

WHAT WORKS—A PKAL VISION

A VISION FOR NEW SCIENCE FACILITIES AT ST. OLAF COLLEGE

Modern science facilities do not guarantee a forward-looking program, but they certainly help enable it. Within the inspiring and inviting confines of the new Science Complex, our creative and energetic faculty will provide a highly visible program of 21st century science and mathematics, engaging students in the interdisciplinary, investigative, interactive, and innovative learning necessary to train the next generation of scientists, physicians, engineers, and mathematicians.

The Science Complex will be a place where one can readily find:

- ◆ A group of psychology and biology students doing collaborative research on meaningful neuroscience questions, fostered in this endeavor by shared research spaces that promote cross-disciplinary dialogue.
- ◆ Chemistry students combining rigorous fundamental instruction in chemical reactions with environmentally conscious “green chemistry,” working in laboratories where the commitment to green chemistry has translated into a building where the ecological footprint is minimized by eliminating unnecessary fume hoods.
- ◆ Students and faculty in full debate about the ethical implications of modern scientific technology, huddled around a conference table at the end of a hallway where natural light pours into spaces designed to foster such interaction.
- ◆ A physics class where the professor easily maneuvers between chalkboard problem solving, multimedia presentation, technological demonstration, or small group discussion, teaching in a classroom with flexible seating, modern multimedia equipment, and computer technology at the fingertips of all students.
- ◆ Student research teams in mathematics using their combined intellects, the tried and tested chalk on slate, and the latest computational software to solve sophisticated mathematical problems, gathered in a renovated loft space that inspires and invites collaboration and creative thinking.
- ◆ First-year students sharing ideas as they prepare for their group presentation of a investigative project that was part of their integrated introductory chemistry-biology class, congregated around a large flat-screen monitor in a small group meeting room with magnificent views to the outside that is part of a technology-rich science library.
- ◆ Students and faculty from the Statistics Program teaming with their compatriots from across the campus to deliver rigorous statistical analysis to investigative projects, using the Center for Interdisciplinary Research as a home base for their deliberations.

From their first day of classes to completion of their last set of final exams, students will be immersed in an interdisciplinary environment, finding an integrated curriculum that is naturally supported by thoughtfully designed spaces that lack traditional departmental boundaries.

St. Olaf College

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Project Shepherd

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Shared research laboratories and highly interactive teaching spaces will promote the collaboration and communication skills necessary to solve the many complex scientific and computational challenges of the 21st century. Instructional and investigative work will be augmented by sophisticated instrumentation and the latest computational technology as students develop first-hand experience with the tools and problem solving approaches that will assist their future scientific careers. All of this will be done in a sustainability-minded green building that itself serves as a teaching tool and speaks to the integrity of a St. Olaf education.

Rationale for Requiring Natural Science in the General Education Curriculum

The 21st century is a time of accelerated technological development and rapid accumulation of scientific knowledge, a time of unprecedented ability to observe, monitor, and modify life.

Enhanced computational capabilities and sophisticated new instrumentation have opened up entirely new interdisciplinary fields (e.g. bioinformatics) and have launched many of the traditional disciplines in fascinating new directions. Science and technology are playing an increasingly visible role in daily life, from the ability to self-diagnose medical problems on the internet to the debate on the ethics of stem cell research.

In the face of shrinking effective distances among people and nations, creative scientific propositions are necessary to address pressing worldwide issues such as global warming, the management of genetically modified organisms, or the containment of infectious diseases. Clearly, these and many other issues are informed in critical ways by fundamental scientific considerations. The educated citizen must understand the form of scientific inquiry and debate, must be able to formulate relevant questions, and must know the means by which to access current knowledge and expertise. It is these things that compel inclusion of the natural sciences as part of a liberal arts curriculum.

There is in science a back-and-forth between theory and observation, a testing of models against specific numerical data, revealing through this process the beauty and complexity of the natural world in ways that are not otherwise attainable. The natural science requirement at St. Olaf must therefore provide an opportunity for students to engage in meaningful scientific inquiry, to learn the grammar and form of investigation from formulation to observation to interpretation to communication. A science education at St. Olaf must also include the practice of scientific integration, providing an opportunity to focus on a topic that emphasizes multiple levels of scientific understanding and broader connections with the other liberal arts. ■