UNIVERSITY OF FLORIDA
Departments of Geography & Anthropology
GEO6938 & ANT6930 Artificial Societies and Social Simulation

INSTRUCTOR INFORMATION:

Instructor:	Dr. Nicolas Gauthier Dickinson Hall 376
Office Hours:	Wednesdays 2-4pm or email to schedule appointment
E-Mail:	nicolas.gauthier@ufl.edu
Phone:	(352)-273-1946

COURSE INFORMATION:

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

COURSE DESCRIPTION:

This course introduces agent-based modeling (ABM) techniques for understanding complex social systems and disease dynamics. Students will learn fundamental modeling concepts including contagion, population dynamics, movement patterns, and decision-making, then explore how spatial and network structures transform these dynamics. Using the Black Death as a unifying case study, students will develop skills in model building, experimental design, and hypothesis testing. Emphasis will be placed on understanding emergence, designing computational experiments, and integrating models with data. Students will use NetLogo to build and analyze their own ABMs, culminating in an independent research project.
Prerequisites: None

STUDENT LEARNING OUTCOMES:

After completing this course students should be able to:

1. Explain the cyclical nature of model-based science.
2. Read and write formal summaries of ABMs in the literature.
3. Make use of basic coding concepts in NetLogo (e.g. if-then statements, for loops, etc.).
4. Compose, modify, and design ABMs using NetLogo to observe, test, and control their models.
5. Appraise spatial data to address a range of scientific questions within an ABM.
6. Use R and/or Python to systematically analyze the results of ABM experiments.

LIST OF GRADED WORK:

1. **Class Wiki (9 posts x 10 pts = 90 points)**
   Students will post to the collaborative class wiki throughout the semester 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. **Homework (10 x 15 pts = 150 points)**
   Weekly assignments that extend the in-class tutorials and modeling activities. Graduate students will complete additional reflection questions connecting the models to their research interests, and may be asked to run supplementary analyses in R or Python. Templates and rubrics are available on Canvas.
3. **Project Proposal (30 points)**
   Students will develop a research proposal that includes their research question, proposed methods, and planned experiments. Graduate students should include a brief literature review (2-3 pages) and may propose their own research topic beyond those discussed in class, with instructor approval. Template and rubric are available on Canvas.
4. **Peer Review (15 points)**
   Each student will provide constructive feedback on one classmate's project proposal. The review should address the feasibility of the proposed model, clarity of the research question, and appropriateness of the planned experiments. A peer review guide will be provided on Canvas.
5. **Progress Reports (4 x 10 pts = 40 points)**
   During the final weeks of the semester, students will submit brief weekly reports on their project progress. These reports help ensure steady development and provide opportunities to identify and address challenges. Template provided on Canvas.
6. **Final Project (175 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. (75 pts for the presentation, 100 pts for written summary).

Total semester points: 500

GRADING SCALE & GPA EQUIVALENT:

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

COURSE SCHEDULE

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

	Tuesday	**Thursday**	***Landmarks***
Unit 1: Core Dynamics			
Week 1	*No class*	Introduction & NetLogo tour	
Week 2	Movement & Patterns	Simple Contagion	*Homework #1*
Week 3	Complex Contagion		*Homework #2*
Week 4	Population Dynamics		*Homework #3*
Week 5	Decision-Making & Game Theory		*Homework #4*
Unit 2: Space and Networks			
Week 6	Spatial Structure and Geography		*Homework #5*
Week 7	Schelling & Spatial Models		*Homework #6*
Week 8	Network Structure		*Homework #7*
Week 9	Network Dynamics	*No class*	*Homework #8*
Unit 3: Doing Science			
Week 10	*No class*	Scenarios & Forcing	*Homework #9*
Week 11	Experiments & Sensitivity		*Homework #10, Project proposals due*
Week 12	Model-Data Integration		*Proposal peer review, Progress report #1*
Week 13	*No class - Veteran's Day*	Final project work time	*Progress report #2*
Week 14	Final project work time		*Progress report #3*
Week 15	*No class - Thanksgiving*		
Week 16	Final project presentations	No class – Reading days	*Progress report #4*
Finals Week	Submit your final project		*Final project write-up*

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 I cannot guarantee troubleshooting on personal computers.

RECOMMENDED TEXTS:

There are no required textbooks for this course. All necessary materials will be provided through Canvas and in-class tutorials. However, students who wish to supplement their learning may find the following texts helpful (references copies of these are available for in-class use):

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

Wilensky, U., & Rand, W. (2015). *An introduction to agent-based modeling: modeling natural, social, and engineered complex systems with NetLogo*. MIT press.

Smaldino, P. (2023). *Modeling social behavior: mathematical and agent-based models of social dynamics and cultural evolution*. Princeton university press.

Romanowska, I., Wren, C. D., & Crabtree, S. A. (2021). *Agent-based modeling for archaeology: simulating the complexity of societies. SFI Press*. *This text is freely available online at https://www.sfipress.org/books/agent-based-modeling-archaeolo

Course Policies & Class Environment

This course complies with all UF academic policies. For information on those polices and for resources for students, please see this link. Course-specific policies are detailed below:

Attendance Policy

You can miss up to 5 classes, no questions asked. After that, each absence drops your final grade by 5%. **More than 8 absences means you fail the course**. Days class is cancelled by me or due to university-wide closure, as well as absences covered by university policy (religious observances, medical emergencies, etc.), don't count. (See university attendance policies here: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/). **If you know you'll miss class, please email me beforehand so I can adjust activities for a smaller group**. For extended emergencies or serious illness, come see me to discuss alternatives like an incomplete.

Generative AI Policy

ChatGPT, Claude, Gemini, and other AI tools can be valuable for learning to code. However, they often produce incorrect or outdated code, particularly for NetLogo's specific syntax and commands. Always verify their outputs against the NetLogo Dictionary and Models Library. AI works best for explaining error messages, reviewing your existing code, understanding NetLogo commands, or brainstorming approaches—not for generating complete models from scratch. Use it to enhance your learning, not replace it.

For code: If you use AI assistance, add comments like "*AI-assisted: [what it helped with]*"—this helps both your future self and me understand your work.

For written work: Using AI as part of your writing process—brainstorming, developing rough drafts, refining arguments—is acceptable as long as you're actively engaged in shaping the final product. What's not acceptable is submitting AI-generated text that you haven't thoughtfully revised and made your own. The difference is effort and iteration: workshopping ideas with AI is fine; copying and pasting AI responses is not.

You are responsible for everything you submit. Poor quality work will be graded accordingly, whether AI-assisted or not. You must be able to explain any code or writing you turn in—I may ask you to do so at my discretion. If you can't explain it, don't submit it. Submitting unrevised AI-generated text or failing to clearly label AI-generated code is academic dishonesty. If you're relying heavily on AI because you're struggling, please come to office hours instead.

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; I 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 my 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. I 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

Instructor's 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.

Accommodations

Instructor's note: I 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 me 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 instructor as soon as possible (preferably at the beginning of the course)!