2023S SYS 611-A

[Jump to Today](#)

❓

SYS 611: Systems Modeling and Simulation

School of Systems and Enterprises

Spring 2023

Instructor:	Paul Grogan
Canvas Course Address:	**https://sit.instructure.com/courses/64674 (https://sit.instructure.com/courses/64674)**
Course Schedule:	Lecture: Thursdays, 6:30-9:00pm ET (Babbio 319)
Contact Info:	**pgrogan@stevens.edu, (mailto:pgrogan@stevens.edu,)** 201-216-5378
Office Hours:	Tuesdays, 5:00-6:15pm ET (Babbio 502B or **Zoom** ⬂ **(https://stevens.zoom.us/j/95538756160)**)
Grader:	Louise Gottwald (**lgottwal@stevens.edu (mailto:lgottwal@stevens.edu)**)

Prerequisite(s)/Corequisite(s): None

COURSE DESCRIPTION

This course emphasizes the development of modeling and simulation concepts and skills necessary to design, program, implement, and use computers to solve complex systems/products analysis problems. The key emphasis is on problem formulation, model building, data analysis, solution techniques, and evaluation of alternative designs/processes in complex systems/products. Overview of modeling techniques and methods used in decision analysis, including Monte Carlo simulation and discrete event simulation are presented.

STUDENT LEARNING OUTCOMES

After successful completion of this course, students will be able to:

- Apply classic and modern (state-of-the-art) modeling and simulation methods, techniques and software packages to analyze real world data.
- Understand the linkage and importance of modeling and simulation to systems engineering, domain-specific engineering, and engineering management activities and best practices.
- Utilize methods, processes, and tools needed to perform effective and efficient modeling and simulation on complex projects/programs.

COURSE FORMAT AND STRUCTURE

This course is offered as a distance learning mode of instruction. Lectures will be live-streamed and recorded for remote access. Assignments and exams will be administered online using Canvas. All course requirements can be completed online. To access the course, please visit **stevens.edu/canvas** ⤷ **(http://stevens.edu/canvas)** . For more information about course access or support, contact the TRAC by calling 201-380-6599 or 201-216-5500.

Course Logistics

- Lectures are held on Thursdays from 6:30-9:00pm ET. All lectures are live, attendance is expected, and recordings will be available for personal learning.
- Weekly discussion questions are due on Wednesdays by 11:59pm ET on Canvas.
- Homework assignments are due on Wednesdays by 11:59pm ET on Canvas.
- Exams will be administered in person.
- The term project deliverable is a written report to be submitted via Canvas.

Instructor's Online Hours

I am available via email and will respond as soon as I am available (generally within 1 business day). I monitor Canvas discussions and respond as soon as possible (generally sooner than 1 business day).

Hybrid Office Hours

Hybrid office hours provide a physical (Babbio Center 502B) and virtual (Zoom) opportunity to discuss questions related to the weekly readings and/or assignments.

Online Etiquette Guidelines

Help foster a safe online learning environment. All opinions and experiences, no matter how different or controversial they may be perceived, must be respected in the tolerant spirit of academic discourse. You are encouraged to comment, question, or critique an idea but do not attack individuals. Our differences, some of which are outlined in the University's inclusion statement below, add richness to this learning experience. Please consider that sarcasm and humor can be misconstrued in online interactions. Working as a community of learners, we can build a polite and respectful course ambience.

TENTATIVE COURSE SCHEDULE

The following schedule identifies tentative dates and topics for class sessions. Any changes will be communicated via an announcement and an updated schedule on Canvas.

#	Date	Topic(s)	Recommended Readings	Assignm
1	1/19	**Overview and Introduction** **(https://sit.instructure.com/courses/64674/modules/299805)** Fundamentals of Modeling M&S in Systems Engineering	Farr Ch. 1 Maria (1997)	**DQ-1** **(https://si** : due 1/2
2	1/26	**Modeling Tools** **(https://sit.instructure.com/courses/64674/modules/299806)** Conceptual Models (Graphical Diagrams) Computational Models (Excel and Python)		**DQ-2** **(https://si** : due 2/1 **HW-1** **(https://si** due 2/1
3	2/2	**Review of Probability** **(https://sit.instructure.com/courses/64674/modules/299807)** Random Variables Process Generators	Farr Ch. 3 (p. 1-38) Ross Ch. 2-5	**DQ-3** **(https://si** : due 2/8 **HW-2** **(https://si** due 2/8
				DQ-4

4	2/9	**Stochastic Simulation** **(https://sit.instructure.com/courses/64674/modules/299808)** Monte Carlo Simulation Variance Reduction Techniques	Farr Ch. 3 (p. 39-47) Farr Ch. 4 Ross Ch. 8-9	**(https://si** : due 2/1 **HW-3** **(https://si** due 2/15
5	2/16	Review Lecture / Practice Problems		**DQ-5** **(https://si** : due 2/2
6	2/23	**Exam 1** **(https://sit.instructure.com/courses/64674/modules/299809)** (Weeks 1-4)		**Exam 1** **(https://si**
7	3/2	**Dynamic Simulation** **(https://sit.instructure.com/courses/64674/modules/299810)** Discrete Time Models Continuous Time Models	Zeigler (2000) Sayama Ch. 4 and 11	**DQ-6** **(https://si** : due 3/8 **HW-4** **(https://si** due 3/8
8	3/9	**Dynamic Probability Models** **(https://sit.instructure.com/courses/64674/modules/299811)** Markov Chain Models Queuing Theory	Farr Ch. 2 Larson & Odoni (2007)	**DQ-7** **(https://si** : due 3/2 **HW-5** **(https://si** due 3/22
--	3/16	Spring Break -- No Class		
9	3/23	**Discrete Event Models** **(https://sit.instructure.com/courses/64674/modules/299812)** Queuing System Model Inventory System Model	Ross Ch. 7	**DQ-8** **(https://si** : due 3/2 **HW-6** **(https://si** due 3/29
		Simulation in Practice	Farr Ch. 9	**DQ-9** **(https://si**

10	3/30	**(https://sit.instructure.com/courses/64674/modules/299814)** Exam 2 Review Verification, Validation, and Accreditation	Ross Ch. 11 Hazelrigg (2003)	: due 4/1: **HW-7 (https://si** due 4/12
11	4/6	**Exam 2 (https://sit.instructure.com/courses/64674/modules/299813)** (Weeks 7-9)		**Exam 2 (https://si**
12	4/13	**Discrete Event Simulation (https://sit.instructure.com/courses/64674/modules/299815)** Discrete Event Simulation in SimPy Discrete Event Simulation in AnyLogic	SimPy Tutorial Grigorev (2014)	**DQ-10 (https://si** : due 4/1: **HW-8 (https://si** due 4/19 **Project (https://si** due 5/15
13	4/20	**Agent-based Simulation (https://sit.instructure.com/courses/64674/modules/299816)** Agent-based Models Agent-based Simulation in NetLogo	Bonabeau (2002) Macal & North (2010) Wilinsky & Rand (2015)	**DQ-11 (https://si** : due 4/2(**HW-9 (https://si** due 4/26
14	4/27	**Advanced Topics in Systems Simulation (https://sit.instructure.com/courses/64674/modules/299817)**		**DQ-12 (https://si** : due 5/3
	5/15	**Term Project (https://sit.instructure.com/courses/64674/assignments/379406)** Due		

COURSE MATERIALS

Textbook(s):

- **J.V. Farr (2007).** *Simulation of Complex Systems and Enterprises.* **Course Notes for SYS 611. Stevens Institute of Technology.**
  (https://sit.instructure.com/courses/64674/files/10852569/download?wrap=1) ↓
  (https://sit.instructure.com/courses/64674/files/10852569/download?download_frd=1)

Recommended Reference:

- Ross, S.M. (2013). *Simulation*. 5th Edition, Elsevier. ISBN: 978-0-12-415825-2.

Other Readings:

- Maria, A., "Introduction to Modeling and Simulation," *Proc. 1997 Winter Sim. Conf.*, pp. 7-13, 1997. Doi: **https://doi.org/10.1145/268437.268440** ⤷ **(https://doi.org/10.1145/268437.268440)** [**PDF** **(https://sit.instructure.com/courses/64674/files/10852573/download?wrap=1)** ↓ **(https://sit.instructure.com/courses/64674/files/10852573/download?download_frd=1)**]
- Zeigler, B.P., H. Praehofer, and T.G. Kim, "Modeling Formalisms and Their Simulators," Chapter 3 in *Theory of Modeling and Simulation*, 2nd Edition, Academic Press, pp. 37-74, 2000. [**PDF** **(https://sit.instructure.com/courses/64674/files/10852565/download?wrap=1)** ↓ **(https://sit.instructure.com/courses/64674/files/10852565/download?download_frd=1)**]
- Sayama, H.*, Introduction to Modeling and Analysis of Complex Systems*, Open SUNY Textbooks, 2015. Online: **http://bingweb.binghamton.edu/~sayama/textbook/** ⤷ **(http://bingweb.binghamton.edu/~sayama/textbook/)**
- Larson, R.C. and A.R. Odoni, "Introduction to Queuing Theory and Its Applications," Chapter 4 in *Urban Operations Research*, Dynamic Ideas, 2007, pp. 182-267. Online: **https://web.mit.edu/urban_or_book/www/book/chapter4/contents4.html** ⤷ **(https://web.mit.edu/urban_or_book/www/book/chapter4/contents4.html)**
- Hazelrigg, G.A., "Thoughts on Model Validation for Engineering Design," *Proc. 2003 Design Eng. Tech. Conf.*, Chicago, IL, 2003. Doi: **https://doi.org/10.1115/DETC2003/DTM-48632** ⤷ **(https://doi.org/10.1115/DETC2003/DTM-48632)** [**PDF** **(https://sit.instructure.com/courses/64674/files/10852581/download?wrap=1)** ↓ **(https://sit.instructure.com/courses/64674/files/10852581/download?download_frd=1)**]
- Bonabeau, E., "Agent-based Modeling: Methods and Techniques for Simulating Human Systems," *Proc. National Academy of Sciences*, Vol. 99, Suppl. 3, pp. 7280-7287, 2002. Doi: **https://doi.org/10.1073/pnas.082080899** ⤷ **(https://doi.org/10.1073/pnas.082080899)** [**PDF** **(https://sit.instructure.com/courses/64674/files/10852598/download?wrap=1)** ↓ **(https://sit.instructure.com/courses/64674/files/10852598/download?download_frd=1)**]

- Macal, C.M. and M.J. North, "Tutorial on Agent-based Modelling and Simulation," *Journal of Simulation*, Vol. 4, No. 3, pp. 151-162, 2010. Doi: **https://doi.org/10.1057/jos.2010.3** ⤴ **(https://doi.org/10.1057/jos.2010.3)** [**PDF (https://sit.instructure.com/courses/64674/files/10852596/download?wrap=1)** ⤓ **(https://sit.instructure.com/courses/64674/files/10852596/download?download_frd=1)**]
- Grigorev, I. *AnyLogic in Three Days: Modeling and Simulation Textbook*, 2014. Online: **https://www.anylogic.com/resources/books/free-simulation-book-and-modeling-tutorials/** ⤴ **(https://www.anylogic.com/resources/books/free-simulation-book-and-modeling-tutorials/)**
- Wilinsky, U. and W. Rand, *An Introduction to Agent-based Methods: Modeling Natural, Social, and Engineered Complex Systems with NetLogo*, MIT Press, 2015.

Software:

- Python 3.8 (**Google Colab** ⤴ **(https://colab.research.google.com)** recommended): only required to introduce SimPy in week 12
- NetLogo 6.3.X (available at **https://ccl.northwestern.edu/netlogo/download.shtml** ⤴ **(https://ccl.northwestern.edu/netlogo/download.shtml**): introduced in week 13
- AnyLogic PLE 8.8.X (available at **https://www.anylogic.com/downloads/** ⤴ **(https://www.anylogic.com/downloads/**): introduced in week 12

COURSE REQUIREMENTS

Attendance: Live online attendance at lectures is expected. Please contact the instructor in writing to be excused from lecture.

Participation: Complete weekly discussion questions to earn up to 5 points per week.

Homework: Homework assignments must be submitted on Canvas by 11:59pm ET on the due date. Extensions must be requested in writing at least 48 hours before the deadline. Collaboration is allowed on homework provided each student completes their own independent work. List any collaborators on the assignment cover sheet and submit all source code and supporting materials. **Copying code, scripts, programs, saved models, or answers from others will not be tolerated and will result in a 0 for the assignment and referral to the Office of Graduate Academics.**

Project(s): A term project is due during the final exam period. Working individually or in pairs, the project develops a new simulation model to address a technical problem or research question. The final submission is a 6-8 page written report. More information will be shared after Exam 2.

Exams: Two exams cover core course content. Questions focus on fundamentals and work problems

out by hand and do not use of software (Excel/Python). No communication with others (except the instructor) is permitted during the exam period and students may not share any information about the exams with others during the exam week. **Violation of the Graduate Code of Academic Integrity will result in a 0 for the exam and referral to the Office of Graduate Academics.**

TECHNOLOGY REQUIREMENTS

Baseline technical skills necessary for online courses

- Basic computer and web-browsing skills
- Navigating Canvas

Technology skills necessary for this specific course

- Live web conferencing using Zoom, if required

Required Equipment

- Computer: Mac (OS X), Linux (e.g. Ubuntu), or Windows (7+) with high-speed internet connection

Required Software

- Current or first previous major release of Chrome, Firefox, Edge, or Safari browser
- Python 3.8 (Google Colab recommended at **https://colab.research.google.com ↗ (https://colab.research.google.com)**)
- NetLogo 6.3.X (available at **https://ccl.northwestern.edu/netlogo/download.shtml ↗ (https://ccl.northwestern.edu/netlogo/download.shtml)**)
- AnyLogic PLE 8.8.X (available at **https://www.anylogic.com/downloads/ ↗ (https://www.anylogic.com/downloads/)**)

GRADING PROCEDURES

This course will be graded on a points system with the following components:

Item	Quantity	Points	Total Points	% Final Grade
Participation*	10	5	50	8.3
Homework**	8	25	200	33.3
Exam	2	75	150	25.0

Project	1	200	200	33.3

* Drop 2 lowest participation scores from 12 weeks
** Drop 1 lowest homework score from 9 assignments

Grades will be assigned with the following criteria:

Final Points	Percent	Grade
540 - 600	90.0 - 100.0	A
510 - 539	85.0 - 89.9	A-
480 - 509	80.0 - 84.9	B+
450 - 479	75.0 - 79.9	B
420 - 449	70.0 - 74.9	B-
390 - 419	65.0 - 69.9	C+
360 - 389	60.0 - 64.9	C
< 360	< 60.0	F

Late Policy

Late discussion questions or assignments are penalized at a rate of 0.42% per hour (10% per day) and will not be accepted after solutions are posted (approximately 1 week after deadline).

Late exams and projects will not be accepted.

Extensions must be requested in writing at least 48 hours before the deadline.

Academic Integrity

Graduate Student Code of Academic Integrity

All Stevens graduate students promise to be fully truthful and avoid dishonesty, fraud, misrepresentation, and deceit of any type in relation to their academic work. A student's submission of work for academic credit indicates that the work is the student's own. All outside assistance must be acknowledged. Any student who violates this code or who knowingly assists another student in violating this code shall be subject to discipline.

All graduate students are bound to the Graduate Student Code of Academic Integrity by enrollment in graduate coursework at Stevens. It is the responsibility of each graduate student to understand and adhere to the Graduate Student Code of Academic Integrity. More information including types of violations, the process for handling perceived violations, and types of sanctions can be found at **www.stevens.edu/provost/graduate-academics** ⤷ **(http://www.stevens.edu/provost/graduate-academics)** .

EXAM CONDITIONS

The following procedures apply to exams for this course. As the instructor, I reserve the right to modify any conditions set forth below by printing revised Exam Conditions on the quiz or exam.

1. Students may use the following materials during exams. Any materials that are not mentioned in the list below <u>are not</u> permitted.

Material	Permitted?	
	Yes	No
Handwritten/Typed Notes	X	
Textbooks	X	
Readings	X	

2. Students may use the following devices and software during exams. Any devices or software that are not mentioned in the list below <u>are not</u> permitted.

Device/Software	Permitted?	
	Yes	No
Calculator	X	
Computer		X
Modeling Software		X

3. Students <u>are not</u> allowed to work with or talk to other students during exams.

LEARNING ACCOMMODATIONS

Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. The Office of Disability Services (ODS) works with undergraduate and

graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, psychiatric disorders, and other such disabilities in order to help students achieve their academic and personal potential. They facilitate equal access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage independence and self-advocacy with support from the ODS staff. The ODS staff will facilitate the provision of accommodations on a case-by-case basis.

For more information about Disability Services and the process to receive accommodations, visit **https://www.stevens.edu/office-disability-services** ⤴ **(https://www.stevens.edu/office-disability-services)** . If you have any questions please contact: Phillip Gehman, the Director of Disability Services Coordinator at Stevens Institute of Technology at **pgehman@stevens.edu (mailto:pgehman@stevens.edu)** or by phone 201-216-3748.

Disability Services Confidentiality Policy

Student Disability Files are kept separate from academic files and are stored in a secure location within the Office of Disability Services. The Family Educational Rights Privacy Act (FERPA, 20 U.S.C. 1232g; 34CFR, Part 99) regulates disclosure of disability documentation and records maintained by Stevens Disability Services. According to this act, prior written consent by the student is required before our Disability Services office may release disability documentation or records to anyone. An exception is made in unusual circumstances, such as the case of health and safety emergencies.

INCLUSIVITY

Name and Pronoun Usage

As this course includes group work and class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform the instructor of the necessary changes.

Inclusion Statement

Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in academic discourse and innovation. In this class, the perspective of people of all races, ethnicities, gender expressions and gender identities, religions, sexual orientations, disabilities, socioeconomic backgrounds, and nationalities will be respected and viewed as a resource and benefit throughout the semester. Suggestions to further diversify class materials and assignments are encouraged. If any

course meetings conflict with your religious events, please do not hesitate to reach out to your instructor to make alternative arrangements.

You are expected to treat your instructor and all other participants in the course with courtesy and respect. Disrespectful conduct and harassing statements will not be tolerated and may result in disciplinary actions.

MENTAL HEALTH RESOURCES

Part of being successful in the classroom involves a focus on your whole self, including your mental health. While you are at Stevens, there are many resources to promote and support mental health. The Office of Counseling and Psychological Services (CAPS) offers free and confidential services to all enrolled students who are struggling to cope with personal issues (e.g., difficulty adjusting to college or trouble managing stress) or psychological difficulties (e.g., anxiety and depression). Appointments are can be made by phone (201-216-5177).

EMERGENCY INFORMATION

In the event of an urgent or emergent concern about the safety of yourself or someone else in the Stevens community, please immediately call the Stevens Campus Police at 201-216-5105 or on their emergency line at 201-216-3911. These phone lines are staffed 24/7, year round. For students who do not reside near the campus and require emergency support, please contact your local emergency response providers at 911 or via your local police precinct. Other 24/7 national resources for students dealing with mental health crises include the National Suicide Prevention Lifeline (1-800-273-8255) and the Crisis Text Line (text "Home" to 741-741). If you are concerned about the wellbeing of another Stevens student, and the matter is *not* urgent or time sensitive, please email the CARE Team at **care@stevens.edu (mailto:care@stevens.edu)** . A member of the CARE Team will respond to your concern as soon as possible.

Course Summary:

Date	Details	Due
Thu Jan 19, 2023	📅 **SYS 611 (https://sit.instructure.com/calendar? event_id=253154&include_contexts=course_64674)**	6:30pm to 9pm

Wed Jan 25, 2023	📨 **DQ-01** (https://sit.instructure.com/courses/64674/assignments/379394)	due by 11:59pm
Thu Jan 26, 2023	📅 **SYS 611** (https://sit.instructure.com/calendar? event_id=253155&include_contexts=course_64674)	6:30pm to 9pm
Tue Jan 31, 2023	📅 **SYS 611 Office Hours (Optional)** (https://sit.instructure.com/calendar? event_id=263197&include_contexts=course_64674)	5pm to 6:15pm
Wed Feb 1, 2023	📨 **DQ-02** (https://sit.instructure.com/courses/64674/assignments/379393)	due by 11:59pm
	📝 **HW-01** (https://sit.instructure.com/courses/64674/assignments/379397)	due by 11:59pm
Thu Feb 2, 2023	📅 **SYS 611** (https://sit.instructure.com/calendar? event_id=253156&include_contexts=course_64674)	6:30pm to 9pm
Sat Feb 4, 2023	📝 **HW-01** (https://sit.instructure.com/courses/64674/assignments/379397) (1 student)	due by 11:59pm
Tue Feb 7, 2023	📅 **SYS 611 Office Hours (Optional)** (https://sit.instructure.com/calendar? event_id=263198&include_contexts=course_64674)	5pm to 6:15pm
Wed Feb 8, 2023	📨 **DQ-03** (https://sit.instructure.com/courses/64674/assignments/379392)	due by 11:59pm
	📝 **HW-02** (https://sit.instructure.com/courses/64674/assignments/379398)	due by 11:59pm
	📅 **SYS 611** (https://sit.instructure.com/calendar? event_id=253157&include_contexts=course_64674)	6:30pm to 9pm

Thu Feb 9, 2023	📝 **HW-02** **(https://sit.instructure.com/courses/64674/assignments/379393)** (1 student)	due by 11:59pm
Fri Feb 10, 2023	📝 **HW-02** **(https://sit.instructure.com/courses/64674/assignments/379393)** (3 students)	due by 11:59pm
Tue Feb 14, 2023	📅 **SYS 611 Office Hours (Optional)** **(https://sit.instructure.com/calendar? event_id=263199&include_contexts=course_64674)**	5pm to 6:15pm
Wed Feb 15, 2023	💬 **DQ-04** **(https://sit.instructure.com/courses/64674/assignments/379391)**	due by 11:59pm
	📝 **HW-03** **(https://sit.instructure.com/courses/64674/assignments/379399)**	due by 11:59pm
Thu Feb 16, 2023	📅 **SYS 611** **(https://sit.instructure.com/calendar? event_id=253158&include_contexts=course_64674)**	6:30pm to 9pm
Tue Feb 21, 2023	📅 **SYS 611 Office Hours (Optional)** **(https://sit.instructure.com/calendar? event_id=263200&include_contexts=course_64674)**	5pm to 6:15pm
Thu Feb 23, 2023	📅 **SYS 611** **(https://sit.instructure.com/calendar? event_id=253159&include_contexts=course_64674)**	6:30pm to 9pm
	📝 **Exam 1** **(https://sit.instructure.com/courses/64674/assignments/379395)**	due by 9pm
Tue Feb 28, 2023	📅 **SYS 611 Office Hours (Optional)** **(https://sit.instructure.com/calendar? event_id=263201&include_contexts=course_64674)**	5pm to 6:15pm

| Wed Mar 1, 2023 | 📠 **DQ-05**
(https://sit.instructure.com/courses/64674/assignments/379390) | due by 11:59pm |

| Thu Mar 2, 2023 | 📅 **SYS 611**
(https://sit.instructure.com/calendar?
event_id=253160&include_contexts=course_64674) | 6:30pm to 9pm |
| | 🚀 **Exam 1 (Online)**
(https://sit.instructure.com/courses/64674/assignments/403861) | due by 6:30pm |

| Tue Mar 7, 2023 | 📅 **SYS 611 Office Hours**
(Optional)
(https://sit.instructure.com/calendar?
event_id=263202&include_contexts=course_64674) | 5pm to 6:15pm |

| Wed Mar 8, 2023 | 📠 **DQ-06**
(https://sit.instructure.com/courses/64674/assignments/379389) | due by 11:59pm |
| | 📝 **HW-04**
(https://sit.instructure.com/courses/64674/assignments/379400) | due by 11:59pm |

| Thu Mar 9, 2023 | 📅 **SYS 611**
(https://sit.instructure.com/calendar?
event_id=253161&include_contexts=course_64674) | 6:30pm to 9pm |

| Fri Mar 10, 2023 | 📝 **HW-04**
(https://sit.instructure.com/courses/64674/assignments/379400)
(6 students) | due by 11:59pm |

| Tue Mar 14, 2023 | 📅 **SYS 611 Office Hours**
(Optional)
(https://sit.instructure.com/calendar?
event_id=263203&include_contexts=course_64674) | 5pm to 6:15pm |

| Tue Mar 21, 2023 | 📅 **SYS 611 Office Hours**
(Optional)
(https://sit.instructure.com/calendar?
event_id=263204&include_contexts=course_64674) | 5pm to 6:15pm |

	🗨 **DQ-07** [(https://sit.instructure.com/courses/64674/assignments/379388)](https://sit.instructure.com/courses/64674/assignments/379388)	due by 11:59pm
Wed Mar 22, 2023		
	📝 **HW-05** [(https://sit.instructure.com/courses/64674/assignments/379401)](https://sit.instructure.com/courses/64674/assignments/379401)	due by 11:59pm
	🗓 **SYS 611** [(https://sit.instructure.com/calendar?event_id=253162&include_contexts=course_64674)](https://sit.instructure.com/calendar?event_id=253162&include_contexts=course_64674)	6:30pm to 9pm
Thu Mar 23, 2023		
	📝 **HW-05** [(https://sit.instructure.com/courses/64674/assignments/37940](https://sit.instructure.com/courses/64674/assignments/37940)1) (1 student)	due by 11:59pm
Tue Mar 28, 2023	🗓 **SYS 611 Office Hours (Optional)** [(https://sit.instructure.com/calendar?event_id=263205&include_contexts=course_64674)](https://sit.instructure.com/calendar?event_id=263205&include_contexts=course_64674)	5pm to 6:15pm
	🗨 **DQ-08** [(https://sit.instructure.com/courses/64674/assignments/379387](https://sit.instructure.com/courses/64674/assignments/379387))	due by 11:59pm
Wed Mar 29, 2023		
	📝 **HW-06** [(https://sit.instructure.com/courses/64674/assignments/379402](https://sit.instructure.com/courses/64674/assignments/379402))	due by 11:59pm
	🗓 **SYS 611** [(https://sit.instructure.com/calendar?event_id=253163&include_contexts=course_64674)](https://sit.instructure.com/calendar?event_id=253163&include_contexts=course_64674)	6:30pm to 9pm
Thu Mar 30, 2023		
	📝 **HW-06** [(https://sit.instructure.com/courses/64674/assignments/37940](https://sit.instructure.com/courses/64674/assignments/37940)2) (2 students)	due by 11:59pm
Tue Apr 4, 2023	🗓 **SYS 611 Office Hours (Optional)** [(https://sit.instructure.com/calendar?event_id=263206&include_contexts=course_64674)](https://sit.instructure.com/calendar?event_id=263206&include_contexts=course_64674)	5pm to 6:15pm
	🗓 **SYS 611** [(https://sit.instructure.com/calendar?](https://sit.instructure.com/calendar?)	6:30pm to 9pm

| Thu Apr 6, 2023 | [event_id=253164&include_contexts=course_64674)](https://sit.instructure.com/calendar?event_id=253164&include_contexts=course_64674) | |

| | 📝 **[Exam 2](https://sit.instructure.com/courses/64674/assignments/379396)** **(https://sit.instructure.com/courses/64674/assignments/379396)** | due by 9pm |

| Tue Apr 11, 2023 | 📅 **[SYS 611 Office Hours (Optional)](https://sit.instructure.com/calendar?event_id=263207&include_contexts=course_64674)** **(https://sit.instructure.com/calendar? event_id=263207&include_contexts=course_64674)** | 5pm to 6:15pm |

| Wed Apr 12, 2023 | 🗨 **[DQ-09](https://sit.instructure.com/courses/64674/assignments/379386)** **(https://sit.instructure.com/courses/64674/assignments/379386)** | due by 11:59pm |
| | 📝 **[HW-07](https://sit.instructure.com/courses/64674/assignments/379403)** **(https://sit.instructure.com/courses/64674/assignments/379403)** | due by 11:59pm |

| Thu Apr 13, 2023 | 📅 **[SYS 611](https://sit.instructure.com/calendar?event_id=253165&include_contexts=course_64674)** **(https://sit.instructure.com/calendar? event_id=253165&include_contexts=course_64674)** | 6:30pm to 9pm |
| | 📝 **[HW-07](https://sit.instructure.com/courses/64674/assignments/379403)** **(https://sit.instructure.com/courses/64674/assignments/379403)** (2 students) | due by 11:59pm |

| Fri Apr 14, 2023 | 📝 **[HW-07](https://sit.instructure.com/courses/64674/assignments/379403)** **(https://sit.instructure.com/courses/64674/assignments/379403)** (1 student) | due by 11:59pm |

| Tue Apr 18, 2023 | 📅 **[SYS 611 Office Hours (Optional)](https://sit.instructure.com/calendar?event_id=263208&include_contexts=course_64674)** **(https://sit.instructure.com/calendar? event_id=263208&include_contexts=course_64674)** | 5pm to 6:15pm |

| Wed Apr 19, 2023 | 🗨 **[DQ-10](https://sit.instructure.com/courses/64674/assignments/379385)** **(https://sit.instructure.com/courses/64674/assignments/379385)** | due by 11:59pm |
| | 📝 **[HW-08](https://sit.instructure.com/courses/64674/assignments/379404)** **(https://sit.instructure.com/courses/64674/assignments/379404)** | due by 11:59pm |

| | 📅 **SYS 611** | |

Thu Apr 20, 2023	(https://sit.instructure.com/calendar?event_id=253166&include_contexts=course_64674)	6:30pm to 9pm
	📝 **HW-08** (https://sit.instructure.com/courses/64674/assignments/379404) (1 student)	due by 11:59pm
Fri Apr 21, 2023	📝 **HW-08** (https://sit.instructure.com/courses/64674/assignments/379404) (1 student)	due by 11:59pm
Tue Apr 25, 2023	📅 **SYS 611 Office Hours (Optional)** (https://sit.instructure.com/calendar?event_id=263209&include_contexts=course_64674)	5pm to 6:15pm
Wed Apr 26, 2023	🗨 **DQ-11** (https://sit.instructure.com/courses/64674/assignments/379384)	due by 11:59pm
	📝 **HW-09** (https://sit.instructure.com/courses/64674/assignments/379405)	due by 11:59pm
Thu Apr 27, 2023	📅 **SYS 611** (https://sit.instructure.com/calendar?event_id=253167&include_contexts=course_64674)	6:30pm to 9pm
Sat Apr 29, 2023	📝 **HW-09** (https://sit.instructure.com/courses/64674/assignments/379405) (1 student)	due by 11:59pm
Tue May 2, 2023	📅 **SYS 611 Office Hours (Optional)** (https://sit.instructure.com/calendar?event_id=263210&include_contexts=course_64674)	5pm to 6:15pm
Wed May 3, 2023	🗨 **DQ-12** (https://sit.instructure.com/courses/64674/assignments/379383)	due by 11:59pm
Wed May 10, 2023	📅 **SYS 611 Office Hours (Optional)**	5pm to 6:15pm

[(https://sit.instructure.com/calendar?](https://sit.instructure.com/calendar?event_id=263211&include_contexts=course_64674)
event_id=263211&include_contexts=course_64674)

Mon May 15, 2023	📝 **Term Project** [(https://sit.instructure.com/courses/64674/assignments/379406)](https://sit.instructure.com/courses/64674/assignments/379406)	due by 11:59pm