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Degrees Offered
  • Bachelor of Science in Geology
  • Bachelor of Science in Geophysics
  • Bachelor of Science in Petroleum Engineering
  • Master of Science
  • Doctor of Philosophy

General Information

The Mewbourne College of Earth and Energy was established January 1, 2006 in a progressive move by the University signaling its ongoing commitment to energy education and research. Building on a rich history and a tradition of excellence, the MCEE maintains its historical focus on oil and gas, with continued emphasis on the fundamental understanding of the earth, to ensure an appropriate breadth in the educational experience of our students. The Mewbourne College of Earth and Energy consists of the Mewbourne School of Petroleum and Geological Engineering, the ConocoPhillips School of Geology and Geophysics, Sarkeys Energy Center, and the Oklahoma Geological Survey, and offers degree programs in the following disciplines:

  • Petroleum Engineering — B.S., M.S., Ph.D.
  • Geology — B.S., M.S., Ph.D., and Geology Minor
  • Geophysics — B.S., M.S., Ph.D.
  • Geological Engineering — M.S., Ph.D.
  • Natural Gas and Engineering Management — M.S.

Distinguished faculty, exceptional students and state-of-the-art research laboratories make the Mewbourne College of Earth and Energy a center of excellence that endeavors to understand the complex issues relating to energy, industry and our environment that effect our nation and our world.

Programs for Academic Excellence
PARTICIPATION IN THE HONORS PROGRAM

A high percentage of eligible university undergraduate students participate in the university-wide Honors Program described elsewhere in this catalog. Specially designed Honors courses and seminars provide the Honors student with small classes and opportunities for interaction with the university's best and brightest faculty members, both within the student’s major field of study and in other courses used to satisfy curricular requirements.

Undergraduate Study

ADMISSION TO THE UNIVERSITY

Students must be admitted to the University of Oklahoma before being admitted to the College of Earth & Energy. Please refer to the “Admissions, Enrollment, and Student Financial Services” section of the catalog for detailed information on admission to the university. First-year students are admitted to the University College. Inquiries concerning admission to the university and University College should be addressed to the: Office of Admissions, University of Oklahoma, 1000 Asp Avenue, Room 127, Norman, OK 73019-4076 (http://www.ou.edu/admissions/home.html). Students should carefully assess their potential to meet the College’s requirements before committing to attend the University of Oklahoma with a proposed major in Geology, Geophysics or Petroleum Engineering.

ADMISSION TO THE COLLEGE

Students will be admitted to the College of Earth and Energy once they declare a major in Geology, Geophysics or Petroleum Engineering and complete the following requirements:

  • Applicants who are direct from high school must be admitted to OU and have earned 24 semester credit hours with a combined retention grade point average of 2.0 or higher.
• Students transferring to the University of Oklahoma College of Earth and Energy must have a retention GPA of a 2.5.
• University of Oklahoma readmits must have an OU retention and combined retention GPA of a 2.5 before being admitted into the College of Earth and Energy.

See the individual school sections for additional grade requirements.

STUDENT ADVISEMENT
Each student meets with a faculty adviser during enrollment periods and as necessary during the academic year. The College of Earth and Energy Student Services is staffed by an academic adviser who is available for student support. Students may visit with the academic counselor in the Mewbourne College of Earth and Energy Student Services Office in Sarkeys Energy Center, N118, during normal working hours, or they can call (405) 325-4005. Although the dean’s office and the school/department office check each student’s records, the responsibility for meeting graduation requirements lies with the student and not with the adviser, the school/department or the dean.

SCHOLASTIC REQUIREMENTS
A student must maintain at least a 2.00 average in order to be in good standing in the College. Any student whose combined, semester or OU retention grade average falls below 2.00 is on academic performance contract. Further, any student whose major or curriculum OU and/or combined retention grade point average falls below 2.00 is on academic performance contract. The Mewbourne School of Petroleum and Geological Engineering, and the ConocoPhillips School of Geology and Geophysics have additional grade requirements. For details, see the specific school chapter in this section of the catalog.

COLLEGE TEN-YEAR LIMITATION RULE
A student may elect to graduate under the requirements for an undergraduate degree set forth in the catalog in effect at the time of his or her first enrollment in the state system, provided that he or she completes the work for a degree within a maximum of six years. If the work for a degree covers a period longer than that specified by the College, the College will determine the degree plan in effect for that student’s graduation. Credit in a student’s major which is more than 10 years old may not be applied toward a bachelor’s degree unless it is validated by the major department.

TRANSFER STUDENTS
a. Students transferring to the University of Oklahoma Mewbourne College of Earth and Energy must have a retention GPA of a 2.5.
b. Students should check transfer equivalencies on the transfer equivalency tables on the OU home page at http://www.ou.edu/admrec/etables.htm.
c. Students should visit the Mewbourne College of Earth and Energy Student Services Office to determine exactly how their transfer credits apply to their degree program.
d. Pass/No Pass course enrollments may not be used to satisfy College of Earth and Energy course requirements.
e. Academic credit from any division of the University of Oklahoma — Norman campus, OU Health Sciences Center, OU-Tulsa, or Continuing Education — is considered resident credit at the University of Oklahoma. Grades and hours earned at any of these divisions are included in the OU retention and cumulative grade point averages for purposes of admission or readmission to the University, and to the individual colleges within the University. (See also Residence Requirements under Graduation Requirements.)

SCHOLARSHIPS AND FINANCIAL AID
Students entering the University of Oklahoma are eligible to apply for any of the general scholarships awarded by the University Scholarship Committee. General scholarships are awarded on the basis of academic achievement and financial need. These scholarships and other forms of financial aid may be applied for through the Office of Financial Aid Services, University of Oklahoma, 1000 Asp Avenue, Room 216, Norman, OK 73019-4078. In addition to general scholarships offered through the University of Oklahoma, the Mewbourne College of Earth and Energy offers several scholarships sponsored by alumni and industry. In addition, the ConocoPhillips School of Geology and Geophysics and the Mewbourne School of Petroleum and Geological Engineering offers many scholarships sponsored by alumni and industry. You may contact the schools directly for application information.

COLLEGE GRADUATION GPA REQUIREMENTS
To obtain credit toward any degree in the college of Earth and Energy, a student must have a 2.0 combined retention grade point average in all coursework attempted, a 2.00 grade point average in all coursework attempted in their major area, a 2.0 grade point average in their curriculum and a 2.0 OU retention grade point average. Any student whose combined retention semester and/or OU retention grade point average falls below 2.0 is placed on enrollment contract. The Schools of Petroleum and Geological Engineering and Geology and Geophysics have additional grade requirements. For details, see the specific school section in this chapter of the catalog.

Graduation Requirements

BASIC REQUIREMENTS
The Mewbourne College of Earth & Energy is organized into departments and schools. The degree of Bachelor of Science qualified by the name of the field pursued is conferred upon graduates of the College.

The student must satisfy the following requirements:
1. Curricular Courses: complete all prescribed curricular courses or equivalent courses as approved by the faculty.
2. Two-year College Transfer Credits: a minimum of 60 semester hours must be earned in a senior college for a baccalaureate degree.
3. Catalog Requirements: fulfill all requirements listed in the catalog. Although the dean’s office and school office check each student’s records, the responsibility for meeting graduation requirements lies with the student, and not with the adviser, the school or the dean.
4. Be in good academic standing with the College and the University.
5. Make application for the degree by March 1 for spring graduation, November 1 for fall graduation and June 1 for summer graduation.
6. To insure that the above conditions will be met, the student should request the Mewbourne College of Earth and Energy Student Services office to make a degree check by completing the Graduation Self Check form. This action should be taken no later than the semester before the student expects to graduate.
7. Residence Requirements: to be recommended for a degree, a candidate must have:
   a. spent two semesters or the equivalent in residence in the College of Earth and Energy;
   b. completed at OU 36 of the last 60 hours in residence. Twenty-four of these 36 hours must be in the major field;
   c. fulfilled the grade and grade point requirements of the College and School; **NOTE:** Academic credit from any division of the University of Oklahoma — Norman campus, OU Health Sciences Center, OU-Tulsa, or Continuing Education — is considered resident credit at the University of Oklahoma. Grades and hours earned at any of these divisions are included in the OU retention and cumulative grade point averages for purposes of determining completion of degree requirements.

Degrees are formally conferred at spring commencement and convocation exercises. However, degrees are also awarded in absentia at the end of each fall semester and summer session. All diplomas are mailed to students following the official graduation date. The degree and date of the diploma are entered on the student’s permanent academic record. The date of graduation is the last day of the semester or summer session in which all requirements for the degree are completed. When a student completes all requirements for a degree other than at the close of a semester or summer session, the Office of Academic Records, upon request, will issue a certified statement that the student is eligible for the degree as of the date when the requirements for the degree were completed.
DEAN’S HONOR ROLL

To be eligible for the Mewbourne College of Earth and Energy Dean’s Honor Roll, a full-time undergraduate student must earn at least 12 or more hours (hours of A, B, C, D, S) and attain a grade point average of 3.00 or higher during a regular fall or spring semester. Part-time students may qualify for the honor roll by earning at least six but less than 12 hours and attaining a grade point average of 3.00 or higher; provided they have no W’s for that semester. There is no college honor roll during the summer session or during intersession, and hours and grades earned during these sessions are not included in any way in determining eligibility for inclusion on regular semester honor rolls.

MINORS

The Mewbourne College of Earth and Energy offers the students the option of declaring a minor subject. A minor in the college is available in Geology and the specific minor requirements can be found in the Geology and Geophysics section of the catalog. Students may complete minors in other areas and these will be posted on the transcript after graduation. For a listing of the minors offered at the university, reference the OU catalog or Web site.

Second Bachelor’s Degrees

A student who has completed the requirements for the bachelor’s degree at OU may also receive a second bachelor’s degree at OU upon the completion of the curriculum prescribed for the second degree, provided that the work completed includes at least 30 additional hours of upper-division geology, geophysics or engineering (according to second undergraduate degree program), applied science and elective courses appropriate to the field of the second degree at OU. These courses must be over and above the credit hours required for the first degree.

General Information

Charles Gould founded the Department of Geology in 1900. During the early part of this century, Gould and other faculty members pioneered the application of geological and geophysical techniques in the search for petroleum, and as a result of their efforts the department gained early recognition in the field of petroleum geology. In the 1930’s the title of the department was changed to school in recognition of the national prominence of the program. Later, geophysics was added to the title and an undergraduate degree in geophysics was instituted. Today, we offer baccalaureate degrees in geology and geophysics (with specialization options in each discipline), and masters and doctoral degrees in geology and in geophysics as well. The School, which is housed in the Sarkeys Energy Center, presently consists of 20 full-time faculty members and approximately 90 undergraduate students and 80 graduate students. Our graduates are distinguished professionals working in industry, academia, and government organizations.

Geology is the study or science of the solid Earth and is one of several related subjects commonly grouped in the geosciences. Geologists are concerned primarily with rocks that make up the outer part of the Earth and the fluids and resources they contain, as well as various aspects of the Earth’s deeper interior. An understanding of the Earth involves principles of physics, chemistry, and biology (but with the time domain emphasized, as in stratigraphy and paleontology). The study and mapping of surface forms is shared with geography. Hydrogeology is the study of subsurface fluids and their role in geologic processes, such as contaminant transport. An understanding of fluids is crucial in understanding ore formation and petroleum migration. Paleontology, the study of records left by animals and plants that lived in past ages, is part of geology and involves fundamental aspects of biological science.

Geophysics is the scientific study of the Earth using the methods of physics. The aim of geophysics is to determine the composition and state of the Earth’s interior, and the manner in which internal processes produce the observed features of the Earth’s surface, primarily through methods of remote sensing. Our geophysics teaching and research concentrates on gravity studies, exploration and development seismology for hydrocarbons, near-surface hydrologic problems, and imaging of shallow structures; geomagnetics and paleomagnetics; geomechanics; and terrestrial heat flow studies.

The mission of the ConocoPhillips School of Geology and Geophysics is to be a premier program in the petroleum geosciences as studied through geological and geophysical methods. At its core, however, the School is dedicated to providing a spectrum of educational programs that give our graduates the breadth needed to in the multidisciplinary realm of this profession, and which afford opportunities for undergraduate or advanced study in most of the most exciting subdisciplines in the geosciences today. We maintain disciplinary strengths in five areas: Energy, Earth Chemistry, Geophysics, Lithosphere Dynamic, and Paleo-Climatic-Paleoenvironment–Ancient biosphere. Consequently, the school strives to provide the intellectual environment where students can develop into successful modern geoscientists able to understand, manage, predict, and in some cases control the dynamic processes of Planet Earth.

Programs for Academic Excellence

For the student, excellence can be achieved through immersion in the science itself.

- Students are encouraged to participate with their peers in professional societies through local chapters.
- Seminars and colloquia are regularly offered in the School featuring presentations of the latest advances in the geosciences by experts in the field.
- Students are actively encouraged to become involved in current faculty research projects, develop their own research projects, and present these results at regional and national meetings with school support.
- Opportunities for summer employment in professional and research settings are promoted.
- Strong connections are maintained with the Oklahoma Geological Survey, where many environmentally and economically important site-specific problems are being investigated.

ConocoPhillips School of Geology and Geophysics
Special Facilities and Programs

BASIN ANALYSIS LABORATORY

Petroleum system analysis requires the integration of geology, geophysics, petrology, geochemistry, and risk analysis. For basin modeling, this workstation and micro-computer laboratory complements the Seismic Stratigraphy MPI Laboratory by taking the output an additional step. For basin analyses, the lab incorporates ProComm’s Basin Modeling Toolbox, and Plate River’s BasinMod, BasinView, and BasinFlow software. Both 1D and 2D models for tectonic subsidence analyses and for geochronological modeling are performed from either importing seismic line data and/or from generating models from borehole data. Risk analyses are performed using our own fuzzy arithmetic and other dynamic algorithms as well as Palisade’s @Risk.

ELECTRON MICROPROBE LABORATORY

The electron microprobe laboratory is built around a fully automated Cameca SX50 microanalyzer that incorporates the latest innovations in hardware, software, and computing capabilities. The five wavelength-dispersive spectrometers and a new PGT energy-dispersive detector are integrated with all analytical and imaging functions (which include secondary electron, backscattered electron, x-ray, and cathodoluminescence). The system provides quantitative elemental microanalysis of boron to uranium; rapid qualitative analysis (B to U); digital acquisition of electron, x-ray intensity, and visible luminescence images; image analysis and other data processing routines. A full description of the laboratory and its functions is available at http://research.ou.edu/Microprobe/OUEMPLhome.asp. The S. M. Noble Electron Microscopy Laboratory, located in George Lynn Cross Hall, augments the electron microprobe facility with high-resolution SEM (JEOL 880) and TEM (JEOL 2000FX) electron microscopes.

EXPERIMENTAL PETROLOGY LABORATORY

The experimental petrology laboratory has facilities for mineral synthesis, studies of phase equilibria of heterogeneous reactions, exchange equilibria of homogeneous reactions, and annealing and reaction rates. In addition to sample preparation facilities, the experimental laboratory contains 18 externally heated reaction vessels for experimental operations to 900°C, 200 MPa.

FLUID INCLUSION MICRO-THERMOMETRY LABORATORY

This facility is used to assess the compositions and physical properties of fluid inclusions through microthermometric techniques. In addition to specialized sample preparation equipment, the laboratory includes a new Linkam TH600 programmable heating/freezing stage on a Zeiss Research Photomicroscope.

POROMECHANICS INSTITUTE

The school participates with the Mewbourne School of Petroleum and Geological Engineering and the Sarkeys Energy Center in maintaining laboratories dedicated to characterization of deformation and measurement of rock properties. Pressure vessels and load frames are available to study a variety of problems of interest to structural geology and reservoir characterization such as acoustic imaging of the fracturing process, fault sealing mechanisms, and borehole stability.

INSTITUTE OF RESERVOIR CHARACTERIZATION

Roger Slatt, Director of the Institute of Reservoir Characterization, brings expertise drawn from a 14 year career in the oil and gas industry with Cities Service Co. and ARCO/ARCO International, and focused on various aspects of reservoir characterization globally. Dr. Slatt is joined by Daniel O’Meara, serving as senior adviser and formerly a Shell and British Petroleum engineer, noted for his expertise in integrated petroleum engineering and geology, principally through software development such as Geo2Flow. Other individuals and affiliates include Shankar Mitra (structure and tectonics), Younane Abousleiman (geomechanics), and Paul Philip (petroleum geochemistry), all are internationally recognized for their interdisciplinary approach to the science and application of reservoir characterization.

Geophysicists, geologists, engineers, mathematicians and computer scientists collaborate with university personnel and facilities to develop and test reservoir characterization tools and methods. Interdisciplinary courses on applied reservoir characterization, as well as collaborative or consortium research programs, are available through the Institute to industry professionals globally.

INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS LABORATORY

The INAA laboratory contains gamma-ray spectrometers for the determination of rare-earth elements and other trace element abundances in neutron activated geological materials.

ORGANIC GEOCHEMISTRY/STABLE ISOTOPE LABORATORY

The organic geochemistry laboratory has state-of-the-art facilities and instrumentation for the isolation and analysis of organic compounds from geologic materials. The laboratory contains a Finnigan Triple Stage Quadrupole MS/MS system, an Ion Trap Detector, a combined gas chromatograph-isotope ratio mass spectrometer, a Delta E isotope ratio mass spectrometer, several Varian, HP and Carlo Erba gas chromatographs equipped with nitrogen and sulphur selective detectors, CDS pyrolysis units, HPLC equipment and a PYRAN pyrolysis system equipped with an INCOG 50 mass spectrometer.

PALEOMAGNETICS LABORATORY

The paleomagnetic laboratory is located in a magnetically shielded room and contains a 2G cryogenic magnetometer with DC squids, an automated sample handler and alternating field demagnetizer, a thermal demagnetizer, two magnetic susceptibility systems, and an impulse magnetizer. Most of the studies performed in the lab focus on understanding remagnetization mechanisms, paleomagnetic dating of diagenetic events, and paleoclimate studies.

PALEONTOLOGY LABORATORIES

The primary research facilities in invertebrate paleontology, vertebrate paleontology, and micropaleontology are housed at the Sam Noble Oklahoma Museum of Natural History. The laboratories contain a variety of equipment for the mechanical preparation of vertebrate and invertebrate fossils, and for macrophotography. The museum is also the repository for extensive paleontological collections which include more than 250,000 fossil specimens.

SEDIMENTOLOGY/STRATIGRAPHY LABORATORY

The Sedimentology/Stratigraphy Laboratory at OU contains all the necessary equipment and facilities to conduct basic and advanced
sedimentological and sedimentary geochemical studies. This equipment includes acid-resistant fume hoods, centrifuge, freeze dryer, furnace, vacuum filtration system, rock crusher and equipment for slabling rocks or making thin sections. More specialized equipment includes a Beckman-Coulter laser particle-size analyzer equipped with a Micro-Volume module (for small sample sizes), a Bartington portable magnetic susceptibility meter, and several research grade petrographic and stereo microscopes, one of which is equipped with an automated point-count system and with digital image acquisition and analysis systems. The Lab also houses a cathodoluminescope as well as a teaching flume.

ENVIRONMENTAL BIOGEOCHEMISTRY LABORATORY

The Environmental Biogeochemistry Laboratory is dedicated to the study of geochemical and microbiological systems relevant to the near-surface environment. Equipment includes two anaerobic chambers (Coy and Plas-Labs), a Pacific Nanotechnology Nano-Rp Atomic Force Microscope (AFM) system with environmental cell, electrodes and meters for laboratory and field analysis, and a variety of apparatus for anaerobic microbiology. It is located adjacent to shared facilities with the Physical Geochemistry Laboratory.

GAS HYDRATES LABORATORY

The Gas Hydrates Laboratory houses high pressure equipment necessary for forming CO2 and CH4 gas hydrates in situ, including two Parr reactors. Analytical equipment includes pressure transducers and thermocouples for measuring the thermodynamics and kinetics of hydrate formation and dissociation, as well as polarized light microscopy for analyzing gas hydrate phases in fluid inclusion samples.

PHYSICAL GEOCHEMISTRY LABORATORY

The Physical Geochemistry Laboratory is dedicated to the study of the thermodynamics and kinetics of natural materials relevant to sediments, soils, and solutions on Earth and planetary bodies. Equipment includes Atomic Absorption Spectrometer (Perkin-Elmer 2380), analytical balances, furnaces, gas adsorption analysis for surface area and pore size distribution (Beckman Coulter SA 3100), geochemical thermodynamic and reaction path modeling software (Geochemist’s Workbench), geochemical reactors of various types, ultracentrifugation, ultrapure water system (Barnstead Nanopure Diamond), UV-visible scanning absorption spectroscopy (Thermo Scientific Genesys 6).

STRUCTURAL GEOLOGY LABS

The digital workroom includes two dual monitor Dell PC workstations, a Sun Blade workstation, and a SGI Octane workstation. The PCs are primarily used for GIS applications, Cross section construction and 3-D modeling. The Sun Blade and SGI workstations are primarily used for seismic interpretation (Landmark and Geoquest) and 3-D visualization.

The physical modeling lab is equipped with a few sand box loading frames and a clay modeling apparatus. The rock mechanics lab includes two triaxial frames with bending capabilities. Under current construction is a rotary loading frame for testing fault gauge under earthquake slip conditions. The structural geology teaching lab was funded recently by the Richardson Endowment Funds. It will include Projection Interactive whiteboards, software and hardware for structural interpretation and mechanical modeling, physical modeling apparatus and materials and classroom rock-mechanics apparatus for undergraduate teaching.

SEISMIC STRATIGRAPHY-MPI LABORATORY

This facility is a premier geophysical exploration and development research laboratory focused upon integrated seismic modeling, processing, and interpretation (MPI) of seismic data worldwide. Such integration forms a prerequisite foundation for accurate seismic stratigraphic interpretation and of eventual petroleum system analysis in the Basin Analysis Laboratory. Continually upgraded computer facilities include a fire-walled 100 MIPS + Ethernet assembly of five Sun workstations (dual processor Ultra 80 and Ultra 2’s) with terabytes of memory, disk, and tape storage capabilities including standard open reel, exabyte, and the industry standard 10 cartridge IBM 3590 robotic. Numerous color image plotting peripherals exist in addition to the industry standard Versatec 8900 36 inch. 2D seismic data include more than 100 km of industry-acquired multifold marine and land seismic field and stacked records from North America, South America, the Middle East, and Southeast Asia. 3D seismic data sets represent contemporary land and marine acquisition from both the United States and South America.

Modeling is conducted using both GXTechnology and GeoQuest software with a variety of digital inputs in addition to a 1.5m x 2m Summagraphics digitizer. Two- and three-dimensional AVO modeling and inversion is conducted using our own algorithms as well as Hampson-Russell software. Seismic processing is conducted using a four license installation of Western Omega, the preeminent industry standard for commercial processing of 2D and 3D reflection seismic data. Seismic stratigraphic interpretation uses the complete GeoQuest GeoFrame group of geological, geophysical, and petrophysical software.

SHELL CRUSTAL IMAGING FACILITY

This facility provides a state-of-the-art geophysical computer environment for the integration of 2D and 3D modeling, data processing, interpretation, mapping and visualization of seismic reflection and georadar data, as well as petrophysical analysis and reservoir modeling as related to the data interpretation.

The local fast ethernet network supports a SUN HPC 450 Enterprise server. Software includes GXTechnology’s GXII software, a complete set of geophysical analysis software, Hampson-Russell Software Services Ltd.’s GeoQuest/Schlumberger’s complete GeoFrame line of geological, geophysical, petrophysical and reservoir applications, and Landmark Graphic Corporation’s ProMAX processing software.

Additionally, the 2D/3D Interpretation Teaching Lab provides 8 dual-headed PC Pentium Pros with an NT server for teaching and research with Seismic Micro-Technology, Inc.’s Kingdom Suite software for seismic interpretation and Interplex Ltd.’s Seistrix software for data processing. The SCIF is maintained by a full-time systems administrator.

TEXACO X-RAY LABORATORY

The Texaco X-Ray Laboratory contains an automated x-ray diffractometer for the determination of phase compositions and crystallite orientations in geological samples, and an automated x-ray diffractometer for the quantitative determination of major and trace elemental abundances in geological samples.

THIN SECTION/ROCK PREPARATION LABORATORY

This is a fully-equipped laboratory for the preparation of rock thin sections for petrographic and paleontologic analysis and for sample preparation for the X-Ray Laboratory.

THE YOUNGBLOOD ENERGY LIBRARY

A gift to the University of Oklahoma in memory of a leading Oklahoma City oilman has created a spacious geology library ranging a two-story atrium in the heart of the Sarkeys Energy Center. This attractive new library space is named in honor of Laurence S. Youngblood.

The library collection began in the late 1800's with the personal library of Charles N. Gould (one of the earliest university faculty members, the first geologist on the OU faculty, and the first director of the Oklahoma Geological Survey). Its growth was accelerated with the depositor status Gould established with the U.S. Geological Survey that continues today. During the 1950s and 1960s, numerous complete retrospective runs of foreign serials were acquired through the Farmington Plan (a federal program to acquire literature in specific fields for libraries of identified excellence). Via the Oklahoma Geological Survey’s domestic and international exchanges, publications are acquired in several languages from nations around the world.

The current collection contains over 170,000 map sheets and approximately 99,000 catalogued volumes on the subjects of geochemistry, geology,
undergraduate study

scholastic requirements

to be eligible for admission into geology and geophysics, applicants who are direct from high school must be admitted to OU and have earned 24 semester credit hours with a combined retention grade point average of 2.0 or higher. students transferring to the University of Oklahoma College of Earth and Energy must have a retention GPA of 2.5.

undergraduate study

field courses

to geologists and geophysicists, planet Earth is a natural laboratory. thus, it is important that students devote a portion of their academic careers to exploring and studying aspects of the earth away from the OU campus. field trips in geology are offered in the central and western U.S. as well as a senior-level geology field camp in Colorado, and faculty members involve students in their active field research programs around the world.

research opportunities

Faculty-supervised research is an important component of the School of Geology and Geophysics graduate program. Most graduate students are supported financially through research assistantships funded by federal and private industry grants and contracts. Other graduate students are financially supported through teaching assistantships awarded by their academic unit. In either case, faculty-supervised student research leads to master’s theses and doctoral dissertations as part of the overall graduate degree requirements. This research is often published in scientific journals which may be useful in assisting graduates to obtain employment. Talented undergraduate students are encouraged to work with faculty on research projects. These student research projects can be an important component of the Honors Program and/or a source of part-time income and scholarship support. Such research participation provides the student with important experience in his or her discipline in addition to meeting normal academic requirements.

career opportunities

There are approximately 75,000 geologists and geophysicists at work in the United States today. Most are employed by private industry as petroleum geologists and geophysicists whose work is vital to oil and gas companies. Other geologists and geophysicists work for mining companies to locate ore deposits and estimate reserves. Geologists are also employed in other commercial fields such as cement and ceramic industries; sand and gravel firms; railroads; engineering companies; environmental agencies and in the banking industry. The largest single employer of geoscientists in the U.S. is the federal government. Most work for the United States Geological Survey, but others work for the U.S. Department of Energy national laboratories, Soil Conservation Service, Bureau of Land Management, Environmental Protection Agency, National Aeronautics and Space Administration, National Park Service, Bureau of Mines, Forest Service, or the U.S. Army Corps of Engineers. Many geoscientists work for the 50 state geological surveys. Colleges and universities employ about 8,000 geoscientists in teaching and research positions. Many geoscientists are self-employed. Some are independent oil operators; others work as consultants. Most consultants have acquired prior experience in industry, teaching or research. Opportunities also now exist in public school teaching. The curricula for the Bachelor of Science in Geology and the Bachelor of Science in Geophysics are designed to provide the necessary preparation for professional work or graduate study. Options are available in petroleum geology, environmental geology, paleontology, and in exploration geophysics. The Master’s Degree in Geology or Geophysics is designed to provide a professional level degree for industry employment. Traditionally, this degree level has been favored by major petroleum companies. The Ph.D. in Geology is a research-oriented degree which provides students the opportunity to seek employment in a variety of areas including academia, industry and government.

undergraduate employment opportunities

Geology and geophysics students are eligible to participate in research projects and part-time employment opportunities with faculty members. Other opportunities for research and employment exist at the Oklahoma Geological Survey and the Youngblood Energy Library.

financial support — graduate studies

Several types of financial aid are available to students on a competitive basis. Prospective graduate students are considered automatically for financial aid at the time of application. The school offers annually approximately 14 teaching assistantships with stipends which include a partial waiver of tuition. International students are required to pass an English language proficiency exam (administered by the English Assessment Program) before they can hold a teaching assistantship. Additionally, the school awards several research assistantships and fellowships using funds from industrial and other private sources. Funds for graduate support are also available from the Oklahoma Geological Survey, and the institutes of the Sarkeys Energy Center. Grant-supported research assistantships are available through faculty conducted federal-, foundation- or industry-sponsored research. These assistantships carry a stipend comparable to teaching assistantships. Ph.D. students are encouraged to write research proposals with their graduate advisers for financial support and to apply for National Science Foundation Graduate Fellowships.

Bachelor of Science in Geology

This curriculum is designed to provide the necessary background for professional work or graduate studies in geology and allied sciences. Students with an inadequate high school or two-year college background in mathematics, chemistry or physics may require more than four academic years to complete this program. For detailed semester by semester curriculum requirements, please consult: http://checksheets.ou.edu/earthindx.htm.

1. General Education Requirements: 40 semester hours distributed in accordance with University requirements.

2. School of Geology and Geophysics Requirements: English 1113, English 1213 or Expository Writing 1213, and ENGL 3153, History 1483 or 1493, Political Science 1113, Math 1823, 2423, 2433 and 2443, Computer Science 1313, Chemistry 1315 and 1415, Physics 2514 and 2524, nine hours of science electives in geophysics, geography, meteorology, biological sciences, chemistry, computer science, mathematics, physics and/or engineering (six hours must be upper-division and three hours must be outside the college); and 12 hours of humanities and social sciences (three hours must be upper-division outside the major). Credit for some of these courses may be used to satisfy General Education requirements.

3. Geology Core Requirements: Geology 1114, 1124, 2224, 3114, 3223, 3233, 3513, 4113, 3123, 4136, three hours of geology/geophysics elective, and Geophysics 3413.

4. Other Requirements: 13 hours of free electives (five of these hours must be upper-division).
ENVIRONMENTAL GEOLOGY OPTION

To obtain a B.S. in Geology with an Environmental Geology option, a student must take the same coursework required for a B.S. in Geology, except the 12 hours of geology/geophysics and science electives are more narrowly specified. The student must satisfy six hours of geology/geophysics elective requirements by taking GEOL 3154 and GEOL 4633, and the additional six hours of science electives must be chosen from a faculty-adviser approved course list.

PETROLEUM GEOLOGY OPTION

To obtain a B.S. in Geology with a Petroleum Geology option, a student must take the same coursework required for the B.S. in Geology, except the free elective and science requirements are more structured, and one additional hour is required. The following courses are specific to this option: GEOL 4133, GEOL 4233, PE 3213, PE 3221, PE 3813, GPHY 3413 and GPHY 4874.

PALEONTOLOGY OPTION

To obtain a B.S. in Geology with a Paleontology option, a student must take the same coursework required for a B.S. in Geology, except the geology/geophysics and science electives are more narrowly specified, and two additional hours are required. The following courses are specific to this option: GEOL 4413, 4513, and ZOO 1114, 1121, 3013, 3403 and 5204.

Bachelor of Science in Geophysics

This curriculum constitutes a preparation for professional work and also provides the necessary background for graduate work in geophysics and geology. The curriculum has two options: exploration geophysics and general geophysics, which differ only in the required geophysics courses. For detailed semester by semester curriculum requirements, please consult: http://checksheets.ou.edu/earthindx.htm.

GENERAL OPTION

1. General Education Requirements: 40 semester hours distributed in accordance with University requirements.

2. Degree Requirements: English 1113, English 1213 or Expository Writing 1213, English 3153; History 1483 or 1493; Political Science 1113; Math 1823, 2423, 2433, 2443, 3113, three hours of upper-division math elective; Computer Science 1313; Chemistry 1315 1415; Physics 2514, 2524, 3043 seven hours of upper-division physics electives; and 12 hours in social sciences and humanities (three hours must be upper-division). Credit for some of these courses may be used to satisfy General Education requirements.

3. Geophysics Core Requirements: Geology 1114, 1124, 2224, 3233, 3114, 3123, six hours of upper-division geology electives; Geophysics 3413, 5713, 4953, 12 hours of upper-division geophysics electives. Credit for some of these courses may be used to satisfy General Education requirements.

4. Other Requirements: three hours of free elective.

EXPLORATION GEOPHYSICS OPTION

1. General Education Requirements: 40 semester hours distributed in accordance with University requirements.

2. Degree Requirements: English 1113, English 1213 or Expository Writing 1213, English 3153; History 1483 or 1493; Political Science 1113; Math 1823, 2423, 2433, 2443, 3113, three hours of upper-division math elective; Computer Science 1313; Chemistry 1315 1415; Physics 2514, 2524, 3043 seven hours of upper-division physics electives; and 12 hours in social sciences and humanities (three hours must be upper-division). Credit for some of these courses may be used to satisfy General Education requirements.

3. Geophysics Core Requirements: Geology 1114, 1124, 2224, 3233, 3114, 3123, six hours of upper-division geology electives; Geophysics 3413, 4874, 5864, 4953, and nine hours of geophysics electives. Credit for some of these courses may be used to satisfy General Education requirements.

4. Other Requirements: three hours of free elective.

MINOR IN GEOLOGY

For completion of a minor in Geology, students are required to complete one of the following:

1. GEOL 1114, 1124, and 2224, plus a minimum of six hours of upper-division coursework; or,

2. GEOL 1114, 1124, plus a minimum of nine hours of upper-division coursework; or,

3. GEOL 1114 or 1124, or 2224, plus a minimum of nine hours of upper-division coursework; or,

4. GEOL 1114 or 1124, plus a minimum of 12 hours of upper-division coursework.

GEOLGY AND GEOPHYSICS GRADUATION WITH DISTINCTION

The faculty may recommend that the degree “With Distinction” be conferred on graduates who have a grade point average at OU of 3.50 or higher and “With Special Distinction” on students who have an OU grade point average of 3.75 or higher.

Graduate Study

Admission

The School of Geology and Geophysics seeks to bring together students from diverse cultural and academic backgrounds. Hence, we encourage applications from qualified international students as well as Americans. Decisions on admission to the graduate program are based on several criteria, including course grades; results on the verbal and quantitative sections of the Graduate Record Examination (Note: the advanced examination in geology or geophysics is not required for admission); letters of recommendation evaluating academic performance and potential; a statement of purpose composed by the student; and an undergraduate degree (or the equivalent) with a minimum 3.00 grade point average (4.00 scale). International students whose native language is not English must have a TOEFL score of at least 213.

The minimum requirements for full admission standing to the Master of Science program is evidence of the completion of a B.A./B.S. degree from an accredited college/university, and for the Doctor of Philosophy program in geology is evidence of a M.S. degree (with thesis) from an accredited college/university. For the Doctor of Philosophy Program in Geophysics, a student must have a Master of Science (M.S.) Degree in science, mathematics, or engineering (with thesis). There are no formal course requirements for admission to the Ph.D. program in Geology, however minimum course work requirements for admission to the Ph.D. program in Geophysics are: Calculus I, II, III, and IV (or equivalent) plus one upper-division math course, two semesters of calculus-based physics; and other deficiencies, such as geology, geophysics and computer programming, that may be assessed by the Adviser and/or Dissertation Committee. Students must remove these deficiencies at the earliest offering of these courses. However, additional undergraduate coursework in specific areas may be required by the student’s committee if it is essential for the completion of their degree in their chosen area of study.

Normally, students are admitted to the graduate program in the fall semester. Applications for fall admission are reviewed in February, and offers of admission and financial aid are extended in March. In order to be considered for admission with financial aid, application materials should be...
received by February 1. Application materials are available from the school at the address below, or forms may be downloaded from the Web at http://geology.ou.edu/library/application.pdf and http://geology.ou.edu/library/RECO.pdf:

Graduate Admissions Committee
School of Geology and Geophysics
The University of Oklahoma
Sarkeys Energy Center
100 E. Boyd Street, Suite 810
Norman, OK 73019-1009

Degree Requirements

The School of Geology and Geophysics offers programs leading to the M.S. degree in geology, M.S. degree in geophysics, and the Ph.D. degree in geology. Some important aspects of these degree programs are described below.

Master of Science

The master’s degree programs in geology and geophysics are intended primarily for those students who plan careers in the petroleum or minerals industries or with state and federal government agencies. The goal of the M.S. degree program is to prepare students by providing a broad background in the Earth sciences and related science and engineering fields through coursework; and encouraging critical thinking and analysis in the solution of geological and geophysical problems through independent thesis research.

The Master of Science degrees in geology and geophysics normally require four semesters and one summer of full-time study and research. Generally, three of the four semesters of residence are devoted primarily to coursework; the summer and fourth semester are devoted primarily to the completion of research for the M.S. thesis. Twenty-six semester hours of coursework carrying graduate credit and four hours of thesis are required for completion of the M.S. degree. Each candidate for the M.S. in geology is required to complete at least one approved course in three of six core areas in the Earth sciences: geochemistry, geophysics, igneous/metamorphic petrology, stratigraphy-paleontology, sedimentary petrology/sedimentology, and structural geology. In addition, the student is required to complete at least two approved courses (carrying graduate credit) of science, mathematics or engineering outside geology and geophysics with the final approval given by the student’s major professor.

The M.S. degree in geophysics also requires completion of 26 semester hours of coursework and four hours of thesis. Coursework includes at least three courses in physics or related engineering beyond general physics; at least three courses in mathematics beyond the general calculus sequence; at least one graduate course in geology, and three courses in geophysics.

An original, independently executed research project reported in a thesis is required to successfully complete M.S. degrees in both geology and geophysics. Normally, a research topic is selected by the student in consultation with a faculty adviser during the second semester of residence. Although the research topic can include any field of geology or geophysics, most students elect to work closely with a faculty adviser on a problem in the adviser’s research specialty. The research projects selected by M.S. students are expected to lead to presentations at regional and national meetings and papers in national and international journals.

A graduate degree candidate in geology and geophysics must present the results of his/her thesis research at a Graduate Colloquium of the School of Geology and Geophysics before he/she may schedule the final oral examination.

Doctor of Philosophy

The Ph.D. degree programs in geology and geophysics are intended primarily for those students who plan research careers in the Earth sciences in universities, industry or government agencies. The goals of the Ph.D. degree program are to prepare the student for a career in research by providing coursework in an area of specialization in geology or geophysics, provide a strong background in allied fields such as mathematics, physical science, biological science, and engineering to give the student the necessary tools to conduct original and significant geological research, and encourage critical thinking and analysis of geological problems through the design of original research projects.

The Ph.D. degree in geology normally requires a minimum of three years beyond the M.S. degree. The Graduate College at the University of Oklahoma requires 90 post-baccalaureate semester hours of coursework. Generally, the first year of residence is devoted primarily to coursework in preparation for the general examination; the remaining two years are devoted to both coursework and research. There are no specified course requirements for the Ph.D. degree in Geology. Rather, a coursework program is designed for each student in consultation with a doctoral committee composed of at least five graduate faculty members, including at least one from outside the major department within the University and one member outside the University. The Ph.D. in Geophysics has specific core requirements which will be determined by the faculty adviser. The purpose of the coursework is to prepare the student for the general examination, which tests the mastery of the field of specialization and related fields as well as the capacity for synthesis, sound generalization, and critical thinking. The examination consists of a written section in the major field of study, written sections in related fields, and oral defense of an original research proposal. Frequently, the original research proposal is the student’s dissertation topic.

The dissertation is the culmination of an original research project in the student’s field of specialization and should make a significant contribution to scientific understanding in the field. Normally, the student works closely with the faculty adviser in the design and execution of the research project. The student and the adviser may submit proposals to foundations or industry for financial support to carry out the research, and they report the results of the research at regional, national and international meetings and in papers published by national and international journals.

A graduate degree candidate in geology and geophysics must present the results of his/her dissertation research at a Graduate Colloquium of the School of Geology and Geophysics before he/she may schedule the final oral examination.
Geological Engineering is prepared to produce such engineers. The Mewbourne School of Petroleum and Geological Engineering must be well prepared. The Mewbourne School of Petroleum and Geological Engineering analyze and design systems and facilities for current producing systems to make them succeed. Engineers who work on producing researching systems must be integrated into the engineering design of specific processes. Rather, projects are complex and the extreme financial and social risks must be managed carefully. Large-scale equipment includes a system for studying crude oil displacement by steam, bottom hole pressure and temperature instruments, drilling and cementing tools, cement consistometer, subsurface pumps, artificial lift equipment, scanning electron microscope, acoustic microscope, Fourier transform infrared spectrometer, load frame and models to illustrate various principles of drilling and production. The University has access to several thousands of electrical logs and cores from oil and gas wells drilled in Oklahoma.

### Faculty Roster

Professors Abousleiman, Civan, Oliver, Rai, Roejers, Shah, Sondergeld, Tiab; Associate Professors Osisanya; Assistant Professors Ahmed, Akkutlu, Callard, Devegowda, Shiau; Research Professors Sigal, Hubbard.

### Degrees Offered

- Bachelor of Science in Petroleum Engineering
- Master of Science (Geological Engineering, Natural Gas Engineering and Management, and Petroleum Engineering)
- Doctor of Philosophy (Geological Engineering and Petroleum Engineering)

### General Information

The Mewbourne School of Petroleum and Geological Engineering is nationally ranked as one of the best. Petroleum is synonymous with energy. A large fraction of the energy used in this country originates from oil or natural gas. Although the overall percentage provided by petroleum is expected to drop, the total amount provided by petroleum sources will increase. The next “energy crisis” may soon occur, and the petroleum industry will be required to meet the international demands for economical sources of fossil mineral fuels. Because of enhanced oil recovery, unconventional natural gas and frontier producing areas will provide a greater fraction of this production, the need for complex technology required to produce such difficult resources will produce a continued demand for qualified petroleum and geological engineers.

Petroleum and geological engineering are many-faceted disciplines that are directed toward exploiting natural resources contained in a geological habitat. Graduates from our programs can work in several different areas and at different levels of technical involvement. They may work on specific production-related problems in a technical area or they may work as broad technical problem solvers within their organizations. Between these extremes is the complete spectrum of job possibilities. Petroleum and geological engineers are required to utilize complex technologies. Exploration and production are not simple, independent processes. Rather, projects are complex and the extreme financial and physical risks must be managed carefully. Engineers who analyze and design systems and facilities for current producing systems must be well prepared. The Mewbourne School of Petroleum and Geological Engineering is prepared to produce such engineers.

### Special Facilities and Programs

#### LABORATORY FACILITIES

Laboratories, located in the Sarkeys Energy Center and the north campus, are well-equipped to give undergraduate and graduate instruction in all phases of petroleum engineering. Specific laboratory items include equipment for the following: core analysis, capillary pressure and relative permeability measurements; ultrasonic velocity; nuclear magnetic resonance spectra; fines migration and formation damage control; the testing and treatment of drilling muds, emulsions, and oil field brines; pressure-volume-temperature measurements of gas and oil mixtures under reservoir conditions; units for studying the flow of oil, gas, and water through porous media; electrolytic models; gas analysis, regulation, and metering; electrical properties of cores; high pressure PVT equipment; corrosion rate measurement and enhanced oil recovery techniques such as surfactant flooding, polymer flooding, in-situ combustion and microbial processes. Large-scale equipment includes a system for studying crude oil displacement by steam, bottom hole pressure and temperature instruments, drilling and cementing tools, cement consistometer, subsurface pumps, artificial lift equipment, scanning electron microscope, acoustic microscope, Fourier transform infrared spectrometer, load frame and models to illustrate various principles of drilling and production.

The University has access to several thousands of electrical logs and cores from oil and gas wells drilled in Oklahoma.

### Undergraduate Study

#### SCHOLASTIC REQUIREMENTS:

To be eligible for admission into Petroleum Engineering, applicants who are direct from high school must be admitted to OU and have earned 24 semester credit hours with a combined retention grade point average of 2.0 or higher. Students transferring to the University of Oklahoma College of Earth and Energy must have a retention GPA of a 2.5.

University of Oklahoma readmits must have an OU retention and combined retention GPA of a 2.5 before being admitted into the College of Earth and Energy.

A student must have been in good standing in the College of Earth and Energy. All undergraduate petroleum engineering students are required to make a minimum grade of C in each course presented for the degree. Also, students must make a C in each prerequisite course before progressing to the next course(s).

#### LAPTOP REQUIREMENT

Students with a major in Petroleum Engineering are required to have a laptop computer. The laptop technologies are used to enhance the learning experience. Students should consult with faculty advisers and the CEE Dean’s office for additional information.

### Bachelor of Science in Petroleum Engineering

The objectives of the B.S. in Petroleum Engineering are:

1. Our graduates will be able to apply basic math, science, and engineering knowledge to identify, formulate, and solve engineering problems, design and conduct experiments, analyze and interpret data, and design systems, components or processes using modern techniques, skills, and engineering tools suitable for engineering practice.

2. Our graduates will experience a broad-based education in an environment that fosters an understanding of contemporary issues, the global and social impact of engineering solutions, their ethical and professional responsibility, and the need for effective communication and continuous learning for successful careers.

3. Our graduates will be able to characterize and evaluate subsurface geological formations using geological and engineering methods.
4. Our graduates will be able to design and analyze systems for drilling, completing and producing wells and apply reservoir engineering principles for optimizing resource development.

5. Our graduates will be able to incorporate engineering economics and resource evaluation methods with the concepts of uncertainty and risk management in the design and selection of equipment and procedures and development of systems or processes for production and recovery of resources.

Graduates receiving the degree of Bachelor of Science in Petroleum Engineering are professionally prepared for positions in the fields of drilling, production, well completion, reservoir management and evaluation. They may work in industry or government. They are well prepared to continue their education in professional or graduate studies. Students who choose to specialize in advanced developments or research may pursue graduate studies leading to the master’s or doctor’s degree.

CURRICULUM IN PETROLEUM ENGINEERING

(Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.)

This program requires a minimum of 127 credit hours with a minimum grade point average of 2.0 (combined and at OU, in the major, curriculum and overall). Students take the “Fundamentals of Engineering Exam” given by the Oklahoma State Board of Registration for Professional Engineers and Land Surveyors as part of senior-level course requirement and the University-wide assessment program. For detailed semester by semester curriculum requirements, please consult http://checksheets.ou.edu/earthindx.htm.

LOWER DIVISION REQUIREMENTS

The lower-division (1000- and 2000-level courses) requirements of 72 hours are to be met as follows:

1. Communication: 6 hours. English 1113 and English 1213 or Expository Writing 1213.
2. Foreign Language: 0-10 hours. Two years in high school or two consecutive semesters (6-10 hours) of foreign language. (College-level foreign language does not count toward the curricular hours required for the engineering degree.)
4. Humanities: 12 hours. History 1483 or 1493; one course each of the following General Education fields: Understanding Artistic Forms, Western Civilization and Culture; and Non-Western Culture. (Three hours of these nine must be upper-division.)
5. Science and Math: 34 hours. Chemistry 1315, 1415; MATH 1823, 2423, 2433, 2443; PHYS 2514, 2524; GEOL 1114.
6. Core Engineering: 12 hours. ENGR 1410, 1420, 2003; PE 2113, PE 2153, PE 2213.

UPPER-DIVISION REQUIREMENTS

The upper division (3000- and 4000-level courses) requirements of 55 hours are to be met as follows:

1. Math and Science: 9 hours. MATH 3113, Geology 3003, Geophysics 3423.
2. Petroleum Engineering: 40 hours. PE 3213, 3221, 3222, 3022, 3123, 3223, 3313, 3413, 3513, 3723, 3813, 4521, 4713, 4331, 4423, 4533.
4. Internship: 2 hours. PE 3222, Petroleum Engineering Practice II is required in the summer of either the sophomore or junior year.

COLLEGE GRADUATION WITH DISTINCTION

The faculty may recommend that the degree With Distinction be conferred on students who have a combined cumulative grade point average of 3.40 and With Special Distinction on students who have a combined cumulative grade point average of 3.70.

RETENTION

Enrollment Stops and Readmission: Petroleum Engineering Students on academic performance contract who fail to bring their OU, combined and/or semester GPA to a 2.0 after one semester will have an enrollment stop placed by the Mewbourne College of Earth and Energy. A student who has taken a curricular course twice and not completed it for curricular credit (for instance, has made a D, F, I, U, AW, W, or AU) is on contract. If the student does not successfully (grade of C or better) complete the course the third time it is taken, the student is stopped from the college. A student with a stop from the Mewbourne College of Earth and Energy may be eligible for enrollment in another college under the University retention policy. To continue at the University of Oklahoma, the student will need to make an appointment with the Center for Student Advancement, 311 Old Science Hall, or call 325-2574.

A student with an academic stop from the Mewbourne College of Earth and Energy is unlikely to be readmitted to the College.

Graduate Study

Areas of Specialization

The graduate program offers specialized training in drilling, well completion and stimulation, rock mechanics, production engineering, petrophysics, formation damage and control, miscible, immiscible and microbial enhanced oil recovery, reservoir engineering, natural gas engineering, coal bed methane, geological engineering, oil field management and several other allied areas.

Master of Science Degree

PETROLEUM ENGINEERING

Students may pursue a thesis or nonthesis option for the Master of Science degree in petroleum engineering.

The thesis program requires at least 30 credit hours, including six credit hours for the thesis. For the remaining 24 hours, a student must take nine credit hours of core petroleum engineering courses (PE 5353, 5990 and 6573); three credit hours of approved applied mathematics courses; and 12 credit hours of approved electives. The thesis is to be defended in a final oral examination.

The nonthesis program requires at least 36 credit hours. A student must take nine credit hours of core petroleum engineering courses (PE 5353, 5990 and 6573); three credit hours of approved applied mathematics courses; and 24 credit hours of approved electives. A final comprehensive examination must be passed for graduation in the nonthesis program. The examination may be either oral, written or both. The maximum number of attempts to pass the comprehensive examination is limited to two.
GEODETICAL ENGINEERING

Students may pursue a thesis or non-thesis option for the Master of Science degree in geological engineering.

The thesis program requires at least 30 credit hours, including four credit hours for the thesis. For the remaining 26 credit hours, a student must take at least nine hours of petroleum/geological engineering courses from PE 4803, GE 5143, 5243 and 6263; three credit hours of approved applied mathematics courses; two credit hours of either GE 5971 or 5990; and 12 credit hours of approved electives with at least nine credit hours in PGE. The thesis is to be defended in a final oral examination.

The nonthesis program requires at least 36 credit hours. A student must take at least nine credit hours of petroleum/geological engineering courses from PE 4803, GE 5143, 5243 and 6263; three credit hours of approved applied mathematics courses; two credit hours of either GE 5971 or 5990; and 22 credit hours of approved electives with at least 15 credit hours in PGE. A final comprehensive examination must be passed for graduation in the nonthesis program. The examination may be either oral, written or both. The maximum number of attempts to pass the comprehensive examination is limited to two.

Master of Science in Natural Gas Engineering and Management Degree

Students may pursue a thesis or non-thesis option for the Master of Science in Natural Gas Engineering and Management degree.

The thesis program requires at least 30 hours, including six credit hours of thesis, plus one credit hour PE 5971 graduate seminar. For the remaining 24 hours, a student must take 18 credit hours of the required courses PE 5603, 5613, 5623, ChE 5643, FIN 5322, 5332 and two additional hours of an approved course with financial emphasis; plus eight credit hours of approved electives. The thesis is to be defended in a final oral examination.

The non-thesis program requires at least 36 hours courses plus one credit hour PE 5971 graduate seminar. A student must take 18 credit hours of the required courses PE 5603, 5613, 5623, ChE 5643, FIN 5322, 5332 and two additional hours of an approved course with financial emphasis; plus eight credit hours of approved electives. In addition, a comprehensive project, presentation, and exam during the final semester must be passed for graduation. The maximum number of attempts to pass the comprehensive examination is limited to two.

Doctor of Philosophy

Candidates for the Doctor of Philosophy shall satisfy all requirements for the Ph.D. degree in engineering. The degree requires 90 post-baccalaureate credit hours of coursework including the dissertation. Each candidate must meet the general requirements as specified in the bulletin of the Graduate College, as well as all requirements as specified in the general requirements for the master’s degree in Petroleum and Geological Engineering, including the satisfactory passage of the Qualifying and General Examinations.

A student should normally expect to spend the equivalent of three full academic years beyond the master’s degree in study for the doctorate. As a general rule, either his/her bachelor’s degree or master’s degree (or both) will be in PE or GE. All students may, on recommendation of the student’s Advisory Conference, be applied to his/her doctoral program. Exceptional applicants who have bachelor and master degrees in other engineering and science fields may be admitted to the MPGE Ph.D. program. Course work deficiencies may be necessary (such as geology), depending upon the applicant’s background. Coursework deficiencies will be determined by the Graduate Liaison and will not be counted as part of the student’s Ph.D. program.

The coursework applied toward the Ph.D. degree must include a minor consisting of a minimum of 12 hours (out of 90 credit hours) of applied mathematics or other natural sciences. Courses of study are individually structured to capitalize upon each student’s background and to meet his/her specific needs and research interests. Every candidate for the Ph.D. degree in petroleum and geological engineering must satisfactorily complete the Qualifying and General Examinations.

Oklahoma Geological Survey

G. Randy Keller, Ph.D., Interim Director
100 East Boyd St. Suite N131
Norman OK 73019
Phone: (405) 325-3031 or (800) 330-3996 (Toll-free)
Fax: (405) 325-7069
Internet: http://www.ogs.ou.edu/
e-mail: ogs-web@gcn.ou.edu

The Oklahoma Geological Survey was created by directive of the State Constitution written in 1907. An enabling act was presented to Oklahoma’s first legislature and signed into law by Gov. Charles N. Haskel on May 29, 1908.

Our Mission

The Oklahoma Geological Survey is charged with investigating the land, water, mineral, and energy resources of the state, and disseminating the results of those investigations to promote the wise use of Oklahoma’s natural resources consistent with sound environmental practices.

The Oklahoma Geological Survey carries out this charter through fossil and unconventional energy research, geological mapping programs, earth-science education activities, an industrial minerals program, and basic geological studies conducted in various areas of Oklahoma. The results of these investigations are made available through publications of technical and educational material, maps, a web site, the Oklahoma Petroleum Information Center (OPIC), data made available for computer use, presentations to all segments of the public, and numerous public meetings and workshops for technology transfer to industry and academia. At the OPIC facility in Norman, thousands of core and well samples, well logs, well-data libraries, and other petroleum-related material is available to the public, and OGS publications are sold and distributed at this site. The Survey also operates a geophysical observatory at Leonard, near Tulsa, where a statewide network of seismometers feed data to monitor earthquakes from Oklahoma and around the world. In pursuing these activities, the OGS works closely with local, state and federal agencies, as well as with professional and educational organizations and agencies from other states. Academic classes are not taught through OGS, however the geologists serve as mentors, adjunct faculty, instructors, and committee members to students enrolled at the University of Oklahoma and other universities, and the Survey is an active affiliate of OU’s Mewbourne College of Earth and Energy.
The Mewbourne College of Earth and Energy

Interdisciplinary Institutes

Larry R. Grillot, Ph.D., Dean
Sarkeys Energy Center
100 E. Boyd Street
Norman, OK 73019-1014
Phone: (405) 325-3821
FAX: (405) 325-3180
Internet: www.sec.edu

The Mewbourne College of Earth and Energy Programs programs include four interdisciplinary institutes. All the institutes involve faculty from the colleges of Earth and Energy, Arts and Sciences, Law, Business and Engineering. Focusing on the energy-related strengths of the university, the institutes develop technology and programs that advance the energy industry in the state and throughout the world and provide significant, “real world” research and education opportunities.

Mewbourne Dean of the College of Earth and Energy, Dr. Larry R. Grillot, joined the University of Oklahoma in April 2006 after 30 years of varied technical and managerial assignments in oil and gas exploration, production and research.

PoroMechanics Institute (PMI)

The University of Oklahoma (OU) boasts the top program in the world dedicated to the investigation of the mechanics of porous media, in particular to rock mechanics, with applications to the exploration and production of hydrocarbon energy. Directed by Dr. Younane Abouzeid, who holds the Larry W. Brummett/ONEOK Chair and is a faculty member in the Mewbourne School of Petroleum and Geological Engineering (MPGE), the School of Geology and Geophysics (SGG), and the Sarkeys Energy Center (SEC) in addition he holds and adjunct faculty position in the School of Civil Engineering & Environmental Science (CEES). The institute has two major research efforts with funding provided by two consortia the Rock mechanics Consortium (RMC), and the GeoGenome™ Industry Consortium (G2IC). The latter is in collaboration with Massachusetts Institute of Technology. These consortia involve 17 domestic/international oil and gas companies, from the Americas, Europe and the Middle East (e.g. Shell, Total, Aramco, Chevron, Halliburton, Hydro, Ecopetrol, etc.). a staff of prominent scientists from multiple disciplines to conduct research. One of the major sources of funding is provided by a consortium (i.e., PoroMechanics Institute Consortium) of 16 domestic/international oil and gas companies and educational institutes. Research efforts and technology transfer (industry deliverables) are conducted by undergraduate and graduate OU students with affiliations in three different colleges.

Institute for Energy and the Environment (IEE)

IEE is dedicated to providing the scientific foundation for solutions to applied environmental problems that impact the infrastructure of energy production and use. Noted environmental microbiologist and George Lynn Cross Research Professor, Dr. Joseph M. Sulitza, directs IEE. To date, IEE research has focused on understanding the processes that control the environmental fate of energy-related substances like, spill hydrocarbons, hydrogen sulfide corrosion, and contaminating radionuclides. This work is important for assessing environmental risks, designing appropriate remedial measures, and even for environmental forensic analyses. IEE research relates closer to the wider strength of OU in the area of anaerobic microbiology and the University is easily recognized as one of the premier places in the world to study in this discipline. Particular emphasis is on bacteria that produce renewable energy forms such as ethanol and natural gas. Current studies concern biotechnological measures for the enhanced recovery of energy from marginal reservoirs, heavy oil production and the control of problematic paraffin deposits. Research activities span the gamut from basic to applied projects. Institute scientists, including Drs. Lee Krumholz, Mark Nanny and Kathleen Duncan work closely with graduate and undergraduate students to investigate greener solutions to many environmental issues that attend the use and production of energy in the world today.

Institute for Reservoir Characterization (IRC)

Director of the Institute is Dr. Roger Slatt who has had a 14-year career in the oil and gas industry with Cities Service Co. and ARCO/ARCO International, focused on various aspects of reservoir characterization globally. He also has had a 17-year career in academia, including Head of the School of Geology and Geological Engineering at Colorado School of Mines (1992-2000), Director of the School of Geology and Geophysics at University of Oklahoma (2000-2005), and Director of the Rocky Mountain Regional Petroleum Technology Transfer Council (1995-2000). Senior Advisor in the Institute is Dr. Daniel O’Meara, formerly a Shell and British Petroleum engineer, noted for his expertise in integrated petroleum engineering and geology, principally through software development such as Geo2Flow. These individuals, and other affiliates to the Institute such as Dr. Shankar Mitra (structure and tectonics) and Dr. Paul Philp (petroleum geochemistry), are all internationally recognized for their interdisciplinary approach to the science and application of reservoir characterization.

Geophysicists, geologists, engineers, mathematicians and computer scientists collaborate with university personnel and facilities to develop and test reservoir characterization tools and methods. Interdisciplinary courses on applied reservoir characterization, as well as collaborative or consortium research programs, are available through the Institute to industry professionals globally.

Energy Institute of the Americas (EIA)

The Energy Institute of the Americas was chartered in May 1995 by the University of Oklahoma and Simón Bolívar University in Caracas, Venezuela to address issues raised by the growing economic interdependency of the Americas. Directed by Yoana Walschap, the institute focuses on collaborative research agendas, human resources development, and helps independent companies establish contacts with Western Hemisphere business and government officials. The EIA works closely with SEC Institutes and provides administrative support. The EIA has nine member universities in Canada, USA, Mexico, Colombia, Venezuela, Brazil, Argentina and Trinidad and Tobago. It also conducts activities in Peru, Bolivia and Guatemala.