

**Systems in Science**  
**EDU 5702**  
(3 Credit Hours)

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## **Course Description and Outcomes**

This is an asynchronous online course with regular conversations, activities, and assignments via Canvas, SUU's learning management system (LMS). This course focuses on what systems are and how systems support the sensemaking of phenomena. Using a systems lens, participants engage with the science and engineering practices of obtaining, evaluating, and communicating information and developing and using models to understand disciplinary core ideas better. Participants observe, prepare, enact, and reflect on three-dimensional instruction.

### **Course Objectives:**

- 1) **Develop science content knowledge through experience** by obtaining, evaluating, and communicating information about how systems are an organized group of related parts that make up a whole and carry out functions the individual parts cannot. Additionally, develop and use models to represent systems and tier interactions, including inputs, processes, and outputs, along with energy, matter, and information flows within systems to explain phenomena.
- 2) **Prepare and enact three-dimensional instruction** based on authentic phenomena and problems and supports the development of students' conceptual sense understanding and scientific literacy.
- 3) **Become a community of practitioners, leaders, and advocates** by promoting effective and equitable science instruction both in personal practice and in the science education community.

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## **Required Text and Course Material**

Duncan, R. G., Krajcik, J. S., & Rivet, A. E. (2017). *Disciplinary core ideas: Reshaping teaching and learning*. National Science Teachers Association.

All other readings are to be posted on Canvas.

## Online Course Reminders

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As everyone receives the same information in Canvas, you will only be satisfied if you ask questions about anything unclear. Please don't wait for feedback on an assignment, or the course evaluations, to ask for clarification.

### Using Canvas

On the class page, go to ACCOUNT SETTINGS to ensure that the preferred email you gave to SUU is there. If you wish, add other Contact Methods, such as text messaging.

You can also link up other web tools (such as Google) with Canvas. If you choose to add a Profile picture, please use a picture and not an avatar or other image. In the NOTIFICATIONS tool, you should indicate how often and where you would like to receive notifications when new information is posted to Canvas. "ASAP" is recommended for things like Announcements and Due Date Changes.

### Communicating With the Instructor

Canvas has a built-in email tool called "Inbox." Please work to use this method for communicating in the class.

### Expectations

- Meaningful Participation—Discussion Prompts, and other scheduled events (such as video seminars) are opportunities to consolidate and apply what you understand about course topics. Missed or less thoughtful postings mean fewer opportunities to ask questions, check your understanding, or benefit from each other's experiences and insights.
- Respectful electronic etiquette
- Contributions to shared understandings and experiences
- Prompt completion and submission of work. *Expect to spend 6-7 hours on the introduction, texts, activities, discussion board, and assignments each week.*

### Tentative Schedule (Check Canvas for updates)

	Weekly Topic(s)	Assignments
Week 1	What is a system? Using a systems lens in science	
Week 2	Obtaining, evaluating, and communicating information about systems in multiple disciplines	Journal Entry: Systems and their components  Discussion: Evaluating scientific information
Week 3	Understanding core ideas through developing and using models to represent systems	Journal Entry: Models of systems  Discussion:

<b>Week 4</b>	Three-dimensional instruction (Part 1) Effective phenomena GRC Instructional Model	Discussion: Selecting effective phenomena  Lesson Plan 1
<b>Week 5</b>	Three-dimensional instruction (Part 2) Authentic science communication Equity	Discussion: Advocating for equity  Lesson Plan 1 Revision Video of lesson plan 1 instruction and reflection
<b>Week 6</b>	Systems in Engineering	Lesson Plan 2
<b>Week 7</b>	Assessment	Peer Evaluation: Lesson Plan 2  Video of Lesson 2 instruction and reflection

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**ACADEMIC INTEGRITY:** Scholastic dishonesty will not be tolerated and will be prosecuted to the fullest extent. You must read and understand the current issue of the Student Handbook (published by Student Affairs) regarding student responsibilities and rights, and for the intellectual property policy, information about procedures, and what constitutes acceptable behavior.

**ADA STATEMENT:** Students with medical, psychological, learning, or other disabilities desiring academic adjustments, accommodations, or auxiliary aids will need to contact the Disability Resource Center, located in Room 206F of the Sharwan Smith Center or by phone at: (435) 865-8042. SSD determines eligibility for and authorizes the provision of services. If your instructor requires attendance, then you will need to seek an ADA accommodation to request an exception to this attendance policy. Please contact the Disability Resource Center to determine what, if any, ADA accommodations are reasonable and appropriate.

**HEOA COMPLIANCE STATEMENT:** The sharing of copyrighted material through peer-to-peer (P2P) file sharing, except as provided under U.S. copyright law, is prohibited by law. Detailed information can be found at <https://help.suu.edu/article/1097/p2p-and-copyright-infringement>.

**DISCLAIMER STATEMENT:** Information contained in this syllabus, other than the grading, late assignments, makeup work, and attendance policies, may be subject to change with advance notice, as deemed appropriate by the instructor.

## **Supporting Student Health and Basic Needs**

Southern Utah University is committed to proactively facilitating all students' well-being. We welcome and encourage students to use the following resources for their physical, intellectual, occupational, spiritual, environmental, financial, social, and/or emotional needs:

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[HOPE Pantry](#) for basic food and toiletry items

[SUU Mental Health Resources](#) (this is incredibly comprehensive)

[Health Care in Cedar City](#)

[SUU Student Health and Wellness](#)

[SUU Counseling and Psychological Services](#) at 435-865-8621

[Financial Wellness at SUU](#)

[Campus Recreation and Wellness](#)

[Equity and Inclusion Campus](#)

[Resources](#)

Students dealing with heightened feelings of sadness or hopelessness, thoughts of harm or suicide, or increased anxiety may contact the SUU Counseling and Psychological Services at 435-865-8621 or the SUU Police at 435-586-1911.

To learn effectively, you must have basic security: a roof over your head along with a reliable place to sleep and enough food to eat. If you're having trouble with any of those things, please talk with me or the Dean of Students Office (435-865-8710, [jaycihacker@suu.edu](mailto:jaycihacker@suu.edu)). Together we can work to meet those needs.

**Responsible Employee:** Southern Utah University is committed to creating an educational, work, living, and campus environment free from all forms of sexual harassment, sexual assault, dating violence, domestic violence, stalking, and unlawful discrimination and harassment on the basis of protected class. As a responsible employee, I am responsible for reporting all incidents of prohibited sexual harassment, including sexual assault, stalking, and dating and domestic violence, to the university's Title IX coordinator. Students can choose to discuss their experiences confidentially with the following resources:

- Title IX Office at [title9@suu.edu](mailto:title9@suu.edu) or 435-586-5419
- SUU Counseling and Psychological Services at 435-865-8621

### **Mutual Respect and Professionalism**

In order to learn, be open to the views of people different from ourselves. Please honor the uniqueness of your classmates, and appreciate the opportunity to learn from one another. Please respect each other's opinions and refrain from personal attacks or demeaning comments of any kind. Keep confidential issues of a personal or professional nature that are discussed in class. Please contact the instructor if you have suggestions for improving the classroom environment. It is preferable if students discuss issues directly with the instructor; however, students may also begin the conversation via email.