

# Integrating Project- Based Learning, Systems Thinking and Problem Solving to **Save the World**

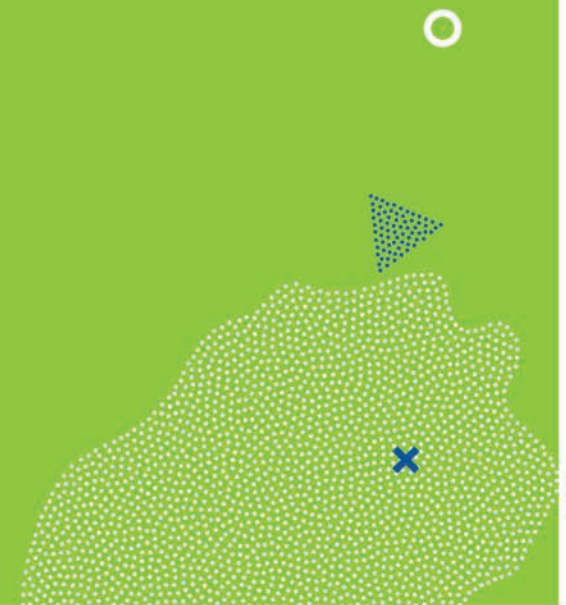
ALS2410 CHALLENGE 2050: GLOBAL UNCERTAINTY

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# Overview

- About the Course
- Systems Thinking
- Problem Solving and the KAI
- The Final Project
- Integration and WASABI
- Other Course Happenings
- Recommendations



# About the Course

- ALS 2410 Challenge 2050: Global Uncertainty
- This introductory course explores questions in human well-being and sustainability and builds a foundation for addressing global challenges associated with population growth.
- Interdisciplinary - 39 undergraduate students, variety of majors, freshmen to senior levels



# Systems Thinking

- “Systems thinking is an interdisciplinary approach whose primary goal is solving complex problems or implementing technical systems that rely heavily on each another” (Lewrick, Link, and Leifer, pg. 217, 2018). ○
- Global systems considered: food, environmental, economical, social, and health



# Problem-Solving Styles

- Individual problem solving styles exist on a spectrum, highly adaptive to highly innovative (Kirton, 1976).
- Kirton's Adaptation-Innovation Inventory helps identify an individual's preferred approach to problem solving.



# The Final Project

- Development based on the Buck Institute for Education's Gold Standard Project-Based Learning Model (2015).
- Included 12 components that facilitated team development, issue understanding, solution design, reflection, and presentation.

## Gold Standard PBL

Seven Essential Project Design Elements



## Your Solution to the Challenge

### Systems Synthesis Project, Fall 2018 - ALS2410

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Throughout the semester, students will develop perspectives about addressing the 2050 challenge. Through this assignment, students are asked to synthesize these perspectives and work in groups to create a plan integrating all five systems (i.e., food, economic, environment, social, and health) to address the 2050 challenge.


Introducing the Team		Checkpoint	Who's in charge?
<b>Team Name</b>		Week 8	
<b>Individual Bios</b>		Week 8	
<b>Team Mission</b>		Week 8	
Understanding the Issue		Checkpoint	Who's in charge?
<b>Issue Brief (3 pages)</b>	Research and describe the issue, its relevance to society and the future, as well as its known causes and effects.	Week 9-10	
<b>Expert Interviews</b>	What does science say? Find and contact an expert in the field to	Week 9-10	



	effects.		
<b>Expert Interviews (2 pages)</b>	What does science say? Find and contact an expert in the field to discuss your issue.	<b>Week 9-10</b>	
<b>Media Scout</b>	Create a library of photos, videos, and/or podcasts related to your team's issue.	<b>Week 9-10</b>	
<b>Solving the Problem</b>		<b>Checkpoint</b>	<b>Who's in charge?</b>
<b>Current efforts (2 pages)</b>	What is currently being done to solve the issue? If nothing, why?	<b>Week 11-12</b>	
<b>Proposed solutions (3 pages)</b>	Brainstorm, list, and describe your team's top potential solutions to the issue.	<b>Week 11-12</b>	
<b>Solution Sketch (5 pages)</b>	From start to finish, describe your team's top solution for the issue. Include details related to development, resources needed, potential roadblocks, and why your solution is THE solution.	<b>Week 11-12</b>	
<b>Reflecting on the Journey</b>		<b>Checkpoint</b>	<b>Who's in charge?</b>
<b>Plan for implementation (2 pages)</b>	How does your team plan to implement the solution?	<b>Week 13</b>	





(2 pages)	Solve the issue? If nothing, why?		
<b>Proposed solutions (3 pages)</b>	Brainstorm, list, and describe your team's top potential solutions to the issue.	<b>Week 11-12</b>	
<b>Solution Sketch (5 pages)</b>	From start to finish, describe your team's top solution for the issue. Include details related to development, resources needed, potential roadblocks, and why your solution is THE solution.	<b>Week 11-12</b>	
<b>Reflecting on the Journey</b>		<b>Checkpoint</b>	<b>Who's in charge?</b>
<b>Plan for implementation (2 pages)</b>	How does your team plan to implement the solution?	<b>Week 13</b>	
<b>Personal endorsements of the solution (2 pages)</b>	Why do you believe this is the right solution to the issue?	<b>Week 13</b>	
<b>Pitching Your Solution</b>		<b>Checkpoint</b>	<b>Who's in charge?</b>
<b>Presentation</b>		<b>Week 14</b>	





Systems  
Overview  
& Values  
Clarification

SYSTEMS THINKING



Formed Initial  
Groups based  
on System  
Interests



KAI and  
Problem  
Solving  
Overview



Regrouping  
based on KAI  
Results  
(Wasabi)



Final Project  
Discussions  
and Planning



Presentation of  
Final Solution  
Sketch

PBL LEARNING

# Other Happenings

- Issue-Expert Guest Speakers
- Site Visits
- Weekly reflections
- Final presentation outside of the classroom

## Gold Standard PBL

Seven Essential Project Design Elements



# How'd it go?

- Issues addressed included deforestation, clean water, carbon reduction, genetically modified foods, education, and policy. ○
- Reflections and evaluations indicated students valued the experience of working with other perspectives in a collaborative environment.
- Adversity contributed to their critical and creative thinking.



# Recommendations

- Solution Symposium event added value to the experience (public product)
- Weekly reflections on content, project, or applications (reflection) ○
- Develop a safe, comfortable space for discussion
- Using KAI to create groups added purpose
- More deadlines



# Questions?

