

Signature First-Year Experiences: Creating a distinctive first-year experience in- and out-of-the classroom

Sam Spiegel, PhD, Trefny Center
Colin Terry, CASA



Core curriculum committee

GEGN 101: Earth Systems

Learning Outcomes

- Cover Earth Science through a systems approach
- Investigate details of the geosphere, hydrosphere, atmosphere, and biosphere and their interconnections
- Seeing how human activities influence the environment

Teaching structure

- Three 1hr lectures
- Fall / Spring / Summer II
- 150 max in lectures

PHGN 100: Mechanics

Learning Outcomes

- Apply appropriate fundamental principles of kinematics, dynamics, energetics, and momentum to analyze and interpret mechanical phenomena
- Apply appropriate conservation laws to analyze and interpret mechanical phenomena
- Communicate fluently with the vocabulary of mechanics
- Interpret physical phenomena portrayed by and appropriately translate between by different representations
- Design, perform, analyze and interpret experimental results
- Carefully read, analyze and make sense of written documents
- Recognize the role of physics in engineering, research and your everyday world
- Appreciate the role and value of interactions with peers, TAs and instructors in learning
- Believe that you can learn difficult concepts through repeated exposure and practice

Teaching structure

- Two lectures and Two studios
- Fall / Spring / Summer II
- 150 max in lectures / 108 max in studios
- Two 50 minute lectures and Two 1 hour 50 minute studios per week
- 2 professors in charge of 4 lecture sections
- 3 professors and 30 UG TAs in charge of 5 studio sections

Key Features

- ✓ Group learning
- ✓ Hands-on
- ✓ Scaffolded problem solving
 - ✓ Context analysis
 - ✓ Representations
 - ✓ Sketching
 - ✓ Labeling
 - ✓ Diagramming
 - ✓ System identification
 - ✓ Application of principles
- ✓ Experimental skills development
 - ✓ Context analysis
 - ✓ Objective identification
 - ✓ Representations
 - ✓ Prediction and Modeling
 - ✓ Data analysis and interpretation
 - ✓ Error analysis
- ✓ Mathematical communication
- ✓ Introduce and provide environment to facilitate movement from novice toward competent for various problem solving and experimental skills

EPIC151 - 1st year Design EPICS

Learning Outcomes

- Break down large problems into smaller problem(s), generate alternatives, and analyze methods
- Effectively in teams process using project planning, to solve problems.
- Communicate technical ideas and solutions orally, written, and through prototype models.
- Analyze the context of problems, through stakeholder input.
- Build prototypes based upon a cycle of defining, iterating, and feedback.

Teaching structure

- 3 credit hours, 5 contact hours / week
- Fall: 26 sections of 25
- Spring: 20 sections of 25
- Summer: 2 sections of 25
- Professors / TAs / UTAs – numbers and duties (brief)

Notes & Collaborations

- Focus on interactive engagement and group learning
- Focus on skills development in experimental and problem solving scenarios
- Currently involved in collaboration with EPICS, Math and Physics on developing group dynamics coherence
- Would like to expand collaboration to include multi-disciplinary contexts

Course sequencing

- Translational kinematics & dynamics with vector calculus
- Rotational kinematics & dynamics with vector calculus
- Energy and Momentum in translation and rotation
- Waves
- Pre-requisite: Calculus I / Co-requisite: Calculus II
- Core requirement for all students

Notes & Collaborations

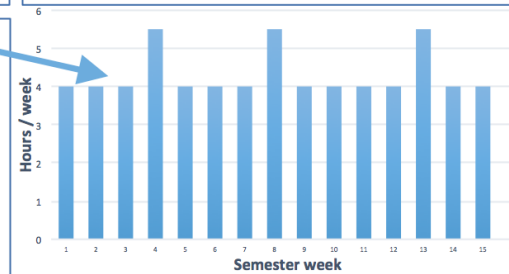
- A combination course with NHV and Engineering Grand Challenges TLC
- Working with Math and Physics to integrate and integrate instruction
- Involving departments and recruiters to address critical workplace skills

Course sequencing

- Freshmen year, all take it
- No pre reqs or co reqs
- Exemptions made for relevant and sufficient military or full-time work experience
- EPIC155 offered as a 1 cr / hour graphics-only option for those exemptions missing graphics.

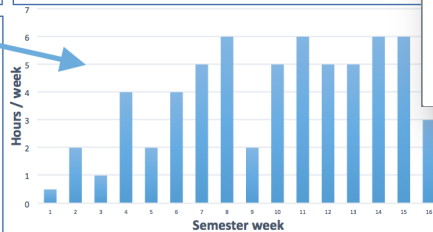
Student Course workload

- *Roughly 4 hours per week for out-of-class reading, homework and studying*
- *Three 1 ½ hr common-hour exams during the semester*
- *Students spend 6 hours per week in class (not included)*
- *> 80 hours per week of out-of-class resources – OHs, HW help, CASA Tutoring & CSI*



Student Course workload

- Rough estimates for the chart – HW, study, meetings
- Narrative or key features in this box



1st & Second Year Experience Committee 2015

1. Reduce/eliminate sources of frustration for students in our curriculum
2. Improve the active learning and hands-on nature
3. Improve and deepen relationships in first year
4. Improve integration of the educational experience
5. Make potential pathways and majors easily visible



Learning across their college experiences



Learning across their college experiences

Learning across their experiences at Mines



Learning across their college experiences

Learning across their experiences at Mines

Program learning outcomes

Learning across their college experiences

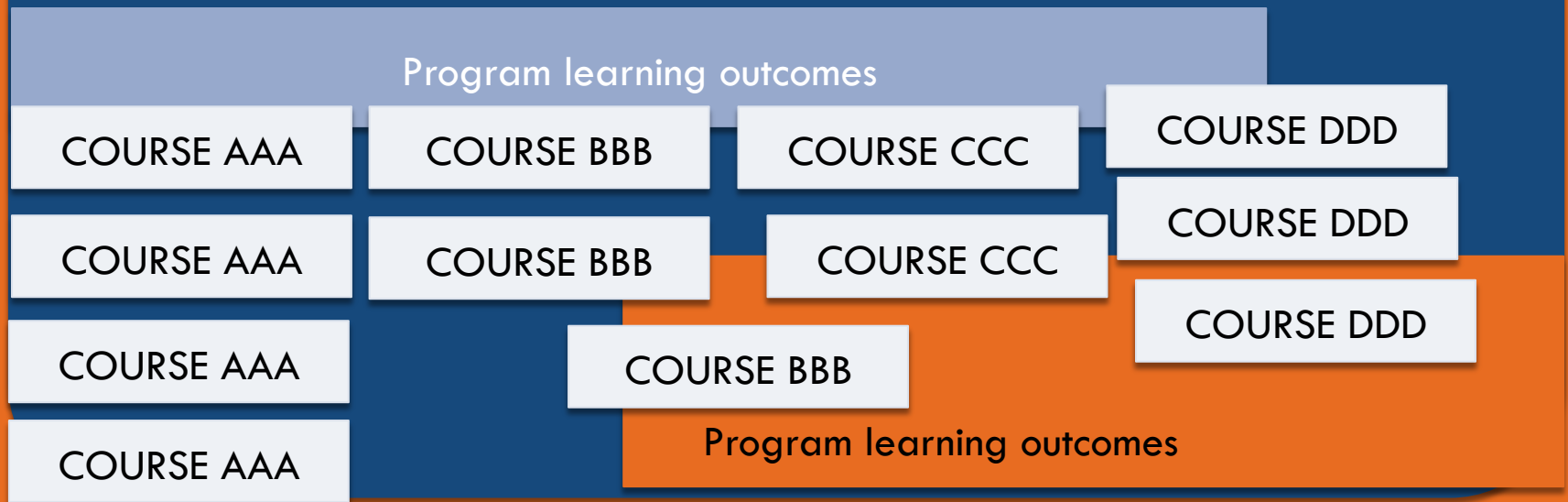
Learning across their experiences at Mines

Program learning outcomes

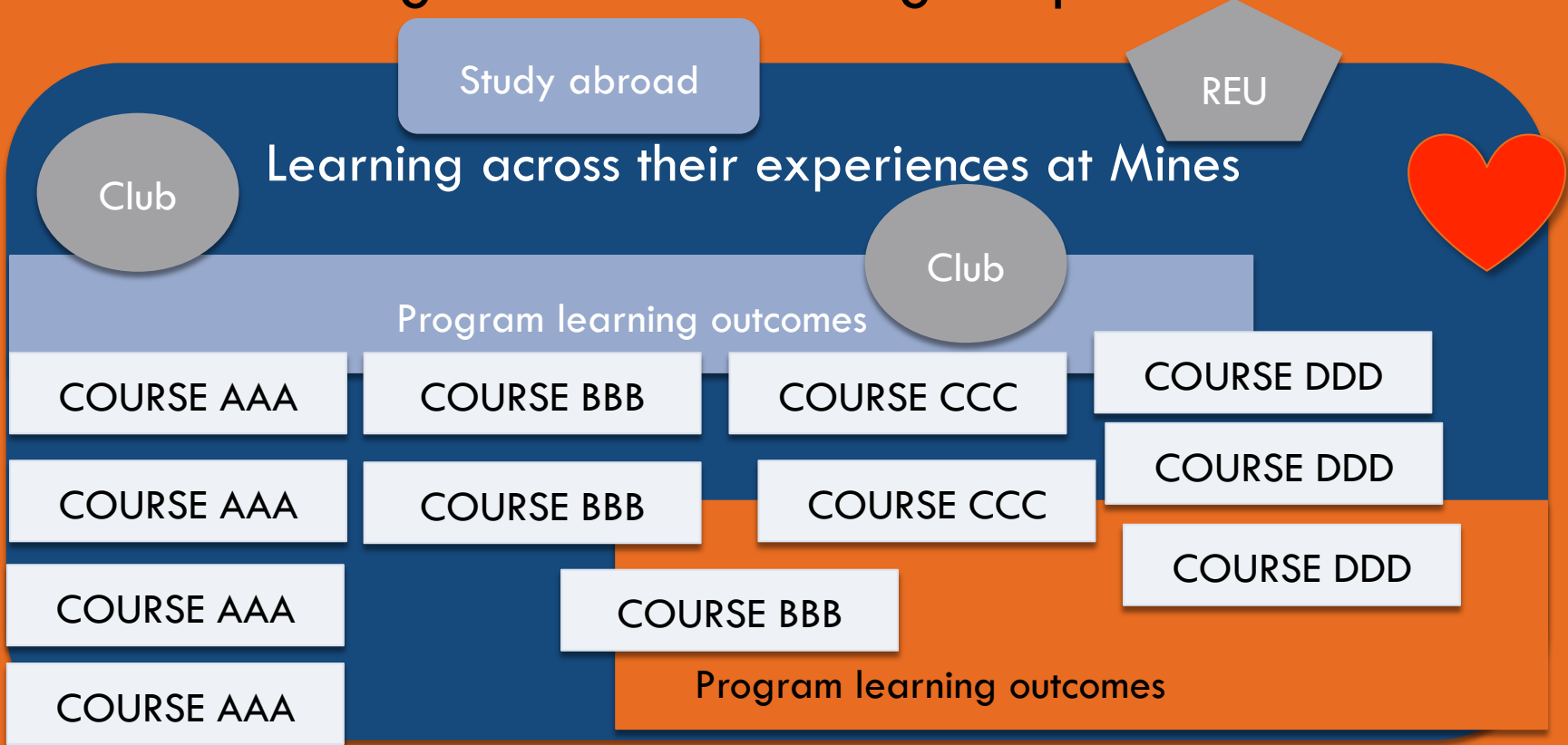
Program learning outcomes

Learning across their college experiences

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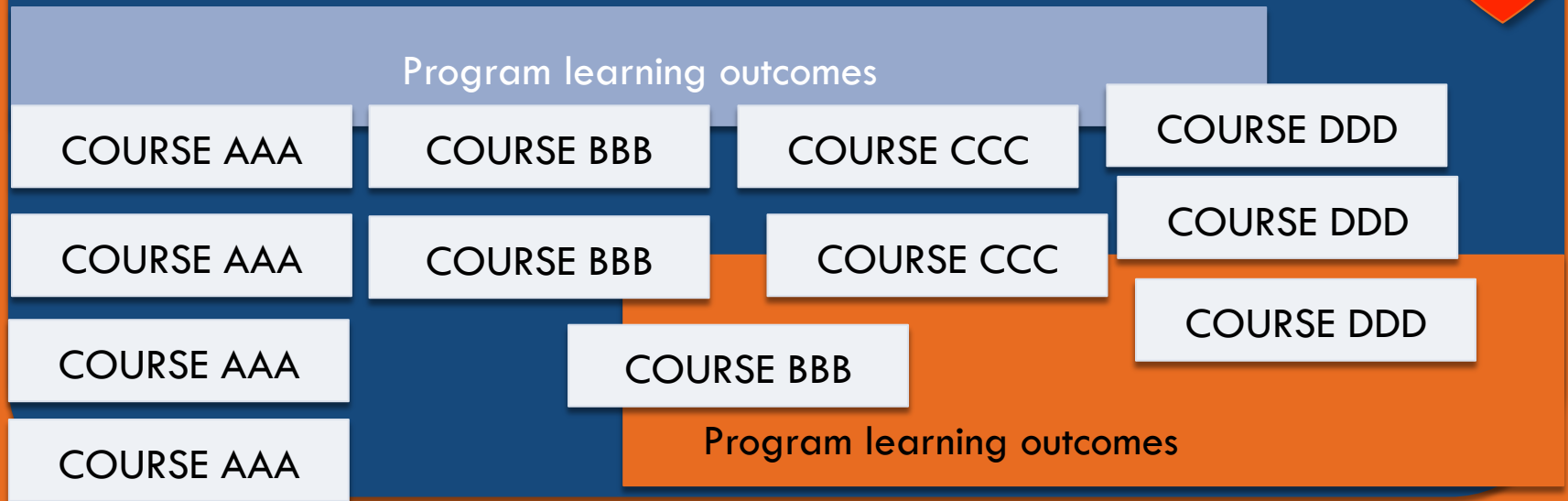


Learning across their college experiences



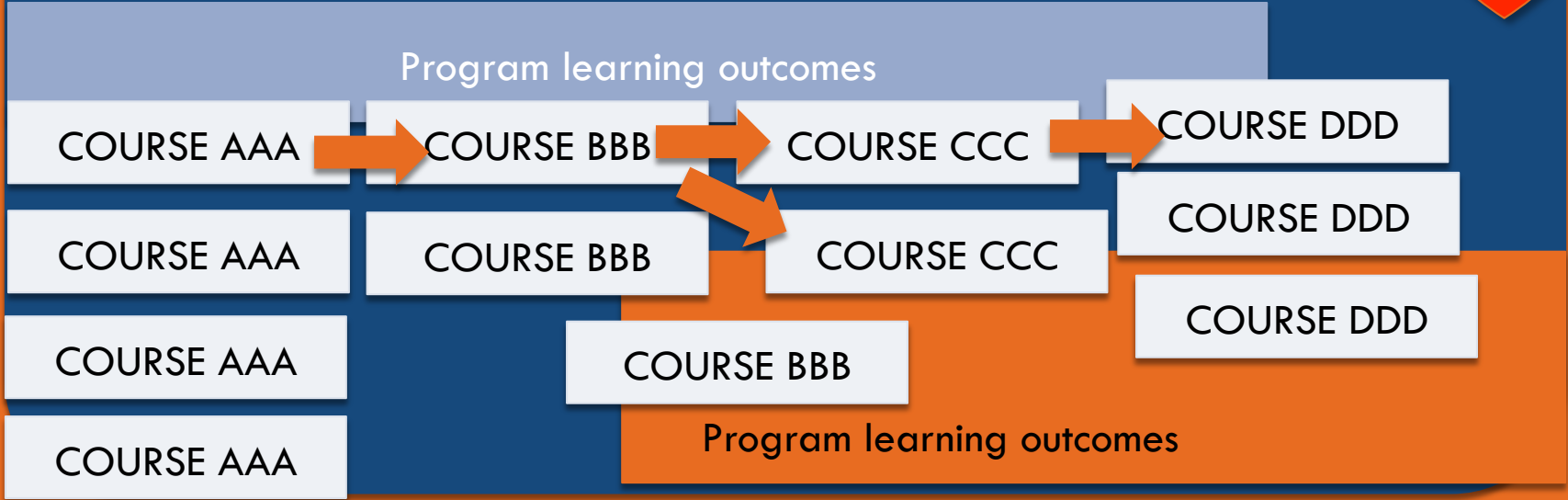
Learning across their college experiences

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Let's focus on YEAR 1

- What are the experiences and/or outcomes we want for all students in year 1?
- How can we create and support the richest learning opportunities for first-year students?



What if we built it as a single course?

- Brainstorming session:
 - ▣ Just to think about what might we want out of 1st year (not getting bogged down into single content areas)
- A single year one course design to focus outcomes and coherence
- A single out-of-class experience design
- Define as a foundation to build to major or graduation: Not isolated experience

Work in small groups

Have a recorder who will write or type the top 5 points/ideas of the discussion. Represent the whole group.

- What are the experiences and/or outcomes we want for all students in year 1?
- How can we create and support the richest learning opportunities for first-year students?

Contact us to follow up

□ Colin Terry - cterry@mines.edu

□ Sam Spiegel – sspiegel@mines.edu

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