TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

Department GEOS
Prepared by Patrick Druckenmiller
Email Contact ffpsd@uaf.edu

College/School CNSM
Phone 474-6954
Faculty Contact Patrick Druckenmiller

1. ACTION DESIRED
   (CHECK ONE):
   Trial Course
   New Course X

2. COURSE IDENTIFICATION:
   Dept GEOS Course # F4XX No. of Credits 3
   Justify upper/lower division status & number of credits:
   The course consists of two hours of lecture and one three-hour lab per week. The 400 level designation is justified on the basis of requiring prerequisite courses in either geology or biology (or permission of the instructor).

3. PROPOSED COURSE TITLE:
   VERTEBRATE PALEONTOLOGY

4. CROSS LISTED?
   YES/NO
   YES If yes, Dept: BIOL Course # F4XX/F6XX
   (Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)

5. STACKED?
   YES/NO YES If yes, Dept: GEOS Course # F6XX

6. FREQUENCY OF OFFERING:
   Alternate Spring
   (Every or Alternate) Fall, Spring, Summer — or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING (if approved) Spring 2011

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 one) 1 2 3 4 5 X 6 weeks to full semester
   OTHER FORMAT (specify) Lecture and lab

9. CONTACT HOURS PER WEEK:
   2 LECTURE hours/weeks 3 LAB hours/week PRACTICUM hours/week
   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 http://www.uaf.edu/uafgov/faculty/cd/credits.html for more information on number of credits.

OTHER HOURS (specify type)

10. COMPLETE CATALOG DESCRIPTION including dept., number, title and credits (50 words or less, if possible):

   GEOS F4XX. Vertebrate Paleontology.
   3 Credits Offered Spring Odd-numbered years
   The study of vertebrate evolution through geologic time. The course covers the temporal range, diversity, and systematics of major vertebrate groups as documented in the fossil record, with an emphasis on current problems in vertebrate evolutionary pattern and process. Labs emphasize comparative morphology and identification of major vertebrate groups. Prerequisites: BIOL F310 or BIOL F317 or GEOL F315 or permission of the instructor. (Offered listed with BIOL F4XX. Stacked with GEOS F6XX; BIOL F6XX.) (2+3)
11. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)

H = Humanities □ N = Natural Science X S = Social Sciences □

Will this course be used to fulfill a requirement for the baccalaureate core? □ YES □ NO

IF YES, check which core requirements it could be used to fulfill:

O = Oral Intensive, Format 6 □ W = Writing Intensive, Format 7 □ Natural Science, Format 8 □

12. COURSE REPEATABILITY:

Is this course repeatable for credit? □ YES □ NO

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

How many times may the course be repeated for credit? □ TIMES □ 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?

13. GRADING SYSTEM:

LETTER: □ PASS/FAIL: □

REstrictions on Enrollment (if any)

14. PREREQUISITES

BIOL F310 or BIOL F317 or GEOL F315 or permission of the instructor

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

RECOMMENDED

Classes, etc. that student is strongly encouraged to complete prior to this course.

15. SPECIAL RESTRICTIONS, CONDITIONS

16. PROPOSED COURSE FEES

$95.00

Has a memo been submitted through your dean to the Provost & VCAS 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.: GEOS F492, Spring 2008, Spring 2009

18. ESTIMATED IMPACT

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

The course development will have little, if any, impact on the departmental budget as teaching specimens have already been procured. However, a teaching assistant will be needed for enrollment over 7 students. Other teaching specimens will be used from existing collections at the Museum of the North, the Dept. of Geology and Geophysics, and the Dept. of Biology and Wildlife. Lecture and lab space for a small class size of 20 or less is available at the UA Museum. Teaching material will be stored in existing space at the museum. Instruction will be performed by Patrick Druckenmiller, Curator of Earth Sciences, UA Museum.

19. LIBRARY COLLECTIONS

Have you contacted the library collection development officer (ffkij@uaf.edu, 474-6695) 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.

No □ Yes □ X Will receive course syllabus; library subscribes to the pertinent journals

20. IMPACTS ON PROGRAMS/DEPARTMENTS

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

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

The Department of Geology and Geophysics and the Department of Biology and Wildlife will be most affected. Students from both of these degree programs are most likely to take this course.

21. POSITIVE AND NEGATIVE IMPACTS

Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.
The Department of Geology and Geophysics and Department of Biology and Wildlife will both benefit from having an additional elective course for their students. No negative impacts are 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.

The new course compliments and expands on existing courses in paleontology (GEOS F112X and GEOS F315) and vertebrate zoology (BIOL F317, BIOL F425, BIOL F426, BIOL F427) found in both the departments of Geology and Geophysics and Biology and Wildlife. The course is pertinent to Alaska, in that discussion will involve important material collected in the state (e.g. North Slope dinosaurs and Ice Age megafauna). The great research and teaching collections at the UA Museum will also be utilized. The course matter covers an area of growing interest on campus and nationally, and will help attract new students, both undergraduate and graduate, to UAF. The course is stacked in order to provide opportunities for graduate student credit. As described in the syllabus, graduate students are expected to demonstrate greater scholarship at all levels of the class and are given a number of additional responsibilities, including leading class discussions, reading more peer-reviewed papers, producing a longer and more comprehensive term paper, and making an hour-long oral presentation. The course was successfully taught in Spring 2008 and the course evaluations were positive. A sample lab exercise is attached.

APPROVALS:

Signature, Chair, Program/Department of: ____________________________ Date 10/14/08

Signature, Chair, College/School Curriculum Council for: CNSM - Diane Wagner Date 10/17/08

Signature, Dean, College/School of: CNSM Joan Braddock Date

Signature of Provost (if applicable)

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

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

Signature, Chair, UAF Faculty Senate Curriculum Review Committee
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<thead>
<tr>
<th>Name</th>
<th>Date</th>
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<tr>
<td>CNSM</td>
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<td>CNSM</td>
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Syllabus: GEOS F4XX/F6XX, BIOL F4XX – VERTEBRATE PALEONTOLOGY
3 Credits

Professor: Patrick S. Druckenmiller
Office: Museum of the North, Rm. 30 (by appointment only; must check in at front desk)
Phone: 474-6954
Email: ffpsd@uaf.edu
Office hours: TBA or by appointment
TA: TBA
Office: TBA
Prerequisites: BIOL F310 or BIOL F317 or GEOL F315 or permission of the instructor
Lectures and discussions: MUSEUM 151*, Wed. and Fri. @ 9:15 – 10:15 am
Labs: MUSEUM 151*, Tues. @ 2-5 pm
  *NOTE: In order to gain admittance to the museum classroom, you must enter at the main entrance
      and check in at the front desk.
Other required materials: A lab notebook, suitable for illustrations and answering questions (ideally, both
lined and unlined pages). A hand lens is optional, but may be handy.

Course description: This course covers the history of vertebrate life as documented from its rich fossil
record. At one level, this course will examine the overall pattern of vertebrate history, both temporally and
in terms of taxonomic diversity. We will also place the vertebrate fossil record in the context of major
gеологічні і біологічні процеси, що можуть пояснити зазначений паттерн. Наприклад, коли зірвав
лімб перші документовані в палеонтологічній рекорд і як вони виглядають? Які був континентальний
конфігурація на цей час? Залежно від седиментних порід, в яких вони знайдені, в які типи
депозитних середовищ відбувається це трансформація? Які класи відбивають розвиток изуробник
широкий шлях того перехід? Інші важливих еволюційних трансформації та наразіні проблем в
палеонтології відбувається і використовується на вивчення або батьків, в тому числі
птахів.

As a discipline, vertebrate paleontology is built on a foundation taken from both the geological and
biological sciences. Thus, an introductory background in either, or both, fields is necessary. However,
important concepts necessary to discuss the material, such as geologic time and biological classification, will
be reviewed in class in order to make the topics understandable and interesting to an audience with a
background in either field.

Course goals and student learning outcomes: At a broad level, the primary objective of this course is to
gain an understanding of the major patterns in vertebrate evolution through time. Students should be able
to place the origin and extinction of major vertebrate groups in a geologic time scale, have a working
knowledge of vertebrate skeletal anatomy, understand the mechanisms of fossil preservation, identify key
differences among major vertebrate groups, and be familiar with the important problems and questions facing
vertebrate paleontologists today.

Instructional methods: The course includes both a lecture and lab component. (Please note that the
schedule outlined below is tentative and is designed with flexibility in mind in order to explore topics in
greater detail as dictated by student needs.) Lectures are not only a time to listen to the instructor, but also to
ask questions and participate in discussion. Please come to lecture prepared to discuss the assigned reading
and to ask questions. An important component of the class will consist of supplemental readings taken from
the primary literature that will be handed out on a weekly basis in class. These articles will be recent and
relevant to our lecture topics (usually taken from Nature and Science), and you are expected to participate in
the discussion of these papers, which will be distributed during the previous lecture period. Expect some
exam questions to be drawn from these readings!
All students are also expected to complete a short research paper of at least 12 double-spaced pages. The topic of this paper should summarize a major evolutionary event in vertebrate history. Topics that merely discuss/describe a particular taxonomic group are not acceptable. Possible topics will be discussed in class and must ultimately be approved by the instructor. A handout providing more details about the project, and specific deadlines for choosing a topic, turning in an outline, and assembling an appropriate bibliography will be provided in class. The final paper is due on the last day of lecture.

Graduate students enrolled in GEOS F6XX or BIOL F6XX are expected to exhibit a great level of scholarship in all areas of the course. Additional responsibilities will be also be assigned, which are intended to enhance critical thinking, as well as skills in written and oral communication. First, each graduate student will lead two or three (depending on enrollment) class discussions that are based on the readings taken from the primary literature (described above; counted toward your discussion grade). In order to lead and more fully participate in these discussions, additional readings will be assigned. Secondly, your research paper will follow the same general guidelines described above, but you will be expected to provide greater background and coverage to your topic, resulting in a paper at least 20 double-spaced pages in length. A required component of the paper will be to demonstrate critical thinking based on past work, and to suggest possible approaches, techniques, or new sources of data by which this problem could be further investigated. You will also make an oral presentation about your topic summary to your peers during one full class period, in lecture and/or discussion format. Using an evaluation form provided by the instructor, all other students (graduate and undergraduate) will anonymously critique this presentation and provide constructive feedback for the student’s benefit.

Labs are an integral part of this course, and are designed to provide students with an enjoyable and practical knowledge of fossil vertebrates. The primary aim of the labs is to gain hands-on experience identifying and familiarizing yourself with actual specimens, both real and cast. Handouts, consisting of key words, concepts, exercises, and illustrations will accompany each lab. An integral component to the labs will be your notebook; this is where you will make the requested illustrations, answer lab questions, a write observations and notes. These will be turned in at the end of each lab, and graded; the lab books will be returned in lecture. Notebook assignments constitute 20 percent of your total grade. Ultimately, it will become an important study guide for lab exams, as well as a useful reference even after the course has ended!

If possible, a field trip to the Permafrost Tunnel will be made near the end of the semester to examine Pleistocene vertebrate material in situ. The field trip will occur during our scheduled lab time and will count as a regular lab for attendance and grading purposes.

Course policies: Attendance in both lecture and lab is mandatory. For this reason, 5% of the total grade will be based on attendance and participation. Students missing no more that three hours of class time (one lab or three lectures) will receive an A for attendance, those missing 4-6 hours will receive a B, etc. I expect students to arrive in class on time, and repeated and/or excessive tardiness will be treated as non-attendance. Make-up exams are allowed for legitimate excuses (illness, attending a conference, etc...) and can be scheduled with the instructor. Students are expected to conform to student code of ethic, as outline in the UAF catalog. Plagiarism and cheating will not be tolerated and will be dealt with seriously.

Evaluation: Grading will be divided as follows:

- Lecture Exam 1: 15%
- Final Exam: 15%
- Lab Exam 1: 15%
- Lab Exam 2: 15%
- Research paper: 15%
- Lab notebooks: 20%
Attendance/Participation 5%
TOTAL 100%

Lecture exams are short answer and essay style, and will come from the lecture, text readings, and supplemental readings. The final exam will build on the entire semester and will be partially comprehensive in its coverage. Lab exams are practical and will be based on your familiarity with the specimens examined in lab. Grading will be established on a curve using letter grades A, B, C, D, F. The letter grades (except F) may include a "+" or "-" to indicate that a student’s level of performance is slightly higher or lower than that of the letter grade alone.

Support Services: All efforts will be made by the instructor to assist students seeking support in this class, either during regular office hours or by appointment. If needed, the instructor will assist the student in arranging additional support, including ASUAF tutoring services (474-7355), or through other instructors on campus.

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 (474-7043) to provide reasonable accommodation to students with disabilities. Please let me know at the start of the course if accommodations should be provided.
# LECTURE AND LAB SCHEDULE
*(Dates as taught in Spring 2008)*

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
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<tbody>
<tr>
<td>1/24</td>
<td><strong>Lect. 1:</strong> Introduction to vertebrate evolution</td>
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<tr>
<td>1/29</td>
<td><strong>Lab 1:</strong> Lab techniques in paleontology</td>
<td>Chapter 2 (25-28)</td>
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<td>1/30</td>
<td><strong>Lect. 2:</strong> Geologic time and preservation</td>
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<td>2/1</td>
<td><strong>Lect. 3:</strong> How to become a fossil – taphonomy</td>
<td>Chapter 2 (22-28)</td>
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<td>2/5</td>
<td><strong>Lab 2:</strong> Fossil vertebrate preservation</td>
<td>Chapter 2 (31-35)</td>
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<td>2/6</td>
<td><strong>Lect. 4:</strong> Phylogenetic reconstruction</td>
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<td>2/8</td>
<td><strong>Lect. 5:</strong> Vertebrate origins</td>
<td>Chapter 1 (1-15)</td>
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<td>2/12</td>
<td><strong>Lab 3:</strong> Bone lab I: head skeleton</td>
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<td>2/13</td>
<td><strong>Lect. 6:</strong> Early fish and the origin of jaws</td>
<td>Chapter 3 (38-55)</td>
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<td>2/15</td>
<td><strong>Lect. 7:</strong> Paleozoic fish</td>
<td>Chapter 3 (55-72)</td>
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<td>2/19</td>
<td><strong>Lab 4:</strong> Bone lab II: postcrania skeleton</td>
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<td>2/20</td>
<td><strong>Lect. 8:</strong> Post-Devonian fish radiation</td>
<td>Chapter 6 (159-186)</td>
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<td>2/22</td>
<td><strong>Lect. 9:</strong> Origin of tetrapods</td>
<td>Chapter 4 (74-85)</td>
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<td>2/26</td>
<td><strong>Lab 5:</strong> “Fish”</td>
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<td>2/27</td>
<td><strong>Lect. 10:</strong> Amphibians: Paleozoic to Recent</td>
<td>Chapter 4 (85-105)</td>
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<td>2/29</td>
<td><strong>Lect. 11:</strong> Origin of amniotes</td>
<td>Chapter 5 (106-112)</td>
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<td>3/4</td>
<td><strong>Lab:</strong> LAB EXAM 1</td>
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<td>3/5</td>
<td><strong>Lect. 12:</strong> Early anapsids and diapsids</td>
<td>Chapter 5 (113-119)</td>
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<td>3/7</td>
<td><strong>Lect. 13:</strong> Triassic tetrapods</td>
<td>Chapter (137-147)</td>
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<td>3/10-14</td>
<td><strong>NO CLASSES – SPRING BREAK</strong></td>
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<td>3/18</td>
<td><strong>Lab 6:</strong> Aquatic amniotes</td>
<td>Chapter 8 (241-248)</td>
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<td>3/19</td>
<td><strong>Lect. 14:</strong> Marine reptiles</td>
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<td>3/21</td>
<td><strong>Lect. 15:</strong> LECTURE EXAM 1</td>
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<td>3/25</td>
<td><strong>Lab 7:</strong> Dinosaurs</td>
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<td>3/26</td>
<td><strong>Lect. 16:</strong> Pterosaurs, turtles, crocs</td>
<td>Chapter 8 (224-237)</td>
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<td>3/28</td>
<td><strong>Lect. 17:</strong> Dinosaurs: Ornithischia</td>
<td>Chapter 8 (188-204)</td>
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<td><strong>Lab 8:</strong> Volant vertebrates</td>
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<td>4/2</td>
<td><strong>Lect. 18:</strong> Dinosaurs: Saurischia</td>
<td>Chapter 8 (205-219)</td>
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<td>4/4</td>
<td><strong>Lect. 19:</strong> Dinosaurs – origin of birds</td>
<td>Chapter 9 (257-265)</td>
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<td>4/8</td>
<td><strong>Lab 9:</strong> Mammals</td>
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<td>4/9</td>
<td><strong>Lect. 20:</strong> Diversification of birds</td>
<td>Chapter 9 (265-287)</td>
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<td>4/11</td>
<td><strong>Lect. 21:</strong> Early synapsids</td>
<td>Chapter 5 (120-135)</td>
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<td>4/15</td>
<td><strong>Lab 10:</strong> Ice Age mammals of AK 1</td>
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<td>4/16</td>
<td><strong>Lect. 22:</strong> Origin of mammals</td>
<td>Chapter 10 (288-298)</td>
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<tr>
<td>4/22</td>
<td>Lab 11: Ice Age mammals of AK 2</td>
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<td>4/23</td>
<td>Lect. 23: Mesozoic mammals</td>
<td>Chapter 10 (298-312)</td>
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<td>4/25</td>
<td>Lect. 24: Cenozoic mammals: South America</td>
<td>Chapter 10 (312-323)</td>
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<td>4/29</td>
<td><strong>Lab: LAB EXAM 2</strong></td>
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<td>4/30</td>
<td>Lect. 25: Cenozoic mammals: placentals</td>
<td>Chapter 10 (323-359)</td>
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<td>Lect. 26: General topics/wrap up</td>
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<td>5/5</td>
<td>Last day of classes</td>
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<tr>
<td>5/6-9</td>
<td><strong>FINAL EXAMS</strong></td>
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