

GEOGRAPHY COURSE OUTLINE 2004 (FALL)

GEOGRAPHY 307 H(3-2) (AREA III)
LANDFORM PROCESSES AND MORPHOLOGY

Timetable: FALL SESSION**Catalogue #:** 2544

Lec 01 TR 12:30 75 ES 443
 Lab 01 Replaced with four one-day field trips, field trip reports, and three two-hour map interpretation and aerial photo labs (labs: November and December)

Instructors:

Derald G. Smith

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Aaron Williams

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Gisele Fortier

Office: ES 316**Office Hours:** TBA**Phone:** 220-5587**E-mail:** gffortie@ucalgary.ca**DATE****TENTATIVE LECTURE SCHEDULE & TOPICS**

September 9 Introduction, course objectives, grading scheme, laboratory information, tips on how to study, take notes, write field trip reports, aerial photo interpretation, labs and exams. Glaciology lecture.

September 14 Glaciology defn. cause, glacier flow behaviour, surges, thermal regimes, mass balance and movements, time lags and ice structures.

September 16 Mountain glacial landforms (erosional and depositional) plus glaciofluvial and glaciolacustrine processes and deposits.

September 18 (Saturday) Field Trip #1: Columbia Icefield and braiding rivers, Banff Park. Leave 0700 hrs (from Parking Lot #20, north side of Earth Sciences Building), return 2000 hrs.

September 19 (Sunday) Field Trip #2: Nose Hill, Fish Creek Park, Porcupine Hills, Chain Lakes. Leave 0800 hrs, return 1800 hrs from Parking Lot #20.

September 21 Continental glacier landforms and deposits.

September 23 Glacial chronology (advances and retreats, problems, sea level fluctuations and rebound). Extent of North American and Eurasian ice sheets. Glacial history of Banff-Yoho Parks, Calgary area and southwestern Alberta.

September 28 Glacial and pluvial lakes (Agassiz, Champlain, McConnell, Missoula, Bonneville, and others). Video (Missoula Flood, pers. copy).

September 30 Major Quaternary scientific problems: 1) extinction of Pleistocene megafauna; 2) ice free corridor and peopling of North America; 3) causes of global climate changes and glaciations (past, present, future); 4) impacts of sea level rise or fall due to glaciation.

October 5 Periglacial forms; ground ice, pingos, rock glaciers, soliflucation, needle ice, peatlands.

October 7 Permafrost; defn., extent, thermokarst, how people cope with developments on frozen ground.

October 12 River hydrology and sediment transport.

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| October 14 | Concept of the graded, degraded and aggrading river, river classification schemes, channel morphology, bed and bank processes. Hjulstrom sediment erosion curve. |
| October 16 | (Saturday) Field Trip #3: Kananaskis Valley, Canmore, Ghost Res., Cochrane. Leave 0700 hrs, return 1900 hrs. |
| October 17 | (Sunday) Field Trip #4: Drumheller Badlands, Red Dee River. Leave 0700 hrs, return 1900 hrs. |
| October 19 | Degrading rivers: terraces, gorges, shale badlands, pediments. |
| October 21 | Braided river plains and Alluvial fans, river planning. |
| October 26 | Meandering river and lateral accretion deposition model, anastomosing river model. |
| October 28 | MID-TERM EXAM (20%) all material through October 18 – mass movements |
| November 2 | Aeolian (wind) processes and landforms; impact of devegetation and recreation vehicles. |
| November 4 | Karst (limestone solution) processes and terrain. |
| November 5 | First Lab (1-3 pm and 3-5 pm in ES 355) |
| November 9 | Mass movements, classification, causes, fall, slides, debris flows. |
| November 11 | READING DAYS (no classes) |
| November 16 | Mass movements, earth flows, colluvial processes, and colluvial debris flows, (video, Debris Flow Dynamics XMV055518). |
| November 18 | Coastal beach processes (short movie film, XMP00640-01), Waves and Currents. Coastal landforms, beach types, sediment characteristics, barrier islands, wave-influenced coasts. |
| November 19 | Second Lab (1-3 pm and 3-5 pm in ES 355) |
| November 23 | Marine river deltas, tides and tidal estuaries (video Miss. Delta, XMV57412). |
| November 25 | Lacustrine (lake) systems: importance in Canada, causes of lakes, shore processes, river deltas in lakes, major problems. |
| November 30 | Coastal processes, sea shelf and deep sea terrain processes. |
| December 2 | Global tectonics (video, XMV60877). Global tectonics, mega scale features - continents and ocean basins, meso scale features - mountains and plains; micro scale effects local landforms to be discussed in the remainder of the term. |
| December 3 | Third Lab (1-3 pm and 3-5 pm in ES 355) |
| December 7 | Volcanism classification volcanoes and flows (short film, XMP-01452), Hawaiian volcanoes. |
| December 9 | Volcanic intrusives and associated terrain (short film, XMP00918), Fire Under the Sea, Origin of Pillow Lava, concluding remarks. |
| Dec 13-22 | FINAL EXAM (25%) to be scheduled by the Registrar's Office. |

Field Trip Reports:

All reports are to be turned in to the Teaching Assistant, (fourth floor dropbox) by 1800 hrs on the day they are due. Late reports will be deducted a half-point per day unless the student has a

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medical or other excuse (i.e., a letter signed by an authorized physician). Reports will be graded and returned to the students in lecture one week following the report due dates listed below. All questions about grading of field reports, aerial photo lab reports should be discussed with the teaching assistant. Lectures and examination questions should be discussed with Professors Smith and Williams.

DATES: Sept 18 & 19 **FIELD TRIP REPORTS:** Field Trip: Columbia Ice Fields & Little Bow R. **DUE:** Oct 1 & Oct 15, respectively

Oct 16 & 17 Field Trips: Bow-Valley-Cochrane & Drumheller Oct 29 & Nov 15, respectively
All field trip and lab reports will be graded by teaching assistant Gisele Fortier.

Field Trip Information:

All field trips will leave from lot #20 north of the Earth Sciences Building at 0700 or 0800 hrs and use 14-passenger vans. Always bring a substantial lunch, snack and a non-alcoholic beverage(s) (or water bottle). Due to often adverse weather conditions, bring warm clothing (i.e., ski jacket, windbreaker, sweaters, toque, gloves, sun glasses, runners with grip soles (not smooth), or hiking boots). Bring a notebook and camera to record field observations for your field reports.

NOTE: A university-approved mandatory field trip fee of \$40.00 has been assessed for this course; and will be added to your university course fees.

Labs:

Three labs in November will meet in two groups in ES 355 (see lecture schedule). Labs will use the book Landforms of Alberta and stereoscopes (provided by the department) to better understand landforms through the interpretation of aerial photographs and maps. Laboratory exercises will be held during November 5, 19 and December 3 (Lab 01 at 1:00 and Lab 02 at 3:00 pm). Completed lab exercises are to be returned to the Teaching Assistant. Please place completed exercises in Gisele Fortier's 4th floor drop box one week after the lab session except for the first lab which will be due November 15.

Grading:

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| Four field trip reports | 40% (reports will each count 10% of total grade) |
| Mid-term exam | 20% (October 23) |
| Lab exercises | 15% (3 aerial photo labs, 5 points each lab) |
| Final exam | 25% (to be scheduled by the Registrar's Office) |

Course Grade

Percentage to letter conversion

| % Score | Letter Grade |
|---------|--------------|
| 0-50 | F |
| 50-58 | D |
| 58-62 | D+ |
| 62-66 | C- |
| 66-70 | C |
| 70-74 | C+ |
| 74-78 | B- |
| 78-82 | B |
| 82-86 | B+ |
| 86-90 | A- |
| 90-94 | A |

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| 94-100 | A+ |
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It is necessary to attend and pass both field trips and reports, labs and all exams in order to receive a passing grade for the entire course. A passing grade is greater than 50% of the possible 100 percentage points for the course.

Textbooks:

Course textbooks from the bookstore are not mandatory, but are strongly suggested as supplementary reading to the lecture material.

Easterbrook, 1998. *Surface Processes and Landforms*. (about \$100.00 hardback)
Beatty, 1975. *Landscapes of Southern Alberta*, about \$5.00 paperback.

Prerequisite: Geography 201 or Geology 201, 203 or 209.

The above could be revised and changed before the beginning of classes.

Re: Posting of Grades and Picking-up of Assignments

- Assignments will be handed back only in class or by the Professor at pre-arranged time(s).
- If you would like to receive your assignment through the mail, please include an appropriately sized self-addressed, stamped envelope with your assignment when you hand it in to the professor.
- Posting of grades will be at the discretion of each Professor and, if posted, they will be scrambled. Please note, grades will not be available in the Geography office.