

Systems Thinking

STM 401.I60

Fall 2020

Number of Credits: 3

Contact Phone: N/A

Days Class Meets: Tuesday

Contact Email: BurkheaEdwardL@jccmi.edu

Meeting Times: 2 pm – 4 pm

Online Office Hours: Thursday 10 am to 8 pm,
by appointment

Location/Venue: (Instructional method)

Instructor: Eddie Burkhead

Course Description

In a changing world, systems-thinking is needed to make wise decisions, solve complex problems, and understand your role within the larger context. This course uses topics in sustainability to develop systems thinking skills and to engage with real-world, meaningful issues. Topics include: complex systems theory, energy systems, social systems, ecosystems, and others. Students will research, speak, and write about these topics in depth to explore the complete system, the challenges involved, and the potential solutions that exist.

Course Goals

To understand the concepts of Systems Thinking and use Python programming to demonstrate basic systems thinking skills

Course Objectives

Students will explain the key terms and ideas of systems thinking, including loops, stocks, interconnections, systemic failures, and goals

Students will speak about systemic problems and propose solutions to those problems

Students will learn to gather data using a variety of techniques, and use that data to model system behaviors

Students will program basic computer systems using Python

Textbook (chose appropriate options below)

Text Book Zero! This text is available in a digital format. Please see the links posted on our class Jet Net site. This text is available to rent or purchase in digital format through the JC Bookstore.

OER: This textbook is provided for free as an open source resource on JetNet! NO purchase necessary

Follett Access! Please review the cost of your required materials at the following link to determine the best option for you to purchase your materials:

<https://www.bkstr.com/jacksonstore>

For more information on the Follett ACCESS Program, you can view the frequently asked questions here: <https://www.jccmi.edu/bookstore/student-services-follett-access/>.

If after reviewing the costs, you choose to opt out, you may do so here: www.jccmi.edu/optout.

Please note your opt out selection is for your entire semester schedule. You cannot opt out and opt in to individual courses. And you must opt out by the due date for your first class.

Class Starts On:	Opt Out Date:
August 31, 2020	September 3, 2020
October 6, 2020	October 9, 2020
October 27, 2020	October 30, 2020
November 11, 2020	November 14, 2020

If you have questions about materials, please contact the Jackson College Follett bookstore at jackson@bkstr.com. For account billing questions, please contact the Jackson College Cashier at jccashier@jccmi.edu.

Extras

Students will need a laptop. Students will need to download Python (free) and a text editor such as PyCharm, VSCode, or Atom.io (also free)

Grading Procedure

80% Weekly programming exercises

20% Systems Final Project

Grading Scale

GPA	GRADE RANGE
4.0	94-100%
3.5	89-93%
3.0	84-88%
2.5	78-83%
2.0	72-77%
1.5	66-71%
1.0	60-65%
0.5	55-59%
0.0	0-54%

Failure

Any grade below 2.0 is considered failing.

Academic Honesty Policy

Academic Honesty is defined as ethical behavior that includes student production of their own work and not representing others' work as their own, by cheating or by helping others to do so.

Plagiarism is defined as the failure to give credit for the use of material from outside sources.

Plagiarism includes but is not limited to:

- Submitting other's work as your own
- Using data, illustrations, pictures, quotations, or paraphrases from other sources without adequate documentation
- Reusing significant, identical or nearly identical portions of one's own prior work without acknowledging that one is doing so or without citing this original work (self-plagiarism)

Cheating is defined as obtaining answers/material from an outside source without authorization. Cheating includes, but is not limited to:

- Plagiarizing in any form
- Using notes/books/electronic material without authorization
- Copying
- Submitting others' work as your own or submitting your work for others
- Altering graded work
- Falsifying data

- Exhibiting other behaviors generally considered unethical

Allowing your work to be submitted by others

Accessibility

Jackson College understands that cultivating a broadly diverse community is crucial to our educational mission and to our foundational commitment to leadership and service. Jackson College is fully committed to ensuring our courses are accessible to everyone including those with disabilities. We are currently working to increase accessibility and usability of our course materials in order to meet or exceed the requirements of Section 508 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1991 and Web Content Accessibility Guidelines (WCAG) 2.0. For more information about Jackson College's efforts to ensure accessibility please visit the [Jackson College accessibility web page](#).

If you have an accessibility need in any of our classes please e-mail the Center for Student Success at JCCSS@jccmi.edu or visit the [Center for Student Success web page](#).

At the Center for Student Success (CSS), we are committed to providing all students the opportunity to achieve academic success by providing a variety of support services free of charge to Jackson College students. This includes, but is not limited to, peer and faculty tutoring, mental health referral, temporary assistance with transportation, various workshops/seminars, and the TRIO program.

In addition, the CSS staff is committed to adapting the College's general services to meet the individual needs of otherwise qualified students with disabilities, for the purpose of providing equal access to all programs and facilities.

Makeup Policy

All quizzes are due at the end of the semester. Each week, new material will be added for students to work on.

Help

Available learning services or opportunities for students seeking help with their course work. May include information about tutors, learning centers, reserved library materials, counseling services.

Academic Advising

It is important to contact a Center for Student Success professional prior to the start of the semester in order to receive accommodations in a timely manner. While we will make every effort to coordinate accommodations in a timely manner, failure to self-identify prior to the start of the semester may delay notification to instructors and timeliness of acquiring accommodations.

Accommodations do not automatically carry over to the next semester. Please e-mail JCCSS@jccmi.edu or visit the [Accommodations for Students with Disabilities](#) web page

Student Responsibilities

You are required to manage your own time thoughtfully as you progress through the projects and lecture videos. This course is a lot of work, and should not be left until the last minute.

Attendance- Participation Policy

For online sections:

Just as in a traditional classroom course, regular class participation and keeping up on the reading and assignments is strongly correlated with survival in college. It is my recommendation that you plan to do your assignments and take your exams **BEFORE** the last day they are due. If problems occur, there is time to fix them before the deadline.

In compliance with Federal Title IV funding requirements, as well as college initiatives, I will be monitoring student participation on a regular basis and officially reporting student activity throughout the term to assure compliance with college policy and federal regulations. It is imperative that you log in to the course and actively participate ***within the first couple of days of the term*** to validate your enrollment in the course. After that, not actively participating in class may result in you being withdrawn from the course. Being withdrawn from a course can have an impact on financial aid, billing, athletic eligibility, and housing status. As a college student you are responsible for how your participation impacts your academic progress; the accountability lies with you.

Caveat

Calendar

**Also include a statement that calendar timelines and assignments are an approximation and could be changed.*

WEEK #	DATE	TOPIC	HOMEWORK (RECOMMENDED PACE)
1	10/27	Intro to Systems Thinking and Python Programming	Exercises
2	11/4*	Loops in Python and Loops in Systems	Exercises
3	11/10	Data in Python and Data in Systems	Exercises
4	11/17	Interconnections and Networking	Exercises
5	11/24	JSON, Web Services, and System Traps	Exercises

