

# Nurturing the Next Generation of Computer Science Professionals

## IUSE/PFE:RED: Computer Science Professionals Hatchery

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*The Computer Science Professionals (CSP) Hatchery will create a revolutionary learning environment by modeling the best practices of a software company work experience, layering nurturing aspects that promote ethical questioning, value diversity, and a focus on professional skills such as increased collaboration, communication, and teamwork. (NSF Award# #1623189)*

**The CSP Hatchery**  
Software Company Environment

Incubate Agents of Change

Moral, Ethical, Social, Technical, Professional, Entrepreneurship, Business Mindset

### Objectives

- Actively Engaged Stakeholders
  - Industry
  - Students
  - Faculty
  - Continuous Innovation Together
- VITaL: Vertically Integrated Teaching and Learning
  - Agile
  - Foundational
  - Capstone Integration
- Diversity for Mutual Gain
  - Ethical/Moral Infusion

Professional & Entrepreneurial

### Knowledge, Skills & Abilities

Through several meetings with industry representatives, we iteratively developed the KSA categories and desired outcomes shown below.

KSA Category	Desired Outcomes
Business	An understanding of how a company makes money and executes its strategy
Collaboration & Teams	Working with people and groups to achieve a goal
Entrepreneurship	Organizes, manages, and assumes the risks of a business or enterprise
Professional	A person engaged and qualified in the computing profession
Research & Development	Seeks innovation and improvement of products and processes
Technical	Practical knowledge and skills associated with the computing field

### Partner for Success!

Foundational Values, Navigating Computing Systems, Intro to Version Control, Agile Development, Intro to Database System Usage, Technical Interviews, Jobs and Careers

Faculty Staff Advising Students

Boise State University RED Team

### Next Steps

- Second round HU proposals planned - Desire:
  - ~3 additional required HUs
  - ~6 elective HUs (satisfies CS electives)
- Threading HU content in CS courses
- Capstone integration
- Establish an "Entrepreneurial Emphasis"
- Examine students' social/emotional levels
- Interview industry partners
- Monitor HU content implementation
- Research, Validation, and Publication

### Progress

- 14 HU proposals submitted (2/3<sup>rd</sup> faculty participation)
- Approved 6 HU courses
- RED team member on each HU team
- All CS faculty interviewed by social science PI
- Received 500+ student responses on beliefs, perceptions, educational experience, social (cultural competence) and emotional (self-esteem)

### Challenges

- Ingrained biases and comfort zones
- Building student and faculty buy-in and participation
- Logistics: scheduling, integration and threading, advising, communication
- New course development
- Modifying existing courses to utilize Hatchery concepts - "Threading"
- Increasing future survey response rate and willingness to provide feedback on beliefs and experiences
- Using survey and interview data to identify and address ongoing challenges

...every bit of computer science touches and affects society. We have to be careful what our tools do to people!...

...That's just the way the world is! If [under-represented groups] can't handle that, I can't help them...

### Hatchery\* Change Process

\*Hatchery Units (HUs) are one credit courses focused on skills relevant to computer science professionals and designed to rapidly adapt to the changing needs of industry. HUs are also a vehicle to diffuse social justice and equity through the curriculum.

Proposal: Concept Development, Review: Project & Follow-up, Curriculum Integration, HU 1<sup>st</sup> Preparation, HU 1<sup>st</sup> Offering, HU Integration

Agile HU Students Assist Capstone Teams

### Foundational Values

(Diversity and Social Justice) Threaded Freshman to Senior Courses

### Hatchery Curriculum Map

CS 121/121L Computer Systems I, Navigating Systems, Foundational Values, CS 221 Computer Systems II, Configuration Management, Agile Development, Entrepreneurship, Systems Administration, CS 253 Intro to Systems Programming, CS 321 Data Structures, Pre-req Co-req, Secure Development, CS 354 Programming Languages, CS 361 Intro to Theory of Computation