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# Supporting and Developing a Course to Save the World

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MAA Session for MPE-13  
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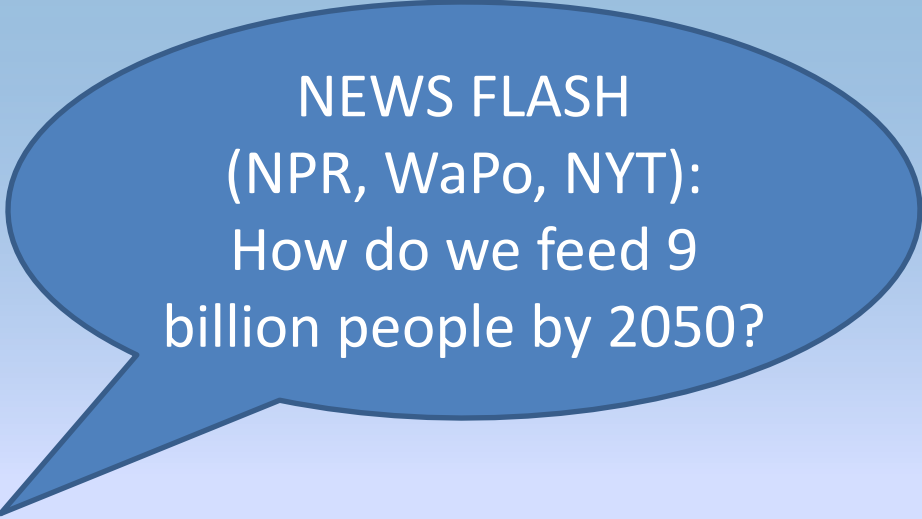
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# Outline

- Motivation for the course
- Course Content Development
- Course Structure Development
- Final Thoughts

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# Motivation



NEWS FLASH  
(NPR, WaPo, NYT):  
How do we feed 9  
billion people by 2050?

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Corn feeds  
people not cars!



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How do we feed 9  
billion people by 2050?

Eat local!

Go organic!

Say no to GMO!

Go vegan!

Eat bugs!?

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people not cars!

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# Motivation

- My own personal passion
- National media attention
- Interest at my university
  - Course sponsored by the newly formed Center for Explorations in Mathematics and Science (CEMS)

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# Motivation

- Enough material to motivate a whole course!
- Non-calculus based math-modeling course
  - Discrete dynamical systems
  - Curve fitting
  - Network science

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# Motivation

- Enough material to motivate a whole course!
- Non-calculus based math-modeling course
  - Discrete dynamical systems
  - Curve fitting
  - Network science
- Student skills
  - Finding, understanding, and referencing resources
  - Critical thinking and developing sound arguments
  - Oral and written communication skills
  - Team work, ability to see other points of view

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# Course content development

- Discrete Dynamical Systems
- Curve Fitting / Data Analysis
- Network Science

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# Course content development

- Discrete Dynamical Systems
- Curve Fitting / Data Analysis
- Network Science
- Motivating questions for exploration (examples)
  - When will we run out of food? Then what?
  - How does mono-cropping deplete the soil, and of the solutions, which is the “best”?
  - Is eating local sustainable and viable for the whole planet’s human population?
  - Is organic farming really better for the earth and can it produce enough to feed EVERYONE?

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# Course content development

- Resources
    - News / Media (newspapers, magazines, radio, TV, internet) as motivation
    - Government reports for data
    - Lobbyist reports for “spin”
    - Others???
- (Students are responsible for finding, using, and documenting all resources)

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# Course structure development

- How can we cover it all?!
- For first two units:
  - Groups of 6
    - Assigned a topic
    - Given some initial guiding questions & starting resources
    - Develop and tweak a model
  - Divide each group into 2 teams of 3
    - One team takes one stance, one the other (pro/con)
    - Adapt model to support “spin”
    - Debate / presentation for the class and guests
    - Prepare written report



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# Course structure development

- Final unit:
  - As a class:
    - Discuss food growing / production / distribution networks
  - As individuals:
    - Choose one topic to study in-depth
    - Prepare a written report
    - Prepare a poster
    - Present the poster at a poster session with invited guests from the college and the community

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# Final Thoughts

- Driving factors combined:
  - Personal passion
  - National/international media interest
  - University interest
- Student development opportunities:
  - Generate mathematical appreciation for non majors
  - Develop mathematical literacy skills
  - Encourage positive collaborative and competitive working relationships with peers
  - Enhance reading, writing, and speaking skills

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# QUESTIONS?

Want to follow along?

Email me to get additional information including  
access to the course website!

Jessica M. Libertini

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