



# KEAN UNIVERSITY

Earth Sciences



Geology



Meteorology

Oceanography

Geography



Astronomy



DEPARTMENT OF GEOLOGY AND METEOROLOGY  
SCIENCE BUILDING, THIRD FLOOR

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# DEPARTMENT OF GEOLOGY AND METEOROLOGY

The Department of Geology and Meteorology at Kean University offers degree in five areas: Geology, Meteorology, Earth System Science, General Earth Science, and K-12 Earth Science Teaching. The department provides the highest quality education in the earth sciences and is dedicated to the academic growth of our students. Students in the department share concerns about our global environment and an interest in how the earth behaves and the appropriate management of these. Our graduates have been successful in exciting careers including governmental agencies, private companies, environmental consulting firms, radio and TV broadcasting, teaching and studies for advanced graduate degrees at major universities.

## DEGREES

### Bachelor of Science (B.S.) in Earth Science

#### Geology Option:

This option prepares students for careers with governmental agencies and private companies that work with the solid earth environment. The geology option requires courses in mineralogy, petrology, structural geology, paleontology, geomorphology, stratigraphy, field geology and geographic information system (GIS). The option is rounded out with elective courses such as marine geology, remote sensing, oceanography, hydrology and environmental internship. Topics that geologists study include beach and shore problems, river and stream flooding, groundwater use and contamination, land-use planning, geologic mapping and field investigations, and the petroleum and mining industries.

#### Meteorology Option:

This program provides a strong background in meteorology that enables our graduates to pursue careers in operational meteorology, broadcasting meteorology as well as graduate level work in atmospheric science. Required courses follow the federal government recommendations and guidelines that include atmospheric dynamics, advanced atmospheric dynamics, atmospheric thermodynamics, physical meteorology, meteorological instrumentation, synoptic meteorology, remote sensing and hydrology. Elective courses that broaden students' experiences and make them competitive in the job market include climatology, oceanography, GIS, air pollution and others. Students who are interested in operational meteorology are actively involved with weather forecasting and manage the student-run Keancast program. Students who are interested in broadcasting can work with the KUTV and KU Radio for opportunities to practice and polish their on the air communication skills. Students who pursue graduate studies can participate in active research projects with faculty on topics such as hurricanes, tornadoes, thunderstorms, fog, mesoscale systems, global warming, El Niño and numerical weather forecasting.

#### Earth System Science Option:

Earth System Science is the integrated study of the earth with an emphasis on problem-solving and decision-making. Students learn the relationship of different earth processes, data collection techniques, computerized methods of analysis, application of geographic information systems, and remote sensing, and teamwork to build solutions for real-world problems, particularly in urban environments and other surroundings. Courses include geoscience methods, remote sensing, environmental issues seminar, earth structure and processes, geographic information system, and internship. Students in this option seeks careers in land-use planning, climate change impact analysis, policy and decision-making, water resource management, economic and environmental development, forest and park management and others.

### Bachelor of Arts (B.A.) in Earth Science

#### Earth Science, General Option:

This option provides a range of courses in geology, meteorology, oceanography and astronomy. The earth science general option provides a broad background in the earth sciences and is an excellent starting point for careers in teaching and environmental study and management.

#### Earth Science Teacher(K-12) Certification Option:

This option prepares students for teaching positions in earth science for grades K-12. Students follow the program for the General Option along with courses taken in the College of Education.

#### Physical Therapy Track:

This track is for students who plan in their junior year to apply to the Doctor of Physical Therapy (D.P.T.) Program at the University of Medicine and Dentistry of New Jersey. Students admitted to the D.P.T. program will earn two degrees in six years (a B.A. in Earth Science General Option from Kean University and a Doctor of Physical Therapy from UMDNJ).

#### Occupational Therapy Track:

This track is for students who plan in their junior year to apply to the Master of Science in Occupational Therapy Program at the Kean University. Students admitted to the master's program will earn two degrees in six years (a B.A. in Earth Science General Option and a Master of Science in Occupational Therapy from Kean University).

## ADDITIONAL PROGRAMS

### Collateral Program in Marine Sciences

Students major in earth science may also enroll in the Collateral Program in Marine Sciences. Kean University participates with other colleges in the New Jersey Marine

Sciences Consortium. Field stations are maintained at Sandy Hook and Seaville. The field stations enable the Consortium to offer courses, sponsor student and faculty research, and provide a site for meetings, symposia, workshops and fieldwork.

### **Second Degrees**

The Department of Geology and Meteorology offers Second Degree Programs in the following areas: B.A. in Earth Science, B.S. in Geology, B.S. in Meteorology, and B.S. in Earth System Science. This involves taking the required major courses and the necessary prerequisite courses. Students need not have an undergraduate degree in the sciences to qualify for these programs.

### **RESOURCES**

The Department has a wide range of resources that support our educational research program. The geology laboratories are equipped for microscopic and chemical analyses, spectrographic analyses, X-ray diffraction investigations, topographic and other map analyses. The Department has extensive mineral, rock and fossil collections for use in instruction, a rock, fossil and mineral display museum, and a seismograph that keeps students up to date with the latest global earthquake events. A departmental van provides comfortable traveling on field trips associated with course work and field research. Field trips are supported with GPS technologies (Garmin E-Trex) and surveying equipment.

The Department has a range of data resources that support meteorology, hydrology and climatology. Daily weather data is delivered via the Internet Data Distribution (IDD) and is available for student analysis in the computer laboratories. We also maintain several climatological databases. Students have access to a range of software for data analysis such as McIDAS, GEMPAK, IDV, ArcGIS for GIS applications, and IDRISI for remote sensing applications. Instrumentation for meteorology includes a 10 meter tall observation tower, climatological station, remote weather observing stations, and mobile instruments. A variety of tools and instrumentation exist for hydrology and climatology including a YSI multi-probe, SMART2 colorimeter, chemical test kits for water quality and watershed analysis, and a deluxe stream table for landform modeling and simulation.

### **CENTRAL CARIBBEAN MARINE INSTITUTE (CCMI)**

Field courses are also offered through the Department of Geology and Meteorology on Little Cayman Island. This is an ideal place to explore tropical marine ecosystems because they are removed from continental influences and the coral reef systems are well developed. The aim of CCMI is to involve students of all ages in the hands-on process of scientific discovery.

### **FACULTY**

The Department consists of faculty members with expertise in the areas of meteorology, geology, astronomy, oceanography, and geography. The faculty is dedicated to quality teaching and student learning and research. Faculty research interests include petrology, glaciology, paleontology, cloud dynamics, mesoscale systems, numerical modeling, operational forecasting, climatology, coral reef dynamics, and applications of geographic information systems.

### **CAREER OPPORTUNITIES**

Careers in meteorology exist with a variety of private companies, governmental agencies, commercial and industrial sectors, as well as increasing career opportunities in financial market and weather information services. Meteorology graduates have gone on to work with the National Weather Service, private forecasting companies, environmental positions with both governmental and consulting firms, and in the transportation industry. Graduates have also worked on air and behind the scenes in both radio and television stations such as NBC, CBS, FOX and ABC. A number of our graduates have also gone on to pursue advanced degrees in atmospheric science at major universities.

Geology students are prepared for careers as a geologist in both government and private industries. Geologists are involved with mineral and natural resource exploration, environmental protection, land use planning, water resources, river and stream flooding, and geologic mapping and field investigations. The geology program also prepares students to pursue graduate studies in geology and geosciences.

### **LEARNING ENVIRONMENT**

The learning environment in the Department of Geology and Meteorology is characterized by small class size and close personal attention by faculty members. The Department promotes an active learning environment which shares experiences between students and faculty. A number of opportunities exist for out-of-class study and socialization including clubs such as the Kean Student Chapter of the American Meteorological Society, National Weather Association and the Omega Club (for earth science). The faculty also promote professional development opportunities for all majors.

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