

**GEO. 420K - INTRODUCTION TO FIELD AND STRATIGRAPHIC METHODS  
MONDAY/WEDNESDAY SECTIONS, SPRING 2017**

**LECTURE:** Monday and Wednesday, 2:00 - 3:00 p.m.; JGB 2.218

**LAB:** Friday 2:00 - 5:00 p.m. in EPS 2.104 (#26865), EPS 4.104 (#26875), JGB 2.308 (#26880)

**INSTRUCTORS:**

Dr. Mark Helper, JGB 4.112 helper@jsg.utexas.edu Phone: Office: 512- 471-1009 Mobile: 512-924-2526	Mr. Benjamin Smith, JGB 6.142 bsmithguitarman@gmail.com Phone: Office: Mobile: 281-253-5737
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**TEACHING ASSISTANTS:**  
EPS 2.104  
EPS 4.104  
JGB 2.308

**OFFICE HOURS:** Helper: M, W, F 1-2 and whenever my door is open.  
Smith: T, Th 2-3 or by appointment

**GRADING:**

Field Projects .....	55%	There will be no makeup exams or projects.
Labs .....	15%	
Lab Exam(s).....	15%	
Class Exam(s) .....	15%	

**PREREQUISITES:** A grade of C or better in Geo. 416K, 426P, and 416M (Geo. 426P may be taken concurrently with 420K) for B.S. Geology, or C or better in Geo. 416M and Geo. 416K for G.E.H., Geophysics, Hydrogeology and B.A. Geology. If you do not have these prerequisites and have not already done so, see one of us immediately.

**OTHER ITEMS:** By registering for Geo. 420K, students agree to be available for field trips on at least **6 (six)** weekends, though we will likely use only 5 this semester. See the attached schedule for the dates trips are planned. In addition some Friday labs will be conducted off campus, but during normally scheduled lab hours.

**Announcements, information pertinent to field trips, labs, etc. will be posted on the 420K Canvas site. Check it often for information about materials for upcoming labs and field trips.**

Academic dishonesty will not be tolerated. Anyone in violation of University policy (see Student Handbook) will receive a failing grade and is subject to additional punitive measures, which may include expulsion from the University.

**REQUIRED TEXT:** Coe, A. L., Geological Field Techniques. Wiley-Blackwell, 323 pp.  
Lisle, R.J., Brabham, P.J. and Barnes, J.W., Basic Geologic Mapping, 5<sup>th</sup> edition, Wiley-Blackwell, 216 pp.  
Geo420K Lecture, Lab and Field Trip Manual, available from UT Duplicating Center the 2<sup>nd</sup> week of class.

**WEB SITE:** UT Canvas site for Geo420K

**REQUIRED ITEMS:** See Attached list. These items are available in a supply packet at the University Coop.

**GEO. 420K - INTRODUCTION TO FIELD AND STRATIGRAPHIC METHODS**  
**TUESDAY/THURSDAY SECTIONS, SPRING 2017**

**LECTURE:** Tuesday and Thursday, 2:00 - 3:00 p.m.; JGB 3.120

**LAB:** Friday 2:00 - 5:00 p.m. in JGB 3.116 (#26885), JGB 3.120 (#26890), JGB 3.222 (#26900)

**INSTRUCTORS:** Dr. Michael Prior, EPS 4.102B  
mprior@utexas.edu  
Phone: Office:  
Mobile: (714)-270-9968

Dr. Timothy (Tip) Meckel  
tip.meckel@beg.utexas.edu  
Phone: Office: 512-471-4306  
Mobile: (512)-364-9142

**TEACHING ASSISTANTS:**  
JGB 3.116  
JGB 3.120  
JGB 3.222

**OFFICE HOURS:** Prior: Tuesday, Wednesday, and Thursday, 1-2 PM  
Meckel: Tuesday 1-2 PM, JSG Student Center (by prior appointment)

**GRADING:**

Field Projects .....	55%	There will be no makeup exams or projects.
Labs .....	15%	
Lab Exam(s).....	15%	
Class Exam(s) .....	15%	

**PREREQUISITES:** A grade of C or better in Geo. 416K, 426P, and 416M (Geo. 426P may be taken concurrently with 420K) for B.S. Geology, or C or better in Geo. 416M and Geo. 416K for G.E.H., Geophysics, Hydrogeology and B.A. Geology. If you do not have these prerequisites and have not already done so, see one of us immediately.

**OTHER ITEMS:** By registering for Geo. 420K, students agree to be available for field trips on at least **6 (six)** weekends, though we will likely use only 5 this semester. See the attached schedule for the dates trips are planned. In addition some Friday labs will be conducted off campus, but during normally scheduled lab hours.

**Announcements, information pertinent to field trips, labs, etc. will be posted on the 420K Canvas site. Check it often for information about materials for upcoming labs and field trips.**

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Geo420K Lecture, Lab and Field Trip Manual, available from UT Duplicating Center the 2<sup>nd</sup> week of class.

**WEB SITE:** UT Canvas site for Geo420K

**REQUIRED ITEMS:** See Attached list. These items are available in a supply packet at the University Coop.

**GEO420K – FIELD TRIP DATES**  
**Monday/Wednesday Sections, SPRING 2017**

By registering for GEO 420K, you agree to be available for field trips on at least six weekends. The five field trip weekends this semester for the MW class are:

- Trip 1: January 28 AND 29 – Drs. Helper & Prior
- Trip 2: February 11 or 12– Dr. Helper
- Trip 3: February 25 or 26 – Dr. Helper
- Trip 4: April 8 or 9 – Mr. Smith
- Trip 5: April 22 or 23 – Mr. Smith

These dates are provided to you now so that you can plan your spring semester weekend activities accordingly. Unlike other courses, the field trips are not supplementary to the classroom work; *they are 55% of your grade*. **Your attendance and participation in all field exercises are required for a passing grade, without exceptions.** Specific information for each trip, *including which days you are expected to attend*, will be posted on the class Canvas site and can be found in the Lab/Field Trip Manual.

A list of materials needed for the field exercises, all contained in the **required** course packet available from the Co-Op, is attached.



**GEO. 420K – FIELD TRIP DATES**  
**Tuesday/Thursday Sections, SPRING 2017**

By registering for GEO 420K, you agree to be available for field trips on at least six weekends. The five trip weekends for the TTh class this semester are:

- Trip 1: February 4 AND 5 – Drs. Prior and Helper
- Trip 2: February 18 or 19– Dr. Prior
- Trip 3: March 4 or 5 – Dr. Prior
- Trip 4: April 15 or 16 – Dr. Meckel
- Trip 5: April 29 or 30 – Dr. Meckel

These dates are provided to you now so that you can plan your spring semester weekend activities accordingly. Unlike other courses, the field trips are not supplementary to the classroom work; *they are 55% of your grade*. **Your attendance and participation in all field exercises are required for a passing grade, without exceptions.** Specific information for each trip, *including which days you are expected to attend*, will be posted on the “Trips” pages of the class Canvas site and can be found in the Lab/Lecture Manual.

A list of materials needed for the field exercises, all contained in the **required** course packet available from the Co-Op, is attached.

LECTURE AND LAB SCHEDULE - GEO. 420K, MW Sections, 2017

**DRAFT – TOPICS SUBJECT TO CHANGE**

<u>Date</u>	<u>Lecture</u>	<u>Lab</u>
1/18	Overview and Introduction The Geologic Compass – Strike/Dip, Bearing/Plunge (M. H.)	1. Compass/Pace and Compass Map*
1/23	Base Maps, Grids and Location Methods (M. H.)	2. Topographic Maps & GPS
1/25	Field Trip 1 Prep. & Cenozoic Geology of Central Texas <b>Field Trip 1: Mapping Project 1 (1/28 AND 1/29)</b>	
1/30	The Global Positioning System (M. H.)	3. Geologic Maps I
2/1	Geologic Map Patterns; Strike Lines, Dip & Unit Thickness (M. H.)	
2/6	Introduction to Faults (M. H.)	4. Geologic Maps II
2/8	Field Trip 1 Debrief; Trip 2 Prep.; Paleozoic of Llano Uplift (M. H.) <b>Field Trip 2: Mapping Project 2 (2/11 or 2/12)</b>	
2/13	Introduction to Folds (M. H.)	5. Geologic Maps III/ Folds and Faults
2/15	Metamorphic Rocks: Textures and Fabrics in Tectonites (M. H.)	
2/20	Precambrian Geology of the Llano Uplift (M. H.)	6. Describing Metamorphic Rocks
2/22	Field Trip 2 Debrief; Trip 3 Preparation (M.H.) <b>Field Trip 3: Sketching and Measuring in pC Rocks (2/25 or 2/26)</b>	
2/27	Down Plunge Viewing/Geologic Maps as Cross Sections (M. H.)	7. Cross Sections
3/1	Cross Section Construction (M. H.)	
3/6	Digital Mapping Tools and Techniques (M. H.)	8. No Lab
3/8	Field Trip 3 Debrief (M. H.)	
3/11 - 3/19 SPRING BREAK		
3/20	Sedimentary Rock Description: Essential Elements (B. S.)	9. Rock and Rock Unit Descriptions
3/22	Vertical Successions in Clastic Strata (B. S.)	
3/27	Basic Stratigraphy and Approaches to Subsurface Mapping (B. S.)	10. Net Sand Isopach Mapping
3/29	Texas GOM history and Tertiary Regional Context (B. S.)	
4/3	Scales of Cyclicity and Correlation of Sedimentary Rocks (B. S.)	11. Cyclicity/ Fisher Plots
4/5	Trip 4 Prep. (B. S.) <b>Field Trip 4: Tertiary Clastics (4/8 or 4/9)</b>	
4/10	Cretaceous Stratigraphy of Central Texas (B. S.)	12. Unconformities, Correlation & Facies
4/12	Biostratigraphy, Sed. Structures, Trace Fossils, Fauna (B. S.)	
4/17	Chronostratigraphy and Age Dating of Sedimentary Rocks (B. S.)	13. Maps, time-stratigraphic reconstructions
4/19	Logging Carbonate Strata; Trip 4 Debrief & Trip 5 Prep. (B. S.) <b>Field Trip 5: Cretaceous Carbonate Section Correlation (4/22 or 4/23)</b>	relations & geologic
4/24	Chronostratigraphy and Age Dating of Sedimentary Rocks (B. S.)	
4/26	Lithostratigraphy, Chronostratigraphy, and Tools for Correlation	14. Exam Review
5/1	Trip 5 Debrief (B. S.)	15. Lab Final
5/3	Course Evaluation and Review (B. S.)	
TBA	<b>Final Exam</b>	

\* Lab conducted outdoors, prepare accordingly.

(M. H.) - Dr. Mark Heper

(B. S.) – Mr. Benjamin Smith

LECTURE AND LAB SCHEDULE - GEO. 420K, TTH Sections, 2017

**DRAFT – TOPICS SUBJECT TO CHANGE**

<u>Date</u>	<u>Lecture</u>	<u>Lab</u>
1/17	Overview and Introduction (M. H., T.M. & M. P.)	1. Compass/Pace and Compass Map*
1/19	The Geologic Compass – Strike/Dip, Bearing/Plunge (M. P.)	
1/24	Base Maps, Grids and Location Methods (M. P.)	2. Topographic Maps & GPS
1/26	The Global Positioning System (M. P.)	
1/31	Geologic Map Patterns; Strike Lines, Dip & Unit Thickness (M. P.)	3. Geologic Maps I
2/2	Field Trip 1 Prep. & Cenozoic Geology, Central Texas <b>Field Trip 1: Mapping Project 1 (2/4 AND 2/5)</b>	
2/7	Introduction to Faulting (M. P.)	4. Geologic Maps II
2/9	Introduction to Folding (M. P.)	
2/14	Down Plunge Viewing/Geologic Maps as Cross Sections (M. P.)	5. Geologic Maps III/ Folds and Faults
2/16	Field Trip 1 Debrief; Trip 2 Prep.; Paleozoic of Llano Uplift (M. P.) <b>Field Trip 2: Mapping Project 2 (2/18 or 2/19)</b>	
2/21	Cross Section Construction (M. P.)	6. Cross Sections
2/23	Metamorphic Rocks: Textures and Fabrics in Tectonites (M. P.)	
2/28	Precambrian Geology of the Llano Uplift (M. P.)	7. Describing Metamorphic Rocks
3/2	Field Trip 2 Debrief; Trip 3 Prep.; <b>Field Trip 3: Sketching and Measuring in pC Rocks (3/4 or 3/5)</b>	
3/7	Digital Mapping Tools and Techniques (M. P.)	8. No Lab
3/9	Field Trip 3 Debrief (M. P.)	
3/11 - 3/19 SPRING BREAK		
3/21	Sedimentary Rock Description: Essential Elements (T.M.)	9. Rock and Rock Unit
3/23	Vertical Successions in Clastic (T.M.)	
3/28	Basic Stratigraphy and Approaches to Subsurface Mapping (T.M.)	10. Net Sand Isopach Mapping
3/30	Texas GOM history and Tertiary Regional Context (T.M.)	
4/4	Scales of Cyclicity and Correlation of Sedimentary Rocks	11. Cyclicity/ Fisher Plots
4/6	Cretaceous Stratigraphy of Central Texas (T.M.)	
4/11	Biostratigraphy; Sed. Structures, Trace Fossils, Fauna	12. Unconformities, Correlation & Facies
4/13	Trip 4 Prep. <b>Field Trip 4: Tertiary Clastics (4/15 or 4/16)</b>	
4/18	Chronostratigraphy and Age Dating of Sedimentary Rocks (T.M.)	13. Maps, time-stratigraphic relations & geologic reconstructions
4/20	Lithostratigraphy, Chronostratigraphy, and Tools for Correlation	
4/25	Logging Carbonate Strata (T.M.)	14. Exam Review
4/27	Trip 4 Debrief & Trip 5 Prep. (T.M.) <b>Field Trip 5: Cretaceous Carbonate Section Correlation (4/29 or 4/30)</b>	
5/2	Trip 5 Debrief (T.M.)	15. Lab Final
5/4	Course Evaluation and Review (T.M.)	
TBD	<b>Final Exam</b>	

\* Lab conducted outdoors, prepare accordingly.

M. P. – Dr. Michael Prior

T. M. – Dr. Tip Meckel

GEO 420K - EQUIPMENT LIST

**THESE MATERIALS ARE REQUIRED** and are available in a single course packet for sale at the UT Co-Op. This packet contains the least expensive versions of the items that YOU WILL NEED for the class. **PLEASE PURCHASE THE COURSE PACKET** and *don't shop for alternatives*.

**REQUIRED MATERIALS**

Field notebook with waterproof paper (e.g. surveyor's field book)  
Geologic hammer  
Hand lens - 10X Mag. or better  
Small squirt bottle for acid (acid will be provided)  
Six-inch ruler with mm and inch scale (best if with a protractor)  
Protractor, smaller is better  
Mechanical Pencil: Pentel 0.5 mm or equivalent with F or 2H hardness lead  
Colored pencil set - 6 colors minimum; hard lead, shouldn't smudge  
2 technical (drafting) pens (#0 and #00)  
Proper field clothes, particularly hat and shoes/boots  
Clipboard with cover (standard 8 1/2 x 11" size, without a large metal clip)  
Erasers/liquid paper  
Canteen (1 or 2 one-quart canteens)  
Watch  
Knapsack or carrying bag  
Grain size scale card – available in the JSG undergraduate office

**DESIRABLE MATERIALS:**

Rainwear  
Aspirin, chap stick, bandaids, sunscreen or tanning lotion, insect repellent, etc.  
Toilet paper

**PROHIBITED ITEMS:**

Firearms  
Alcoholic beverages in University vehicles  
Controlled substances and narcotics