

**UNIVERSITY OF FLORIDA**  
Departments of Geography & Anthropology  
GEO4938 & ANT4930 Artificial Societies and Social Simulation

**INSTRUCTOR INFORMATION:**

<b>Instructor:</b>	Dr. Nicolas Gauthier Dickinson Hall 376
<b>Office Hours:</b>	Wednesdays 2-4pm or email to schedule appointment
<b>E-Mail:</b>	nicolas.gauthier@ufl.edu

**COURSE INFORMATION:**

<b>Time:</b>	Tuesday 7-8; Thursday 7 (Tu 1:55 pm – 3:50 pm; Th 1:55 pm – 2:45 pm)
<b>Location:</b>	Turlington Hall 3006

**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 population growth, agriculture, infectious disease, biodiversity, opinion dynamics, interactions between human populations and nonhuman species, urban systems, and violent conflict. Students will use NetLogo to develop their own ABMs.

**STUDENT LEARNING OUTCOMES:**

After completing this course students should be able to:

1. Explain the cyclical nature of model-based science.
2. Make use of basic coding concepts in NetLogo (e.g. if-then statements, for loops, etc.).
3. Compose, modify, and design ABMs using NetLogo to observe, test, and control their models.
4. Appraise spatial data to address a range of scientific questions within an ABM.

**RECOMMENDED TEXT:**

Railsback, S. F., & Grimm, V. (2019). *Agent-based and individual-based modeling: a practical introduction*. Princeton university press. 2<sup>nd</sup> edition.

\*The instructors have a few reference copies for classroom use.

**LIST OF GRADED WORK:**

1. **Class Wiki (15 posts x 10 pts = 150 points)**

Students will post weekly to the collaborative class wiki to facilitate their understanding of NetLogo and coding. It is expected that two thirds of these posts will be questions and one third of the posts are responses to a classmate’s post. A rubric and examples are available on Canvas, where all posts will be completed and submitted.

**2. Tutorial Summaries (3 x 30 pts = 90 points)**

The tutorial summaries correspond to the NetLogo tutorials that are introduced in Unit 1. Each student will briefly summarize the goal of the tutorials assigned for the week, identify why/how their code achieved those goals, and provide at least two suggestions for expansion. A tutorial summary template will be provided on Canvas.

**3. Exploration Progress Reports (8 x 10 pts = 80 points)**

There are three “ABM Exploration” activities during Unit 2 of the semester where we will use class time to replicate and explore a published model. Students will then expand the model in small groups using NetLogo. Each group will complete a weekly progress report on their work to summarize their expansion and submit it to Canvas. Each progress report also contains a brief individual summary of each student’s contributions to the group accomplishments and plans. Template and rubric are available on Canvas.

**4. Exploration Summaries (2 x 25 pts = 50 points)**

For Explorations 2 and 3, students will compose a final summary of their work. This summary will be recorded to a FlipGrid to share with the class. Each student is also responsible for commenting on a classmate’s presentation to make connections between the projects being completed in the class. Template and rubric are available on Canvas.

**5. Final Project (180 points)**

Students will individually conceptualize an ABM to address a research question of their own design by producing a written summary. Each student will compose and present their ABM design during the last week of the semester. The presentation is paired with a final project write-up, wherein students will respond to a series of questions to summarize their model. Rubrics, templates, and in-class work time will be provided. (80 pts for the presentation, 100 pts for written summary).

**Total semester points: 550**

**GRADING SCALE & GPA EQUIVALENT:**

<b>A</b> 100%-94%	<b>A-</b> <94%-90%	<b>B+</b> <90%-87%	<b>B</b> <87%-84%	<b>B-</b> <84%-80%	<b>C+</b> <80%-77%
<b>C</b> <77%-74%	<b>C-</b> <74%-70%	<b>D+</b> <70%-67%	<b>D</b> <67%-64%	<b>D-</b> <64%-61%	<b>E</b> <61%

**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>

## COURSE SCHEDULE

NOTE: the syllabus is a guideline and there may be changes to the class schedule.

	<b>Tuesday</b>	<b>Thursday</b>	<b>Landmarks</b>
	<b>Unit 1: Introduction to Spatial ABMs &amp; NetLogo</b>		
<b>Week 1</b>	<i>No class</i>	Class structure, Lecture: Intro to agent-based modeling	
<b>Week 2</b>	Lecture: Model-based science	Lecture: Space and time	<i>Tutorial summary #1</i>
<b>Week 3</b>	Lecture: Networks	Lecture: Game theory, evolution, and adaptation	<i>Tutorial summary #2</i>
<b>Week 4</b>	Lecture: Zen and the art of programming	Lecture: Analyzing ABMs	<i>Tutorial summary #3</i>
	<b>Unit 2: ABM Exploration</b>		
<b>Week 5</b>	Lecture: Introduction to explorations & brainstorming	Exploration 1 (instructor guided)	
<b>Week 6</b>	Exploration 1 (instructor guided)		<i>Progress report</i>
<b>Week 7</b>	Exploration 2 work time		<i>Progress report</i>
<b>Week 8</b>			<i>Exploration 2 summary</i>
<b>Week 9</b>			<i>Progress report</i>
<b>Week 10</b>	Exploration 3 work time		<i>Progress report</i>
<b>Week 11</b>			<i>Exploration 3 summary</i>
	<b>Unit 3: Final Project</b>		
<b>Week 12</b>	Introduction to the final project	Final project work time	<i>Progress report</i>
<b>Week 13</b>	Final project work time		<i>Progress report</i>
<b>Week 14</b>			<i>Progress report</i>
<b>Week 15</b>	No class - Holiday		<i>Progress report</i>
<b>Week 16</b>	Final project presentations	No class – Reading days	
<b>Finals Week</b>	Submit your final project		<i>Final project write-up</i>

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, we will use the computer lab machines. You are welcome to bring your laptop, though the instructors cannot guarantee troubleshooting on personal computers.

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## *University Policies*

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### **Class Attendance and Make-Up Policy**

Class attendance is expected. Each unexcused absence will result in a 10 point reduction in the final grade. Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

Students who can demonstrate that they were unable to submit an assignment by the deadline due to an excused absence and who can provide appropriate documentation for the absence will be given a reasonable period of time to make up the late work.

### **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.

### **Students Requiring Accommodations**

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>.

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.

### **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 [gatorevals.ua.ufl.edu/students/](http://gatorevals.ua.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 [ufl.bluera.com/ufl/](http://ufl.bluera.com/ufl/). Summaries of course evaluation results are available to students at [gatorevals.ua.ufl.edu/public-results/](http://gatorevals.ua.ufl.edu/public-results/).

### **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.

### **University 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 (<https://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 or TAs in this class.

### **Counseling and Wellness Center**

Contact information for the 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.

### **Writing Studio**

The writing studio is committed to helping University of Florida students meet their academic and professional goals by becoming better writers. Visit the writing studio in 302 Tigert Hall for one-on-one consultations and workshops, or online at <http://writing.ufl.edu/writing-studio/>.

### **In-Class Recordings**

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.

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## *Course Policies & Class Environment*

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### **Meeting Policy**

If you need help with any aspect of the course, you are encouraged to come to office hours (see the details on Page 1 of this syllabus). Alternatively, you can schedule a 1-on-1 meeting with the

instructor. Outside of office hours, email is the preferred method of contact. I will do my best to respond to messages within 48 hours (not including weekends or holidays). As a courtesy, please check the syllabus and Canvas before reaching out; answers to many of your questions can be found there.

### **Canvas**

Important announcements and updates will be regularly posted to the course Canvas website, so be sure to check Canvas frequently. To ensure that you do not miss anything, please make sure that your Canvas profile is set to receive notifications.

### **Email Accounts**

It is UF policy that you use your GatorLink account or Canvas when emailing your instructors; we will not answer emails sent from other accounts (e.g., personal Gmail, etc.).

### **Professional Conduct**

All members of the class are expected to always conduct themselves in a professional and respectful manner. Please use appropriate etiquette when interacting with your peers and instructors, including on Canvas and via email. Students who behave disrespectfully or disruptively will be reported to the Dean of Students Office.

### **Extra Credit**

Extra credit assignments may be posted at the instructors' discretion only. Any other extra work submitted to raise a grade will not be accepted and requests for additional extra credit will not be considered.

### **Submitting Assignments**

All assignments must be submitted electronically via Canvas unless otherwise noted. Emailed or paper submissions for Canvas assignments will not be accepted. You are responsible for ensuring that all your work is uploaded correctly and completely by the deadline. Corrupted files will be treated as missing work (= 0 grade) until they are re-uploaded correctly and late penalties will apply if your resubmission is past the deadline. So, please always double check your files right after you upload them. If you experience technical problems when submitting your work in Canvas, contact the UF Computing Help Desk for assistance: <https://helpdesk.ufl.edu>.

### **Disputing a Grade**

If you wish to dispute a grade for any assignment, you must contact the instructor in writing within two business days (48 hours) after the assignment has been returned. In your message, you must include a specific explanation for why you think the grade is incorrect and how you think it should be changed. An instructor will then arrange a meeting with you to discuss the issue and determine whether the grade should be changed. The grade assigned following this meeting will be final.

### **Late Work & Make-Up Assignments**

All assignments must be submitted by the due date and time indicated on Canvas. If an assignment is submitted late, 10% of its total point value will be deducted for every day that it is late. Credit cannot be earned for assignments that are turned in 5+ days past the due date, or for those that are submitted after the instructor has graded and returned the assignment to the class. Late work will not be accepted after the deadline for the final assignment in the course.

Extensions will be considered on a case-by-case basis (at the instructor's discretion) only in the event of unforeseen emergencies. In such a case, you must contact the instructor as soon as possible

to discuss the situation; note that the instructor may request documentation. No extensions will be granted for students who miss the due date for any other reason.

*A note about deadlines: Remember, the due date does not have to be the “do” date. In other words, it is highly encouraged to work on your assignments in advance– do not wait until right before the deadline to submit your work. Last-minute computer problems or other non-emergency situations that arise right before the deadline are not valid reasons for requesting an extension; such requests will not be considered and late penalties will be applied to your work if it is not submitted before the deadline.*

## Academic Honesty

Instructors’ note: Any action that subverts the learning goals of the course (or a particular course activity) will be treated as academic misconduct and reported to the Dean of Students Office. This includes– but is not limited to– cheating or assisting others in cheating, plagiarism (i.e., misrepresenting someone else’s work as your own, whether it is copied directly or paraphrased), self-plagiarism (i.e., copying/reusing work that you have submitted previously), collaborating with others when it is not permitted, fabricating data, lying to an instructor, and bad faith attempts to undermine the intent of an learning activity. In addition to being reported to the Dean of Students Office, a student will earn a grade of 0 on any assignment that is plagiarized or that otherwise violates these academic honesty policies. This 0 grade is irreversible– it cannot be dropped and the assignment cannot be resubmitted for a different grade. After this, any subsequent incidents of plagiarism or academic honesty will result in an automatic E (= failing grade) in the course.

## Generative AI Policy

ChatGPT and other large language models are powerful tools for generating content and assisting with tasks such as coding assignments, especially for those with little to no coding experience.

However, it's essential to understand that while these models often provide valuable information, they just as often produce inaccurate or misleading outputs. **Always** cross-check and critically assess the answers you receive. For writing and coding assignments, if you use ChatGPT to help, **always** acknowledge the portions of your text or code that were influenced by or directly taken from it in your written reports and code comments. You are solely responsible for the quality of the work you turn in.

We recommend posing clear and concise questions to ChatGPT or asking it to explain, comment on, and review existing code, or even explain bugs and error messages, rather than asking it to create complex models or procedures from scratch. You can also use ChatGPT to brainstorm or workshop new ideas, enhancing your creativity without outsourcing the actual content creation. As with any tool, it's there to help you do your best work rather than to do it for you. *-Written with the help of ChatGPT*

## Accommodations

Instructors’ note: We want you to succeed in this course! To ensure your accommodations are in place when you need them, please be sure to have your DRC accommodation letter sent to us as early as possible– ideally at the beginning of the semester.

## Understanding This Syllabus

It is your responsibility to ensure that you fully understand the policies outlined in this syllabus as well as the policies of the university as they relate to this course. By remaining enrolled in this

course, you agree that you have read and understood all of these policies and that you will be held accountable to them.

At their discretion, the instructor may change aspects of the course during the semester to accommodate new opportunities, unforeseen disruptions, or other circumstances. These changes will be communicated clearly in class and through Canvas. The current version of the syllabus will always be available on our course's Canvas website. It is your responsibility to ensure that you are following the most recent version of the syllabus.

If you have any questions, please contact the instructors as soon as possible (preferably at the beginning of the course)!