Earth Sciences (EARTH)

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Degree conferred: M.Ed.

The Graduate Faculty

Eliza Richardson, Ph.D. (MIT), Assistant Professor of Geosciences, Program Manager
Richard Alley, Ph.D. (UW Madison), Evan Pugh Professor of Geosciences
Sridhar Anandakrishnan, Ph.D. (UW Madison), Associate Professor of Geosciences
Charles Ammon, Ph.D. (Penn State), Associate Professor of Geosciences
Michael Arthur, Ph.D. (Princeton), Professor of Geosciences
David Babb, Ph.D. (Penn State), Assistant Professor of Meteorology
Timothy Bralower, Ph.D. (UC San Diego), Professor and Head, Department of Geosciences
Roger Downs, Ph.D. (Bristol), Professor of Geography
Kevin P. Furlong, Ph.D. (Utah), Professor of Geosciences and Director, EMS Environment Institute Natural Hazards Center
Tanya Furman, Ph.D. (MIT), Professor of Geosciences
Russell W. Graham, Ph.D. (UT Austin), Associate Professor of Geosciences and Director, EMS Museum
Peter J. Heaney, Ph.D. (Johns Hopkins), Associate Professor of Geosciences
Paul Howell, Ph.D. (Cambridge), Professor of Materials Science and Engineering.
James Kasting, Ph.D. (Michigan), Professor of Geosciences
R. Allen Kimel, Ph.D. (Penn State), Assistant Professor of Materials Science and Engineering
Eric Kirby, Ph.D. (MIT), Assistant Professor of Geosciences
Lee Kump, Ph.D. (South Florida), Professor of Geosciences
Chris Marone, Ph.D. (Columbia), Professor of Geosciences
Jonathan Mathews, Ph.D. (Penn State), Assistant Professor of Energy and Mineral Engineering
Scott P. McDonald, Ph.D. (Michigan), Assistant Professor of Education
Andrew A. Nyblade, Ph.D. (Michigan), Associate Professor of Geosciences
Christopher Palma, Ph.D. (Virginia), Outreach Fellow, Science
Demian M. Saffer, Ph.D. (UC Santa Cruz), Assistant Professor of Geosciences
Kamini Singha, Ph.D. (Stanford), Assistant Professor of Geosciences
Timothy White, Ph.D. (Penn State), P.G., Senior Research Associate, EMS Earth & Environmental Systems Institute

The M.Ed. in Earth Sciences program is designed for secondary science teachers who seek to enrich their knowledge and practice through rigorous courses and individual projects supervised by Penn State faculty members. Combining graduate courses from academic departments in Penn State’s College of Earth and Mineral Sciences, College of Education, and Eberly College of Science, the curriculum will prepare teachers to help students in grades 7 through 12 master educational objectives related to Earth and space science, as specified in National Science Education Standards (National Academy of Sciences, 1996). To accommodate working teachers
who are only able to study part-time and at a distance, courses will be offered online through Penn State’s World Campus. Fall, Spring, and Summer semester offerings will be available. Students will be granted licenses to use the courseware modules developed for the M.Ed. in Earth Sciences program in their secondary classrooms.

Admission Requirements

Applications should include a professional sketch or vita, and a statement of professional goals, two letters of recommendation, and official records of scores on either the Graduate Record Exam (GRE) or the Miller Analogies Test (MAT). All applicants are expected to have earned a junior/senior grade point average of 3.0.

The language of instruction at Penn State is English. International applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, 213 for the computer-based test, or a total score of 80 with a 20 on the speaking section for the internet-based test. The minimum composite score for the IELTS is 6.5. International applicants are exempt from the TOEFL/IELTS requirement who have received a baccalaureate or a masters degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States and Wales.

Requirements listed here are in addition to general Graduate School requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin.

Students may initially enroll in M.Ed. in Earth Sciences classes as non-degree graduate students. Up to 15 credits earned in non-degree status may be counted toward the M.Ed. in Earth Sciences degree.

Master's Degree Requirements

The M.Ed. in Earth Sciences degree is conferred upon students who earn a minimum of 30 credits with grades of "B" or better in all courses, including at least 18 credits at the 500-level or above (with at least 6 credits at the 500-level), and who complete a quality culminating individual project in consultation with a graduate advisor. Students will have the opportunity to participate in face-to-face field experiences or workshops at University Park or other locations during Summer sessions.

Student Aid

Graduate assistantships are not available. Financial aid opportunities for part-time students who participate through the World Campus are discussed at http://worldcampus.psu.edu/StudentServices_Paying.shtml
EARTH SCIENCE (EARTH) course list

EARTH 501 CONTEMPORARY CONTROVERSIES IN THE EARTH SCIENCES (3) Exploration of current areas of research in the Earth sciences.

EARTH 591 INDIVIDUAL STUDIES (3) Development of a capstone project, supervised on an individual basis outside the scope of formal courses.

ENERGY AND MINERAL ENGINEERING (EGEE ME) course list

EGEE 401 ENERGY IN A CHANGING WORLD (3) Energy is in transition, with increased international energy demand and increasing environmental pressures. Energy transitions, approaches, and outcomes are addressed.

METEOROLOGY (METEO) course list

METEO 801 UNDERSTANDING WEATHER FORECASTING FOR EDUCATORS (3) Fundamental principles of synoptic and physical meteorology, satellite and radar imagery and data analysis in the setting of mid-latitude weather forecasting.

CURRICULUM AND INSTRUCTION (C I) course list

C I 501 TEACHING AS INQUIRY (3) Course guides teachers to develop systematic inquiries into effective teaching and learning.

C I 550 OVERVIEW OF CONTEMPORARY SCHOOL CURRICULUM (3) Current school programs and options and their impact on pupils; problems in introducing new content into the curriculum. Prerequisite: 12 credits in education and psychology or teaching experience.

ASTRONOMY AND ASTROPHYSICS (ASTRO) course list

ASTRO 801 PLANETS, STARS, GALAXIES, AND THE UNIVERSE (3) Overview of the structure, formation, and evolution of planets, stars, galaxies, and the universe.

ADDITIONAL COURSES may be taken from the following list of Earth Science, Geography, Meteorology, Educational Psychology, and Science Education courses. Descriptions of these courses can be found at http://www.psu.edu/bulletins/bluebook/ (400-level) and http://www.psu.edu/bulletins/whitebook/$programs.htm (500-level and above).

EARTH SCIENCE (EARTH)

EARTH 497 SPECIAL TOPICS -- FIELD EXPERIENCE (1, residential)

EARTH 520 PLATE TECTONICS AND PEOPLE: FOUNDATIONS OF SOLID EARTH SCIENCE (3)

EARTH 530 EARTH SURFACE PROCESSES IN THE CRITICAL ZONE (3)

EARTH 540 ESSENTIALS OF OCEANOGRAPHY FOR EDUCATORS (3)
GEOGRAPHY (GEOG)

GEOG 482 NATURE OF GEOGRAPHIC INFORMATION (2)
GEOG 483 PROBLEM-SOLVING WITH GIS (3)
GEOG 484 GIS DATABASE DEVELOPMENT (3)
GEOG 486 CARTOGRAPHY AND VISUALIZATION (3)
GEOG 487 ENVIRONMENTAL APPLICATIONS OF GIS (3)

METEOROLOGY (METEO)

METEO 802 MESOSCALE WEATHER FORECASTING FOR EDUCATORS (3)
METEO 803 TROPICAL WEATHER FORECASTING FOR EDUCATORS (3)
METEO 804 ADVANCED TOPICS IN WEATHER FORECASTING FOR EDUCATORS (3)

EDUCATIONAL PSYCHOLOGY (EDPSY)

EDPSY 421 LEARNING PROCESSES IN RELATION TO EDUCATIONAL PRACTICES (3)

SCIENCE EDUCATION (SCIED)

SCIED 551 HISTORY, PHILOSOPHY, & SOCIOLOGY OF SCIENCE AND SCIENCE TEACHING (3, residential)
SCIED 597 SPECIAL TOPICS (1 - 9, residential)