

**Public Affairs 7572:**

**Policy Simulation and Modeling**

**Autumn 2020**

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| Meeting Days: Tuesday (T) & Thursday (R) |
| Time: 3:55 pm - 5:15 pm |

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**Description**

The world has many persistent, complicated problems that must be addressed with comprehensive solutions. Crafting these policy solutions requires the appropriate tools that can model the complex systems that generate these problems. These tools must also be intuitive so that decision makers can actively engage with them. Analytical tools, which break down problems into smaller problems, cannot work well when there is intercorrelation, interdependencies, and feedback loops within a larger system. Yet, these interdependencies and multiple feedbacks are the reason why these problems are so difficult to manage. Often, attempts to solve “wicked” problems using an analytical cause-and-effect linear view of the world result in unintended consequences because we are ignoring the effects of the entire system. In this course, students will add two new systems-based tools to their toolkit: system dynamics and agent-based simulation modeling.

This class will benefit students who want to learn to use computer-based policy analysis tools to simulate complex problems, while also considering the challenges that decision-makers experience in their efforts to find empirically based solutions. When confronted with the systemic problems facing our nation, from education to healthcare, intuition alone is insufficient for informing policy decisions. Better policies result when decision makers work with models that are easy to use and easy to understand.

**Degree learning goals**

This course provides advanced training in the following MPA degree program goals.

Policy 6 - Evaluate how differences in policy content and systems contribute to policy outputs and outcomes.

Policy 7 - Know and apply basic policy analysis tools.

Econ 1 - Evaluate the quality and validity of economic information.

Mgt 3 - Identify and manage external/ environmental challenges to organizational performance.

Mgt 5 - Engage in strategic planning for public organizations.

Mgt 8 - Manage innovation and change.

Methods 4- Seek and identify patterns in data.

Methods 6 – Support claims with statistically sound quantitative and/or qualitative evidence.

**Course Objectives**

The following course objectives are designed to meet the above course degree objectives.

|  |  |
| --- | --- |
| **Objective** | **Assessment Tool** |
| Understand systems thinking and why it is important to managing today’s complex problems | Group discussionsReflection essays |
| Understand the value and limitations of simulation modeling for policy analysis and management | Group discussionsReflection essays |
| Understand the basic approaches to two simulation modeling techniques: Agent-Based and Systems Dynamics models | Practice assignmentsGroup discussionsWeekly check-ins |
| Develop basic skill level in these modeling techniques using AnyLogic, a Java- based simulation software | Practice assignmentsGroup discussionsWeekly check-ins  |
| How to write and communicate a simulation modeling proposal | “Memo to Boss” assignmentIndividual presentation |
| Develop a simple simulation of a policy or managerial problem | Many subcomponents in Project assignment Weekly check-ins |
| How to write and communicate the results of a simulation model | Individual or group presentation |
| Understand the importance and skills in conducting group modeling  | Class group model building exercise |

**Course Materials**

All course materials can be found online. However, should you have an interest in continuing your studies, you should consider purchasing the Sterman and the Borshchev books as resources.

Borshchev, A. (2013). *The Big Book of Simulation Modeling: Multimethod Modeling with AnyLogic*. Available on Amazon or the AnyLogic website. Available on Kindle for $5.00

Miller, J.H. and Page, S.E. (2007). *Complex Adaptive Systems: An Introduction to Computational Models of Social Life,* Princeton, NJ: Princeton University Press. [Available from main library](https://library.ohio-state.edu/search~S7?/tComplex+Adaptive+Systems/tcomplex+adaptive+systems/1%2C13%2C63%2CB/frameset&FF=tcomplex+adaptive+systems+an+introduction+to+computational+models+of+social&1%2C%2C2). [9780691130965](https://library.ohio-state.edu/search~S7?/i9780691130965+%28acid-free+paper%29/i9780691130965acidfreepaper/-3,-1,0,B/browse)

Sterman, J. (2000). *Business Dynamics: Systems Thinking and Modeling for a Complex World*. New York: McGraw-Hill Higher Education. ISBN: 978-0-07-231135-8.

Students can access textbook information via the Barnes & Noble bookstore website: [https://ohiostate.bncollege.com](https://ohiostate.bncollege.com/) as well as from their BuckeyeLink Student Center. This information is disseminated by B&N to all area bookstores. You may buy from a store of your choice and/or shop for books (always use ISBN# for searches) online.

**Attendance and participation requirements**

While the course is an online course, most of scheduled class time will be synchronous meetings and you are required to attend all of these sessions. Tuesdays will typically involve a short demonstration by the instructors. Many of the Thursday sessions will be “lab sessions” during which you can work on your individual assignments or your project. During these labs, the instructors will be available for questions and we will periodically “drop in” on you to say hello.

**Course resources**

Writing Consulting: Students wishing to have additional help with the writing of their papers can meet with a consultant at the Writing Center (<https://cstw.osu.edu/writing-center>).

Library Assistance: The Glenn College has a dedicated librarian at OSU Libraries, who can help provide research assistance. Please contact Carly Dearborn (Dearborn.8@osu.edu). For more information and links to some common public affairs resources, see - <http://go.osu.edu/8gx>.

## **Course technology**

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24/7.

* **Self-Service and Chat support:** <http://ocio.osu.edu/selfservice>
* **Phone:** 614-688-HELP (4357)
* **Email:** 8help@osu.edu
* **TDD:** 614-688-8743

### ***Baseline technical skills for online courses***

* Basic computer and web-browsing skills
* Navigating Carmen: for questions about specific functionality, see the [Canvas Student Guide](https://community.canvaslms.com/docs/DOC-10701). Additional navigation instructions are provided within the course.

### ***Required technology skills specific to this course***

* CarmenZoom and text chat
* Recording, editing, and uploading video (explanations and instructions are provided on the course website.)

### ***Required equipment***

* Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
* Webcam: built-in or external webcam, fully installed and tested
* Microphone: built-in laptop or tablet mic or external microphone

### ***Required software***

* [Microsoft Office 365](https://ocio.osu.edu/blog/community/2015/08/18/free-microsoft-office-for-ohio-state-students): All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft’s Student Advantage program. Full instructions for downloading and installation can be found at [go.osu.edu/office365help](http://go.osu.edu/office365help).

### ***Carmen Access***

You will need to use [BuckeyePass](https://buckeyepass.osu.edu/) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

* Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](https://osuitsm.service-now.com/selfservice/kb_view.do?sysparm_article=kb05025) help article for step-by-step instructions.
* Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click “Enter a Passcode” and then click the “Text me new codes” button that appears. This will text you ten passcodes good for 365 days that can each be used once.
* Download the [Duo Mobile application](https://osuitsm.service-now.com/selfservice/kb_view.do?sysparm_article=kb05026) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

## **Faculty feedback and response time**

The following list gives you an idea of our availability throughout the course. (Remember that you can call **614-688-HELP** anytime you have a technical problem.)

* **Broken links or missing resources** – We try to check and recheck to make sure that links are working, but if you find a broken link, please let us know **as soon as possible**. We have made lots and lots of resources available. The downside is a higher likelihood of an error on dates or instructions. If there is any confusion, please ask. **You can earn one point for every broken link, erroneous date, or missing resource that is brought to the attention of the instructors**. The first person to identify the problem earns the point.
* **Announcements**: We use Announcements as the way to communicate with the class. If you would like to have announcements sent as an email, you can adjust your notification settings. Please see [video](https://youtu.be/OC-vulJTPc0) on how to manage your emails.
* **Grading and feedback:** For large weekly assignments, you can generally expect feedback within the next **4 days** to allow for timely and thoughtful feedback.
* **Email:** The instructor and teaching assistant will reply to emails within **24 hours on days when class is in session at the university** and **48 hours on the weekend**.
* **Discussion board:** We will reply to messages on the logistics discussion boards and the content discussion board within **24 hours on school days**. If you have a question about the course material or the logistics of the class, we prefer that you post the question on the appropriate discussion board first rather than as an email to us, so that everyone has a chance to hear your question and our response. Of course, you are still free to send us an email as not every question need be public.
* **There will be a midterm check-in** with you by using a course survey to see how the course is progressing. We would appreciate any suggestions on how we can improve your learning experience as this is the first time that we are teaching this class online.

**Policy on grading disputes**

The assigned grade is designed to show the overall quality of work performed by each student, but errors, mistakes, and omissions can occur. If you believe that any grade was not properly assigned, you may write an email explaining why you believe the grade was incorrectly assigned within one week of receiving the graded assignment back. Each appeal will be considered, and if a re-grade is performed, the entire assignment will be re-graded. The final grade may be greater, less, or equal to the original grade.

## **Late assignments**

Late submissions are not accepted except for extenuating circumstances. This is a fast-paced course requiring multiple deliverables. The deliverables, however, are short as they are incremental assignments over the semester that build towards your big final project. You must contact the instructors before the due date. Please refer to Carmen for due dates.

## **Grading scale**

We will use the following grade scale to translate your percentile score into a letter grade.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Letter** | **Percentage** |  | **Letter** | **Percentage** |
| A | 93-100 |  | C+ | 77-79.9 |
| A- | 90-92.9 |  | C | 73-76.9 |
| B+ | 87-89.9 |  | C- | 70-72.9 |
| B | 83-86.9 |  | D+ | 67-69.9 |
| B- | 80-82.9 |  | D | 60-66.9 |
|  |  |  | E | < 59.9 |

## **Discussion and Communication Guidelines**

The following are our expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful. There is a discussion board for establishing our norms and practices that we will use for our professional communication.

* ***Writing style***: While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation so that you can be understood. A more conversational tone is fine for the discussions and peer feedback. The final deliverable, however, is a professional document to your supervisor and, as such, must be written in professional manner.
* ***Tone and civility***: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. Learning requires a willingness to be vulnerable and we will not have great discussions if there is a negative tone or incivility in the class. We have to be willing to risk asking what we fear might be a dumb question or to contribute an interesting comment or observation.
* ***Writing and backing up your work****:* Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

**Typical Activities for Class Modules During the Week**

This is an online class that meets twice a week. We will use Zoom to meet synchronously. Typically, the Tuesday class will include a demo or an explanation of that week’s subject. On Thursdays, the class time is devoted to lab time. Lab time could include time to work on a simulation exercise and / or work on your project. Depending on the exercise, the virtual lab time will involve us meeting as a class. We may also meet as groups or you may work independently. The instructors and guest instructors will be there to help with any questions you may have.

The instructors are also available to meet by appointment. We do not have office hours because we don’t want to help, rather, it is our experience that we sit at the computer with no visits when we do set up office hours. We feel we can be more responsive to your needs by scheduling a mutually convenient time.

**Reflections** are short assignments asking you to think more deeply about a subject. They should take about an hour’s worth of work. Oftentimes, they are the individual work that you are asked to bring into **Discussions**. These discussions sometimes take place during class time and sometimes your comments are posted to a discussion board. Asynchronous discussions take about a half hour to complete. Synchronous discussions will occur class time and will require .5 to .75 of an hour. Discussions are useful in sharing what was learned by individuals in the class. They also reinforce your understanding. **Practice applied assignments** involve a demonstration/ explanation on Tuesdays, followed by lab time on Thursdays. The due date is the next day, Friday, in case you would like to clean something up or try something new. You are required to hand in your Friday assignment by 3 pm so that you can get an early start on your weekend. Every week we expect you to apply the knowledge gained in that week (**reflections**, **discussions**, **practice assignments**) to the building of your own model.

The biggest assignment is in having you build your own **simulation model project**. You will be working on this model every week starting Week 6 so that you can make steady progress until it is due. We ask that you upload your working model to Box and your “**lab notebook**” to Carmen by Sunday, 7 pm so that we have a chance to review your work for that week. Specific directions for the notebook are in the assignment, but generally, the lab notebook should list what things you tried to do, what worked and did not work, and your biggest barrier at the moment. By turning it in on Sunday night, the instructors will have a chance to review your work over the next two days so that we can give you feedback by Tuesday’s class.

**GRADING AND COURSE REQUIREMENTS**

# *Grade points*

|  |  |  |  |
| --- | --- | --- | --- |
| **Due Date** | **Assignment \*** | **Totals** | **Components** |
|  | **Course Warm-Up** | **15** |  |
| 8/26 | Getting to Know You and Your Project |  | 5 |
| 8/25 | Introducing Yourself Video |  | 5 |
| 8/26 | Quiz on Syllabus and Course Policies |  | 5 |
|  | **Reflection Essays** | **40** |  |
| 9/1 | How We Can Use Models? |  | 10 |
| 9/8 | Individuals Create Questions for Speakers |  | 10 |
| 9/17 | What did you learn from Guest Speakers? |  | 10 |
| 10/15 | Discussion of Bass and SIR models |  | 10 |
|  | **Discussion Groups** | **50** |  |
| 9/3 | How We Can Use Models? |  | 10 |
| 9/8 | Develop Questions for Guests |  | 10 |
| 10/17 | What did you learn from Guest Speakers? |  | 10 |
| 10/27 | Group Model-Building |  | 10 |
| 11/17 | Combining SD and ABM Models |  | 10 |
|  | **Practice: Simulation Modeling Assignments** | **130** |  |
| 10/2 | SIR Model using SD |  | 40 |
| 10/9 | Bass model using SD |  | 40 |
| 10/22 | Group Model Building |  | 40 |
| 10/29 | Schelling Model Exercise |  | 10 |
|  |  |  |  |
|  | **Policy Simulation Model** | **380** |  |
| 9/3 | “Once Upon a Time” narrative of proposed project |  | 25 |
| 9/22 | Memo to Boss |  | 25 |
| 10/9 | Model Proposal  |  | 25 |
| 10/13,15 | Class Presentation of Model Proposal |  | 25 |
| 10/14,16 | Individual Comments on Peer’s Models |  | 15 |
| 9/27-11/29 | “Lab Notes” - Posting Weekly Interim Work on Model: 9 weeks @ 15 points |  | 135 |
| 12/1,3 | Class Presentation of Final Model |  | 30 |
| 12/10 | Final Project Model |  | 100 |
|  | Bonus points for identifying errors @ 1pt each  |  |  |
|  | **Total**  | **635** |  |

\* Specific assignment details and due dates can be found on the Carmen website.

***Course Components***

**Course Warm-Up**

*Getting to Know You and Your Project.*

Please provide us with some basic information about the model you would like to build. We also would like to get to know you, including your experiences, interests, and skills.

*Introducing Yourself Video.*

Please create a video introducing yourself to the class. This is an online class so the video will help us get to know another. Directions on how to create and upload the video are provided.

*Quiz on Syllabus and Course Policies.*

There are a lot of moving parts in this class. We want to make sure that you have a general idea about the class and how it works. Online classes are different from ion-person classes because we have less of an opportunity to explain and clarify misunderstandings. Consequently, we need more specific online materials in order to communicate well. It is also important to use the online discussion boards if you have a question or if something is not working. Please do so immediately so that we can correct a mistake or misunderstanding. Everyone will benefit from your question and my response. Thank you in advance.

**Reflection Essays**

*How can we use models?*

“All models are wrong, but some are useful.” Too many people confuse models with reality. They are an approximation to reality. At the same time, models are useful in many ways. When we understand the ways models can be used, we will have a better understanding on when and how to use them. Give all of the discussions about models in the public discourse, this reflection will allow you to be an active participant of this discussion. This individual reflection will require you to be clear about how you think about models, and thereby, become a more engaged discussant in our class discussion.

*Develop Individual Questions for Guest Speakers.*

We will have two guests who are working with the Ohio Department of Health to discuss their work in modeling the CoVID19 pandemic. On Tuesday, during class, we will be formulating questions for them so that we have some good questions when they visit on Thursday with us. This assignment requires you to individually submit your questions before our class session. Preparing for this discussion will allow us to get the most out of our time with these speakers.

*What did you learn from Guest Speakers?*

A quick reflection about the guest speaker session will deepen your understanding of the material, make connections to what you already know, and retain what you have learned.

*Discussion of Bass and SIR models.*

We have two applied assignments in which you develop two popular models: SIR and Bass models. The hope is that you might be able to apply what you have learned in these assignments to your own project model. You may also want to do some ‘meta-learning’ so that you can reflect on how you learn best to do modeling.

**Discussion Groups**

Much of what I learned in Graduate School was either self-taught or from my peers. (For example, I learned in a public lab how to log on to IBM CMS mainframe systems in Europe and say hello to whoever was logged on. Pretty damn cool.). Discussion topics are chosen when understanding the material would benefit from sharing diverse perspectives. There are five discussion questions.

*How can we use models?*

Building on your own understanding of models through the reflection essay, the class discussion will help you refine your thinking, and offer you additional perspectives, on models. The discussion will be synchronous.

*Develop Questions for Guest Speakers.*

Building on your own set of questions in the reflection essay assignment, we will develop a list of questions for our guest speakers. By doing so, we push our understanding of their work deeper into the material so that we can get full advantage of their time with us. The discussion will be synchronous.

*What did you learn from Guest Speakers?*

We complete the cycle with our guest speakers by sharing what you learned from the Guest Speaker session. People hear different things so you will all benefit from what others have heard. You will also be able to confirm whether what you heard was heard by others. The discussion will be asynchronous.

*Group Model Building.*

Simulation modeling, in the end, is a group modeling exercise. Group model building is necessary to gain the perspectives on the complete system. This exercise will allow you to see how important multiple perspectives are and learn some of the basic group modeling building exercises. This will be a live, synchronous session.

*Combining SD and ABM Models.*

We will be learning about both systems dynamic models and agent-based models. The natural question will arise as to what the strengths of each approach are and how they can compliment each other. This understanding is deepened when we ask how we can combine them. The discussion will be asynchronous.

**Application Modeling Assignments**

There are four simulation modeling exercises to build skills and build confidence. The instructors will be there to answer your questions. These are good models to learn as they are standard tools in your toolkit.

**En-ROADS** – This assignment will have us exploring simulation modeling from the decision-maker’s perspective. We will learn how important understanding this perspective is for the success of simulation from our guest speakers (I am predicting.). En-ROADS is a web-based interface that allows the decision-maker to manipulate elements of a model in order to understand the system and thereby develop policy.

**SIR Model** - Susceptible, Infected, Recovery models are used to help modelers understand the spread of disease. A very timely model to learn.

**Bass Model** - Are a class of models used to simulate the diffusion of things through an economy (innovation, technology, products, ideas). Again, a very useful tool.

**Schelling Model Exercise** - We will be playing with a table-top exercise to understand how individual agents’ actions in response to each other lead to segregation.

***Project Simulation Model***

You will build a model on a problem of your choosing. Most likely, it will be a systems dynamics model. The strategy is to utilize a series of smaller assignments that allow you to incrementally improve your model over the full 15 weeks of the course. You will be assisted by both instructors. There are a series of smaller modeling exercises that build your set of concepts and skills that can then be applied to your model. Please note that the highest percent of your grade will be earned by the work you do each week on your project (“Lab Notes”; higher than the final project deliverable).

You are required to develop your individual model until the first presentation of your model proposal in Week 8. At that point, you may decide to work together in wo-person groups. The work done up until this time serves as a backstop should you run into problems with your group model.

* Course Warm-up Survey: (includes questions about your proposed model)
* “Once Upon a Time” narrative of proposed project – you begin to understand the problem in your own words
* Memo to Boss: Learn how to explain simulation modeling and how to justify a research proposal
* Present Model to Class for suggestions: Learn how to give and get feedback
* Final Project Model – You will be responsible for completing a final project of your choice. It will be assessed using “face validity.” Full details can be found on Carmen.
* Class Presentation of Final Model – Practice presenting model again this time focusing on presenting results to a decision-maker.
* Lab Notes – Each week you will be presenting the work you did that week with comments on where you are “stuck” and what you plan to work on next.

**Academic Misconduct**

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University’s [*Code of Student Conduct*](https://studentconduct.osu.edu/), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University’s *Code of Student Conduct* and this syllabus may constitute “Academic Misconduct.”

The Ohio State University’s Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: “Any activity that tends to compromise the academic integrity of the University or subvert the educational process.” Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University’s Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

**If we suspect that a student has committed academic misconduct in this course, we are obligated by University Rules to report our suspicions to the Committee on Academic Misconduct.** If COAM determines that you have violated the University’s Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me. Other sources of information on academic misconduct (integrity) to which you can refer include:

* The Committee on Academic Misconduct web pages ([COAM Home](http://oaa.osu.edu/coam.html))
* Ten Suggestions for Preserving Academic Integrity ([*Ten Suggestions*](http://oaa.osu.edu/coamtensuggestions.html))
* Eight Cardinal Rules of Academic Integrity ([www.northwestern.edu/uacc/8cards.htm](http://www.northwestern.edu/uacc/8cards.html))

Having given you the requisite legal notice, let’s look at the reality. One of the most important ways to learn is through collaboration. Even if one person knows more than another person, just explaining it to someone else, deepens your understanding. (We joke as instructors that “teaching is learning.”) Over the course of the semester you will be spending a lot of time building simulations using AnyLogic. Collaboration with your classmates is encouraged, but you must submit individual assignments. Directions for each assignment will make it clear what is individual work and what is collaborative work. We require demonstration of learning through groups and through individual learning (the best way to learn in my opinion).

## **Statement on Title IX**

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu

**COVID Responsibilities**

Safety and health requirements: All teaching staff and students are required to comply with and stay up to date on all University safety and health guidance, which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses.

## **FERPA and Privacy in CarmenZoom**

Video and audio recordings of class lectures will be part of the classroom activity. The video and audio recording is used for educational use/purposes and may be made available to all students presently enrolled in the course. The [*Family Educational Rights and Privacy Act*](http://e.osu.edu/eoa/yOpXQHuT8U/) (FERPA) protects **a**ll meetings held in CarmenZoom that include course content or student information. Please see this CarmenZoom [privacy link](https://resourcecenter.odee.osu.edu/carmenzoom/ferpa-and-privacy-carmenzoom?utm_campaign=oaa_faculty-staff-awareness_fy20_COVID-academic-update-040320&utm_medium=email&utm_source=EOACLK) to learn more.

## **Covid Process SLDS Statement**

## The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university’s [request process](https://slds.osu.edu/covid-19-info/covid-related-accommodation-requests/). If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options.  To establish reasonable accommodations, I may request that you register with Student Life Disability Services.  After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307, 098 Baker Hall, 113 W. 12th Avenue.

## **Glenn College Diversity Values Statement**

## The Glenn College is committed to nurturing a diverse and inclusive environment for our students, faculty, staff, and guests that celebrates the fundamental value and dignity of everyone by recognizing differences and supporting individuality. We are dedicated to creating a safe space and promoting civil discourse that acknowledges and embraces diverse perspectives on issues and challenges that affect our community.

## **Your Mental Health**

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student’s ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know is suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting <https://ccs.osu.edu/> or calling 614-292- 5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614--292--5766 and 24-hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1--800--273--TALK or at https://suicidepreventionlifeline.org/. Also, the OSU Student Advocacy Center is a resource to help students navigate OSU and to resolve issues that they encounter at OSU – visit <http://advocacy.osu.edu/>.

# Accessibility accommodations for students with disabilities

**The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options.  To establish reasonable accommodations, I may request that you register with Student Life Disability Services.  After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.**

## ***Requesting accommodations***

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential. In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.

Go to [http://ods.osu.edu](http://ods.osu.edu/) for more information.

## ***Accessibility of course technology***

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

* [Carmen (Canvas) accessibility](https://community.canvaslms.com/docs/DOC-2061)
* Streaming audio and video

# Schedule

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| Week - Topic | Readings | Assignments / Activities |
| 8/25, 8/271. Introduction to Class and Systems Models | Sterman, “Learning in and about Complex Systems”Page, Scott, “Model Thinker”Epstein, Joshua, “Why Model?” | Warm-up - Getting to Know You and Your Project (Due 8/26)Warm-up - Video Introduction (Due 8/25)Warm-up - Syllabus and Course Policy Quiz (Due 8/26) |
| 9/1, 9/32: Introduction to Simulation Models | Sterman, “The Modeling Process”Hightower, “Iterative Story-Telling” | T: Reflection - How do we use models?R: Discussion - How do we use models?R: Project - “Once upon a time...” narrative of project |
| 9/8, 9/103: Simulation at the Front Lines: COVID at the Ohio Department of Health  | Guest Speakers: Ayaz Hyder, Sam Malloy, OSU COVID-19 simulation modeling team for ODHWilensky & Rand (2017), “Agent-Based Modeling”Materials provided by Guests | T: Reflection - Create Individual Question for DiscussionT: Discussion - Create questions for Guest SpeakersR: Guest SpeakersR: Install AnyLogic |
| 9/15, 9/174: Simulation from a Decision-Maker’s Perspective | En-ROADS materials | T: Reflection -What did you learn from guest speakers?T, R: En-ROADS – Run-Time SimulationR: Discussion - What did you learn from guest speakers? |
| 9/22, 9/245: Stock-and-flow diagrams and accumulations | Sterman, “Stock-and-Flow Models” (Big Reading) | T: Project - Memo to Boss, (Due 9/22) T: Practice: Stocks and Flows Exercises on Stock and FlowsR: Practice: Stock and Flow exercise/apply to project modelSun: Project - Post Lab Notes Due |
| 9/29, 10/16: System Dynamics: SIR Models | AnyLogic in 3 days (Systems Dynamics, pp. 101-131) (SIR model)Ghaffarzadegan, “Small Models in Policy”  | T: Practice - Demo SIR modelR: Practice - Work on SIR model (Due 10/2) Sun: Project - Post Lab Notes Due |
| 10/6, 10/87: Bass Models | Bass Model Assignment | T: Demo Bass ModelR: Practice - Work on SIR model (Due 10/9) Sun: Project - Post Lab Notes Due |

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| 10/13, 10/158: Share project model proposals in class and class provides feedback | Materials for creating and assessing presentations  | T: Reflection - What you learned from SIR and Bass R: Discussion - What you learned from SIR and BassT, R: Project - Present Project ProposalsW, F: Project - Feedback on Discussion BoardSun: Project - Post Lab Notes Due |
| 10/20, 10/229: System DynamicsGroup Model-Building – Infant Mortality  | Hosseinichimeh, “Group Model Building”Hovmand, “Group Model-Building ‘Scripts’”ODH, “Ohio Infant Mortality Report”ODH, “Infant Mortality in Ohio (2011-2018)’ | T: Introduce GMB (Guest Speaker)R: Practice - GMB Build a conceptual modelSun: Project - Post Lab Notes Due |
| 10/27, 10/2910: Agent-Based ModelingUnderstanding Agent Based Modeling | Schelling, “Micromotives and Microbehaviors”Schelling, “Models of Segregation”Zhong, “Pandemic Influenza Simulation” | T: Discuss - GMB exerciseT: Practice - Schelling Segregation Exercise in Class (10/28)R: Project - Work on Project ModelSun: Project - Post Lab Notes Due |
| 11/3, 11/511: Complex Adaptive Systems | Miller and Page, “Complex Adaptive Systems”: Grimm, “ODD protocol” | T: Introduce ODD ProtocolR: Model individuals in your model – In Class Exercise Sun: Project - Post Lab Notes Due |
| 11/10, 11/1212: Combining ABM and SD Methods | Swinerd & McNaught, “Hybrid Simulation”Gajary, “Hybrid Modeling” | T: Dr. Maurer presents her dissertationR: Project - Work on Project ModelSun: Project - Post Lab Notes Due |
| 11/17, 11/1913: Final work on Structure of Model | Lab Time During Regular Class Time | T: Discuss Combining ABM and SD modelsT, R: Instructors will help refine modelsSun: Project - Post Lab Notes Due |
| 11/24, (Thanksgiving)14: Clean-up model. Documentation.  | Lab Time Tuesday | Sun: Project - Post working model for presentation next weekSun: Project - Post Lab Notes |
| 12/1, 12/315: Present / Final Changes  |  | T, R: Class presentations |
| Final Exam Week  |  | Final Model Due: Thursday, Due Dec. 10, 5 pm |