

A Program of the National Center for Science and Civic Engagement (NCSCE.net)



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WHAT IS

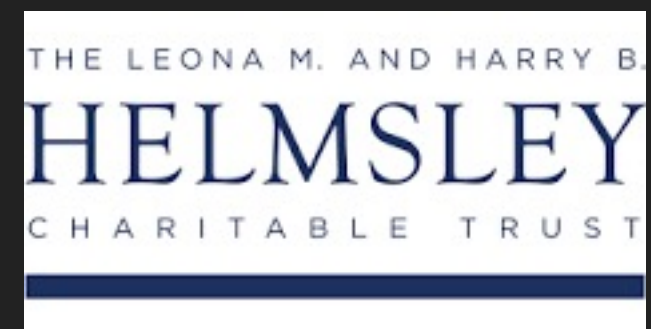
SENCER?

USING CIVIC CHALLENGES TO DRIVE
STUDENT ENGAGEMENT & PERSISTENCE IN
STEM:

SENCER

HISTORY

- Established in 2001 at the Association of American Colleges and Universities with funding from the National Science Foundation, SENCER is a curricular improvement and faculty development program that has reached over 7000 educators at more than 500 institutions. NSF funded research has identified SENCER as a “community of transformation” in STEM reform. (Kezar, 2015)



SENCER is a curricular improvement initiative that was developed to do three things:

1. **Engage** underrepresented and “science averse” students in science by teaching through issues of immediate relevance to them.
2. **Improve** understanding and retention of science concepts by grounding them in real-world contexts.
3. **Build** civic confidence and capacity in students as evidence-based problem solvers and agents of change.

THE SENCER IDEALS

- ▶ SENCER approaches **invite students to put scientific knowledge and the scientific method to immediate use** on matters of pressing interest to them.
- ▶ SENCER courses **explores the power of science to solve great problems, but also its limits**, by recognizing the complex political social, cultural, and economic contexts in which science is practiced.
- ▶ SENCER **regards learning as practical and engaged** from the start, as opposed to education models that view the mind as a kind of “storage shed” where abstract knowledge may be secreted for some unspecified potential use.

2001-2015 THE PRIMARY VEHICLE FOR
DISSEMINATING THE STRATEGY WERE
“MODEL” COURSES

THE SENCER MODELS

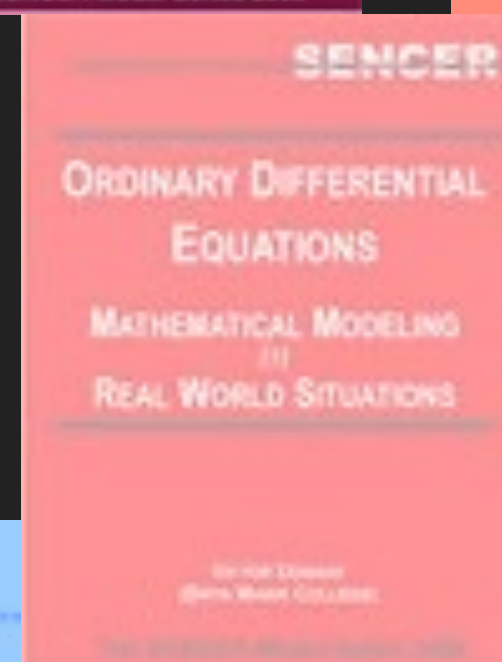
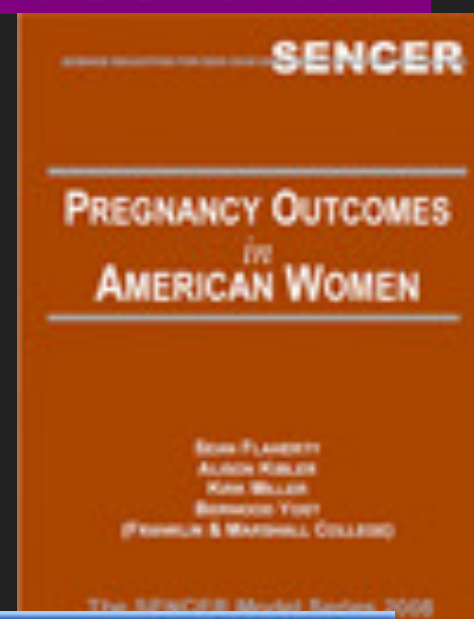
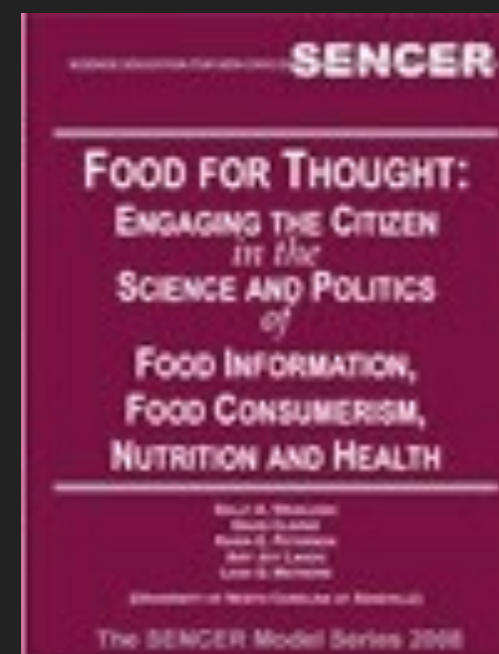
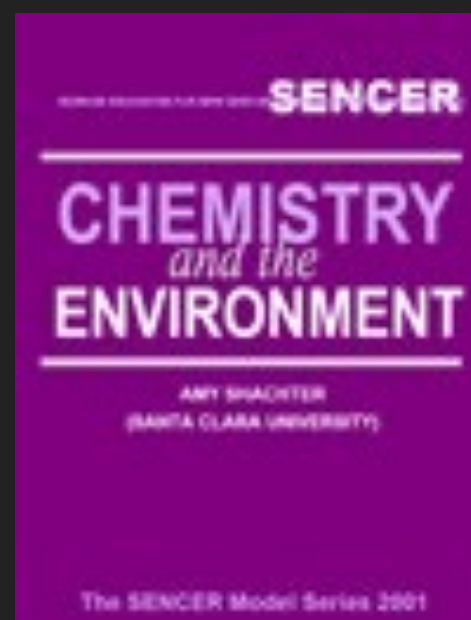
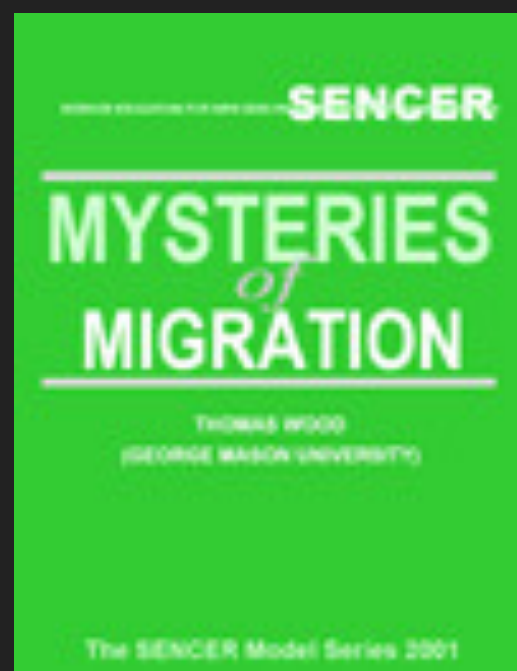
SENCER.NET/MODEL-COURSES/

SENCER evolved from the redesign of a single course at Rutgers University in the 1990s, **Biomedical Issues of HIV/AIDS** (formerly Bio 172) that taught most of the conventional content of introductory biology through a focus on HIV disease. Using a contemporary problem to organize the disciplinary content helped students learn and retain complex biological concepts while deepening their engagement with, and understanding of, an urgent public health challenge.



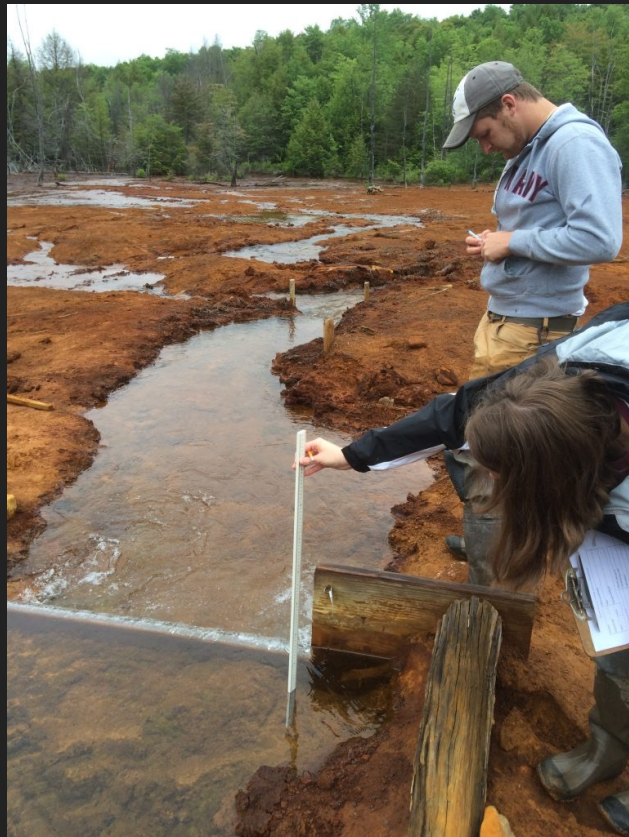
SENCER COURSES AND PROGRAMS;

- ▶ Change the focus of STEM courses from a sequence of abstract disciplinary concepts to an immediate, relevant, and unscripted problem that demands STEM knowledge to solve. Some Examples:
- ▶ General Biology becomes "Biomedical Issues of HIV-AIDS,"
- ▶ Cellular and Molecular Biology becomes "Cancer,"
- ▶ Gen Chem becomes "Exposure to Toxic Chemicals,"
- ▶ Environmental Bio becomes "Ecosystems of Southwest Florida," or "Pollinators and Sustainability."
- ▶ Upper division Math becomes "Differential Equations in Real-World Contexts (Modeling)"



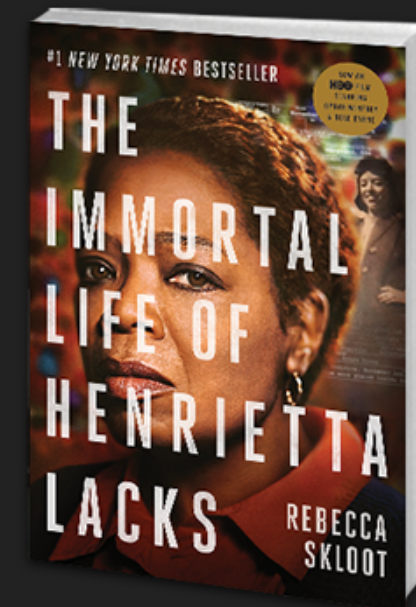
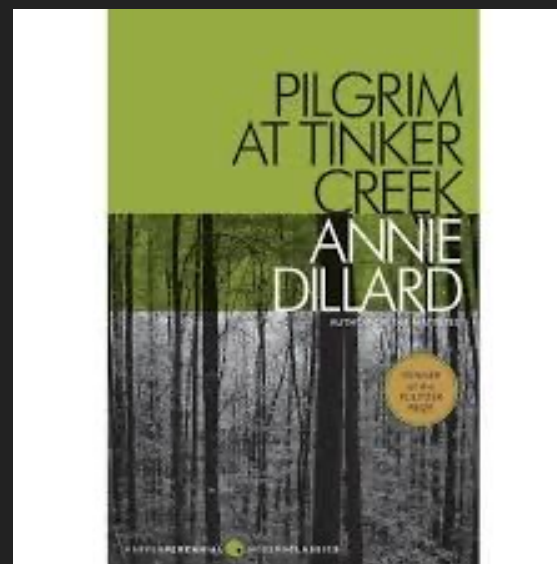
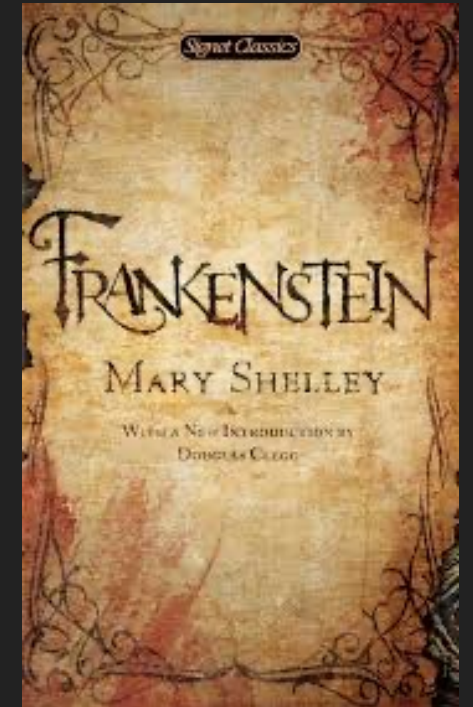
SENCER COURSES USE “HIGH IMPACT” TEACHING PRACTICES TO IMPROVE STUDENT LEARNING

- Research projects and field experiences



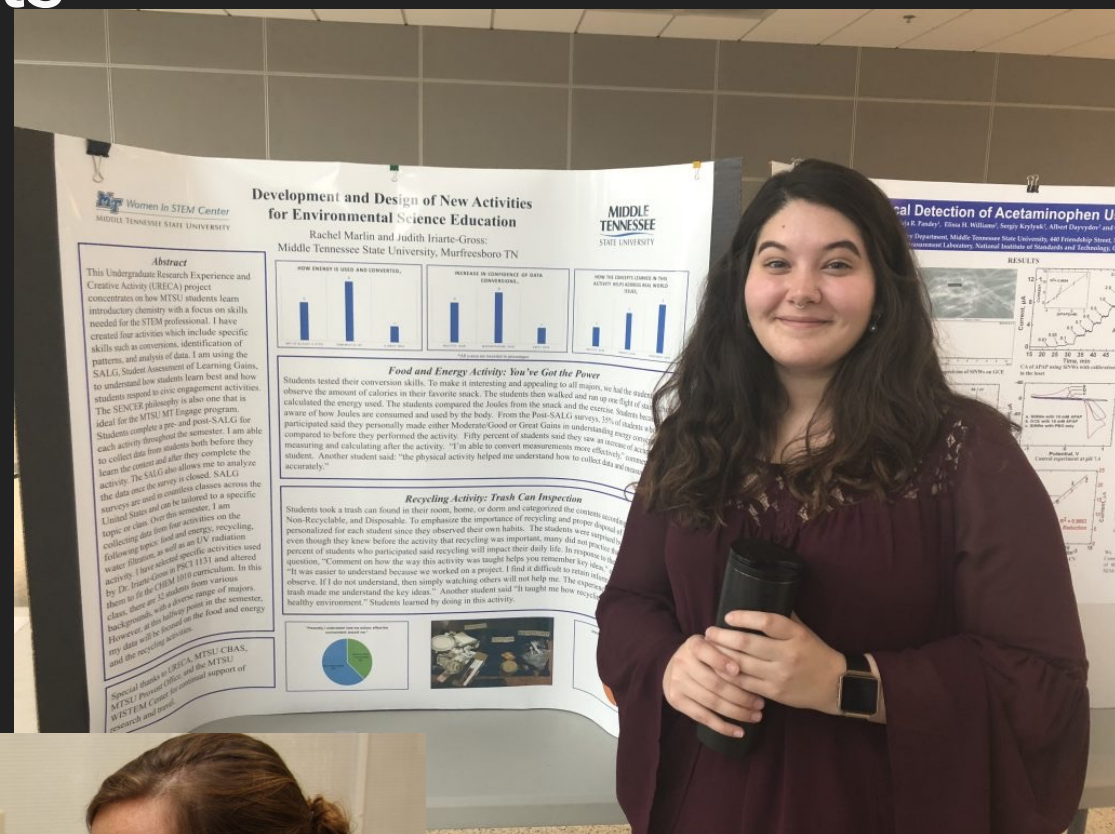
SENCER COURSES USE INTERDISCIPLINARY RESOURCES TO PROVIDE CONTEXT FOR STEM LEARNING

- Narratives (novels, films, performances, journalism, role play) and outside experts and speakers from all disciplines add context to complex civic problems.

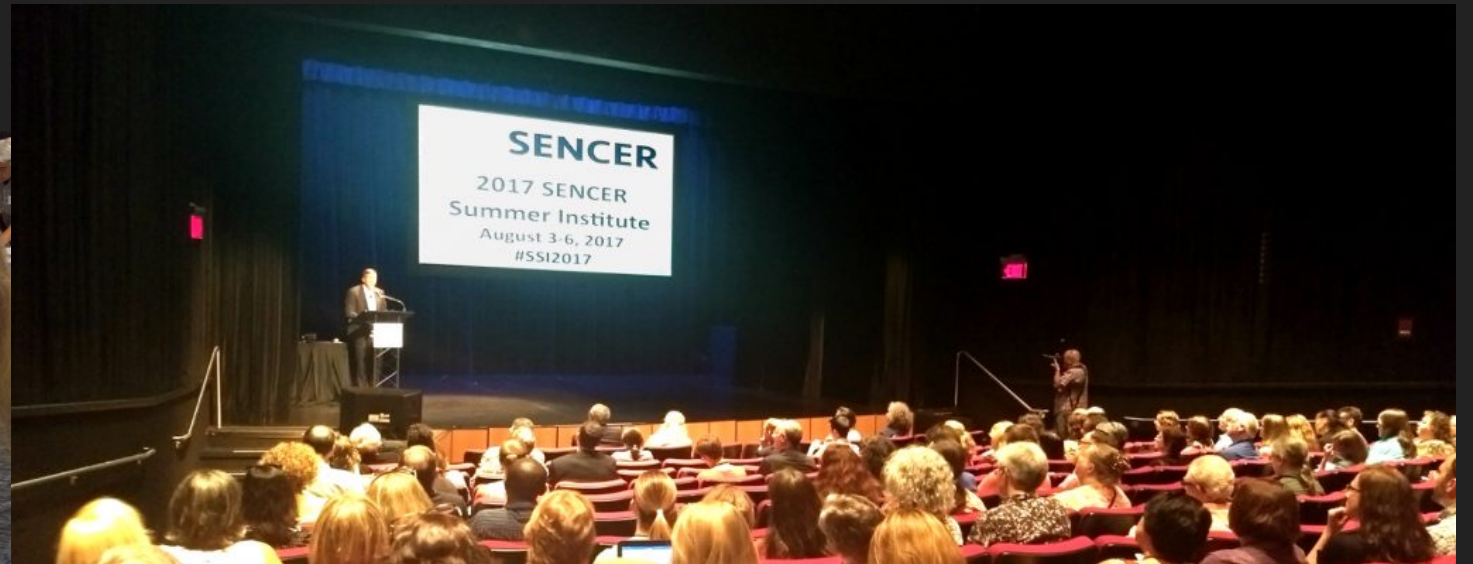


SENCER COURSES USE MEANINGFUL ASSESSMENTS

- Integrative assignments and assessments (Posters, presentations, demonstrations, portfolios, journals, exams, analytical essays etc) show mastery and competence beyond acquisition of facts



SENCER HOSTS NATIONAL AND REGIONAL WORKSHOP AND CONFERENCES FOR EDUCATORS WHO WANT TO ADOPT AND REFINE PROBLEM BASED AND SOCIALLY RELEVANT LEARNING STRATEGIES (AND WE HAVE FUN TOO)



The SENCER Centers for Innovation (SCIs) offer expertise, local support for members of the SENCER community, meetings and workshops to complement our national meetings and funded projects.

- SCI-New England (hosted by Worcester Polytechnic Institute)
- SCI-MidAtlantic (hosted by Rutgers University)
- SCI-Chesapeake Bay (hosted by George Mason University)
- SCI-Great Lakes (hosted by Case Western Reserve University)
- SCI-Central Plains (hosted by Butler University)
- SCI-Midwest (hosted by Roosevelt University)
- SCI-South (hosted by University of North Carolina – Asheville)
- SCI-Southwest (hosted by Texas Woman's University)
- SCI-West (hosted by Santa Clara University)

Learn more about each at <http://sencer.net/community/>

NCSCE publishes a peer-reviewed journal, Science Education and Civic Engagement: an International Journal.

The mission of this journal is to explore constructive connections between science education and civic engagement that will enhance learning for all students. In the 21st century, mathematical and scientific reasoning is an essential element for full participation in a democratic society.

Learn more at <http://new.seceij.net/>

