.0)	(3.67)	(3.33)	(3.0)	(2.67)	(2.33)	(2.0)	(1.67)	(1.33)	(1.0)	(0.67)	(0)

Note: A grade of C- is not a qualifying grade for major, minor, Gen Ed, or College Basic distribution credit. For further information on UF's Grading Policy, see:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx#hgrades
http://www.isis.ufl.edu/minusgrades.html

Academic Honesty: 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 (http://www.dso.ufl.edu/sccr/process/student-conduct-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 in this class.
Accommodations for Students with Disabilities: Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. Contact the Disability Resources Center (http://www.dso.ufl.edu/drc/) for information about available resources for students with disabilities.
Counseling and Mental Health Resources: Students facing difficulties completing the course or who are in need of counseling or urgent help should call the on-campus Counseling and Wellness Center (352-392-1575; http://www.counseling.ufl.edu/cwc/).
Online Course Evaluation Process: Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at https://evaluations.ufl.edu. 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 https://evaluations.ufl.edu/results.

COURSE SCHEDULE

Students should note that the syllabus is a guideline and that there may be changes to the class schedule.

	Monday	**Wednesday**	**Friday**
Week 1	Introduction	What is Modeling?	What are ABMs and How do we use them?
Week 2	The ODD Protocol	Example ODD Protocols (Homework 1)	
Week 3	No Class	NetLogo introduction and tutorials (Homework 2)	
Week 4	Your first ABM (Homework 3)		
Week 5	What is GIS	Integrating GIS and ABMs	
Week 6	Spatial NetLogo and tutorials		
Week 7	Spatial NetLogo and the ODD Protocol (Homework 4)		No Class
Week 8	Example ABM and Expand #1: Disease		
Week 9	No Class	Example ABM and Expand #1: Disease (Summary 1)	
Week 10	Example ABM and Expand #2: Land use		
Week 11	Example ABM and Expand #2: Land use (Summary 2)		
Week 12	Example ABM and Expand #3: Networks		
Week 13	Example ABM and Expand #3: Networks (Summary 3)		
Week 14	Work time for final presentations	No Class	
Week 15	Work time for final presentations		
Week 16	Final Presentations		No Class

This course will use NetLogo to develop, test, and analyze ABMs. NetLogo is a free software available for download to your computer, or through UF Apps. To facilitate our course activities, please be prepared to bring your laptop to every class meeting. If this will pose a challenge, please contact the instructor in advance.