New Courses

Texas A&M University
Departmental Request for a New Course
Undergraduate ♦ Graduate ♦ Professional

• Submit original form and attach a course syllabus.•

RECEIVED
DEC 16 2013
GRADUATE STUDIES

Form Instructions

1. Request submitted by *(Department or Program Name)*: Educational Psychology

2. Course prefix, number and complete title of course: EPSY 656: Survey Instrument Development

3. Catalog course description (not to exceed 50 words): Experiences in developing instruments to measure cognition, attitude, or behavior; issues and practices relating to construct specification, instrument design and administration; emphasis on analysis and summary of validity study data.

4. Prerequisite(s): Graduate Classification; EPSY 640 or equivalent; Approval of Department Head

   Cross-listed with: _____ Stacked with: _____

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

5. Is this a variable credit course? ☐ Yes ☒ No If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes ☒ No If yes, this course may be taken _____ times.
   Will this course be repeated within the same semester? ☐ Yes ☐ No

7. This course will be:
   a. required for students enrolled in the following degree programs(s) *(e.g., B.A. in history)*
      None
   b. an elective for students enrolled in the following degree program(s) *(e.g., M.S., Ph.D. in geography)*
      For Doctoral Students in Educational Psychology; School Psychology; Counseling Psychology and other programs across the University. Also Master'students in Educational Psychology may take this course.

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. **Attach approval letters.**

9.

Prefix	Course #	Title (excluding punctuation)
EPSY	656	SURVEY INSTRUMENT DEV

Lect.	Lab	SCH	CIP and Fund Code	Admin. Unit	Acad. Year	FICE Code	Level
03	00	03	13060400004	0920	14-15	003632	6

Approval recommended by:

Victor Willson, Ph.D. — Department Head or Program Chair *(Type Name & Sign)* — Date

Department Head or Program Chair *(Type Name & Sign)* — Date
(if cross-listed course)

Submitted to Coordinating Board by:

Associate Director, Curricular Services — Date

George Cunningham, Ph.D. — Chair, College Review Committee — 12/10/13 — Date

George Cunningham, Ph.D. — Dean of College — 12/10/13 — Date

Mark Zoran, Ph.D. — Chair, GC or UCC — 1-14-14 — Date

Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/10

EPSY 656 Survey Instrument Development

Syllabus Fall 2013

Class Time & Location
Monday, 9:00 ~ 12:00 PM
Room 717, Harrington Education Center (EDCT)
Office Hours
Monday, 2:00 ~ 4:00 PM, or by appointment

Instructor
Jessica Yue
725A Harrington Tower
jessicayue@tamu.edu

Course Description

This course will provide you with experiences in developing instruments to measure cognition, attitude, or behavior. Issues and practices relating to construct specification, instrument design and administration, and analysis and summary of validity study data will be emphasized. Prerequisite: Graduate Classification; EPSY 640 or equivalent; Approval of Department Head.

Course Objectives

1) This course will provide you with insights into validity studies in the process of developing instruments to measure cognition, attitude, or behavior.
2) Issues and practices relating to construct specification, instrument design and administration, and analysis and summary of validity study data will be emphasized with Psychometric techniques, specifically Rasch measurement.
3) By the end of the course, you should be able to produce a written summary that is suitable for publication in a peer-review journal based on your cumulative coursework.

Textbook

Smith, E. V., Jr., & Smith, R. M. (Eds.). (2004). *Introduction to Rasch Measurement: Theory, Models, and Applications*. Maple Grove, MN: JAM Press. (ISBN: 0975535110 $47.00, soft cover)

Supplemental

Osterlind, S.J. (2006). *Modern Measurement: Theory, Principles, and Applications of Mental Appraisal*. Upper Saddle River, NJ: Pearson Education. (ISBN: 013025590) ($84, hard cover)

AERA, APA, & NCME. (1999). *Standards for Educational and Psychological Testing*. Washington, DC: American Educational Research Association.

Downing, S.M., & Haldyna, T.M. (Eds.). (2006). *Handbook of Test Development*. Mahwah, NJ: Erlbaum.

Software Packages

WINSTEPS is available in the EREL lab.

MINISTEP, a reduced version of WINSTEPS is free to download at http://www.winsteps.com/ministep.htm

Tentative Schedule of Topics

Session	Date	Topic	Due
1	August 26	Validity (Development)	
2	September 02	Validity (Development) - continued	
3	09	Instrument Development & Construct Specification	
4	16	Item Writing	
5	23	Sampling, Pilot Testing, & Referencing Framework	Data Description
6	30	True Score Test Theory	
7	October 07	IRT & Rasch Measurement	
8	14	Validity (Data)	
9	21	Dimensionality	Development
10	28	Fit & Item Quality	
11	November 04	Rating Scales & Distracters	
12	11	Information, Reliability, & Precision	
13	18	Logits & Transformations	
14	25	Differential Item Functioning	
15	December 02	FINAL PRESENTATION	Validation Paper

Please note that late assignments are not accepted except in instances of University excused absences. For more information on what is an excused absence and the University's attendance policy please review Student Rule 7 here: http://student-rules.tamu.edu/rule07 Documentation of the excused absence is also required for any late work.

Readings

Sessions 1-2

Messick, S. (1995). Validity of psychological assessment: Validation of inferences from persons' responses and performances as scientific inquiry into score meaning. *American Psychologist, 50*, 741-749.

Wolfe, E. W., & Smith, E. V., Jr. (2007). Instrument Development Tools and Activities for Measure Validation Using Rasch Models: Part I—Instrument Development Tools. In E. V. Smith, Jr. & R. M. Smith (Eds.), *Rasch Measurement: Advanced and Specialized Applications* (pp. 202-242). Maple Grove, MN: JAM Press.

Frisbie, D. A. (2005). Measurement 101: Some fundamentals revisited. *Educational Measurement: Issues and Practice, 24, 3*, 21-28.

Wolfe, E. W., Viger, S. G., Jarvinen, D. W., & Linksman, J. (2007) Validation of Scores From a Measure of Teachers' Efficacy Toward Standards-Aligned Classroom Assessment. *Educational and Psychological Measurement, 60, 3,* 460-474.

Osterlind Chapters 1 & 4

Downing Chapters by Downing (1), Linn (2), Kane (7)

Session 3

Stone, M. H. (2004). Substantive Scale Construction. In J. E.V. Smith & R. M. Smith (Eds.), *Introduction to Rasch Measurement* (pp. 201-225). Maple Grove, MN: JAM

Press. Haladyna Chapter by Mislevy (4)

Session 4

Haladyna, T. M., Downing, S. M., & Rodriguez, M. C. (2002). A review of multiple-choice item-writing guidelines for classroom assessment. *Applied Measurement in Education,*
15, 309-334.

Stiggins, R. J. (1987). Design and Development of Performance Assessments. *Educational Measurement: Issues and Practice* (Fall), 33-

42. Osterlind Chapters: 8-9

Downing Chapter by Zieky (16)

Session 5

Cizek, G. J., Bunch, M. B., & Koons, H. (2004). Setting Performance Standards: Contemporary Methods. *Educational Measurement: Issues and Practice* (Winter), 31-

50. Osterlind Chapters: 6-7

Downing Chapter by McCallin (27)

Session 6

Traub, R. E., & Rowley, G. L. (1991). Understanding Reliability. *Educational*

Measurement: Issues and Practice (Spring), 37-45.

Harvill, L. M. (1991). Standard Error of Measurement. *Educational Measurement: Issues and Practice* (Summer), 33-

41. Osterlind Chapter: 3

Session 7

Harris, D. (1989). Comparison of 1-, 2-, and 3-parameter IRT models. *Educational Measurement: Issues and Practice, 8,* 35-41.

Wright, B. D., & Mok, M. M. C. (2004). An Overview of the Family of Rasch Measurement Models. In E. V. Smith, Jr. & R. M. Smith (Eds.), *Introduction to Rasch Measurement* (pp. 1-24). Maple Grove, MN: JAM Press.

Wilson, M. (2004). On Choosing a Model for Measuring. In J. E.V. Smith & R. M. Smith (Eds.),
Introduction to Rasch Measurement (pp. 123-142). Maple Grove, MN: JAM Press.

Andrich, D. (2004). Controversy and the Rasch Model: A Characteristic of Incompatible Paradigms? In J. E.V. Smith & R. M. Smith (Eds.), *Introduction to Rasch Measurement* (pp. 143-166). Maple Grove, MN: JAM Press.

Osterlind Chapter: 10

Session 8

Wolfe, E. W., & Smith, E. V., Jr. (2007). Instrument Development Tools and Activities for Measure Validation Using Rasch Models: Part II—Validation Activities. In E. V. Smith, Jr. & R. M. Smith (Eds.), *Rasch Measurement: Advanced and Specialized Applications* (pp. 243-290). Maple Grove, MN: JAM Press.

Downing Chapter by Becker (30), Buckendahl (31), Haladyna (32)

Session 9

Smith, E. V., Jr. (2004). Detecting and evaluating the impact of multidimensionality using item fit statistics and principal component analysis of residuals. In E. V. Smith, Jr. & R. M. Smith (Eds.), *Introduction to Rasch Measurement* (pp. 575-600). Maple Grove, MN: JAM Press.

Osterlind Chapter: 13

Session 10

Smith, R. M. (2004). Fit Analysis in Latent Trait Measurement Models. In J. E.V. Smith & R. M.
Smith (Eds.), *Introduction to Rasch Measurement* (pp. 73-92). Maple Grove, MN: JAM Press.

Osterlind Chapter: 12

Downing Chapter by Livingston (19)

Session 11

Linacre, J. M. (2004). Optimal rating scale category effectiveness. In E. V. J. Smith & R. M. Smith (Eds.), *Introduction to Rasch Measurement* (pp. 258-278). Maple Grove, MN: JAM Press.

Bode, R. K. (2004). Partial Credit Model and Pivot Anchoring. In E. V. J. Smith & R. M. Smith (Eds.), *Introduction to Rasch Measurement* (pp. 279-295). Maple Grove, MN: JAM Press.

Andrich, D. (2004). Understanding Resistence to the Data-Model Relationship in Rasch's Paradigm: A Reflection for the Next Generation. In J. E.V. Smith & R. M. Smith (Eds.), *Introduction to Rasch Measurement* (pp. 167-200). Maple Grove, MN: JAM Press.

Session 12

Smith, E. V., Jr. (2004). Evidence for the reliability of measures and validity of measure interpretation: A Rasch measurement perspective. In J. E.V. Smith & R. M. Smith (Eds.), *Introduction to Rasch Measurement* (pp. 93-122). Maple Grove, MN: JAM Press.

Osterlind Chapter: 5

Session 13

Smith, E. V., Jr. (2004). Metric development and score reporting in Rasch measurement. In *Introduction to Rasch Measurement* (pp. 366-390). Maple Grove, MN: JAM Press.

Session 14

Smith, R. M., (2004). Detecting item bias with the Rasch model. In *Introduction to Rasch Measurement* (pp. 391-418). Maple Grove, MN: JAM Press.

Clauser, B. E., & Mazor, K. M. (1998). Using statistical procedures to identify differentially functioning test items. *Educational Measurement: Issues and Practice, 17,* 31-44.

Performance Evaluation

1) Data description (10 points). The Data Description assignment requires students to identify and secure a dataset suitable for analysis for the Validation assignment, to obtain written permission to use those data if the data belong to someone else, to complete the Data Description assignment questionnaire on the Blackboard website; and to supply electronic copies of the instrument from which the data were generated, the record layout for the data, and the dataset in Excel or text format. Note that the Texas A&M IRB does not require class research projects to be approved by the IRB unless there is intention of publishing or disseminating study results.
2) Development (35 points). The Development assignment requires you to write a paper in which you develop a theoretical framework for behavioral measurement instrument of your design.

3) Validation paper (35 points). The Validation assignment requires students to produce a written summary that is suitable for publication in a peer-review journal based on analyses completed on the datasets obtained for the Data Description assignment.
4) Final presentation (20 points). Each student gives a 15-20 minutes presentation on his/her validation paper in the last session.

Grading

Course grades are based on the four components listed for performance evaluation.

Points	Grade
86-100	A
76-85	B
66-75	C
51-65	D
Below 50	F

Students with Special Needs

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.

Any student who could require assistance in the event of a necessary evacuation of the building in which this class is taught are asked to notify the instructor so that individuals can be identified to assist him/her during an evacuation.

Academic Dishonesty

Academic Integrity Statement: *An Aggie does not lie, cheat, or steal or tolerate those who do.* As commonly defined, plagiarism consists of passing off as one's own ideas, words, writings, etc. which belong to another. In accordance with this definition, you are committing plagiarism if

you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues, without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the Honor Council Rules and Procedures on the web at aggiehonor.tamu.edu

Kristy Anderson

Subject: FW: EPSY 656 - Survey Instrument Development

From: Gary Briers
Sent: Tuesday, December 10, 2013 1:52 PM
To: Clarice Fulton; Tim Murphy; James Lindner
Cc: Jack Elliot
Subject: RE: EPSY 656 - Survey Instrument Development

The stewards of ALEC 620 (Dr. Lindner) and ALEC 621 (Dr. Wingenbach) saw no problems with the proposed course EPSY 656.

Thus, as chair of our departmental curriculum committee, I recommend that EPSY 656 go forth as planned. The Graduate Faculty of the Department of ALEC has concern with duplication of effort/interference with courses here in ALEC that appear to be related.

Gary Briers

Gary E. Briers
Professor
Department of ALEC
Chair, ALEC Graduate Curriculum Committee
Texas A&M University
College Station, TX 77843-2116

Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional

• Submit original form and attach a course syllabus.•

RECEIVED
DEC 09 2013
GRADUATE STUDIES

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

2. Course prefix, number and complete title of course: GEOL 614 Advanced Hydrogeology

3. Catalog course description (not to exceed 50 words):

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

4. Prerequisite(s): GEOL 410

Cross-listed with: _____ Stacked with: _____

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

5. Is this a variable credit course? ☐ Yes ☑ No If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes ☑ No If yes, this course may be taken _____ times.
Will this course be repeated within the same semester? ☐ Yes ☑ No

7. This course will be:

a. required for students enrolled in the following degree programs(s) *(e.g., B.A. in history)*

b. an elective for students enrolled in the following degree program(s) *(e.g., M.S., Ph.D. in geography)*

M.S. and Ph.D. in Hydrogeology, M.S. and Ph.D. for Water Management and Hydrological Sciences program.

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. **Attach approval letters.**

9.

Prefix	Course #	Title (excluding punctuation)
GEOL	614	ADVANCED HYDROGEOLOGY

Lect.	Lab	SCH	CIP and Fund Code	Admin. Unit	Acad. Year	HEC Code	Level
02	02	03	4006050002	130514-15		003632	U

Approval recommended by:

Department Head or Program Chair *(Type Name & Sign)* — Date 11/4/13

Department Head or Program Chair *(Type Name & Sign)* (if cross-listed course) — Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services — Date

Chair, College Review Committee — Date 12.4.13

Dean of College — Date 12.4.13

Chair, GC or UCC — Date 1-14-14

Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/10

TEXAS A&M UNIVERSITY

SYLLABUS

Course title and number	GEOL 614: Advanced 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. Hydrogeological concepts for geological engineering and environmental applications.

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.

13) **Graduate students can apply the learned fundamentals to carry out mini research term projects related to hydrogeology**.

Instructor Information

Name	Dr. Hongbin Zhan
Telephone number	979-862-7961 (o), 979-574-4819 (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

Fetter, C. W., *Applied Hydrogeology*, Merril Publishing Co., Columbus, OH, 592 pp., 4nd ed., 2001.
Class notes from the instructor will be emailed to the students at the first day of class free of charge.

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.

A term project report is required.

This class is stacked with GEOL 410 (Hydrogeology). In addition to the requirement of that course, a graduate student must complete a term paper from his/her mini research project based on the fundamentals learned from this class.

The final grade is based on the following distribution of exams, homework assignments, and the term project report.

- homework assignments: 30% ;
- term paper: 5% ;
- midterm exam: 30%
- final exam: 35% ;

Numerical grades on homework assignments, term paper, 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

Week	Topic	Required Reading
1	Hydrological Cycle; Management of groundwater.	Fetter Chapter 1.3, 1.5
2	Porosity.	Fetter Chapter 4.2
3	Groundwater potential and hydraulic head.	Fetter Chapter 5.1-5.5
4	Darcy's law and hydraulic conductivity.	Fetter Chapter 4.4
5	Aquifers, aquitards, and aquicludes.	Fetter Chapter 4.5, 4.7
6	Transmissivity and storativity of confined aquifers; Release of water from confined aquifers.	Fetter Chapter 4.10-11
7	Transmissivity and specific yield of unconfined aquifers.	Fetter Chapter 4.6, 4.8
8	Equations of groundwater flow; Analytical solutions of one-dimensional groundwater flow.	Fetter Chapter 5.7
9	Groundwater flow patterns; Groundwater and geology (effective stress, groundwater flow and faulting).	Fetter Chapter 8.6, class notes
10	Land subsidence; Groundwater and geotechnical engineering; Flood control.	Class notes
11	Sea water intrusion.	Fetter Chapter 9.7-9.8
12	Steady-state flow to a well (the Thiem solution).	Fetter Chapter 7.4.2
13	Transient flow to a well: the Theis method and pumping test.	Fetter Chapter 7.3
14	Transient flow to a well in leaky confined and unconfined aquifer and slug test.	Fetter Chapter 7.4.4

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:

Freeze, A. R. and Cherry, J. A., *Groundwater*, Prentice Hall, Englewood Cliffs, NJ, 1979.
Bear, J., *Hydraulics of Groundwater*, McGraw Hill, New York, 567 pp., 1979.
Hiscock, Kevin, *Hydrogeology, Principles and Practice*, Blackwell Publishing, Oxford, UK, 2005.

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."

RECEIVED
DEC 05 2013
GRADUATE STUDIES

Texas A&M University
Departmental Request for a Change in Course
Undergraduate ♦ Graduate ♦ Professional

• Submit original form and attachments •

cc

1. Request submitted by *(Department or Program Name)*: Geology and Geophysics
2. Course prefix, number and complete title of course: GEOL 410 Hydrogeology

Attach a brief supporting statement for changes made to items 3a thru 3d, and 6 below.

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:

Prefix	Course #	Title (excluding punctuation)
GEOL	410	HYDROGEOLOGY

Lect.	Lab	SCH	CIP and Fund Code	Admin. Unit	FICE Code	Level
03	00	03	4006050002	1305	003632	

   b. Change to:

Prefix	Course #	Title (excluding punctuation)
GEOL	410	HYDROGEOLOGY

Lect.	Lab	SCH	CIP and Fund Code	Admin. Unit	Acad. Year	FICE Code	Level
02	02	03	4006050002	1305	14-15	003632	

Approval recommended by:

John R. Giardino 11/5/13
Department Head or Program Chair *(Type Name & Sign)* Date

Chair, College Review Committee Date

Department Head or Program Chair *(Type Name & Sign)* Date
(if cross-listed course)

Dean of College 12.4.13 Date

Submitted to Coordinating Board by:

Chair, GC or UCC Date

Associate Director, Curricular Services Date Effective Date

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

TEXAS A&M UNIVERSITY

SYLLABUS

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.

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Instructor Information

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Class notes from the instructor will be emailed to the students at the first day of class free of charge.

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

Week	Topic	Required Reading
1	Hydrological Cycle; Management of groundwater.	Fetter Chapter 1.3, 1.5
2	Porosity.	Fetter Chapter 4.2
3	Groundwater potential and hydraulic head.	Fetter Chapter 5.1-5.5
4	Darcy's law and hydraulic conductivity.	Fetter Chapter 4.4
5	Aquifers, aquitards, and aquicludes.	Fetter Chapter 4.5, 4.7
6	Transmissivity and storativity of confined aquifers; Release of water from confined aquifers.	Fetter Chapter 4.10-11
7	Transmissivity and specific yield of unconfined aquifers.	Fetter Chapter 4.6, 4.8
8	Equations of groundwater flow; Analytical solutions of one-dimensional groundwater flow.	Fetter Chapter 5.7
9	Groundwater flow patterns; Groundwater and geology (effective stress, groundwater flow and faulting).	Fetter Chapter 8.6, class notes
10	Land subsidence; Groundwater and geotechnical engineering; Flood control.	Class notes
11	Sea water intrusion.	Fetter Chapter 9.7-9.8
12	Steady-state flow to a well (the Thiem solution).	Fetter Chapter 7.4.2
13	Transient flow to a well: the Theis method and pumping test.	Fetter Chapter 7.3
14	Transient flow to a well in leaky confined and unconfined aquifer and slug test.	Fetter Chapter 7.4.4

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:

Freeze, A. R. and Cherry, J. A., *Groundwater*, Prentice Hall, Englewood Cliffs, NJ, 1979.
Bear, J., *Hydraulics of Groundwater*, McGraw Hill, New York, 567 pp., 1979.
Hiscock, Kevin, *Hydrogeology, Principles and Practice*, Blackwell Publishing, Oxford, UK, 2005.

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."

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GRADUATE STUDIES

Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.•

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NOV 25 2013
ESSAP

Form Instructions

1. Request submitted by *(Department or Program Name)*: Aerospace Engineering

2. Course prefix, number and complete title of course: MSEN 641 Plasticity Theory

3. Catalog course description (not to exceed 50 words): Theory of plastic yield and flow of two and three-dimensional bodies; classical plasticity theories, unified viscoplastic theories, numerical considerations; applications and comparisons of theory to experiment.

4. Prerequisite(s): MEMA 601 or MEMA 602

   Cross-listed with: MEMA 641 Stacked with: _____

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

5. Is this a variable credit course? ☐ Yes ☒ No If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes ☒ No If yes, this course may be taken _____ times.
   Will this course be repeated within the same semester? ☐ Yes ☒ No

7. This course will be:
   a. required for students enrolled in the following degree programs(s) *(e.g., B.A. in history)*

   b. an elective for students enrolled in the following degree program(s) *(e.g., M.S., Ph.D. in geography)*
   graduate students in aerospace engineering, materials science or related fields

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. **Attach approval letters.**

9.

Prefix	Course #	Title (excluding punctuation)
MSEN	641	PLASTICITY THEORY

Lect.	Lab	SCH	CIP and Fund Code	Admin. Unit	Acad. Year	FICE Code
03	00	03	14110106	1864	14-15	003632

Level: 6

Approval recommended by:

John E. Hurtado, AERO — 11-19-13
Department Head or Program Chair *(Type Name & Sign)* — Date

Ibrahim Karaman, MSEN — 11-25-13
Department Head or Program Chair *(Type Name & Sign)* — Date
(if cross-listed course)

John Criscione — 12/17/13
Chair, College Review Committee — Date

John Criscione — 12/17/13
Dean of College — Date

Mark J. Zoran — 1-14-14
Chair, GC or UCC — Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services — Date — Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/10

TEXAS A&M UNIVERSITY

SYLLABUS

AEROSPACE ENGINEERING

Course title and number	**MSEN 641/ MEMA 641 Plasticity Theory**
Term	**Spring 2014**
Meeting times and location	TR 9:35-10:50, HRBB 105

Course Description and Prerequisites

Theory of plastic yield and flow of two and three-dimensional bodies; classical plasticity theories, unified viscoplastic theories, numerical considerations; applications and comparisons of theory to experiment.

Prerequisites: MEMA 601 or MEMA 602

Students should have an undergraduate materials science course and graduate course AERO 605/MEMA 601 Theory of Elasticity or MEMA 602 Advanced Materials Science and Engineering before enrolling.

Learning Outcomes or Course Objectives

1) Understand the role that dislocations play in the macroscopic yield and flow of metals.
2) Understand the components of classical, rate independent plasticity: the yield function, consistency condition, and hardening rule.
3) Be able to formulate and analytically solve three boundary value problems: torsion of bars, bending of beams, and an internally pressurized cylinder.
4) Understand the thermodynamics of plasticity including the use of internal state variables to represent microstructures.
5) Understand the structure of unified viscoplastic constitutive equations used for high temperature applications including transient creep, steady state creep, stress relaxation, and cyclic loading.
6) Understand how the yield surface of polycrystals can be constructed using the yield surfaces of the constituent grains.
7) Understand how plasticity due to phase transformation differs from dislocation-based plasticity.

Instructor Information

Name	James G. Boyd
Telephone	979-458-0419
Email address	jgboyd@aero.tamu.edu
Office hours	Open and by appointment
Office location	HRBB 741C

Time and Location:
TR 9:35-10:50, HRBB 105

Textbook and/or Resource Material

Plasticity Theory, by Jacob Lubliner

Grading Policies

Grading	
Homework	40%
Exam 1	20%
Exam 2	20%
Final exam	20%
Total	100%

Grading Scale
A 90 – 100%
B 80 – 89%
C 70 – 79%
D 60 – 69%
F below 60%

Course Topics, Calendar of Activities, Major Assignment Dates

Subjects that will be covered:

Topic	**Number of Lectures**
Review of elasticity	2
Physics of plasticity	3
Classical plasticity	5
Boundary value problems	3
Modern plasticity, internal variables	3
High temperature plasticity	4
Anisotropy	1
Single crystal plasticity	4
Transformation plasticity, shape memory	2
Exams	3 (2 + final exam)
TOTAL	30

Exam Dates
Exam 1: March 4
Exam 2: April 17

Final Exam Schedule:
The final exam is scheduled for Friday, May 2, 12:30 – 2:30am.

Other Pertinent Course Information

Attendance: The instructor has no attendance requirement for regular lectures. However, makeup exams will be given only for University excused absences. For additional information, including University excused absences, visit the student rules website on attendance: http://student-rules.tamu.edu/rule07 .

Electronic Noise: Pagers, telephones, watches, and all other electronic noise making devices are not allowed to make noise during the lecture.

Food and Drink: You may not eat or drink in class or in lab.

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Academic Integrity

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

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

It is the responsibility of students and instructors to help maintain scholastic integrity at the University by refusing to participate in or tolerate scholastic dishonesty. (*Student Rule 20. Scholastic Dishonesty*, http://student-rules.tamu.edu) An excerpt from the Philosophy and Rational section states, "Apathy or acquiescence in the presence of academic dishonesty is not a neutral act – failure to confront and deter it will reinforce, perpetuate, and enlarge the scope of such misconduct. Academic dishonesty is the most corrosive force in the academic life of a university."