TRIAL COURSE OR NEW COURSE PROPOSAL
(Attach copy of syllabus)

SUBMITTED BY:

<table>
<thead>
<tr>
<th>Department</th>
<th>Geosciences</th>
<th>College/School</th>
<th>CNSM</th>
</tr>
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<tbody>
<tr>
<td>Prepared by</td>
<td>Carey de Wit</td>
<td>Phone</td>
<td>x7141</td>
</tr>
<tr>
<td>Email Contact</td>
<td><a href="mailto:cwendwit@alaska.edu">cwendwit@alaska.edu</a></td>
<td>Faculty Contact</td>
<td>Daniel Mann</td>
</tr>
</tbody>
</table>

1. ACTION DESIRED (CHECK ONE):

| Trial Course | New Course | X |

2. COURSE IDENTIFICATION:

| Dept | GEOG | Course # | F478/678 | No. of Credits | 3 |

Justify upper/lower division status & number of credits:

This is a synthesis course that weaves together a diversity of "knowledge threads" from geography, geology, ecology, anthropology, and climatology that together describe the paleoenvironments of ice age Alaska. This is an upper division course because it relies on students having prior training in one or more of the above disciplines. Furthermore, it will require students to expand their interests and knowledge into fields they may know little about when the class starts. Students will be encouraged to synthesize diverse aspects of their previous knowledge and then add it to it in creative ways.

In comparison to undergraduate students, graduate students in this course will be required to do substantially more reading and writing, and more thorough analysis in their assignments. They will also be required to complete a more substantial term paper, and present their results to the class.

4. PROPOSED COURSE TITLE:

Ice Age Alaska

4. To be CROSS LISTED? YES/NO

Yes

5. To be STACKED* YES/NO

Yes

How will the two course levels differ from each other? How will each be taught at the appropriate level?

In comparison to undergraduate students, graduate students in this course will be required to do substantially more reading and writing, and more thorough analysis in their assignments. They will also be required to complete a more substantial term paper, and present their results to the class.

* Use only one Format 1 form for the stacked course (not one for each level of the course) and attach syllabi. Stacked course applications are reviewed by the (Undergraduate) Curricular Review Committee and by the Graduate Academic and Advising Committee. Creating two different syllabi (undergraduate and graduate versions) will help emphasize the different qualities of what are supposed to be two different courses. The committees will determine: 1) whether the two versions are sufficiently different (i.e., in there undergraduate and graduate level content being offered); 2) are undergraduates being overtaxed?; 3) are graduate students being undertaxed? In this context, the committees are looking out for the interests of the students taking the course. Typically, if either committee has qualms, they both do. More info online — see URL at top of this page.

6. FREQUENCY OF OFFERING:

Fall Even-numbered Years

Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING

(Effective AY2015-16 if approved by 8/31/2015; otherwise AY2016-17)

Fall 2016

8. COURSE FORMAT:

NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school’s curriculum council. Furthermore, any core course compressed to less than six weeks must be approved by the Core Review Committee.

COURSE FORMAT:
(check all that apply)

| 1 | 2 | 3 | 4 | 5 | X |

6 weeks to full semester

OTHER FORMAT (specify)
9. CONTACT HOURS PER WEEK:

<table>
<thead>
<tr>
<th>Hour Category</th>
<th>Hours/Weeks</th>
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<tbody>
<tr>
<td>LECTURE</td>
<td>2.5</td>
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<tr>
<td>LAB</td>
<td></td>
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<tr>
<td>PRACTICUM</td>
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Note: # of credits are based on contact hours. 800 minutes of lecture = 1 credit. 2400 minutes of lab in a science course = 1 credit. 1600 minutes in non-science lab = 1 credit. 2400-4800 minutes of practicum = 1 credit. 2400-8000 minutes of internship = 1 credit. This must match with the syllabus. See [UAF Degree Guidelines](http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/) for more information on number of credits.

OTHER HOURS (specify type) Two weekend field trips occur at the beginning of the semester. This field-trip time equates to 21 lab hours in addition to the lectures on campus: (2.5+1.5)

10. COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

**GEOG F478  Ice Age Alaska**
3 Credits Offered Fall Even-numbered Years
An overview of the paleoenvironments of Alaska including climate, glacier, and biotic history including humans. Emphasis on events of the past that have left important legacies on present landscapes. The course begins with two weekend field trips and then surveys key literature describing Alaska's ice-age history. The focus is on Alaska and the Yukon, but topics will range more widely into other parts of the Arctic and its adjacent seas. Prerequisites: Senior standing in Anthropology, Biological Sciences, Earth Science, Geography, Geoscience, or Northern Studies; or permission of instructor. Cross-listed with GEOG F478. Stacked with GEOG F678; GEOG F678. (2.5+1.5)

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3 Credits Offered Fall Even-numbered Years
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11. COURSE CLASSIFICATIONS: Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H classification appropriately; otherwise leave fields blank.

| H = Humanities   | S = Social Sciences |

Will this course be used to fulfill a requirement for the baccalaureate core? **If YES, attach form.**

<table>
<thead>
<tr>
<th>YES:</th>
<th>NO:</th>
<th>X</th>
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IF YES, check which core requirements it could be used to fulfill:

<table>
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<tr>
<th>O = Oral Intensive, <strong>Format 6</strong></th>
<th>W = Writing Intensive, <strong>Format 7</strong></th>
<th>X = Baccalaureate Core</th>
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</thead>
</table>
11A. Is course content related to northern, arctic or circumpolar studies? If yes, a "snowflake" symbol will be added in the printed Catalog, and flagged in Banner.

| YES | X | NO |

12. COURSE REPEATABILITY:

Is this course repeatable for credit? YES NO X

| Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time). |
| N/A |

| How many times may the course be repeated for credit? |
| N/A TIMES |

| If the course can be repeated for credit, what is the maximum number of credit hours that may be earned for this course? |
| N/A CREDITS |

| If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course? |
| N/A CREDITS |

13. GRADING SYSTEM: Specify only one. Note: Changing the grading system for a course later on constitutes a Major Course Change – Format 2 form.

| LETTER: X | PASS/FAIL: |

14. PREREQUISITES

GEOG/GEOS F478: Senior standing in Anthropology, Biological Sciences, Earth Science, Geography, Geoscience, or Northern Studies; or permission of instructor.

GEOG/GEOS F678: Graduate standing in Anthropology, Arctic and Northern Studies, Atmospheric Sciences, Biological Sciences, Geography, Geology, Oceanography; or permission of instructor.

These will be required before the student is allowed to enroll in the course.

15. SPECIAL RESTRICTIONS, CONDITIONS

None.

16. PROPOSED COURSE FEES

$100/student to cover van rental from UAF and fuel cost.

Has a memo been submitted through your dean to the Provost for fee approval? Yes/No

Yes

17. PREVIOUS HISTORY

Has the course been offered as special topics or trial course previously? Yes/No

Yes

If yes, give semester, year, course #, etc.: Fall 2014, GEOG/GEOS F493/693 Ice Age Alaska

18. ESTIMATED IMPACT

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

None. Uses existing faculty and facilities.

19. LIBRARY COLLECTIONS

Have you contacted the library collection development officer (k.jensen@alaska.edu, 474-6605) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

| X | Yes |

This course will not impact library resources.

20. IMPACTS ON PROGRAMS/DEPTS

What programs/departments will be affected by this proposed action?

Include information on the Programs/Departments contacted (e.g., email, memo)

This course has been developed through collaboration between the Geography and Geoscience programs within the Geosciences Department. The course will serve majors and graduate students in all of the Geosciences programs.

21. POSITIVE AND NEGATIVE IMPACTS
This course will add to the Arctic/Alaska emphasis in the Geography and Geoscience programs, and will also contribute to the overall Arctic teaching and research focus at UAF. It will diversify course offerings in both programs, especially in the Landscape Analysis and Climate Change Studies concentration of the Geography B.S. degree.

No negative impacts anticipated.

**JUSTIFICATION FOR ACTION REQUESTED**

The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

Alaska (Beringia) had a complex and fascinating history during the ice ages (the last 2 my). To understand these legacies, an interdisciplinary approach is needed. Ice Age Alaska will combine field trips with lecture- and discussion-based reviews of the foundational scientific literature concerning the glacial history, paleoclimatic, archaeology, and paleontology of Beringia. It is designed as a capstone, synthesis course for seniors and graduate students in Geography, Geology, Anthropology, Atmospheric Sciences, and Biology.

Ice Age Alaska will fill a gap in existing course offerings. Because it is an overview/synthesis class, it incorporates subsets of the subject matter addressed in other courses. What is unique about this course is its temporal and spatial focus: it concerns the last 2 million years of paleoenvironmental changes in Alaska.

**APPROVALS: Add additional signature lines as needed.**

<table>
<thead>
<tr>
<th>Signature, Chair, Program/Department of:</th>
<th>Geography</th>
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<th>CNSM</th>
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<th>Signature, Dean, College/School of:</th>
<th>CNSM</th>
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Offerings above the level of approved programs must be approved in advance by the Provost.

<table>
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<tr>
<th>Signature of Provost (if above level of approved programs)</th>
<th>Date</th>
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**ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE**

<table>
<thead>
<tr>
<th>Signature, Chair, Faculty Senate Review Committee:</th>
<th>Curriculum Review</th>
<th>GAAC</th>
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<tr>
<th>Signature, Chair, Faculty Senate Review Committee:</th>
<th>Core Review</th>
<th>SADAC</th>
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<tbody>
<tr>
<td>Date</td>
<td></td>
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</table>
APPROVALS: Add additional signature lines as needed.

Signature, Chair, Program/Department of: Geography  Date  9-30-2015

Signature, Chair, Program/Department of: Geosciences  Date  10-13-15

Signature, Chair, College/School Curriculum Council for: CNSM  Date  10/15/15

Signature, Dean, College/School of: CNSM  Date

Offerings above the level of approved programs must be approved in advance by the Provost.

Signature of Provost (if above level of approved programs)  Date

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

Signature, Chair  Date

Faculty Senate Review Committee:  ___Curriculum Review  ___GAAC

___Core Review  ___SADAC
MEMORANDUM

DATE: September 30, 2015

TO: Susan Henrichs, Provost

Through: Paul Layer, Dean CNSM

FROM: Cary de Wit, Geography Program Coordinator

RE: Course fee request for New Course: GEOG/GEOS 478/678 Ice Age Alaska

I am writing to request the inclusion of a course fee for a new course being proposed for Fall 2016: GEOG/GEOS 478/678 Ice Age Alaska, to be taught by Daniel Mann.

This is a 3-credit course that includes several weekend field trips that will require van rental, fuel purchases, and camping fees. I propose a course fee of $100 per student to cover these costs.
SYLLABUS  GEOG/GEOS 478:  ICE AGE ALASKA
Fall 2016    3 credits    MWF 9:15-10:15    204 Reichardt

Instructor: Dr. Daniel Mann
email: dhmann@alaska.edu
Office: 366 Reichardt Building
Phone: 474-6929
Office Hours: MW 10:30-12:30

Course Description
An overview of the paleoenvironments of Alaska including climate, glacier, and biotic history including humans. Emphasis on events of the past that have left important legacies on present landscapes. The course begins with two weekend field trips and then surveys key literature describing Alaska's ice-age history. The focus is on Alaska and the Yukon, but topics will range more widely into other parts of the Arctic and its adjacent seas.

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Course Goals
To provide an interdisciplinary synthesis of what is known about biota, climate, glaciers, geomorphology, and archaeology during the last ice age including the last interglacial and the first few millennia of the Holocene, the present interglacial. The other main objective of this class is to explore the numerous unanswered questions that remain.

Student Learning Outcomes
Students will come away with a broadened perspective on how environments changed during the last ice age, the processes causing these changes, and the legacies of these changes in the present day.

Instructional / Teaching Methods: This is a combined field, lecture, and discussion course that requires students to attend the field trips and keep up with assigned readings. Lectures and directed readings will give students a sound background in what we now know about ice age Alaska. There will be 3-5 guest lecturers over the course of the semester.

Field Trips: These are 2-day trips (Friday night through Sunday evening) that will depart Fairbanks in late afternoon on Fridays. In the field, we will collect data and test hypotheses. Attendance is mandatory for everyone. We will camp out in public campgrounds. Students should be comfortable scrambling over rough terrain and working in the rain.

Regarding the mandatory field trips: Please notify the instructor of any special needs that may require accommodation on the field trips. If you have any concerns about your ability to participate in the field trips, please notify the instructor before or on the first day of class.

Required Text: NONE. There is no upper division textbook that is relevant. Instead we will read a wide range of scientific papers: some old "classics" and others new developments in the fields of paleoecology, paleoclimatology, and Quaternary geology. Reading material will be distributed in class, or available through BlackBoard.

Attendance: Attendance at lectures and on field trips is mandatory. Missing a lecture will result
in a reduction of your final grade, as will missing either of the field trips.

**STUDENT ASSIGNMENTS**

**Field Trip Reports:** Following each field trip, students will submit a report analyzing the data collected during the class field trips.

**Readings:** Undergraduate readings will ordinarily consist of two scientific articles every week. There will be weekly quizzes on the readings.

**Term Paper:** A 5-10 page term paper (including illustrations) is required. Topics vary according to individual students’ interests. Each student will also develop a proposal describing his/her topic prior to writing the term paper. Detailed guidelines for the term paper will be given in lecture.

**Information on Exams and Assignments:** Examination format will include a mixture of multiple choice, short answer / diagram / map, and essay.

**Extra Credit:** Extra credit is not an option in this course.

**GRADING**

Quizzes on readings: 20%
Midterm Exam: 20%
Final Exam: 20%
Class and Field Trip Participation (attendance + discussion + field-trip report: 20%)
Term Paper: 20%

**Course grades** will be assigned as indicated in the table below. Grade point values are indicated in the table as well. Please see “Academics and Regulations” section of UAF 2014-15 Catalog.

<table>
<thead>
<tr>
<th>Grade</th>
<th>%</th>
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<tbody>
<tr>
<td>A+</td>
<td>100-97</td>
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<tr>
<td>A</td>
<td>96-92</td>
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<tr>
<td>A-</td>
<td>91-90</td>
<td>3.7</td>
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<tr>
<td>B+</td>
<td>89-87</td>
<td>3.3</td>
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<tr>
<td>B</td>
<td>86-82</td>
<td>3.0</td>
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<tr>
<td>B-</td>
<td>81-80</td>
<td>2.7</td>
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<td>C+</td>
<td>79-77</td>
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<tr>
<td>D-</td>
<td>61-60</td>
<td>0.7</td>
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**Course Grading Scale:** All grades are determined on an absolute score (with no curve) according to the following scale:
A = 90-100 percent: outstanding work, mastery of topic
B = 80-89 percent: above average work, all assignments completed well
C = 70-79 percent: average, all or most assignments completed, most work satisfactory
D = 60-69 percent: pass, unsatisfactory or missing work
F = less than 60 percent: failure to meet requirements of course

**Disabilities Services:** The Office of Disability Services implements the Americans with
Disabilities Act (ADA) and ensures that UAF students have equal access to the campus and course materials. I will work with the Office of Disability Services (474-5655) to provide reasonable accommodation to students with disabilities. Please let me know at the beginning of the course if accommodations should be provided.

**Plagiarism/Academic Integrity:** University Standards and Policies apply (see UAF Catalog).

**SCHEDULE OF LECTURES, READINGS, EXAMINATIONS, AND TERM PAPER**
(NB: Complete references to all readings will be provided in the finalized syllabus that will be available to students the week before classes begin in the autumn of 2016.)

**Week 1:** Friday: **What is this class about? Requirements, expectations.**

*EVERYONE:*

*GRADUATE AND HONORS STUDENTS:*

**Week 2:** **Basics of geochronology (radiocarbon, cosmogenic nuclides); Glacial history of Alaska**

*EVERYONE:*

*GRADUATE AND HONORS STUDENTS:*

**Field Trip #1:** Delta Junction and Isabel Pass area. **GOALS:** 1) periglacial depositional environments (moraines, outwash, loess); 2) basic glaciology of debris-covered and surging glaciers; 3) field methods: relative age dating moraines, describing a stratigraphic section; 4) how to core a lake; 5) lake-sediment stratigraphy (tephras); 6) the Alaska Range glacial sequence as it is currently known.

**Week 3:** **Permafrost geomorphology; glacial geology**

*Everyone Read:*
Vaks et al. (2013). 500,000-year history of Siberian permafrost…Science.

*Graduate students:*
Go to the literature and answer this question:
*When did the Laurentide Ice Sheet first separate eastern Beringia from the Lower 48 States?*
Use Google Scholar to enter the literature.
I expect you will need to read 2-3 papers to find the answer.
Bring me your answer (typed) in class next Monday.
Be sure to provide citations for your sources.

**Field Trip #2:** Parks Highway to Cantwell. **GOALS:** 1) vegetation zonation, treelines; 2) landslides; 3) glacial landforms; 4) stream planforms; 5) wildland fire; 6) method of multiple working hypotheses as applied to geomorphic mapping; 7) loess stratigraphy; 8) how to core a tree

**Week 4:** **Basics of glaciology with emphasis on interpreting glacial geology**

*EVERYONE:*
Bitz and Battisti (1999) glacier mass balance…Journal of Climate

*GRADUATE STUDENTS:*
Dowdeswell et al (1997) Circum-Arctic glaciers respond to changing climate…Quaternary Research

**Week 5:** ** Aeolian processes and depositional environments**

*EVERYONE:*
Guthrie (2001). Beringia's mesic buckle….Quaternary Science Reviews


Week 6: Alaska's loess and sand dune records
EVERYONE:
Muhs et al (2003). Loess record from Yukon delta...Quaternary Research.
Mann et al. (2002) History of the Kobuk Dunes....Quaternary Science Reviews

GRADUATE STUDENTS:
Muhs et al. (2003) Loess records from Interior Alaska...Quaternary Science Reviews

Week 7: Fluvial processes and depositional environments
EVERYONE:
Mann et al (2013) Responses of arctic rivers to climate change...Quaternary Science Reviews

GRADUATE AND HONORS STUDENTS:

Week 8: Vegetation history
EVERYONE:
Cwynar and Ritchie (1980). Arctic steppe-tundra....Science
Hopkins et al. (1987). (Excerpt from Paleocology of Beringia)

GRADUATE STUDENTS:
Edwards et al. (200) Pollen-based biomes of Beringia....Journal of Biogeography
Mann et al. (2002). Importance of moisture in Alaskan arctic....Quaternary Science Reviews

MIDTERM EXAM

Week 10: Guest Speakers...to be arranged
(readings to be arranged)

Week 11: Alaska's Archaeological past
EVERYONE:
Science

GRADUATE STUDENTS:
Dillehay et al. (2014) archaeology of southern Chile

Week 12: Ice-age biogeography: dispersal, evolution, extinction
EVERYONE:
Mann et al (2015) megafaunal extinctions in Arctic....Proceedings of the National Academy of Science

GRADUATE STUDENTS:
Shapiro et al (2004) Rise and fall of the steppe bison....Science
Stuart and Lister, 2012: extinction chronology of the woolly rhinoceros. Quaternary Science Reviews

Week 13: The Bering Land Bridge and the Ice-Free Corridor
EVERYONE:
Meiri et al. (2013) faunal exchange across Bering Land Bridge ....Proceedings of the Royal Society

GRADUATE STUDENTS:
Hewitt (2004). Structure of biodiversity...lessons from phyllogeography. ...Frontiers of Zoology
Week 14: Dec. 2, 4, 6: Graduate student presentations
(no new readings)

Week 15: Ongoing climate change: perspectives from the past

EVERYONE:

GRADUATE STUDENTS:
Washington Post, February, 2016: “Scientists are floored by what's happening in the Arctic right now.”
Wendler et al. (2014). Warming climate and shrinking sea ice in arctic Alaska. The Open Atmospheric Science Journal, 8, 7-15

Week 16: final examination, term papers due

day
Instructor: Dr. Daniel Mann  
email: dhmann@alaska.edu  
Office: 366 Reichardt Building  
Phone: 474-6929  
Office Hours: MW 10:30-12:30

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in a reduction of your final grade by one letter grade. Missing either of the field trips will result in a failing grade for the course.

**STUDENT ASSIGNMENTS**

**Field Trip Reports:** Following each field trip, students will submit a report analyzing the data collected during the class field trips.

**Readings:** Graduate student readings will ordinarily consist of 3-4 scientific articles per week. There will be weekly quizzes on the readings.

**Class Presentations:** Graduate students will make a 1/2-hour presentation of their term paper topics.

**Term Paper:** A 10-20 page term paper (including illustrations) is required. Topics vary according to individual students’ interests. Each student will also develop a proposal describing his/her topic prior to writing the term paper. Detailed guidelines for the term paper will be given in lecture.

**Information on Exams and Assignments:** Examination format will include a mixture of multiple choice, short answer / diagram / map, and essay.

**Extra Credit:** Extra credit is not an option in this course.

**Additional Expectations for Graduate-level Credit (GEOG/GEOS 678)**

It is important that those enrolled for graduate credit understand the different standards (rubrics) for the different graduate and undergraduate levels of this course. Students who are enrolled for graduate credit will be graded at a significantly different and higher standard than those enrolled for undergraduate credit. I expect students who are enrolled for graduate credit to display a high degree of integration and creativity in the classroom, on field trips, as well as when answering examination questions and writing their term papers. The 600-level students are expected to take leading roles in classroom discussions and on the field trips. My expectation is that their enthusiasm, interest, and specialty knowledge will help guide the class and contribute to its overall success.

The 600-level students must complete substantially more assigned readings than the 400-level students. Undergraduate readings will ordinarily consist of two scientific articles every week, while graduate readings will be 3-4 articles per week, and these will typically be more complex and/or lengthy. Also, the term papers of the 600-level students will be approximately twice the length of the 400-level students and involve approximately twice the number of articles reviewed. Graduate students must make presentations of their term paper research in class. Finally, the midterm and final examinations will differ between the two levels of this course with the graduate students answering 5-10 additional questions on each examination.

**GRADING**

Quizzes on readings: 20%
Midterm Exam: 20%
Final Exam: 20%
Class and Field Trip Participation (attendance + discussion + class presentation+field-trip report): 20%
Term Paper: 20%

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SCHEDULE OF LECTURES, READINGS, EXAMINATIONS, AND TERM PAPER
(NB: Complete references to all readings will be provided in the finalized syllabus that will be available to students the week before classes begin in the autumn of 2016.)

Week 1: What is this class about? Requirements, expectations.
EVERYONE:
GRADUATE AND HONORS STUDENTS:

Week 2: Basics of geochronology (radiocarbon, cosmogenic nuclides); Glacial history of Alaska
EVERYONE:
GRADUATE AND HONORS STUDENTS:

Field Trip #1: Delta Junction and Isabel Pass area. GOALS: 1) periglacial depositional environments (moraines, outwash, loess); 2) basic glaciology of debris-covered and surging glaciers; 3) field methods: relative age dating moraines, describing a stratigraphic section; 4) how to core a lake; 5) lake-sediment stratigraphy (tephras); 6) the Alaska Range glacial sequence as it is currently known.

Week 3: Permafrost geomorphology; glacial geology
Everyone Read:
Vaks et al. (2013). 500,000-year history of Siberian permafrost….Science.
Graduate students:
Go to the literature and answer this question: When did the Laurentide Ice Sheet first separate eastern Beringia from the Lower 48 States?
Use Google Scholar to enter the literature.
I expect you will need to read 2-3 papers to find the answer.
Bring me your answer (typed) in class next Monday.
Be sure to provide citations for your sources.

Field Trip #2: Parks Highway to Cantwell. GOALS: 1) vegetation zonation, treelines; 2) landslides; 3) glacial landforms; 4) stream planforms; 5) wildland fire; 6) method of multiple working hypotheses as applied to geomorphic mapping; 7) loess stratigraphy; 8) how to core a tree

Week 4: Basics of glaciology with emphasis on interpreting glacial geology
EVERYONE:
Bitz and Battisti (1999) glacier mass balance….Journal of Climate
GRADUATE STUDENTS:
Dowdeswell et al (1997) Circum-Arctic glaciers respond to changing climate….Quaternary Research

Week 5: Aeolian processes and depositional environments
EVERYONE:
Guthrie (2001). Beringia's mesic buckle….Quaternary Science Reviews
GRADUATE STUDENTS:

Week 6: Alaska's loess and sand dune records
EVERYONE:
Muhs et al. (2003). Loess record from Yukon delta….Quaternary Research.
Mann et al. (2002) History of the Kobuk Dunes...Quaternary Science Reviews

GRADUATE STUDENTS:

Muhls et al. (2003) Loess records from Interior Alaska...Quaternary Science Reviews

Week 7: Fluvial processes and depositional environments
EVERYONE:
Mann et al (2013) Responses of arctic rivers to climate change...Quaternary Science Reviews

GRADUATE AND HONORS STUDENTS:

Week 8: Vegetation history
EVERYONE:
Cwynar and Ritchie (1980). Arctic steppe-tundra...Science
Hopkins et al. (1987). (Excerpt from Paleoecology of Beringia)

GRADUATE STUDENTS:
Edwards et al. (200) Pollen-based biomes of Beringia...Journal of Biogeography
Mann et al. (2002). Importance of moisture in Alaskan arctic...Quaternary Science Reviews

MIDTERM EXAM

Week 10: Guest Speakers...to be arranged
(readings to be arranged)

Week 11: Alaska’s Archaeological past
EVERYONE:

GRADUATE STUDENTS:
Dillehay et al. (2014) archaeology of southern Chile

Week 12: Ice-age biogeography: dispersal, evolution, extinction
EVERYONE:
Mann et al (2015) megafaunal extinctions in Arctic....Proceedings of the National Academy of Science

GRADUATE STUDENTS:
Shapiro et al (2004) Rise and fall of the steppe bison...Science
Stuart and Lister, 2012, extinction chronology of the woolly rhinoceros. Quaternary Science Reviews

Week 13: The Bering Land Bridge and the Ice-Free Corridor
EVERYONE:
Brikiatis (2014) Arctic land bridges...Journal of Biogeography
Meiri et al. (2013) faunal exchange across Bering Land Bridge ....Proceedings of the Royal Society

GRADUATE STUDENTS:
Hewitt (2004). Structure of biodiversity...lessons from phyllogeography. ...Frontiers of Zoology

Week 14: Dec. 2, 4, 6: Graduate student presentations
(no new readings)

Week 15: Ongoing climate change: perspectives from the past
EVERYONE:

GRADUATE STUDENTS:
Washington Post, February, 2016: “Scientists are floored by what’s happening in the Arctic right now.”
Wendler et al. (2014). Warming climate and shrinking sea ice in arctic Alaska. The Open Atmospheric Science Journal, 8, 7-15

Week 16: **final examination, term papers due**

end
Course grades will be assigned as indicated in the table below. Grade point values are indicated in the table as well. Please see “Academics and Regulations” section of UAF 2014-15 Catalog.

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Course Grading Scale: All grades are determined on an absolute score (with no curve) according to the following scale:
- A = 90-100 percent: outstanding work, mastery of topic
- B = 80-89 percent: above average work, all assignments completed well
- C = 70-79 percent: average, all or most assignments completed, most work satisfactory
- D = 60-69 percent: pass, unsatisfactory or missing work
- F = less than 60 percent: failure to meet requirements of course

Disabilities Services: The Office of Disability Services implements the Americans with Disabilities Act (ADA) and ensures that UAF students have equal access to the campus and course materials. I will work with the Office of Disability Services (474-5655) to provide reasonable accommodation to students with disabilities. Please let me know at the beginning of the course if accommodations should be provided.

Plagiarism/Academic Integrity: University Standards and Policies apply (see UAF Catalog).