DISCOVERING RESEARCH & COMMUNICATING SCIENCE

Librarians Facilitating STEM Learning in a Credit Bearing Course

Margeaux Johnson, Amy Buhler, Donna Wrublewski, & Sara Gonzalez
University of Florida, Marston Science Library

Introduction

In 2006, Science & Technology librarians at the Marston Science Library envisioned a course that would illuminate the world of scientific research for undergraduate students. The goal of the course is to prepare nascent researchers to think critically, ethically, and holistically about approaches to research in their respective STEM fields. It prepares undergraduates interested in pursuing a Ph.D. or a professional degree in STEM disciplines with the information literacy skills, research skills, and understanding of scientific communication necessary for research success. While undergraduates are often prepared to begin graduate level research from a content perspective, they may lack the integrated information research skills and understanding of scientific communication necessary to initiate self-directed and proactive research agendas. This course empowers students through familiarizing them with scientific information sources, funding processes, and publication and presentation practices. It also helps facilitate their search for research mentors by introducing them to STEM faculty, who are invited to give guest lectures throughout the semester.

The development and refinement of the Honors course IDH3931 *Discovering Research & Communicating Science* serves as a model for other programs hoping to educate tomorrow's science professionals.

The 3-credit course is co-taught by a team that includes a librarian with a Ph.D. in a STEM discipline and a librarian with instructional design experience.

Learning Objectives

By the end of this course students will:

- Develop a research proposal using NSF guidelines and understand the grant writing process from both a submission and a reviewer standpoint
- Create a scientific poster presentation that visualizes a STEM research topic of interest
- Write clear, concise abstracts that accurately convey information
- Search the scientific literature for appropriate resources
- Evaluate resources for authority, currency, objectivity, accuracy, and coverage
- Discuss STEM research ethics including plagiarism, data falsification, and data fabrication
- Use citation management software to develop bibliographies
- Analyze the shift in scholarly communication in the scientific community that has led to Open Access models
- Explain the process of submitting an academic article to an academic journal
- Recognize undergraduate research opportunities at the University of Florida and understand how to prepare for graduate school
- Apply tools for scientific communication

Assignments

Fall 2011 Assignments:

- Abstracts (10)
- Subject Mapping Poster
- Information Resources Quiz
- Research Proposal—Topic/ Annotated Bibliography
- Research Proposal—Draft
- Research Proposal—Presentation
- Research Proposal—Final

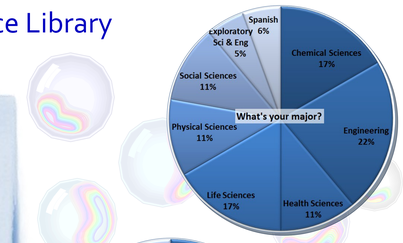
Fall 2010 Assignments:

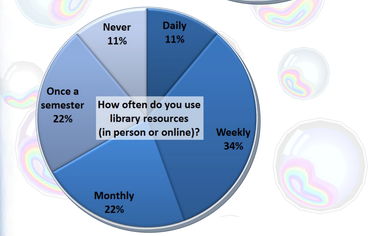
- Abstracts (5)
- Journal Clubs (5)
- Subject Mapping Poster
- Information Resources Quiz
- Open Access Project
- Final Presentation

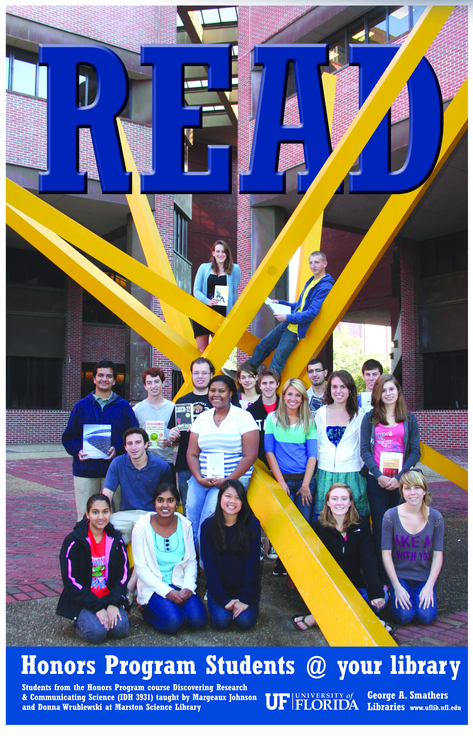
Evaluation

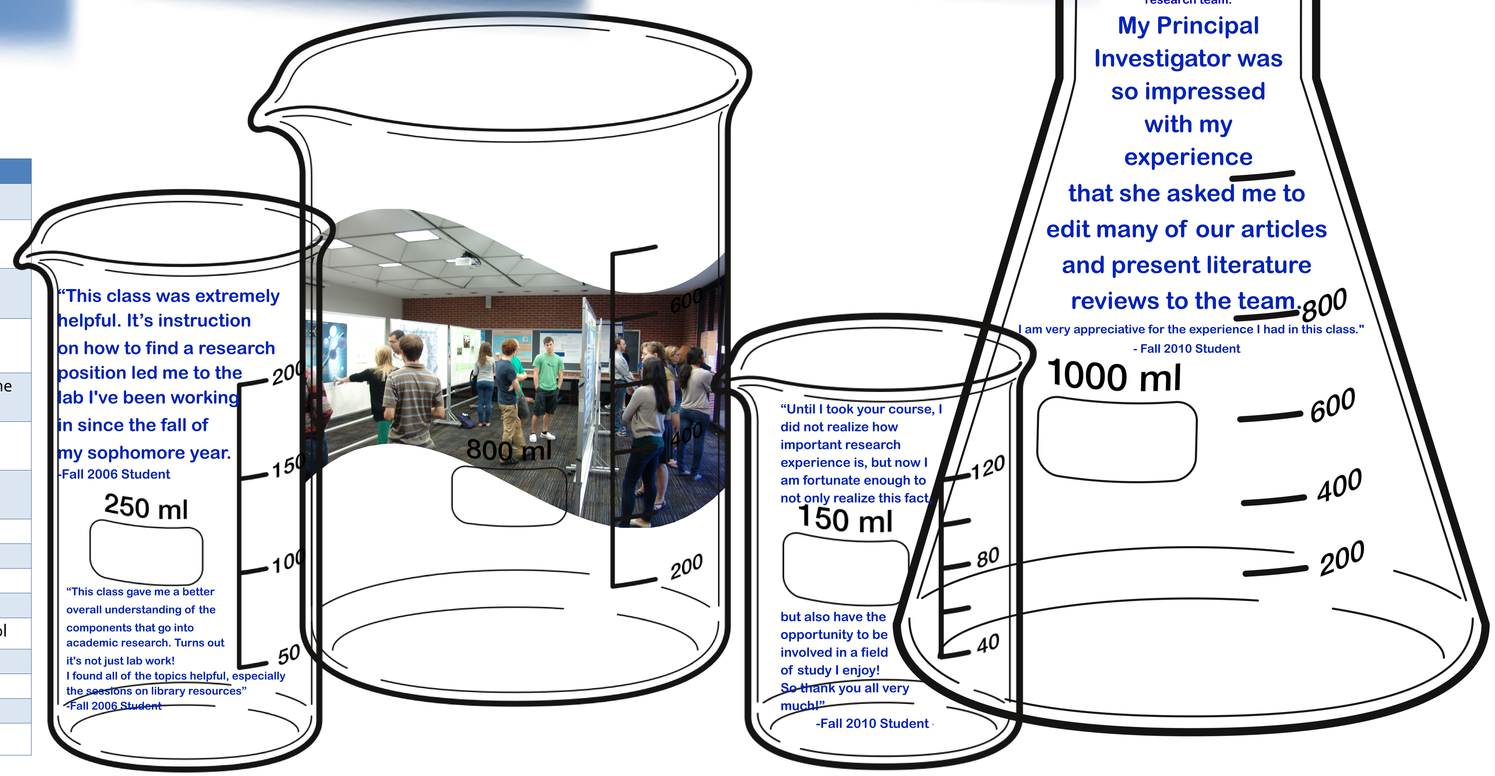
Eighteen former students responded to a survey gathering feedback on *Discovering Research & Communicating Science*. Of these respondents:

- **72%** are currently STEM or Health Sciences majors
- **78%** are still interested in scientific research
- **67%** have participated in research while at the University of Florida
- **72%** are planning to attend or currently enrolled in a graduate program in STEM or Health Sciences
- **89%** would recommend this class to fellow students
- **67%** found the information they learned from class very useful (**28%** found it somewhat useful and **5%** found it not useful)







Weekly Course Schedule

Week	Topic
1	Introduction, Course Overview, STEM Research Ethics
2	Scholarly Communications, Scientific Writing, and Abstracts
3	Citation Management, Constructing Searches, and Evaluating Information
4	Searching the Scientific Literature: General Science, Health Sciences, and Physical & Chemical Sciences
5	Searching the Scientific Literature: Engineering and the Biological Sciences
6	Visualizing Science: Poster Presentations and Data Visualization
7	Communicating Science: Manuscript Preparation and Conference Presentations
8	Open Access and Open Source Resources
9	Grant Writing and Scientific Funding
10	LaTeX, Web 2.0 tools, and CVs
11	Undergraduate Research Opportunities
12	Preparing for Graduate School and Professional School
13	Grant Writing Workshop
14	Mapping and GIS
15	Research Proposal Presentations
16	Research Proposal Presentations and Course Wrap Up