

Science & Mathematics Education

Experience.
Explore.
Discover.
Achieve.

Departments and Programs in the College of Science

Biochemistry & Biophysics

Biology

Botany & Plant Pathology

Chemistry

Environmental Sciences

Geosciences

Mathematics

Microbiology

Molecular & Cellular Biology

Physics

Pre-professional Programs in the Health Sciences

Professional Science Masters

Science & Mathematics Education

Statistics

Zoology

Doctoral students actively investigate critical questions in teaching and learning in the 21st Century, in preparation for a future as science and mathematics education leaders.

Faculty have held leadership positions as elected officers and board members in most of the major science and mathematics organizations in the country.

Master teachers in the public school system provide a critical link between K-12 classrooms and university preparation of future science and mathematics teachers.

Meeting the critical need for quality science and math educators. The department offers programs to develop expert science and mathematics teachers, teacher educators, science educators in informal settings, technology and curriculum specialists, and scholars and leaders for a variety of positions. Internships in a variety of learning environments provide experiences for meeting professional goals as leaders in elementary through graduate school teaching, free-choice science education, and educational research and evaluation.

Faculty

Our faculty members have a combined teaching experience of 80 years in middle school, 100 years in high school and 70 years in informal settings:

President of the Association of Science Teacher Education and of the Northwest Council for Computer Education

Editors of *School Science and Mathematics* and the *Journal of Science Teacher Education*

Mathematics section editor for *Learning and Leading with Technology*, Science Learning in Everyday Life; section co-editors for *Science Education*

Editorial board members for *Curator* and *Journal of Museum Education*

Association of Science Teacher Education Award for Mentoring

Lloyd Carter award for outstanding and inspirational teaching, College of Science, OSU

Pew National Fellowship, Carnegie Academy for the Scholarship of Teaching and Learning

Invited participant, GIS Institute at the Marine Advanced Technology Education Center

As a land, sea, space, and sun grant university, OSU provides a science and mathematics education program where educational research develops and refines the pedagogy of curriculum. This research complements the teaching of those who will provide formal instruction at the elementary, secondary, or college level or in non-formal educational formats.

The department promotes excellence in teaching by faculty and students. It contributes basic and applied research, as well as service, to the state, regional, national, and international communities.

Research

Our faculty members research and evaluate mathematics and science education leadership and professional development, focusing on improving math and science content for teachers across the nation.

Faculty are research partners with school districts, community colleges, businesses, industry, and informal educational entities such as museums, zoos, aquariums, the Internet and broadcast media, and OSU departments:

- A partnership with central Oregon school districts and the High Desert ESD assures that middle school mathematics teachers meet the high qualifications of the No Child Left Behind federal initiative.
- Partnering with Portland Community College, Portland metropolitan area high schools, and the construction industry, students increase understanding of the value of science and mathematics in post-high school, educational and career paths.
- A department faculty member is collaborating with the physics department to offer a course

for prospective elementary and middle school teachers to study physical phenomena and science learning and teaching.

- Faculty connected with OSU Hatfield Marine Science Center Visitors Center provide unique opportunities for research on free-choice learning as well as internship opportunities in informal science education for graduate students.
- Partnering with Vernier Software and Technologies has led to expertise in teaching with technology as an integral part of helping students understand key science and mathematics concepts.
- With NSF funding, free-choice learning faculty investigate the role of zoos and aquariums on the long-term impact of informal science experiences for girls.
- Free-choice learning faculty have done research and professional development in Ukraine, Australia, U.K., Japan, Taiwan, Brazil, and Chile.

OSU's mission is to provide every student the best education, to extend knowledge through research, and to serve the people of Oregon. OSU is committed to strengthening Oregon's resources for a stronger economy. This strength depends on quality science and mathematics education in school and throughout life for all Oregon citizens.

Science & Mathematics Education

Each year the Department of Science and Mathematics Education prepares over 30 science and mathematics teachers for elementary through high school.

Graduates take teaching jobs in remote areas of Alaska, Hawaii, and rural Oregon as well as urban and rural areas across the United States.

Newly licensed educators learn to integrate state-of-the-art technologies (such as GIS, Vernier probe ware, Geometer Sketch Pad, and digital image software) with teaching science and mathematics.

Education

The Department of Science and Mathematics Education directly contributes to the mission of Oregon State University with the following programs:

The Professional Teacher Education Licensure Program is a one-year, rigorous program, combined with the Master of Science in Science Education or Mathematics Education. It prepares science and mathematics teachers (with specific endorsements in mathematics, integrated science, biology, chemistry, and/or physics) for middle and secondary schools. This program not only serves students who have just completed a bachelor's degree in an appropriate field, but also serves professionals in the field who wish to change careers.

The Master of Science in Science Education (M.S.) or in Mathematics Education (M.S.) degree programs provide two options for educators:

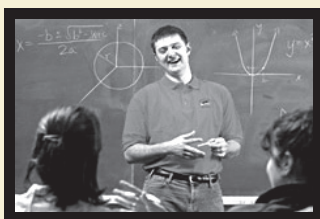
- "School-based science and mathematics educators" option is especially designed for those educators planning to (a) advance their preparation as secondary curriculum, instruction, or professional development

specialists, department heads, and/or other supervisory or research positions preparing to be pre-college level science/math teacher educators or science/math educational researchers; (b) obtain additional authorization and/or endorsement levels; or (c) preparing for entry to the doctoral program. A summer's only version concentrates on in-service course work for elementary, middle and secondary teachers. Course work targets improving teaching specifically in science and mathematics with respect to new curriculum materials, instructional techniques, evaluation techniques, and applications of technology to education. This program attracts teachers not only from Oregon but from all over the United States, because of the faculty's international reputations.

- "Free-choice learning professionals" option is designed for those individuals preparing to work in museums and other informal/nonformal settings, as well as for entry to the doctoral program in free-choice learning.

The Doctor of Philosophy in Science/Mathematics Education (Ph.D.) program provides three options:

- "School-based science and mathematics educators" option is especially designed for those individuals preparing to be pre-college level science/math teacher educators or science/math educational researchers. This degree places a strong emphasis on theoretically-based research as opposed to applied research.
- "Preparation of college science and mathematics instructors" option is especially designed for those individuals preparing to become community college or four-year college science and mathematics instructors. Although there is a strong research component to this degree program, the main focus is on applied rather than theoretical research.
- "Free-choice learning professionals" option is designed for individuals preparing to work and conduct research in support of the public's lifelong free-choice learning. This option places a strong emphasis on a balance between theoretically-based and applied research.



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