The Undergraduate Curriculum Committee recommends approval of the following:

1. Change in Courses

**ATMO 461. Broadcast Meteorology.**

Course description
- From: Instruction in the practice of broadcast meteorology; practice in and preparation of weather forecast products and demonstration videotapes.
- To: Instruction in the practice of broadcast meteorology; practice in and preparation of weather forecast products and demonstration videotapes. May be taken two times for credit with faculty advisor approval.

**GEOL 410. Hydrogeology.**

Lecture and lab contact hours
- From: (3-0). Credit 3.
- To: (2-2). Credit 3.
CHANGE IN COURSES
Texas A&M University
Departmental Request for a Change in Course
Undergraduate • Graduate • Professional
• Submit original form and attachments •

1. Request submitted by (Department or Program Name): Department of Atmospheric Sciences

2. Course prefix, number and complete title of course: ATMO 461, Broadcast Meteorology

3. Change requested

a. Prerequisite(s): From: ____________________________ To: ____________________________

b. Withdrawal (reason):

  [Cross-listed courses require the signature of both department heads.]

c. Cross-list with:

   [Cross-listed courses require the signature of both department heads.]

d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.

c. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. Attach a course syllabus.

4. For informational purposes only, please indicate course number if this course will be stacked:

5. Complete current course title and current catalog course description:
Broadcast Meteorology. Instruction in the practice of broadcast meteorology; practice in and preparation of weather forecast products and demonstration videotapes.

6. Complete proposed course title and proposed catalog course description (not to exceed 50 words):
Broadcast Meteorology. Instruction in the practice of broadcast meteorology; practice in and preparation of weather forecast products and demonstration videotapes. May be taken twice for credit with faculty advisor approval.

7. a. As currently in course inventory:

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Approval recommended by:

Peng Yang
Department Head or Program Chair (Type Name & Sign) 12/19/13

Chair, College Review Committee

Dean of College

Chair, GC or UCC

Submitted to Coordinating Board by:

Associate Director, Curricular Services

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 02/11

RECEIVED CURRICULAR SERVICES
January 29, 2014

MEMORANDUM

TO: Office of the Registrar

THROUGH: Dr. Sarah Bednarz
AOC Dean College of Geosciences

FROM: Dr. Ping Yang
Department Head
Department of Atmospheric Sciences

SUBJECT: Change ATMO 461 to a repeatable course

ATMO 461, Broadcast Meteorology, is currently a technical elective for METR majors. Students that are interested in pursuing a career in Broadcast will benefit from taking this course twice. The case studies in the Broadcast Meteorology course are based on current weather. Because students do not encounter the full range of weather events, during a single semester, students will work with different material if they repeat the course. By making this course repeatable, with faculty advisor approval, we can provide an additional technical elective to help students interested in pursuing a career in Broadcast Meteorology achieve their goals. If you have any questions please contact our Advisor, Missy Mathews, by email at missy@tamu.edu, or by phone at 979-845-7688.
Texas A&M University
Departmental Request for a Change in Course
Undergraduate • Graduate • Professional
• Submit original form and attachments •

1. Request submitted by (Department or Program Name): Geology and Geophysics

2. Course prefix, number and complete title of course: GEOL 410 Hydrogeology

3. Change requested
   a. Prerequisite(s): From: ____________________________ To: ____________________________
   b. Withdrawal (reason):
   c. Cross-list with: ____________________________ (Cross-listed courses require the signature of both department heads)
   d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.
   e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. Attach a course syllabus.

4. For informational purposes only, please indicate course number if this course will be stacked: GEOL 614

5. Complete current course title and current catalog course description:
   Hydrogeology
   Geologic conditions determining the distribution and movement of ground water and their effect on the hydrologic properties of aquifers.

6. Complete proposed course title and proposed catalog course description (not to exceed 50 words):

7. a. As currently in course inventory:

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   Approval recommended by: [Signature]
   Date: 11/5/13

   Chair, College Review Committee: [Signature]
   Date: 12/4/13

   Dean of College: [Signature]
   Date: [Signature]

   Chair, GC or UCC: [Signature]
   Date: [Signature]

   Submitted to Coordinating Board by: [Signature]
   Date: [Signature]

   Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu

   Curricular Services — 02/11
Course title and number: GEOL 410: Hydrogeology
Term: Fall 2014
Meeting times and location: MWF 11:30-12:20PM; 104 Halbouty Building

Course Description and Prerequisites

Geologic conditions determining the distribution and movement of ground water and their effect on the hydrologic properties of aquifers.

Prerequisites: Junior or senior classification or approval of instructor.

Learning Outcomes or Course Objectives

Student will be able to do all of the following:

1) Use different concepts such as evaporation, infiltration, groundwater recharge, base flow to analyze hydrological cycle and surface-groundwater interaction.

2) Conduct quantitative calculation of base flow based on stream hydrographs.

3) Use three important physical parameters (porosity, hydraulic conductivity, and storativity) of aquifers to understand the groundwater flow systems.

4) Measure and calculate hydraulic head, elevation head, pressure head, and hydraulic gradient in the field.

5) Conduct calculation using Darcy’s law for a variety of problems such as computing discharge of water between two paralleled rivers, computing contaminant travel time from a source to a discharge point, and calculating groundwater flow in horizontal and vertical directions.

6) Interpret local, intermediate, and regional groundwater flows, and the law of refraction for groundwater flow at the interface of two media with different hydraulic conductivity values.

7) Derive the groundwater flow governing equation and applying the equation for practical boundary value problems (BVPs).

8) Apply the concept of effective stress and seepage force for geo-engineering problems such as landslide and slope failure, uplifting, erosion of landform, seismic activity after injecting fluid to deep formation, groundwater-surface water interaction during the flooding, and overthrust faulting aided by groundwater.

9) Calculate freshwater-seawater interface in coastal aquifers and islands.

10) Compute drawdowns near a pumping well using Theis solution and leaky Thesis solution.

11) Interpret different well testing results such as Pumping Test and Slug Test.

12) Calculate well capacity and well efficiency.
Instructor Information

Name: Dr. Hongbin Zhan
Telephone number: 979-052-7961 (o), 979-574-4019 (cell)
Email address: zhan@geos.tamu.edu
Office hours: Wednesday 3:00-5:00PM or by appointment
Office location: 259 Halbouty Building

Textbook and/or Resource Material


Grading Policies

Grades will be based on demonstration of understanding of fundamental concepts in hydrogeology, and the ability to apply the concepts to conduct quantitative calculations of some commonly seen groundwater flow problems. An "A" indicates an excellent understanding of all concepts and the capability of interrelating the concepts into a seamless system, and the capability of applying the concepts for quantitative computation of complex groundwater flow problems. A "B" indicates the ability to apply knowledge and skills to solve complex problems. A "C" indicates a clear understanding of the concepts and the capability of performing most calculations correctly. In general, a "D" in this class indicates that a student has serious flaws in understanding the important concepts and is not capable of conducting quantitative calculations correctly. An "F" indicates that the student has a poor understanding of most concepts and cannot carry out the quantitative computation to most problems. The instructor will take attendance randomly and the summary of attendance will be taken into account for students whose numerical scores fall within 1.0 point of the boundaries between A-B (90), B-C(80), C-D(70), and D-F(60).

A student with an official medical, religious, and university excused absence will not be counted as absent. **Students should consult Student Rule 7 for attendance and excused absence.**

There are two exams (Midterm and Final) and a series of assignments and their weights towards the final grade are listed below.

**This class is stacked with GEOL 614 (Advanced Hydrogeology). A graduate student taking GEOL 614 must complete a term paper, which is not required for undergraduate students taking GEOL 410.**

The final grade is based on the following distribution of exams and homework assignments.

- Homework assignments: 35%
- Midterm exam: 30%
- Final exam: 35%

Numerical grades on homework assignments, midterm exam and final exam will be rounded at the first decimal place (e.g. 89.50%→90%, 89.49%→89%). Letter grades for individual assignments will be computed as follows: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F <60%. No extra credit will be available.
# Course Topics, Calendar of Activities, Major Assignment Dates

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<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
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<tbody>
<tr>
<td>1</td>
<td>Hydrological Cycle; Management of groundwater.</td>
<td>Fetter Chapter 1.3, 1.5</td>
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<tr>
<td>2</td>
<td>Porosity.</td>
<td>Fetter Chapter 4.2</td>
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<tr>
<td>3</td>
<td>Groundwater potential and hydraulic head.</td>
<td>Fetter Chapter 5.1-5.5</td>
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<td>4</td>
<td>Darcy's law and hydraulic conductivity.</td>
<td>Fetter Chapter 4.4</td>
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<td>5</td>
<td>Aquifers, aquitards, and aquicludes.</td>
<td>Fetter Chapter 4.5, 4.7</td>
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<td>6</td>
<td>Transmissivity and storativity of confined aquifers; Release of water</td>
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<td>7</td>
<td>Transmissivity and specific yield of unconfined aquifers.</td>
<td>Fetter Chapter 4.6, 4.8</td>
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<td>8</td>
<td>Equations of groundwater flow; Analytical solutions of onedimensional</td>
<td>Fetter Chapter 5.7</td>
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<td>9</td>
<td>Groundwater flow patterns; Groundwater and geology (effective stress,</td>
<td>Fetter Chapter 8.6, class notes</td>
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<td>groundwater flow and faulting)</td>
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<td>10</td>
<td>Land subsidence; Groundwater and geotechnical engineering; Flood</td>
<td>Class notes</td>
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<td>11</td>
<td>Sea water intrusion.</td>
<td>Fetter Chapter 9.7-9.8</td>
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<td>12</td>
<td>Steady-state flow to a well (the Thiem solution).</td>
<td>Fetter Chapter 7.4.2</td>
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<td>13</td>
<td>Transient flow to a well: Theis method and pumping test.</td>
<td>Fetter Chapter 7.3</td>
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<td>14</td>
<td>Transient flow to a well in leaky confined and unconfined aquifer and</td>
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<td>slug test.</td>
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## Other Pertinent Course Information

- Lab 1: Water budget and base flow calculations.
- Lab 2: Map groundwater head distribution and groundwater flow magnitude and direction.
- Lab 3: Apply Darcy's law for different sets of groundwater flow problems.
- Lab 4: Identification and characterization of aquifers, aquitards and aquicludes.
- Lab 5: Illustration of aquifer storativity.
- Lab 6: Calculation of total stress, effective stress, and neutral stress.
- Lab 7: Study land subsidence of Houston, TX; Shanghai, China; and Mexico City, Mexico.
- Lab 8: Study seawater intrusion in Galveston, TX and California coast.
- Lab 9: Case studies of cones of depression in Ogallala aquifer, USA and North China Plain.
- Lab 10: Case study of pumping test interpretation.
- Lab 11: Case study of slug test interpretation.
- Lab 12: Case study of horizontal well and hydraulic fracturing

## References:

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu

Academic Integrity

For additional information please visit: http://aggiehonor.tamu.edu

"An Aggie does not lie, cheat, or steal, or tolerate those who do."