1. **Participants**

People directly involved in working on this project were the following:

1. John L. Falconer: Project PI, screencast and conceptest author, professor
2. Garret Nicodemus: Project assistant, screencast and conceptest author, webpage designer/moderator
3. Janet deGrazia: screencast and conceptest author, instructor
4. Audrey Schaiberger: Project assistant, materials editor
5. Cuining Liu: Undergraduate assistant, materials author/editor

Support for this project has also been provided by Shell (covering some salaries), the Engineering Excellence Fund at University of Colorado Boulder (developing screencasts center), and the NSF (main project funding for screencasts and conceptests).

2. **Activities and Findings**

We have been developing materials for chemical engineering courses with the objective to make it easier for faculty to incorporate active learning methods into their classes. We are creating conceptests (conceptual multiple choice questions) and screencasts (video captures) and are making them available online. Screencasts are available on iTunesU and through our site (www.learncheme.com). They provide worked out examples, supplement lecture materials, and explanations of how to use software for core chemical engineering courses. Conceptests are only available to registered instructors. When used with classroom response systems (i.e., clickers), conceptests promote active learning through peer discussion and instant feedback.

As of May 2nd, 2012, we have created more than 1,075 conceptests and 575 screencasts covering topics in 8 different engineering courses. Specific to the funding from iSTEM, we have created and posted more than 33 bio-related conceptests that address topics in fluid dynamics, material and energy balances, and thermodynamics. We have also created and posted online 24 bio-related screencasts. We currently have 5 bio-related scripts that need to be made into screencasts as well. The screencasts are designated as biologically focused using “(Bio)” after the title on our topics list on learncheme.com.

Our screencasts have been played and downloaded over 475k times on iTunesU, YouTube, and Vimeo. We have 272 teachers signed up as members to use our conceptests and over 600 subscribers to our channel on Youtube/learncheme.

Anonymous feedback from students has been overwhelmingly positive. In five classes, over 97% of the students found screencasts to be useful. Some students comments about screencasts included, “The screencast for extremely helpful for understanding material preparing for exams”, “The screen casts were the best thing that helped me learn in this course”, and “Screencasts were so helpful, I even watched some twice!”. In a recent thermodynamics class, 99% of the class watched at least 5 videos and 25% of the class reported watching more than 30 videos.

Related to outreach, our materials have been accessed in over 105 countries.

3. **Publications and Products**

The following talks on this project have been given:
2. CIRTL online course "Technology in the classroom" session (3/2011 - online). *Using screencasts and clickers in classes.*
4. AIChE meeting (10/2011 – Minneapolis, MN)., Screencasts and conceptests in a materials and energy balances course
5. iSTEM Chancellor’s Award Poster Presentation (10/2011-on campus)

We also published in the Journal of Chemical Engineering Education on our materials and how we use them in our courses: J.L. Falconer, G.D. Nicodemus, J. deGrazia, and J.W. Medlin, “Chemical Engineering Screencasts”, Chemical Engineering Education 46, 58 (2012).

4. **Contributions**

The principal discipline of the project is in chemical engineering education. However, our research and materials can be applied to other engineering disciplines that teach similar courses (i.e. thermodynamics, materials and energy balances, fluids). We plan on continuing to incorporate biologically related conceptests and screencasts into our courses as we continue to work on this project.