

ENVE/ HDYR 320

Credit Hours: 4

Department: Mathematics, Physics and Engineering

Required or Elective (circle one)

**Current Catalog Description:**

**Groundwater Hydrology (3-3)** Topics include aquifer characteristics, infiltration, fluid dynamics of groundwater flow, potential flows, well analysis, water quality, groundwater pollution, legal issues in groundwater.

**Course Schedule:**

3 lecture hr/ wk, 3 lab hr/wk

**Coordinator:**

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**Pre/corequisites by Topic: (list course number, title, and specify if co-requisite)**

HYDR 110 – Introduction to Hydrology OR ENVE 210 – Survey of Environmental Engineering  
ENVE/ HYDR 211 – Soil Mechanics; ENVE/HYDR 300 – Mechanics of Fluids  
GEOL 105 – Physical Geology  
CHEM 108 – College Chemistry II  
MATH 209 - Calculus II; MATH 300 – Principles of Statistics OR MATH 350 – Principles of Bio-Statistics

**Course Grading:** Course evaluation will be at the discretion of the teaching faculty and specifically outlined in the course syllabus. Evaluation will be based on performance in:

1. Exercises;
2. Laboratory Reports;
3. Examinations; and
4. Projects.

**Program Outcome and Course Learning Goals Map:**

The Program Outcomes for Environmental Engineering are:

- A. an ability to apply knowledge of math, engineering & science
- B. an ability to design and conduct experiments, as well as to analyze and interpret data
- C. an ability to design system, component or process to meet needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- D. an ability to function on multi-disciplinary teams
- E. an ability to identify, formulate, and solve engineering problems
- F. an understanding of professional and ethical responsibility
- G. an ability to communicate effectively
- H. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- I. a recognition of need for, and ability to engage in life-long learning
- J. a knowledge of contemporary issues
- K. an ability to use techniques, skills, and modern engineering tools necessary for engineering practice.

Course Goals	Program Outcome(s):
Upon completion of this course with a C or better, students will	
1. Students will demonstrate ability to be able to read, access, and critically evaluate the scientific literature.	A, E, G, H, I, J, K
2. Students will demonstrate the ability to use lab and non-lab methods to estimate values of porosity, specific yield, permeability, and	A, B, E, K

hydraulic conductivity for any given type of porous medium.	
3. Students will demonstrate the ability to describe a hydrogeologic setting in terms of aquifers, aquitards, and hydrostratigraphic units as well as know the basics of aquifer testing and be able to interpret aquifer test results.	A, B, E, G, K
4. Students will demonstrate the ability to use well logs, regional geologic data, surface water records, and other hydrogeologic data to construct hydrogeologic cross sections and maps for a given area.	A, C, E, G, H, K
5. Students will understand understand the proper methods for hydrogeologic evaluation, proper well analysis methods and be able to list common water contaminants and their sources.	A, E, F, H, I, J, K
6. Students will appreciate the importance of groundwater as a resource and understand the scientific, social, and economic problems associated with groundwater pollution.	D, F, H, I, J

**Contribution of Course to Meeting the Professional Requirement:**

Engineering Topics: 100%

**Other Information:** Unless otherwise stipulated in this master syllabus, the following items are subject to faculty discretion as described in each faculty member's individual course syllabus:

1. Class policies;
2. Exams;
3. Laboratory Reports;
4. Homework/Quizzes/Classwork; and
5. Projects.

**Absence policy:**

**Unexcused absences:** Students who miss class without prior approval of their instructor will receive a grade of zero on missed in class assignments, quizzes, and/or exams.

**University excused absences:** Authorized absences must be approved by your instructor in advance of the absence, unless you have an emergency or illness, which still must be approved *immediately* upon your return. Make-up work must be completed outside of normal class hours within ONE WEEK following an excused absence. IT IS YOUR RESPONSIBILITY to see your instructor and make arrangements for make-up work.

**Academic Honesty:**

Cheating, plagiarism (submitting another person's materials or ideas as one's own), or doing work for another person who will receive academic credit are all-impermissible. This includes the use of unauthorized books, notebooks, or other sources in order to secure or give help during an examination, the unauthorized copying of examinations, assignments, reports, or term papers, or the presentation of unacknowledged material as if it were the student's own work. Disciplinary action may be taken beyond the academic discipline administered by the faculty member who teaches the course in which the cheating took place.

**Students with Disabilities Policy:**

It is the policy of Tarleton State University to comply with the Americans with Disabilities Act (ADA) and other federal, state, and local laws relative to the provision of disability services. Students with disabilities attending Tarleton State University may contact the Office of Disability Services at (254) 968-9478 to request appropriate accommodation. Furthermore, formal accommodation requests cannot be made until the student has been officially admitted to Tarleton State University.

**Status of Continuous Improvement Review of this Course:**

**Prepared by:** Beth Jones

**Date:** August 16, 2007

**Reviewed by:** *Xixi Wang*  
**Date:** *September 20, 2007*