Geological Engineering

http://www.geology.und.edu/

FACULTY: Forsman, Gerla (Graduate Program Director), Gosnold (Chair), Groenewold, Hartman, Korom, LeFever, Matheney, Perkins, Putkonen, Yarbrough and Zeng

DEGREES OFFERED: Master of Science

PROGRAM DESCRIPTION

The Master of Science in Geological Engineering is designed to develop students into highly qualified engineers capable of conducting research and solving complex problems related to petroleum/geo-thermal energy, geo-environmental concerns and natural hazards. The program offers both thesis and non-thesis options. Students completing the non-thesis option will be highly qualified professionals capable of working in applied engineering fields. Students completing the thesis option will possess the necessary research skills to pursue a terminal degree, such as the Ph.D. in Engineering offered at UND.

MASTER OF SCIENCE

Mission Statement and Program Goals

The mission of the Master of Science in Geological Engineering is to develop the student into a highly qualified engineer capable of conducting research and solving complex problems related to petroleum and geothermal energy, mineral production, geo-environmental concerns, and natural hazards.

Goal 1: Program graduates shall have sufficient skills in geoscience, mathematics, computer modeling, and poro-mechanics to formulate and solve practical problems in geological engineering.

Goal 2: Program graduates shall have the ability to independently conduct research to advance the state of the knowledge; and/or to provide innovative solutions to technical problems in a timely manner in at least one of the areas of exploration and production of energy and mineral resources, geomechanics, hydrogeology ground water remediation, or site investigation/characterization.

Goal 3: Program graduates shall be skilled in research methods, be able to access, critically analyze, and utilize available information from a variety of sources; and shall be able to communicate the results of a research or development project both orally and in writing.

Admission Requirements

1. Bachelor of Science degree in Geological Engineering from an ABET accredited or equivalent program. A bachelor’s degree in another engineering discipline or in a science field, qualifies a student to be admitted to “qualified status” with an obligation to acquire background undergraduate engineering and geology knowledge.

2. Graduate Record Examination General Test for applicants from non-ABET accredited programs.

3. A cumulative Grade Point Average (GPA) of at least 3.0

4. A minimum TOEFL Score of 550 on the paper-based test or 213 on the computer-based test, or for the Internet-based TOEFL, a composite score of 79, with minimum scores of 21/30 (Speaking*); 19/30 (Listening); 19/30 (Reading); and 17/30 (Writing) for applicants whose native language is not English. Applicants may also meet language requirements by presenting IELTS scores of 6.5.

*Applicants being considered for Graduate Teaching Assistantships must achieve these minimum TOEFL scores, but have a minimum score of 26/30 on the Speaking subtest.

5. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Geological Engineering Department.

Thesis Option:

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.

   Geology/Geological Engineering Coursework .......................... 12 credits

   Other Engineering and Science Coursework ........................... 12 credits

   Thesis .................................................................................. 6 credits

2. At least one-half of the credits must be at or above the 500-level.

3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.

4. Completion of the thesis.

Non-Thesis Option (Independent Study):

1. Thirty-four (34) credits including credits required for the major.

   Geology/Geological Engineering Coursework ................................ 15 credits

   Research Project/Independent Study ........................................... 3 credits

   Electives .................................................................................. 16 credits

2. At least one-half of the credits must be at or above the 500-level.

3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.

4. Preparation of a written independent study approved by the faculty advisor.

5. Comprehensive final examination.

Courses

(geoE)

Most of the 500-level courses listed below are offered at least once every three semesters. Others are offered less frequently, on demand.

500. Sedimentary Geology. 1 to 4 credits. Prerequisite: Consent of instructor. A sequence of courses emphasizing: A. sedimentary processes and deposits; B. carbonate petrology; C. clastic petrology; and D. analysis of depositional systems.

505. Isotope Geochemistry. 3 credits. Prerequisites: Geology 321, or permission of instructor. Geochemistry and cosmochemistry of radioactive and stable isotopes; isotope equilibria; applications in paleoclimatology, environmental isotope geochemistry, igneous, metamorphic, and sedimentary petrology.

506. Glacial Geology. 4 credits. 3 hours lecture, 2 hours laboratory. Prerequisite: Geology 311. Origin, growth, and movement of glaciers; landforms and deposits incident to glaciation.

509. Advanced Mineralogy. 1 to 4 credits. Prerequisite: Geology 320. Geology 321 is also recommended. Advanced study of specific mineral groups or selected topics in mineralogy.

511. Advanced Structural Geology. 4 credits. Reading and research in special topics in structural geology and geotectonics.

512. Advanced Petrology. 1 to 4 credits. Prerequisite: Geology 320. Selected topics in petrology taught using conventional lecture and laboratory/field approach.

515. Advanced Paleontology. 3 to 4 credits. Prerequisites: Geology 415, Biology 101, or consent of instructor. A sequence of courses emphasizing A. Invertebrate paleontology; B. Evolution and the fossil record; C. Paleocology; D. Paleontological procedures; E. Micropaleontology.

518. Topics in Advanced Stratigraphy. 2 to 4 credits. Prerequisites: Geology 411, 415. Selected topics in lithostratigraphy and biostratigraphy.

520. Statistical Applications in Geology. 3 credits. Prerequisites: An introductory statistics course, such as CTL 515 or Psych 241, and consent of instructor. The application of statistical techniques to geologic data and problems, with emphasis on analysis of geologic sequences, map analysis, and multivariate analysis of geologic data.
522. History and Philosophy of Geology. 3 credits. Prerequisite: Permission of instructor. Historical and philosophical development of the science of geology.

523. Topics in Advanced Geomorphology. 1 to 4 credits. Prerequisite: Geology 311. Selected topics in geomorphic processes and landforms.

525. Weathering and Soils. 3 credits. Prerequisites: Geology 311 and 411 or consent of instructor. Properties and classification of soils; the factors and processes of weathering and soil formation.

530. Advanced Physical Hydrogeology. 3 credits. Prerequisites: Geol/GeoE 417, Geol 427, Math 265, or consent of instructor. Selected topics in ground and soil water movement, fracture flow, analytical/numerical modeling, and groundwater supply.

531. Hydrogeochemistry. 3 credits. Prerequisite: Geology 321, Math 166, or permission of instructor. The origin, characteristics and modeling of surface and ground water geochemistry.

532. Contaminant Hydrogeology. 3 credits. Prerequisites: Geol 417, Geol 427, Math 265, or consent of instructor. Chemical and physical processes affecting contaminant behavior in groundwater with analytical/numerical modeling and case studies.

540. Water Sampling & Analysis. 3 credits. Prerequisite: Chemistry 121. Techniques of water and sediment sampling and analysis using equipment in the UND Water Quality Laboratory. Results are interpreted in the context of the natural systems from which the samples are taken. Enrollment is limited to eight students per section. A laboratory fee is required.

590. Research. 1 to 4 credits. Laboratory, field, or library research on problems of interest (may be repeated).

591. Directed Studies. 1 to 4 credits. Directed advanced research in a specialized field of geologic study (may be repeated).


311. Geomorphology. 4 credits.

320. Petrology. 3 credits.

321. Geochemistry. 3 credits.

323. Engineering Geology. 3 credits.

340. Digital Mapping Methods. 3 credits.

401. Geological Interpretation of Aerial Photographs. 3 credits.

405. Industrial Minerals. 3 credits.

406. Ore Deposits. 3 credits.

407. Petroleum Geology. 3 credits.

411. Sedimentology and Stratigraphy. 5 credits.

414. Geophysics. 3 credits.

415. Introduction to Paleontology. 4 credits.

417. Hydrogeology. 3 credits.

418. Hydrogeological Methods. 2 credits.

419. Groundwater Monitoring and Remediation. 3 credits.

422. Seminar. 1 credit.

425. Design Hydrology for Wetlands. 3 credits.

427. Groundwater Modeling. 3 credits.

**Geology**

http://www.geology.und.edu/

**FACULTY:** Forsman, Gerla (Graduate Program Director), Gosnold (Chair), Groenewold, Hartman, Korom, LeFever, Matheney, Perkins, Putkonen, Yarbrough and Zeng

**DEGREES GRANTED:** Master of Arts, Master of Science and Doctor of Philosophy

**PROGRAM DESCRIPTION**

The Department of Geology and Geological Engineering offers programs of study leading to the degrees Master of Arts, Master of Science, and Doctor of Philosophy. Research emphasis is currently in the following areas: 1) hydrogeology and environmental geology; 2) economic geology of petroleum and coal; 3) sedimentology, stratigraphy, and paleontology; 4) glacial geology, geomorphology, and soils; 5) petrology and geochemistry; 6) geophysics and tectonics; 7) engineering geology and, 8) interdisciplinary geological projects involving several research areas including integrated basin analysis, ecohydrology, climate change, carbon sequestration, remote sensing, and underground coal gasification.

**MASTER OF SCIENCE**

**Mission Statement and Program Goals**

The Geology Graduate Program provides instruction and research opportunities for graduate students in the geological sciences, maintains and develops geological research at UND, and serves the community, state, and region.

**Goal 1:** Graduate students will be able to communicate effectively in writing and through oral presentation.

**Goal 2:** Graduates of our program shall be employable in Earth science professions.

**Goal 3:** Graduate students shall be proficient in recently developed computational, laboratory, and field technology, and instrumentation.

**Goal 4:** Graduate students shall be up-to-date concerning current trends in the geological sciences.

**Goal 5:** Graduate students shall have a broad knowledge of geology.

**Goal 6:** Graduate students shall do well in their coursework, demonstrating acquisition of knowledge and skills in the Earth sciences.

**Goal 7:** Graduate students shall have advanced and in-depth training in their chosen field.

**Goal 8:** The faculty who teach and advise geology graduate students shall be actively engaged in research and serve as excellent role models.

**Admission Requirements**

1. For admission to the geology M.S. program, applicants must hold a Bachelor’s degree in geology from an accredited college or university or otherwise demonstrate sufficient course work, training, or experience in geoscience.

2. For “approved” status, students must have completed a 5-6 credit hour geology field course, along with satisfactory achievement in supporting science and mathematics, as determined by the department graduate admissions committee.

3. For all graduate programs in the Department of Geology and Geological Engineering, a cumulative 3.0 or higher grade point average is required.

4. Submission of a Graduate Record Examination (GRE) general test score is strongly recommended if you do not have a degree in geology. Applicants are encouraged to submit their GRE score to support their application.

5. A minimum TOEFL Score of 550 on the paper-based test or 213 on the computer-based test, or for the Internet-based TOEFL, a composite score of 79, with minimum scores of 21/30 (Speaking*); 19/30 (Listening); 19/30 (Reading); and 17/30 (Writing) for applicants whose native language is not English. Applicants may also meet language requirements by presenting IELTS scores of 6.5.

*Applicants being considered for Graduate Teaching Assistantships must achieve these minimum TOEFL scores, but have a minimum score of 26/30 on the Speaking subtest.

6. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

Students missing any of the above requirements may be admitted under provisional or qualified status, but all admission requirements must be completed, without graduate credit, within one year after beginning graduate work.
Initial decisions for admission and financial aid are made about March 1 for the fall semester and about September 1 for the spring semester.

Undergraduate students in the Geology, Geological Engineering, or Environmental Geology and Technology majors are eligible for early admission to the M.S. program on qualified status, providing that they have:

1. Completed 95 semester credit hours of coursework.
2. Completed 30 semester hours of coursework and 8 hours of upper division coursework in the geological sciences, including the equivalent of physical and historical geology.
3. Achieved a GPA of 3.0 or better in the geological sciences.

Advancement to Approved status will occur when the student has completed the graduation requirements for the bachelor’s program they are enrolled in, and when all deficiencies have been removed.

Undergraduate students admitted on qualified status are eligible to take 500 level courses in their last two semesters prior to completing the bachelor’s degree requirements. Students must complete the petition titled, “Graduate Credit as an Undergraduate Student” prior to registering for the courses. Such courses could be included in the 30 credit hours for the degree and could appear in the program of study.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Geology Department.

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Twenty semester hours from subdisciplines listed below are required before a student can be advanced to candidacy. A minimum of 6 semester credits must come from each subject area:
   a. mineralogy, petrology, geochemistry
   b. sedimentology, stratigraphy, paleontology, geomorphology
   c. structural geology, geophysics, hydrogeology
5. Up to 12 hours of 300-400 level coursework in geology (and of courses listed in the Graduate section of the catalog) may be taken for graduate credit.

The time normally needed to complete the requirements for the masters degree in geology is about two years of full-time work. Students with graduate teaching or research assistantships may need more time.

MASTER OF ARTS

Mission Statement and Program Goals

The Geology Graduate Program provides instruction and research opportunities for graduate students in the geological sciences, maintains and develops geological research at UND, and serves the community, state, and region.

Goal 1: Graduate students will be able to communicate effectively in writing and through oral presentation.

Goal 2: Graduates of our program shall be employable in Earth science professions.

Goal 3: Graduate students shall be proficient in recently developed computational, laboratory, and field technology and instrumentation.

Goal 4: Graduate students shall be up-to-date concerning current trends in the geological sciences.

Goal 5: Graduate students shall have a broad knowledge of geology.

Goal 6: Graduate students shall do well in their coursework, demonstrating acquisition of knowledge and skills in the Earth sciences.

Goal 7: Graduate students shall have advanced and in-depth training in their chosen field.

Goal 8: The faculty who teach and advise geology graduate students shall be actively engaged in research and serve as excellent role models.

Admission Requirements

1. For admission to the geology M.A. program, applicants must hold a bachelor’s degree in geology from an accredited college or university or otherwise demonstrate sufficient coursework, training, or experience in geoscience.
2. For “approved” status, students must have completed a 5-6 credit hour geology field course, along with satisfactory achievement in supporting science and mathematics, as determined by the department graduate admissions committee.
3. For all graduate programs in the Department of Geology and Geological Engineering, a cumulative 3.0 or higher grade point average is required.
4. Submission of a Graduate Record Examination (GRE) general test score is strongly recommended if you do not have a degree in geology. Applicants are encouraged to submit their GRE score to support their application.
5. A minimum TOEFL Score of 550 on the paper-based test or 213 on the computer-based test, or for the Internet-based TOEFL, a composite score of 79, with minimum scores of 21/30 (Speaking*); 19/30 (Listening); 19/30 (Reading); and 17/30 (Writing) for applicants whose native language is not English. Applicants may also meet language requirements by presenting IELTS scores of 6.5.
   *Applicants being considered for Graduate Teaching Assistantships must achieve these minimum TOEFL scores, but have a minimum score of 26/30 on the Speaking subtest.
6. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

Students missing any of the above requirements may be admitted under provisional or qualified status, but all admission requirements must be completed, without graduate credit, within one year after beginning graduate work.

Initial decisions for admission and financial aid are made about March 1 for the fall semester and about September 1 for the spring semester.

Undergraduate students in the Geology, Geological Engineering, or Environmental Geology and Technology majors are eligible for early admission to the M.S. program on qualified status, providing that they have:

1. Completed 95 semester credit hours of coursework.
2. Completed 30 semester hours of coursework and 8 hours of upper division coursework in the geological sciences, including the equivalent of physical and historical geology.
3. Achieved a GPA of 3.0 or better in the geological sciences.

   Advancement to Approved status will occur when the student has completed the graduation requirements for the bachelor’s program they are enrolled in, and when all deficiencies have been removed.

**Degree Requirements**

Students seeking the Master of Arts degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Geology Department.

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Twenty semester hours from subdisciplines listed below are required before a student can be advanced to candidacy. A minimum of 6 semester credits must come from each subject area.
   a. mineralogy, petrology, geochemistry
   b. sedimentology, stratigraphy, paleontology, geomorphology
   c. structural geology, geophysics, hydrogeology
5. Up to 12 hours of 300-400 level coursework in geology (and of courses listed in the Graduate section of the catalog) may be taken for graduate credit.

**DOCTOR OF PHILOSOPHY**

**Mission Statement and Program Goals**

The Geology Graduate Program provides instruction and research opportunities for graduate students in the geological sciences, maintains and develops geological research at UND, and serves the community, state, and region.

**Goal 1:** Graduate students will be able to communicate effectively in writing and through oral presentation.

**Goal 2:** Graduates of our program shall be employable in Earth science professions.

**Goal 3:** Graduate students shall be proficient in recently developed computational, laboratory, and field technology and instrumentation.

**Goal 4:** Graduate students shall be up-to-date concerning current trends in the geological sciences.

**Goal 5:** Graduate students shall have a broad knowledge of geology.

**Goal 6:** Graduate students shall do well in their coursework, demonstrating acquisition of knowledge and skills in the Earth sciences.

**Goal 7:** Graduate students shall have advanced and indepth training in their chosen field.

**Goal 8:** The faculty who teach and advise geology graduate students shall be actively engaged in research and serve as excellent role models.

**Admission Requirements**

1. For admission to the geology Ph.D. program, applicants must hold a bachelor’s degree in geology from an accredited college or university or otherwise demonstrate sufficient coursework, training, or experience in geoscience.

2. For “approved” status, students must have completed a 5-6 credit hour geology field course, along with satisfactory achievement in supporting science and mathematics, as determined by the department graduate admissions committee.

3. For all graduate programs in the Department of Geology and Geological Engineering, a cumulative 3.0 or higher grade point average is required.

4. Submission of a Graduate Record Examination (GRE) general test score is strongly recommended if you do not have a degree in geology. Applicants are encouraged to submit their GRE score to support their application.

5. A minimum TOEFL Score of 550 on the paper-based test or 213 on the computer-based test, or for the Internet-based TOEFL, a composite score of 79, with minimum scores of 21/30 (Speaking*); 19/30 (Listening); 19/30 (Reading); and 17/30 (Writing) for applicants whose native language is not English. Applicants may also meet language requirements by presenting IELTS scores of 6.5.

   *Applicants being considered for Graduate Teaching Assistantships must achieve these minimum TOEFL scores, but have a minimum score of 26/30 on the Speaking subtest.

6. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

   Students missing any of the above requirements may be admitted under provisional or qualified status, but all admission requirements must be completed, without graduate credit, within one year after beginning graduate work.

   Initial decisions for admission and financial aid are made about March 1 for the fall semester and about September 1 for the spring semester.

**Degree Requirements**

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Geology Department.

Students normally take the equivalent of three years of full-time work beyond the master’s degree for the doctorate.

1. Completion of 90 semester credits beyond the baccalaureate degree.

2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.

3. With approval of a student’s Faculty Advisory Committee, up to one-half of the work beyond a master’s degree (maximum of 30 semester credit hours) may be transferred from another institution that offers post-master’s degrees in the discipline.

4. A qualifying examination may be required before the end of the student’s first year in a doctoral program.

5. Demonstration of:
   a. proficiency in two foreign languages, or
   b. proficiency in one foreign language and two scholarly tools courses, or
   c. proficiency in four scholarly tools courses (scholarly tools courses typically are advanced undergraduate courses in related fields in mathematics, science, or engineering).

6. Completion of a dissertation, which incorporates independent work that is an original contribution to knowledge.
Most of the 500-level courses listed below are offered at least once every three semesters. Others are offered less frequently, on demand.

500. Sedimentary Geology. 1 to 4 credits. Prerequisite: Consent of instructor. A sequence of courses emphasizing: A. sedimentary processes and deposits; B. carbonate petrology; C. clastic petrology; and D. analysis of depositional systems.

505. Isotope Geochemistry. 3 credits. Prerequisites: Geology 321, or permission of instructor. Geochemistry and cosmochemistry of radioactive and stable isotopes; isotope equilibria; applications in paleoclimatology, environmental isotope geochemistry, igneous, metamorphic, and sedimentary petrology.

506. Glacial Geology. 4 credits. 3 hours lecture, 2 hours laboratory. Prerequisite: Geology 311. Origin, growth, and movement of glaciers; landforms and deposits incident to glaciation.

509. Advanced Mineralogy. 1 to 4 credits. Prerequisite: Geology 320. Geology 321 is also recommended. Advanced study of specific mineral groups or selected topics in mineralogy.

511. Advanced Structural Geology. 4 credits. Reading and research in special topics in structural geology and geotectonics.

512. Advanced Petrology. 1 to 4 credits. Prerequisite: Geology 320. Selected topics in petrology taught using conventional lecture and laboratory/field approach.

515. Advanced Paleontology. 3 to 4 credits. Prerequisites: Geology 415, Biology 101, or consent of instructor. A sequence of courses emphasizing A. Invertebrate paleontology; B. Evolution and the fossil record; C. Palaeoecology; D. Paleontological procedures; E. Micropaleontology.

518. Topics in Advanced Stratigraphy. 2 to 4 credits. Prerequisites: Geology 411, 415. Selected topics in lithostratigraphy and biostratigraphy.

520. Statistical Applications in Geology. 3 credits. Prerequisites: An introductory statistics course, such as CTL 515 or Psych 241, and consent of instructor. The application of statistical techniques to geologic data and problems, with emphasis on analysis of geologic sequences, map analysis, and multivariate analysis of geologic data.

522. History and Philosophy of Geology. 3 credits. Prerequisite: Permission of instructor. Historical and philosophical development of the science of geology.

523. Topics in Advanced Geomorphology. 1 to 4 credits. Prerequisite: Geology 311. Selected topics in geomorphic processes and landforms.

525. Weathering and Soils. 3 credits. Prerequisites: Geology 311 and 411 or consent of instructor. Properties and classification of soils; the factors and processes of weathering and soil formation.

530. Advanced Physical Hydrogeology. 3 credits. Prerequisite: Geol/GeoE 417, Geol 427, Math 265, or consent of instructor. Selected topics in ground and soil water movement, fracture flow, analytical/numerical modeling, and groundwater supply.

531. Hydrogeochemistry. 3 credits. Prerequisite: Geology 321, Math 166, or permission of instructor. The origin, characteristics and modeling of surface and ground water geochemistry.

532. Contaminant Hydrogeology. 3 credits. Prerequisites: GeolE 417, GeolE 427, Math 265, or consent of instructor. Chemical and physical processes affecting contaminant behavior in groundwater with analytical/numerical modeling and case studies.

540. Water Sampling & Analysis. 3 credits. Prerequisite: Chemistry 121. Techniques of water and sediment sampling and analysis using equipment in the UND Water Quality Laboratory. Results are interpreted in the context of the natural systems from which the samples are taken. Enrollment is limited to eight students per section. A laboratory fee is required.

590. Research. 1 to 4 credits. Laboratory, field, or library research on problems of interest (may be repeated).

591. Directed Studies. 1 to 4 credits. Directed advanced research in a specialized field of geologic study (may be repeated).


311. Geomorphology. 4 credits.

320. Petrology. 3 credits.

321. Geochemistry. 3 credits.

323. Engineering Geology. 3 credits.

340. Digital Mapping Methods. 3 credits.

401. Geological Interpretation of Aerial Photographs. 3 credits.

405. Industrial Minerals. 3 credits.

406. Ore Deposits. 3 credits.

407. Petroleum Geology. 3 credits.

411. Sedimentology and Stratigraphy. 5 credits.

414. Geophysics. 3 credits.

415. Introduction to Paleontology. 4 credits.

417. Hydrogeology. 3 credits.

418. Hydrogeological Methods. 2 credits.

419. Groundwater Monitoring and Remediation. 3 credits.

422. Seminar. 1 credit.

425. Design Hydrology for Wetlands. 3 credits.

427. Groundwater Modeling. 3 credits.

Higher Education

See Education: Educational Leadership & Teaching and Learning

History

http://www.und.edu/dept/histdept/

FACULTY: Berger, Broedel, Burin, Campbell, Caraher, Iseminger (Graduate Program Director), Kelsch, Mochoruk, Porter (Chair)

Prescott and Reese

DEGREES GRANTED: Master of Arts, Master of Education, Doctor of Arts and Doctor of Philosophy

PROGRAM DESCRIPTION

The department of History offers programs leading to the Master of Arts degree, the Doctor of Arts degree, and the Ph.D. degree. The M.Ed. degree is also available for students who wish to complete an education degree with an area of concentration in History. See the M.Ed. requirements in the Degree Requirements section for further information. The program advisor for the M.Ed. will be in the Department of History, but students planning to take this option should also consult an advisor in the College of Education and Human Development.

Some Teaching Assistantships, providing stipends and waivers of tuition, are available. Applications for assistantships should be submitted by March 1, but later applications will be considered.

MASTER OF ARTS

Mission Statement and Program Goals

The mission of the Graduate Program of the History Department of the University of North Dakota is to provide quality graduate-level instruction in the fields of North American, European, and World History. Successful students will be prepared to seek careers as history teachers at the high school and junior college level, as public historians, museum curators, archivists, or in a variety of other professions (journalism, business, government service) which require well-developed skills in research, critical thinking, and oral and written expression.

Goal 1: Students will be able to conduct significant, independent research in their chosen field of concentration.

Goal 2: Students will demonstrate considerable knowledge of disciplinary sub-fields, major interpretive schools of thought, appropriate methodological approaches, and a mastery of the major works in their field of concentration.

Goal 3: Students will be able to combine the results of their primary research with their knowledge of the pertinent secondary and theoretical literature and present their findings both orally and in writing.

Admission Requirements

1. A four-year bachelor’s degree from a recognized college or university.

2. Undergraduate preparation of a minimum of 20 semester credits in history with at least six credits at the upper division level.

3. An overall undergraduate GPA of at least 3.00 and at least 3.25 in all undergraduate history courses.

4. A writing sample of 8-10 pages, preferably a research or seminar paper (submitted directly to the department’s Director of Graduate Study).