Department of Biology and Wildlife  
Course Syllabus for  
BIOL F494/694 (CRN: 36212 undergraduate, CRN: 36216 graduate)  
"Arctic Contaminants"  

MWF 915-1015 in Irving I 208.  
3 credits  

Prerequisites: Biol 310 or Biol 111 and 112, Chem 105, Chem 106  
or permission of Instructor  

Instructor, Dr. Todd O’Hara  
474-1838, fftmo@uaf.edu  
AHRB 144, Office Hours Noon- 2PM MWF  
Associate Professor of Wildlife Toxicology  

Draft Version Dec 29 2006 [Trial Course (2nd trial)]  

Recent information provided by the Arctic Monitoring and Assessment Program (AMAP) has been developed into a trial course. AMAP covers the general environmental chemistry and toxicology of the classic contaminants (POPs, heavy metals, radionuclides, hydrocarbons, etc.) and intensively investigates arctic biota (including the human dimension). Students could purchase AMAP texts (optional) and databases (as CDs) for this course to support the notes taken during lectures.  

Text (optional):  
“Arctic Pollution 2002” published by the Arctic Monitoring and Assessment Program PO Box 8100 Dep., N-0032 Oslo, Norway (ISBN 82-7971-015-9). Available at the Library.  

Course policies  

Attendance/tardiness:  
Attendance is vital to the grade. Much, if not all, of the exam information will be based on information from notes given during class or via email. These notes must be obtained from another student when absence is unavoidable. Attendance is recorded occasionally to maintain an idea of who is actually attending. Repeated unexcused tardiness will be noted. Out of respect for the instructor and classmates please be on time. The instructor is sympathetic to fieldwork and scientific meeting requirements.
Evaluation - Tests / Grading:
Undergraduates: Your lecture grade will be based primarily (90%) on three 100-point exams during the semester. These tests will be multiple choice, short answer and short essay type tests. Grades will be based on a scale of 90% = A, 80% = B, 70% = C, 60% = D, <60% = F. There will be 1-2 minor assignments made during the semester, and in combination with attendance and classroom participation will provide 10% of the overall grade.

Graduate Students: The above criteria (exams will be 80% of the overall grade), plus a term paper and an oral examination associated with each written examination. The term paper will constitute 10% of the overall grade and the oral examination another 10%.

Making up an Exam
An exam may be taken ahead of schedule if a suitable time can be agreed upon if there is a good reason, or if appropriate proctoring can be arranged concurrent testing can be done offsite (e.g., professional field colleague). Exams can be made up after the scheduled day but this is at the discretion of the instructor (i.e., it is not guaranteed) and is not preferred. The make-up exam, or the early exam, will not be the same exam given to the other students. There will only be one make-up exam offered. Students who miss (do not take) more than one exam will have difficulty passing the course.

Plagiarism
Simply will not be tolerated in any form. When in doubt cite and quote your sources.

Academic integrity
Examinations are to be performed by the individual and any attempts to gain assistance or knowingly provide assistance during an examination will be punished according to University policy towards “cheating.” Those taking early or make up exams are to not request assistance with the exams nor provide it. The exams should not be discussed until ALL members of the class have taken a specific exam.

Disabilities Services
The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. The Instructor will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities. Please make the Instructor aware of any disabilities that may affect access or performance.
Course calendar (tentative*): Lecture topics & dates for “Arctic Contaminants”
*class can dictate details of what is discussed

January 20, 2006 (1st day)
Course Introduction
Learning Resources:
   AMAP Website
   Biosciences Library

January 23, 25, 27, & 30; February 1, 3*, & 6, 2006
Introduction:
   What are Contaminants?
   What is Toxicology?
   Basic Principles of Toxicology
      Absorption
      Distribution
      Metabolism
      Phase I
      Phase II
   Excretion
   Basic Principles of Toxicokinetics

*Stranding Meeting in Anchorage. Video: “Natural History: Ice Worlds – Polar People”

February 8 & 10, 2006
Environmental Biomarkers

February 13 & 15, 2006
Setting the AMAP Stage:
   History of Arctic Council
   History of AMAP
      AMAP Phase I
      AMAP current status
   Defining the AMAP Arctic
      Geography
      Pathways
      Ecology
      People

Feb. 17, 2006 - Dr. Kimberlee Beckmen, “OCs in northern fur seals and Steller sea lions of the Bering Sea”
   [O’Hara Seattle INBRE meeting]

February 20, 22, 24, 27, & March 1 & 3, 2006.
Persistent Organic Pollutants in the Arctic
   Sources and regulatory status
Pathways to the Arctic
Concentrations and geographical patterns
Time trends
Biological effects
Summary and Review (March 3)

Exam 1 March 6, 2004 (cover material up to March 3, 2006)


March 13-17 Spring Recess

March 10, 20, 22, 24, 2006
Heavy Metals in the Arctic
Introduction
Mercury
Sources and pathways
Time trends
Concentrations and effects
Management: “Is it time for global action?”
Lead – success for political action
Cadmium – still largely unknown
Local sources – severe pollution in the Arctic
Summary

March 27 and 29, 2006
Radioactivity
Introduction
Human and ecosystem health
Risk Management
Sources
Nuclear power plants
Nuclear detonations and nuclear weapons accidents
Reprocessing and transport
Radioisotope thermoelectric generators
Arctic pathways and vulnerability
Human exposure

March 31, & April 3, 5, 7, 10, 12, 14, 2006
Human Health
Health and culture
Food and other lifestyle factors
Environmental contamination and their effects
Spatial trends in maternal blood
Do contaminants pose a risk to human health?
Summary
Exam 2 April 19, 2006 (Cover material from Mar 3 up to April 14, 2006)

No Class April 28

April 17, 21, 24, 26, May 1 & 3, 2006
Species Case Studies (based on publications distributed)
   Bowhead whales
   Polar bear

May 5 Review

Final Exams May 8-11, 2006 (cover material from April 17, 2006)

Optional lectures (if time allows)
Changing Pathways
   Climate change in the Arctic
   Winds, precipitation and temperature
   Lakes, land and glaciers
   Ocean transport
   Sea ice
   Summary

This outline follows that presented in “Arctic Pollution 2002” published by the Arctic Monitoring and Assessment Program, PO Box 8100 Dep., N-0032 Oslo, Norway (ISBN 82-7971-015-9). This is the optional text for this course and is supplemented by the AMAP website.