

General Studies Gold Request Form

Consult the [General Studies Request FAQ](#) for more information and quick answers.

New permanent numbered courses must be submitted to the workflow in [Kuali CM](#) before a General Studies request is submitted here. The General Studies Council will not review requests ahead of a new course proposal being sent to the Senate.

Submission Information

College/School

College of Global Futures (CGF)

Department/School

School for the Future of Innovation in Society (CSFIS)

Submission Type

New Request

New Request: A request for a new designation, a change in designation, or to reinstate a designation that has been lost.

Mandatory Review: Only select if this course (or topic on a *permanent* course) is undergoing mandatory review in the current academic year. Not for omnibus topic use.

Modification: A request to modify the expected learning outcomes of the course, but not change any other aspect of the originally approved proposal. Only for courses that have a previously approved General Studies Gold request.

Requested Effective Date

Fall 2026

ASU Request

Is this request for a permanent course or a topic?

Permanent Course

Subject Code

FIS

Course Number

412

Units/Credit Hours

3

Course Information

Enter the course catalog information, found in the [web course catalog](#) or [Kuali CM](#).

Course Title

Harnessing Complexity

Course Catalog Description

Advanced treatment of the field of complex adaptive systems relevant to governance, economic, biological and social systems including: definitions of complexity, model thinking, systems thinking, applications of complexity in the wild, interdisciplinary influences, leadership, ethics, including the participatory roles of the public in discovery processes. Explores computational tools to measure, simulate and analyze complex systems.

Enrollment Requirements (Prerequisites, Corequisites, and/or Antirequisites)

Prerequisite(s): minimum 45 hours; Credit is allowed for only CAS 394 (Harnessing Complexity - Introduction to Complexity) or CAS 412 or FIS 394 (Harnessing Complexity - Introduction to Complexity) or FIS 412 OR Visiting University Student

Is this a crosslisted course?

List all crosslisted courses by subject code and number.

Yes

CAS 412

Is this course offered by (shared with) another academic unit?

No

Shared or Crosslisted Departments/Schools

School of Complex Adaptive Systems (CSCAS)

Statement of Support #1

Statement of Support #2

Statement of Support #3

[FIS 412CAS 412 General Studies CIVI Designation scas approval.pdf](#)

No Response

No Response

If you are requesting to change the existing GS Gold (not Maroon) designation, please check this box.

General Studies Gold Designation Request

General Studies Designation

Governance and Civic Engagement (CIVI)

Attach a representative syllabus for the course, including course learning outcomes and descriptions of assignments and assessments.

[FIS 412 Harnessing Complexity Syllabus 2026 CIVI.docx](#)

Governance and Civic Engagement (CIVI)

Courses in the Governance and Civic Engagement category explore ways in which humans confront the dilemmas and opportunities of community life and/or develop skills of civic communication.

Governance and Civic Engagement courses will analyze principles and practices of decision-making in historical and/or contemporary contexts and will explore ways in which people have defined and pursued justice and the common good. Courses in the Governance and Civic Engagement knowledge area broaden students' understanding of how collective decisions are made, how they impact communities positively or negatively, and how various groups are included, or excluded, from the decision-making process. Students will have the opportunity to explore dynamics between governance and civic engagement, which can include perceived inequality or marginalization related to a variety of factors including race, class, citizenship, gender, disability, etc. This knowledge area also develops students' skills in civic communication, including listening, deliberation, negotiation, consensus building, and productive use of conflict, which are essential to participating more fully in their communities. Courses in this category may be entirely focused on developing skills in civic communication.

CIVI Learning Outcomes

Upon completion of a course in Governance and Civic Engagement, students will be able to complete all outcomes in one of the two following groups.

Group 1:

1. Analyze the context and consequences of one or more collective decision-making theories or practices.
2. Define an element of the common good and propose a way to pursue it within a specific contemporary context.
3. Communicate coherent arguments using evidence drawn from qualitative or quantitative sources.

Group 2:

1. Articulate diverse perspectives on the common or collective good.
2. Demonstrate the ability to collaborate effectively in the presence of dissenting opinions and experiences.
3. Communicate arguments, narratives, or information using qualitative or quantitative evidence.

Choose the appropriate group of CIVI learning outcomes for this course.

Group 1

Most of the course content should align with the Gold category learning outcomes.

Instructions: In the fields below, state the assignment, project, or assessment that will measure each learning outcome, and provide a description. The description should provide enough detail to show how it measures the learning outcome. If needed, more than one can be identified.

The proposal does not need to include all course assessments that measure a given learning outcome. The provided assessment should include sufficient detail to allow the subcommittee to make their evaluation. When appropriate, the same assessment can be listed for more than one learning outcome (e.g., a culminating project).

You may provide links to a document (Google Drive or Dropbox) that includes the relevant details for the assessment. **Do not provide links to Canvas shells.**

CIVI Learning Outcome 1 (Group 1): Analyze the context and consequences of one or more collective decision-making theories or practices.

Below are the assignments for Modules 5, 6, and 7 which focus on individual and collective decision making theories or practices.

Assignment for Module 5 (Game Theory)

Play through <https://ncase.me/trust/>

and keep a running journal to answer the following questions at the following steps of the simulation.

1. Step 2: What is your score from the tournament?

1.a. Provide a couple sentences of notes and reflections.

2. Step 3: Who do you think will get the highest total score? **Think carefully about it... and then**

PLACE YOUR BETS:

2.b. Provide a couple sentences of notes and reflections. Who did you guess, why? Were you right

and what did you notice?

3. Step 4: Who do you think will win the repeated tournament?

3.c. Provide a couple sentences of notes and reflections. Who did you guess, why? Were you right

and what did you notice?

4. Step 7: Try something... anything... and write a few sentences or more on it.

Conclusion: Write a few sentences on what you think now that you have completed the game and

seen the introduction and conclusion. Where do you notice game theoretic situations in your own

life?

Assignment for Module 6 (collections of decisions and budgets)

Part 1: [Play Spent](#)

For context - read about the Phoenix Mayor attempting to live on a food stamp budget:

Access link here: <https://thinkprogress.org/phoenix-mayor-attempts-to-live-on-a-food-stamp-budget-im-tired-and-it-s-hard-to-focus-4e2a46ec1d83/>

1. What did you learn from playing Spent, and did the design of Spent impact how you took in the

information?

2. Was there anything missing from the simulation that you think should be included and do you

think the game is biased?

3. Spent represents one group of citizens. What other groups of people could a simulation like this represent?

Optional book: [Nickel and Dime: On \(Not\) Getting by in America.](#)

Part 2: Balance the Wilmington Budget

For context on the Wilmington Budget challenges - read [A City's Wrenching Budget Choices.](#)

Using the [budget simulator](#), review the options available and close the budget gap.

1. What was your most difficult decision, what was the easiest. Other observations?

2. Which items to keep or cut in a budget often reflect underlying political philosophy or belief - which items in the Wilmington budget exercise would be likely to be retained or cut for a

Democratic leaning administrator? Which for a Republican leaning administrator? And generally, why do you think each would make the choices they did?

Assignment for Module 7 (Behavioral Economics)

Part 1: Examine these three websites <http://www.stickk.com/Links to an external site.> and <https://www.dealdash.com/Links to an external site.> and <noom.comLinks to an external site.>

1. How do the sites work
2. What class concepts are involved to make this site effect for users? Use any relative concepts from rational decision making, decision making under uncertainty, game theory, and behavioral economics topics.

Spend time thinking about the overall design of the website; there are many dimensions to these websites. Notice that some websites seems to be designed to benefit the users and one seems to be designed to benefit the owners of the website.

Part 2: Find a policy that was created using behavioral economics as it supporting logic.

Describe

the policy, intended effect, and any data that supports its efficacy. A good place to start would be

Obama's White House social and behavioral policy team. Please click the link to open the pdf file (you must be logged into your myASU account):

<https://drive.google.com/file/d/1Z3SGXqnQyM4HTjbse2AVt2BLpRfTBII-/view?usp=sharing>

To understand how these assignments fit into the overall design of the course, please reference [this article](#) written about the original version of this course when it was in Public Affairs. Much of the content is the same with more of an emphasis on decision making and governance as a complex system.

CIVI Learning Outcome 2 (Group 1): Define an element of the common good and propose a way to pursue it within a specific contemporary context.

Below are the assignments from models 2, 3, and 13 on pursuing the common good through organizations (2), algorithms/policy (3), or participatory platforms (13)

Assignment for Module 2 (Organizations as Complex Systems)

Of note is over 50 current cases are presented the students can select from.

On your Canvas page, analyze what is happening in a current news story through the lens of the five constraints presented in last week's readings (law, incentives, education, norms, and architecture). I have provided many current examples in the links at the bottom of this page.

Do

the following:

1. Pick ONE story and describe the situation: what is the problem, who is involved, and what approach are they taking to address the problem? For instance, to combat crime, the local police

force is now using a technical approach of GPS systems to track suspected criminals' cars.

2. Describe what values or issues are in conflict in the situation. For instance, reducing crime vs. unreasonable or warrantless car searches based on monitoring driving behavior.

3. Propose an alternative approach for addressing the same issue using a different constraint or a different combination of the four constraints. For instance, providing a free license plate renewal for all cars that volunteer to have a GPS installed.

4. Analyze the differences in the values or issues that are in conflict in the original idea and those in conflict in your proposed idea. I provided a token car/GPS example above to guide you as to what my expectations are for what type of comments to make. Your analysis should be much more significant, should reference the book, and should demonstrate a creative approach to the problem

To do an excellent job on this assignment, you will need to reference the course readings. This will be true all semester long. Great ideas and writing are a good start, but you also need to demonstrate how your thoughts interact with the course content (even if it is to disagree). Review the other news stories in the links below. Even if you did not choose them. They are all one or two pages and provide a nice variety of the types of issues that will be relevant to the course.

To understand how these assignments fit into the overall design of the course, please reference [this article](#) written about the original version of this course when it was in Public Affairs. Much of the content is the same with more of an emphasis on decision making and governance as a complex system.

Assignment for Module 4 (Rules, Algorithms, and Influence)

The categories of rules and policies we used in the grading of module 3 reflects many policies in society and was designed to reflect a number of rules or systemic factors that regulate our behavior or influence our conditions. Individually or with others review one of the main concepts.

You should write at least a paragraph with regards to each topic:

1. What is the issue
2. How has it changed over time (from where/to where/what)
3. Who is advantaged and disadvantaged
4. Is anyone trying to change it
5. How can we (the people in this class) get involved?

Assignment for Module 13: Participatory Platforms

Find a project to donate our class donations to. I recommend Kiva supported small business projects. ([Click here to search Kiva-supported small business projects](#)).

Post the project to your Canvas page along with a thoughtful justification why you think our class should make this one of the projects in which we invest. Your project will be graded on the reasoning and effort you put behind the justification. Also, be prepared to make a case for your project on Tuesday in the class.

Next Tuesday we will collectively choose which projects to fund.

Dig deeper assignment

Participate in [any citizen science project either on the list](#), or [scistarter](#), or [citizenscience.gov](#).
or
one that you find yourself.

On your Canvas page, identify the project and in one paragraph discuss your experience with the project after you have completed the following evaluation of the site. The question in the evaluation should be useful for your discussion. You need to include what project you worked on as well as what your specific activity was to advance the project.

Dig even deeper assignment

Find a sub-community on reddit, instagram, tumblr, etc.. and post a link to the community below

(add community link here) On your Canvas page, discuss how the community activities are supported by the underlying technology (the class video by Shirky we watched helps with this discussion).

Dig much deeper assignment

Please review the [Federal crowdsourcing and citizen science toolkit](#) and design a theoretical crowdsourcing or citizen science project. Your project should conform to the following ["how-to" structure from the toolkit](#).

[Step 1 – Scope Out Your Problem.](#)

1. Choose a problem in a place
2. Explain why it matters
3. List parties who have a vested interest
4. Detail why and how crowdsourcing or citizen science is the right approach for your problem

[Step 2 – Design a Project.](#)

1. List your objectives and resources
2. Create a timeline
3. Articulate a project management strategy (How do your resources help address your objectives over time)

[Step 3 – Build a Community.](#)

1. List potential community (neighborhoods, businesses) partners in your place
2. List potential academic partners in your place (professors, projects, centers, etc.)
3. Explain how your crowdsourcing or citizen science will offer value to your community. Will it be fun? Will it satisfy curiosity? Will it improve quality of life? Why will your community stay invested?
4. Anticipate some barriers to building community. What preparation could smooth your path?

[Step 4 – Manage Your Data.](#)

1. How will you acquire your data?
2. Where will it be stored? How will it be secured?
3. Who will process it?
4. How will it be used?
5. How will its use address your problem?

[Step 5 – Sustain and Improve.](#)

1. How will you evaluate your project?
2. What metrics and targets would reveal success?

3. How would your evaluation strategy provide a platform for iteration and adaptation for subsequent projects?

To understand how these assignments fit into the overall design of the course, please reference [this article](#) written about the original version of this course when it was in Public Affairs. Much of the content is the same with more of an emphasis on decision making and governance as a complex system.

CIVI Learning Outcome 3 (Group 1): Communicate coherent arguments using evidence drawn from qualitative or quantitative sources.

Below are the assignments from models on evidence based decisions (9), convergence (11), and meltdowns in complex systems (12)

Assignment for Module 9: Evidence-based Decisions

For the first two months of the course you were asked to track something each day. Review the data that you have been tracking and write a paragraph on each of the following that mirrors the sections from above:

1. Part 1: What did you track and did your behavior change because you were monitoring yourself.

In what way? (25%)

2. Part 2: What would you track if you could track something every day for the next year and why?

What would you hope to discover? (25%)

3. Part 3: If you wanted to change your behavior of the activity you tracked, what strategies would

you use, and how does the awareness of your behavior empower you to change? (25%)

4. Part 4: Did you have any difficulty collecting the data? If the data was missing, what did you do?

If the data was approximate, how did you address that challenge? (25%)

Assignment for Module 11: Convergence

Take any big question (how to address climate change, how to reduce tension in the US, how to reduce homelessness, how to get better sleep) and ask a diverse set of people in your life what they think the most important challenge is and how they would solve it.

Document:

1. Ask them to rephrase the prompt into their version of the most important, relevant question?

2. For them, what does success look like, or if you are talking about a system, when would you know it was healthy?

3. What data would they want to have available?

4. What is their recommendation?

5. Document the diversity of the person answering along these dimensions

5.a. What domain do they come from (either discipline or profession)?

5.b. What outcome did they identify as most important)?

5.c. What was their motivation - explaining, predicting?

5.d. How did their method of approaching the problem differ?

5.e. What is the greatest obstacle to addressing this challenge (sharing data, financial investment, polarization of viewpoints, enacting policies, trust among diverse actors)? Then compare answers

among interviewees in the focus stacking reflection.

6. After the interviews - reflect:

6.f. How would the student/interviewee motivate diverse actors to come together to address this challenge?

6.g. Demographically - what race, gender, age, class, region....

6.h. How similar the responses were. How much did they reinforce each other, contradict each other, or add new information? (reflecting on focus stacking would be useful here)

6.i. Who are the most significant/influential actors that would need to be part of any solution?

7. How much value to the overall picture did each new conversation add? What were the characteristics that made one more or less useful?

Assignment for Module 12: Meltdowns in complex systems

Go through the news for the week. Identify and list the different breakdowns/meltdown examples

that the media has reported. You could use either one source or multiple sources. Elaborate on

any one case of your choice. Use the following pointers/

1. What is the case about?

2. How would you describe the meltdown/breakdown in systems?

3. What you do think are the reasons for breakdown? Describe in the coupling-slack (meltdown approach) if possible.

4. What are some methods being used to address the meltdown?

5. What qualitative and/or quantitative evidence supports your conclusions?

6. Describe some ways in which you would approach the issue.

To understand how these assignments fit into the overall design of the course, please reference [this article](#) written about the original version of this course when it was in Public Affairs. Much of the content is the same with more of an emphasis on decision making and governance as a complex system.

List all course-specific learning outcomes. Where appropriate, identify the associated CIVI learning outcome(s) in brackets (see below for example). Note: It is expected that a majority of course-specific learning outcomes will be associated with a CIVI learning outcome.

- 1. Understanding Complexity Theories:** Students should gain a solid understanding of complexity theories including concepts such as emergent behaviors, non-linear dynamics, feedback loops, and self-organization. They should be able to identify complex systems and explain how they are different than simple or complicated systems. [CIVI LO1, LO2]
- 2. Systems Thinking:** Students will learn the principles of systems thinking, which involves examining interconnections and relationships. [CIVI LO1, LO2, LO3]
- 3. Decision Making in Complex Systems:** Students will explore individual, collective, and making decisions in complex systems. This includes individuals with perfect information (microeconomics), individuals with uncertain information (Bayesian reasoning), groups with

perfect information (macroeconomics), and groups with uncertain information (game theory). Students will also explore behavioral economics, and algorithms for agents to make decisions in agent based models or other complex system environments. [CIVI LO1, LO2, LO3]

4. **Network Theory:** An understanding of network theory is crucial in studying complex systems. Students should learn about network structures, properties of networks (such as scale-free networks and small-world networks), network dynamics, and network analysis techniques.[CIVI LO1, LO3]

5. **Agent-based Modeling:** Students may learn about agent-based modeling (ABM), a computational approach used to simulate the behavior of complex systems by modeling individual agents and their interactions. They should be able to design and implement simple ABM simulations to explore emergent phenomena. [CIVI LO1, LO3]

6. **Resilience and Robustness:** Students should learn about resilience and robustness in complex systems, including strategies for enhancing resilience, managing disruptions, and designing systems that can withstand unexpected shocks or failures. [CIVI LO2, LO3]

7. **Ethical Considerations:** Students may explore ethical considerations related to harnessing complexity, such as the implications of interventions in complex systems, unintended consequences, and ethical decision-making in complex socio-technical systems. [CIVI LO2, LO3]

8. **Interdisciplinary collaboration:** Given the interdisciplinary nature of complexity science, the course may emphasize collaboration across disciplines and encourage students to integrate knowledge from multiple domains to tackle complex challenges effectively. [CIVI LO2]

9. **Problem-Solving Skills and real-world applications:** Through case studies and practical exercises, students should develop critical thinking and problem-solving skills to analyze complex problems, identify patterns and trends, and propose innovative solutions. [CIVI LO2, LO3]

10. **Applications across disciplines:** The course may explore applications of complexity theory in diverse fields such as biology (e.g., ecosystems, immune systems), economics (e.g., financial markets, supply chains), sociology (e.g., social networks, organizational dynamics), and urban planning (e.g., traffic flow, urban development). [CIVI LO2, LO3]

Form Submission - Proposer

Submitted for Approval | Proposer

Biridiana Ramirez - January 7, 2026 at 3:54 PM (America/Phoenix)

Department Approval

Approved

Eusebio Scornavacca

Althea Pergakis - January 12, 2026 at 3:05 PM (America/Phoenix)

GSC Coordinator Review

Sent Back

Kimberly Singleton - January 13, 2026 at 9:03 AM (America/Phoenix)

There is a link in the CIVI LO1 field ("Phoenix Mayor attempting to live on a food stamp budget") that appears to be broken and is not accessible. Please update before resubmitting. Thank you.

April Randall

Form Submission - Proposer

Submitted for Approval | Proposer

Biridiana Ramirez - January 14, 2026 at 1:26 PM (America/Phoenix)

Department Approval

Sent Back

Eusebio Scornavacca

Althea Pergakis - January 16, 2026 at 1:00 PM (America/Phoenix)

Can you fix the broken link Kimberly mentioned?

Form Submission - Proposer

Submitted for Approval | Proposer

Biridiana Ramirez - January 16, 2026 at 1:40 PM (America/Phoenix)

Department Approval

Approved

Eusebio Scornavacca

Althea Pergakis - January 16, 2026 at 2:25 PM (America/Phoenix)

GSC Coordinator Review

Sent Back

Kimberly Singleton - January 20, 2026 at 8:31 AM (America/Phoenix)

Thank you for updating the aforementioned link. Unfortunately, there is another link in the CIVI LO 1 field ("White House social and behavioral policy team") that is no longer available since the form was last submitted and requires updating. It appears the website modified its article archive. I attempted to locate an active link myself through an online search but was unsuccessful. It may be helpful to briefly recheck all links before resubmitting. I appreciate your understanding and collaboration.

April Randall

Form Submission - Proposer

Submitted for Approval | Proposer

Biridiana Ramirez - January 21, 2026 at 4:39 PM (America/Phoenix)

Department Approval

Approved

Eusebio Scornavacca

Althea Pergakis - January 22, 2026 at 12:30 PM (America/Phoenix)

GSC Coordinator Review

Approved

Kimberly Singleton - January 23, 2026 at 7:27 AM (America/Phoenix)

April Randall

Assistant Vice Provost Review

Approved

Tamiko Azuma - January 26, 2026 at 3:47 PM (America/Phoenix)

All required components confirmed.

Pre-GSC Meeting

Approved

Kimberly Singleton

April Randall - February 5, 2026 at 3:14 PM (America/Phoenix)

Governance and Civic Engagement (CIVI) Subcommittee

Acknowledgement Requested

Celeste Sepessy

Tamara Rounds

Michelle Saint

Megan Foutz - February 20, 2026 at 12:07 PM (America/Phoenix)

R & R. There was almost too much information in this submission, yet there were few clarifying details, and it was unclear what the assignments entail (readings, discussion boards etc.). The committee would like simplified information in the submission and clearly explain what the assignments are, what readings, if any, are required, and how they connect to the goals of CIVI. The syllabus itself could also use clarifying information.

General Studies Council Meeting

Waiting for Approval

Kimberly Singleton

April Randall

Registrar Notification

Notification

Courses Implementation

Implementation

Approval

Kelli Eberhart

Lauren Bates

Alisha Von Kampen

Proposer Notification

Notification

Biridiana Ramirez

College Notification

Notification

Kate Eaton

Althea Pergakis

ATCS Notification - ASU Course

Notification

Bryan Tinlin

Michele Devine

EdPlus Notification

Notification

Sarah Shipp
