

GROWING ARTIFICIAL SOCIETIES

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Note

Be sure to download NetLogo and install it on a personal computer before the first week of class. Use of NetLogo is a required part of this course.

Econ 450/650 Overview

Topic Overview

This course provides an introduction to agent-based modeling and simulation (ABMS) as a method for the investigation of complex economic phenomena. Students explore, modify, and create virtual worlds that shed light on the actual world. Illustrative applications include the following:

- institutional determinants of inequality in the distribution of wealth
- sources of segregation in urban housing
- characteristics of social dilemmas such as the tragedy of the commons, and possible escapes from these dilemmas
- origins of cooperative behavior
- causes of economic growth

Learning Outcomes

After taking this course, students will be able to:

- explain how agent-based models are used in social-science research
- provide examples of how agent-based simulations can teach us about social processes
- describe a variety of ABMS research programs across the social-science disciplines

- contrast the strengths and weaknesses of agent-based social science with more traditional approaches (e.g., statistical or mathematical approaches)
- list some scientific questions that are best investigated with agent-based modeling
- describe some of the unique insights about economics provided by agent-based methods
- give examples of how ABMS has affected the social sciences
- describe different approaches to empirical validation in ABMS
- use a software toolkit to facilitate ABMS model exploration
- explain and use basic programming constructs, including looping, branching, and procedures
- modify and extend simple agent-based models
- explain why version control software (such as Subversion or git) is important
- design and construct simple agent-based simulations
- formulate hypotheses about a simulation model and create an experimental design to test these hypotheses
- conduct experiments with agent-based models
- use data-visualization techniques to analyze the results of agent-based experiments
- present the results of an agent-based research project

This course is designed as an introduction to tools, methods, and applications. Occasionally I will discuss technical details relevant to specific ABMS applications. Mastery of technical details will often be optional for undergraduates. Graduate students in this course will additionally be able to:

- explain how to use anonymous functions (lambdas)
- explain the difference between procedural design, object-oriented design, and functional design of agent-based models
- explain why object-oriented programming is widely used for ABMS
- describe basic principles of object-oriented program design
- effectively use version control software

Advanced students will additionally be able to:

- describe advantages and challenges of running agent-based simulations on a high-performance computing facility
- explain how parallel and distributed processing can speed up an agent-based simulation

Course Policies

Prerequisites

Students should take an introductory course in microeconomics before attempting this course. There are no other prerequisites. Specifically, there are no prerequisite programming courses.

This course does ***not*** assume prior experience with computer programming. However, it does

assume a real interest in learning to program. In order to master the programming component of this course, you will need:

- commitment to critical thinking and analytical reasoning, along with curiosity about how to make computers do your bidding.
- willingness to start out with some intensive rote memorization, as when learning any new language. I recommend cooperating with classmates to create flashcards based on the NetLogo Dictionary.

In order to master the social-science component of this course, you will need:

- commitment to staying current with the required reading.
- interest in real-world social phenomena where computational approaches can be usefully applied (e.g., environmental policy, market microstructure, conflict, social networks, origins of cooperation/civilization, intergenerational transmission of economic status, social dilemmas, epidemics, or other area of application).

Communication

This class will use Canvas. Look there for the syllabus, lecture supplements, and assignments. Canvas announcements are sent by email; students ***must*** monitor these announcements and Canvas Conversations (Inbox). Students should also subscribe to the Canvas Discussions. In online interactions, all students are expected to adhere to basic etiquette: be respectful, and quote appropriately.

Participation Policy

Active and timely participation is required and graded. See the Assignments module on Canvas for details.

Homework Policy

Important

Submit all homework through Canvas by the due date. **Due dates are firm.** There will be a grade reduction (of 10% of possible points) for each day past a deadline. (This is **automatically** imposed by Canvas.) Due dates are listed in our Canvas Assignments module at the beginning of the term. Plan ahead! If a due date will conflict with a religious or family obligation, plan to turn in that assignment ahead of time.

Homework submissions should be clearly labeled with your last name, the assignment number,

and the course number. For computational assignments, you must submit a *working* program file. (Run it right before sending it: programs that do not run *as submitted* receive a grade of zero!)

Homework must be submitted in approved file formats. Submit written assignments in PDF format. The Software section of this syllabus discusses program and data formats, which each assignment will specify.

BACKUP IS REQUIRED

Back up your homework as you work on it. This is a course requirement. Back up more than once per hour of work to a safe external storage location. (This might be a flash drive or better yet a cloud service such as Google Drive or DropBox.) Since backing up is a required part of the course, work lost due to failure to back up does not excuse non-submission.

Input on Teaching

Near the end of the course, you will have the opportunity to evaluate this class and your learning experience by completing an Input on Teaching from Students (ITS) survey. You are strongly encouraged to fully participate in the ITS process. I especially appreciate written comments that help me to improve and strengthen this course.

Assessment and Grading

Grades are based on total points earned in three components: participation, short computational projects, and a major term project. Students must keep up with the required reading and demonstrate that they are mastering the learning outcomes. Homework projects provide one opportunity to demonstrate mastery, and these receive heavy overall weight in grading. (This course is primarily project-based: there are no exams.) Finally, students work actively on the term project for the entire term; it is broken into components which are submitted as the term progresses. A project-based term paper due at the end of the course replaces the final exam.

The requirements for submitted work are briefly summarized here. However, be sure to visit Canvas for the assignment details and due dates.

Short Computational Projects

Each student will submit computationally oriented homework projects that develop mastery of methods introduced in the course. Students will implement these projects in NetLogo. Successful project completion will demonstrate an ability to design, construct, and analyze very simple agent-based models. (Graduate students should display their mastery of technical topics in their submitted projects.)

Course Project

All students will complete an extensive research project, which involves extending and experimenting with an agent-based simulation model. Required project milestones (experimental designs, project documentation, code, and paper submission) occur during the course. (Be sure to read the Project Details page very carefully, with special attention to the formatting checklist linked there.)

The proposal, model documentation, and project code are group efforts: **each** individual in a given group should submit an identical file. However, experiment design and the term papers are individual: each individual should submit a distinct, original experimental design and term paper. In the term paper, students should show that they have responded to my comments on the milestones and that they have overcome any weaknesses and built on any strengths revealed by their homework projects.

Point Allocations (Summer 2023)

Component	subcomponent	point details	Points (Component)
Participation			5
HW Projects			40
	Project 1	5	
	Project 2	15	
	Project 3	20	
Term Project			50
	Initial Experiment (design)	3	
	Initial Experiment (report)	6	
	Term-project Documentation (ODD + UML)	8	
	Term-project Experimental Design	3	
	Term-project Code	10	
	Term Paper	20	

Course Resources

Core Texts

An Introduction to Agent-Based Modeling

[Wilensky.Rand-2015-MIT] (This book is used for required readings; it is available electronically from the Library.)

NetLogo User Manual

A a free online resource.

Online Statistics Education

A a free (public domain) online resource.

For additional individual exploration, also see my list of supplementary texts.

Software

Please install NetLogo and Excel on your personal computer before the term begins. (NetLogo is a free download; Excel is provided free to AU students.) See the required software listing for more details. You may also wish to consider installing some supplementary software, but this is not required.

Support Services

On campus services such as the Writing Center may require explicit instructor approval before providing assignment-related support. Just show them this paragraph, which provides that approval. Of course you cannot ask these services to actually write assignment-related code or text for you. However, you can request help understanding why code you wrote is not working, how best to format your tables, how to effectively work from an outline, and other useful support.

Topics and Readings

Please read the required reading in the order introduced. Readings marked as *advanced* are required for graduate students only. Optional readings are offered for your own interest and are *not* required in any way. (There is no expectation that you will even casually glance at the optional readings; they are entirely optional.) You are of course responsible for all lecture content.

Introduction to Computational Modeling

TOPIC: WHAT IS NETLOGO?

- ▶ NetLogo: A First Look
- ▶ Video: Tour of the NetLogo Interface
- ▶ Video: Interface Input

MODELS FOR EXPLORATION

Use NetLogo to explore these models!

- ▶ Sample Model: Party
- ▶ Sample Model: Traffic Basic

Find additional optional materials on the syllabus supplement.

TOPIC: GETTING STARTED WITH NETLOGO

You will need to do the readings for this section multiple times, working with NetLogo as you go.

- ▶ Basic Concept: Numerical Computation
- ▶ Video: Statements and Expressions in NetLogo
- ▶ Core Concept: Reporter Procedures
- ▶ Video: NetLogo Command Procedures and Reporter Procedures

OPTIONAL READINGS AND RESOURCES

- ▶ Getting Started with NetLogo
- ▶ Model Entities

Also consider some video tutorials. For advanced students, Gilbert (2008) ch. 4 may be helpful.

TOPIC: WHAT IS COMPUTATIONAL MODELING?

Modeling and Simulation

Read this section of the Discrete-Time Dynamical Systems Lecture Notes module on Canvas.

Models and Modeling

[Railsback.Grimm-2019-PrincetonUP] Preface and Chapter 1. The first chapter of this textbook is available online.

ADVANCED READING

Algorithms and the Shift in Modern Science

[Arthur-2020-Beijer269]

TOPIC: BEGINNING NETLOGO PROGRAMMING

- ▶ Core Concept: Reporter Procedures
- ▶ NetLogo Models: Basic Structure
- ▶ Wolf-Sheep Predation

NETLOGO PLOTTING

- ▶ Core Concept: Plotting
- ▶ Procedures, Monitors, Buttons, Switches, Plotting
- ▶ NetLogo Plotting

MODELS FOR EXPLORATION

NetLogo Plotting Example:

File > Models Library > Code Examples > Plotting Example

Video: Rabbit-Coyote Predation by Maureen Psaila-Dombrowski.

Linked in the NetLogo videos.

ADVANCED READINGS AND RESOURCES

Decomposition by Maureen Psaila-Dombrowski.

Linked in the Basic Programming videos.

Beginning Computational Modeling

TOPIC: POPULATION DYNAMICS

- ▶ Exponential Population Growth
- ▶ Functions (Reporter Procedures)
- ▶ Plotting
- ▶ Video: Population Dynamics (Maureen Psaila-Dombrowski, 2015)
- ▶ Video: NetLogo Monitors and Plots

Also, watch the first of Wurzer's NetLogo tutorials (at the bottom of his list of videos).

TOPIC: MORE PLOTTING

Plotting Example (Models Library)

Find this in the NetLogo Models Library, under Code Examples. (You need this material for your homework projects. Please ask questions about anything you do not understand!)

Histogram Example (Models Library)

Find this in the NetLogo Models Library, under Code Examples. (You need this material for your homework projects. Please ask questions about anything you do not understand!)

TOPIC: SIMPLE RULES FOR COMPLEX OUTCOMES

Logistic Population Growth

Lecture Slides (via Canvas)

Model Parameters as Netlogo Sliders

Review this section of my Netlogo Programming lecture notes.

ADVANCED READING

Simple Mathematical Models with Very Complicated Dynamics

[May-1976-Nature] (Classic introduction to non-linear dynamics.)

RECOMMENDED READING AND RESOURCES

- ▶ Video: The Secret Life of Chaos
- ▶ Logistic Map
- ▶ Short story: A Sound of Thunder

ADVANCED RECOMMENDED READING

- ▶ What Are Algorithms?

- ▶ Iteration, Automatic Computers, and Economic Dynamics

PROGRAMMING TOPIC: DATA EXPORT AND ANALYSIS

- ▶ Exploring and Extending Agent-Based Models
- ▶ Comma-Separated Values (CSV)
- ▶ CSV Extension
- ▶ File-Based IO

RECOMMENDED READING

CSV Files

[Railsback.Grimm-2019-PrincetonUP] Ch. 5

Computational Social Science

TOPIC: INTRODUCTION TO CSS

Models and Modeling

Read this section of my Introduction to Simulation Modeling Lecture Slides

Contrast or Assimilation: Choosing Camps in Simple or Realistic Modeling

[Coen-2009-CMOT] <http://link.springer.com/article/10.1007%2Fs10588-008-9044-0>

Can Artificial Economies Help us Understand Real Economies?"

[Kirman-2012-OFCE] (Emphasis on macro fluctuations.) <http://www.cairn.info/revue-de-l-ofce-2012-5.htm>

ADVANCED READING

- ▶ Why Do Simulation? Towards a Working Epistemology for Practitioners of the Dark Arts
- ▶ “Artificial Adaptive Agents in Economic Theory”
- ▶ “Remarks on the Foundations of Agent-based Generative Social Science”

Also see the supplementary readings.

RECOMMENDED READING

- ▶ “Introduction to Modeling and Simulation”
- ▶ Different Modelling Purposes

DEMONSTRATION MODELS

- Gambler's Ruin (static pairs experimental simulation) (You will need 10 pennies for the next few lectures.)
- Gambler's Ruin (static pairs computer simulation)

TOPIC: CORE CONCEPTS IN NETLOGO PROGRAMMING

- ▶ Creating Simple Agent-Based Models
- ▶ NetLogo: Language Basics, and NetLogo Models
- ▶ NetLogo Procedures (with input arguments)
- ▶ NetLogo 6.0---Quick Guide

TOPIC: WHAT IS AGENT-BASED MODELING?

- ▶ Fishing Economy
- ▶ What Is Agent-Based Modeling
- ▶ Introduction to ABMS
- ▶ NetLogo Agents

RECOMMENDED READING

- ▶ Agent-Based Computational Economics: A Short Introduction
- ▶ Agent-Based Models
- ▶ Introduction to Agent-Based Modeling
- ▶ Rational Fools: A Critique of the Behavioral Foundations of Economic Theory

TOPIC: CSS AND ABM

- ▶ Agent-Based Modeling and Simulation
- ▶ Varieties of Emergence
- ▶ Emergence videos

ADVANCED READING

- ▶ Tutorial on Agent-based Modelling and Simulation},
- ▶ Why Agents? On The Varied Motivations For Agent Computing In The Social Sciences

OPTIONAL READINGS AND RESOURCES

- ▶ The Impact Of Agent-based Models In The Social Sciences After 15 Years Of Incursions
- ▶ Introduction to ABM

From the NetLogo videos, watch Irene Lee on Agent-Based Modeling with NetLogo. From the Basic Programming videos, watch Maureen Psaila-Dombrowski on Variables and Scope. Also consider Wurzer's video tutorials (3-8 and 9-17) For graduate students, Gilbert (2008) ch. 4 may be helpful. (To use Gilbert's code, change **agent** to **agt** everywhere.)

DEMONSTRATION MODELS

- Communication-T-P Example

- Communication-T-T Example
- Ask Ordering Example

TOPIC: EXPERIMENTAL DESIGN

- ▶ Psaila-Dombrowski (2015)
- ▶ BehaviorSpace documentation
- ▶ Experimental Design
- ▶ Designing Simulation Experiments
- ▶ A User's Guide to the Brave New World of Designing Simulation Experiments

ADVANCED READING

Kleijnen et al. (2005),

<http://ideas.repec.org/p/dgr/kubcen/20031.html> A User's Guide to the Brave New World of Designing Simulation Experiments

OPTIONAL READING AND RESOURCES

- ▶ Analyzing Agent-Based Models
- ▶ Behavior Space
- ▶ How to use BehaviorSpace
- ▶ Designing and Running Experiments in NetLogo (VIDEO)
- ▶ Experimental Design: Basic Concepts and Terminology

Implementing ABMs

TOPIC: GIFT WORLD AND THEFT WORLD

- ▶ Simple Economy
- ▶ Dynamic Histogram Example
- ▶ Lorenz Curve and Gini Coefficient

OPTIONAL READING

Integral Calculus: Introduction

Lecture Notes

Also see the supplementary readings on econophysics.

TOPIC: TWO-PLAYER GAMBLER'S RUIN

Gambler's Ruin

Lecture Notes

OPTIONAL READING

- ▶ N-Player Gambler's Ruin
- ▶ Agent-Based and Individual-Based Modeling: A Practical Introduction
- ▶ Agents, Environments, and Timescales
- ▶ Follow the Money

DEMO

- Code Example: Plotting Example
- Gambler's Ruin (static pairs computer simulation: collaborative development)

Documenting Agent-Based Models

TOPIC: COLLABORATIVE PROGRAMMING

Introduction to Subversion

Reread my Subversion lecture slides

Pair Programming

http://en.wikipedia.org/wiki/Pair_programming

Topic:: ODD

You will use the ODD protocol for your project documentation.

Introduction to the ODD Protocol

Lecture Notes (via Canvas)

The ODD Protocol for Describing Agent-Based and Other Simulation Models

[Grimm_etal-2020-JASSS] <http://jasss.soc.surrey.ac.uk/23/2/7.html>

Also see the supplementary reading and resources.

DEMO

Info tab of the Rebellion model

NetLogo Models Library (This model is an adaptation of the Epstein (2002) model of civil violence.) Illustrates NetLogo's documentation facilities

Topic: UML

Unified Modeling Language (UML)

Lecture Notes (via Canvas)

UML for ABM

[Bersini-2012-JASSS] <http://jasss.soc.surrey.ac.uk/15/1/9.html>

The UML supplementary readings and resources include very useful videos.

More Agent-Based Methods

TOPIC: PROGRAMMING PRACTICES

Introduction to Implementation Verification

Lecture Notes

Verification, Validation, and Replication

[Wilensky.Rand-2015-MIT] Chapter 7

RECOMMENDED READING

Testing Your Program

[Railsback.Grimm-2019-PrincetonUP] ch. 6

TOPIC: SEGREGATION

- ▶ Segregation Models
- ▶ The Segregation Model
- ▶ Segregation Model
- ▶ The Parable of the Polygons (interactive)
- ▶ “Seeing around corners”

RECOMMENDED READING

Modeling Interaction:

[Railsback.Grimm-2019-PrincetonUP] ch. 10.3

For this topic, there are optional additional readings on spatially situated agents and segregation.

TOPIC: ZERO-INTELLIGENCE TRADERS

- ▶ Zero Intelligence in Economics and Finance
- ▶ Zero Intelligence Traders: Gode and Sunder (1993)

For this topic there are optional additional readings.

TOPIC: AGENT-PATCH INTERACTIONS

- ▶ Wolf-Sheep Predation (Info Tab)
- ▶ Resource Foraging
- ▶ Video: Agent-Environment Interactions
- ▶ Sustaining the Commons

OPTIONAL READINGS AND RESOURCES

- ▶ Mushroom Hunt
- ▶ Business Investor

DEMONSTRATION MODELS

- ▶ Mushroom Hunt
- ▶ Butterfly Model
- ▶ Business Investor Model
- ▶ Schelling Segregation Model
- ▶ BoysNGirls2

Optional Midsemester Topics (Should Time Permit)

At this point, we may insert one or more optional topics, time permitting.

- Econophysics as Macroeconomics
- Inheritance and Wealth
- Advanced NetLogo Programming

See the syllabus supplement for these and other possible topics.

More Interacting Agents

TOPIC: INTERACTIONS BETWEEN MOBILE AGENTS

- ▶ Traffic Basic (Info and Code tabs)
- ▶ Heroes and Cowards (Info and Code tabs)
- ▶ Heroes and Cowards

OPTIONAL READING AND RESOURCES

- ▶ Flocking Model; Behavior Space
- ▶ Traffic Model and Wolf-Sheep Predation
- ▶ Traffic Experiment
- ▶ Turtle-Turtle Interaction (Peter Brooks)

TOPIC: TEMPLATE MODELS (AN INTRODUCTION)

The ABM Template Models: A Reformulation with Reference Implementations

[Isaac-2011-JASSS] <http://jasss.soc.surrey.ac.uk/14/2/5.html>

TOPIC: SUGARSCAPE (INTRODUCTION)

- ▶ Introduction to Sugarscape
- ▶ Sugarscape 1 (Info and Code tabs)

- Sugarscape 2 (Info and Code tabs)

For this topic there are optional additional readings.

More Spatially Situated Agents

TOPIC: TEMPLATE MODELS (CONTINUED)

The ABM Template Models: A Reformulation with Reference Implementations

[Isaac-2011-JASSS] <http://jasss.soc.surrey.ac.uk/14/2/5.html>

TOPIC:: SUGARSCAPE (CONTINUED)

Seeing Around Corners

[Rauch-2002-Atlantic] <http://www.theatlantic.com/magazine/archive/2002/04/seeing-around-corners/2471/>

Exploring the Sugarscape

[Epstein.Axtell-1996-MIT] Ch. 1–2

DEMO MODELS

- Sugarscape Models Library > Social Science > Sugarscape.
- Sugarscape (detailed)

Modeling Skills

TOPIC: MORE SUGARSCAPE

Growing Artificial Societies

[Epstein.Axtell-1996-MIT] Ch. 3–5 (Comment: students who have not had intermediate micro theory may skim the technical details.)

Also see the supplementary Sugarscape readings.

Networks of Agents

TOPIC: INTRODUCTION TO NETWORKS

- Video: Infectious Disease Model from Scratch
- Video: NetLogo Network Primitives
- Documentation link:
- Video: This Video Will Make You Angry by CGP Grey

ADVANCED READING

On Networks and Markets

[Zuckerman-2003-JEL]

OPTIONAL READING

- ▶ Textbook reading on networks.
- ▶ The Message of Measles
- ▶ Preferential Attachment Graph Creation using NetLogo
- ▶ Introducing Time and Space
- ▶ Agents Making Decisions

TOPIC: NETWORK ANALYSIS

Video: Network Structure

by Jen Golbeck (2013)

OPTIONAL READING

- ▶ Using Visualizations to Explore Network Dynamics
- ▶ Using *Lord of the Flies* to Teach Social Networks

TOPIC:: MEME TRANSMISSION

- ▶ Ants, Rationality, and Recruitment
- ▶ The Dissemination of Culture
- ▶ Video: *Narrative Economics*

Agent-Based Macroeconomics and Finance

TOPIC: MACROECONOMICS

- ▶ Why Do We Need Agent-Based Macroeconomics?
- ▶ Modeling Macroeconomies as Open-Ended Dynamic Systems of Interacting Agents

RECOMMENDED READING

- ▶ The Economy Needs Agent-Based Modelling

TOPIC: FROM ECONOPHYSICS TO MACROECONOMICS

Exploring the Social-Architecture Model

[Isaac-2018-EEJ]_

Other Possible Topics (Should Time Permit)

See the syllabus supplement for other possible topics. Let me know if any are a priority for you.

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Trigger Warnings

This syllabus intentionally lacks trigger warnings. While a university education should be physically safe, it should be intellectually perilous. For a discussion, see [Lukianoff.Haidt-2018-Penguin]. For the views of the American Association of University Professors, see their 2014 report entitled On Trigger Warnings. Any student who finds this lack of trigger warnings personally threatening should contact AU's Well-Being Center for counseling and support.

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Required and Recommended Syllabus Sections

The following sections are required or recommended on all syllabi at American University. The language is unaltered from suggestions provided by the administration.

Academic Support and Access Center (ASAC) MGC 243, 202-885-3360.

All students may take advantage of the Academic Support and Access Center (ASAC) for individual academic skills, counseling, workshops, tutoring and writing assistance, as well as Supplemental Instruction. All services are free. The services include the Writing Center (first floor of Bender Library), which assists students with academic writing and assignments. The Math/Stat Lab (Myers Building, 202-885-3154) which provides mathematics and statistics tutoring. Additional content tutoring is also available in the ASAC's Tutoring Lab.

STUDENTS WITH DISABILITIES

American University is committed to making learning and programming as accessible as possible. Students who wish to request accommodations for a disability, must notify me with a letter of approved accommodations from the ASAC. As the process for registering and requesting accommodations can take some time, and as accommodations, if approved, are not retroactive, I strongly encourage students to contact the ASAC as early as possible. For more information about the process for registering and requesting disability-related accommodations, contact ASAC.

Academic Integrity

Standards of academic conduct are set forth in the University's Academic Integrity Code. By registering for this course, you have acknowledged your awareness of the Academic Integrity Code and your obligation to become familiar with your rights and responsibilities as defined by the code. Violations of the Academic Integrity Code will not be treated lightly, and disciplinary actions will be taken should violations occur. The standard sanction for violations is failure of the course.

Emergency Preparedness

In the event of a declared pandemic (influenza or other communicable disease), American University will implement a plan for meeting the needs of all members of the university community. Should the university be required to close for a period of time, we are committed to ensuring that all aspects of our educational programs will be delivered to our students. These may include altering and extending the duration of the traditional term schedule to complete essential instruction in the traditional format and/or use of distance instructional methods. Specific strategies will vary from class to class, depending on the format of the course and the timing of the emergency. Faculty will communicate class-specific information to students via AU e-mail and Blackboard. Students are responsible for checking their AU e-mail regularly and keeping themselves informed of emergencies. In the event of a declared pandemic or other emergency, students should refer to the AU Web site (american.edu/emergency) and the AU information line at (202) 885-1100 for general university-wide information, as well as contact their faculty and/or respective dean's office for course and school/college-specific information.

Sharing of Course Content

Students are not permitted to make visual or audio recordings, including live streaming, of classroom lectures or any class related content, using any type of recording devices (e.g., smart phone, computer, digital recorder, etc.) unless prior permission from the instructor is obtained, and there are no objections from any of the students in the class. If permission is granted, personal use and sharing of recordings and any electronic copies of course materials (e.g., PowerPoints, formulas, lecture notes and any classroom discussions online or otherwise) is limited to the personal use of students registered in the course and for educational purposes only, even after the end of the course.

Exceptions will be made for students who present a signed Letter of Accommodation from the Academic Support and Access Center. See: How Do I Request Accommodations?

<http://www.american.edu/ocl/asac/Accommodations.cfm>

To supplement the classroom experience, lectures may be audio or video recorded by faculty and made available to students registered for this class. Faculty may record classroom lectures or discussions for pedagogical use, future student reference, or to meet the accommodation needs of students with a documented disability. These recordings are limited to personal use and may not be distributed (fileshare), sold, or posted on social media outlets without the written permission of faculty.

Unauthorized downloading, file sharing, distribution of any part of a recorded lecture or course materials, or using information for purposes other than the student's own learning may be deemed a violation of American University's Student Conduct Code and subject to disciplinary action (see Student Conduct Code VI. Prohibited Conduct).