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GEOG 385.01: Field Techniques in Geography

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GEOGRAPHY 385: FIELD TECHNIQUES IN GEOGRAPHY

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> *Underlying what I am trying to say is the conviction that geography is first of all knowledge gained by observation, that one orders by reflection and reinspection the things one has been looking at, and that from what one has experienced by intimate sight come comparison and synthesis. In other words, the principal training of the geographer should come, wherever possible, by doing field work. The important question here is not whether he gets practice in mapping techniques but whether he learns to recognize forms that express function and process, to see problems implicit in location and areal extension, to think about joint or disjunct occurrence.*
>
> —Carl O. Sauer, *The Education of a Geographer*

Introduction

This course is intended to give students practical experience useful in designing and implementing a research project in geography. The instructor's principal area of expertise is physical geography, but we will emphasize surveying, mapping, and sampling approaches that apply across intradisciplinary boundaries. We will complete several field projects during the course of which we will learn to use field instruments and computer techniques for recording and analyzing data and creating maps of our results.

Using several projects as templates, we will address the following issues:

- What is an interesting/important research question in physical geography?
- What is the significance of this topic?
- What previous research has been done on this topic?
- Based on the data available, can this question be formulated as a hypothesis?
- What data would be useful to answer the question (test the hypothesis)?
- What tools and skills will be required to collect the data?
- How will the data be recorded and described in the field?
- How will the data be analyzed, interpreted, and presented?
- How will alternative explanations for the data be evaluated?

Course Mechanics

The course is structured to include on average two to three hours of lecture, instructional, and organizational time each week, along with the equivalent of about 6-7 full days ("full" days = 8-12 hours) in the field. Fieldwork will be occasionally strenuous and will almost certainly take place regardless of inclement weather. Students should be prepared to work in rain, snow, ice, sleet, wind, cold, dense brush, viscous mud, and both flowing and standing water, although hopefully not all of these hazards will be encountered at the same time.

About half of the regularly-scheduled morning sessions will be used for lectures. Additional time periods will be used for computer labs, equipment training, and field trip planning. Students should schedule additional time (at least 1-2 hours every week, sometimes more) for individual and group laboratory work, including computer training and data entry and analysis.

Most of the field work in this class will be done in small groups of 2-8 students. In most cases you will schedule field trips for time periods that are convenient for your group and either the instructor or the teaching assistant (or both). However, there are several required weekend commitments:

- Compass traverse training is scheduled for Saturday morning, Sep. 7th. You should be able to complete the necessary training before noon. For students unable to attend this Saturday session, one makeup time slot will be scheduled at the instructors' convenience for a weekday afternoon, Sep. 9th-13th.
- Topographic surveying (theodolite and total station) will take place on the weekend of Sep. 28th-29th. This project will require one full day (either Saturday or Sunday) from each student.

If you are unable to participate on any one of these days, please make alternate arrangements well beforehand with the instructor or TA to cover the material. You will schedule several additional field days at your convenience for training and data collection for small group projects (see course outline).

Grades will be based on the following:

- field notes (turned in after each major field day, making up 12% of the semester grade)
- three small group projects based on field exercises (due on Sep. 28th, Oct. 19th, and Nov. 9th, each one worth 12%)
- occasional homework assignments totaling 12%
- an in-class midterm exam and a "practical" final exam, each worth 10%
- a final project worth 20% of the total.

The small group reports will each be approximately 3-5 pages including any tables, graphs, and maps; the final project will be somewhat more substantial and will conform to professional report standards (to be addressed in a handout later in the semester).

Readings

There is no single textbook for field techniques, but the following Forest Service publication is required reading for this class:

Harrelson, C.C., C.L.Rawlins, and J.P.Potyondy, 1994, *Stream Channel Reference Sites: An Illustrated Guide to Field Technique*. Fort Collins, CO: U.S.D.A. Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM-245.

That booklet is available on 24-hour "local reserve" (2nd floor lockers), and as a PDF file on \\Talcott\Geog385\Readings.

Additional practical and methodological guidance can be found in an excellent guidebook by Australian hydrologists:

Gordon, N.D., T.A.McMahon, and B.L.Finlayson, 1992, *Stream Hydrology: An Introduction for Ecologists*. Chichester: Wiley.

That book is on reserve; chapters 4-5 are especially useful.

Selected journal articles, book chapters, and handouts will also be required and/or recommended reading. Reading lists will be distributed periodically throughout the semester; these readings will be available in the "reserve locker" at the Geography Department.

Finally, to complement the methodological emphasis of the assigned readings, each student should spend a couple hours reviewing the principles behind field techniques in the following two books (on reserve):

Haring, L.L., J.F.Lounsbury, and J.W.Frazier, 1992, *Introduction to Scientific Geographic Research* (4th edition). Dubuque: Wm. C. Brown Publishers.

Stoddard, R.H., 1982, *Field Techniques and Research Methods in Geography*. Dubuque: Kendall/Hunt.

Materials

You will need a water-resistant field notebook ("Rite in the Rain"-style, 4.375"x7.25", columns left, graph right) and a pencil (must be #3 or harder).

Geography 385: Field Techniques in Geography—Course Outline (Fall 2002, version 1.0)

Week	Date	Topic
1	3-Sep	Introduction to the course; computer orientation
	5-Sep	Surveying Techniques I: notetaking and data entry; compass traverse surveying
	7-Sep	**Field Day 1 (Saturday): The Compass Traverse**
2	10-Sep	Precision and accuracy; Sources of error; Compass traverse survey data entry
	12-Sep	Video presentation/discussion: Taller Than Everest
3	17-Sep	Surveying Techniques II: cross-section surveying, leveling
	19-Sep	*no class meeting: small group training - leveling and stream survey techniques*
		Field Day 2 (to be arranged): Leveling and Stream Cross-Section Survey (First Small Group Project: due Friday, 9/27)
4	*24-Sep*	*no class meeting: independent leveling survey data entry and analysis*
	26-Sep	Surveying Techniques III: topographic survey, theodolite, total station
	28-Sep	**Field Day 3 (Saturday/Sunday): Topographic Survey (Second Small Group Project: due Friday, 10/18)**
5	1-Oct	computer techniques: working with topographic data (basic tools)
	3-Oct	*no class meeting: independent topographic survey data entry and analysis*
6	*8-Oct*	*no class meeting: independent work on topo map project*
	10-Oct	Surveying Techniques IV: GPS
		Field Day 4 (to be arranged): GPS Mapping
7	15-Oct	GPS surveying, continued
	17-Oct	Midterm Exam
8	22-Oct	Biogeographic Techniques
	24-Oct	*no class meeting: biogeographic techniques training session*
		Field Day 5 (to be arranged): vegetation survey (Third Small Group Project: due Friday, 11/8)
9	29-Oct	Sampling Techniques I: Principles & Design
	31-Oct	*no class meeting: sampling techniques training session*
10	5-Nov	Sampling Techniques II: Statistical Analysis
	7-Nov	*no class meeting: sampling techniques training session*
11	12-Nov	Sampling Techniques III: urban geographic case studies
	14-Nov	computer techniques: working with topographic data (advanced techniques)
12	19-Nov	case studies: topographic and GPS surveying (White Mountain Boulder Train; Moorea lagoon)
	21-Nov	*no class meeting: independent work on final project*
13	26-Nov	case study: sediment analysis
	28-Nov	*Thanksgiving—no class*
14	3-Dec	independent work on final project
	5-Dec	independent work on final project
15	10-Dec	Final Project Reports (attendance required at all sessions)
	12-Dec	Final Project Reports
	19-Dec	*Scheduled Final Exam time period, 10:10–12:10*