Wildlife Diseases – WLF 305, Fall 2013
CRN: 77490

Department of Biology and Wildlife

Syllabus & Course Objectives (Sept 8, 2013 version)
Original Documents provided courtesy of Dr. John Blake, Attending Veterinarian
(adapted by O’Hara)

Lecture: Tuesdays 2:00 – 4:00, Margaret Murie Building 330 (2 lectures/day presented)
Lab: Thursdays 2:00 – 5:00, Margaret Murie Building 303 or BiRD Necropsy Suite

(suite requires escort into secured facility, meet at main entrance to BiRD on 1st floor, BiRD is building behind the museum)

3 credits, Prerequisites: Biol 310 or Biol 111 and 112.
Instructor, Dr. Todd O’Hara; Teaching Assistant; None

tmohara@alaska.edu

Office Hours: By Appointment (one on one meeting about projects)

Required Text: Wobeser, G.A., Essentials of Disease in Wild Animals, Blackwell Publishing,

Website for USGS texts
Field Manual of Wildlife Disease (this is cited in the syllabus)
http://www.nwhc.usgs.gov/publications/disease_emergence/
Disease Emergence and Resurgence: The Wildlife-Human Connection
Helpful website - http://www.wildlifeinformation.org

Course policies

Attendance/tardiness:
Attendance is vital to the grade. Much, if not all, of the exam information will be based on
information from lectures, notes, discussion, laboratory exercises, etc. during class and from
activities in the laboratory. “Notes” from lectures must be obtained from another student
when absence is unavoidable. Attendance is recorded occasionally to maintain an idea of who
is actually attending. Repeated tardiness will be noted. Out of respect for the instructor and
classmates please be on time – disruptive tardiness is not appreciated and is considered in the
participation grade. Laboratories cannot be missed without prior permission, they are impossible
to make up due to the nature of our work (e.g., necropsies, handling biological materials).
Missing laboratories inherently will impact the final grade.

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. Exams can be made up after the scheduled date but this is at the discretion of
the instructor (i.e., it is not guaranteed) and a very good reason for missing the exam must be
documented. The instructor often requests input from the Department Chair on how to best
handle these situations. 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 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. If you do not know what this refers to please meet with Dr. O'Hara. In the past, plagiarism has resulted in student dismissal from the class with no financial refund and registering a for a substitute course required full per credit rate. Dismissal from University is an option for the instructor and Dean of Students to choose. There is software available that can easily check for duplicated text. All assignments must be submitted in Microsoft Word (email is fine) along with a printed hard copy.

**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. Please note plagiarism above, and that this applies to any written or oral assignments that are independent projects.

**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 to provide reasonable accommodation to students with disabilities. Please make the Instructor aware of any disabilities that may affect access or performance.

**OBJECTIVES**
The objective of this course is to introduce the natural resources management, fisheries (e.g., marine mammals), wildlife biology and/or biology (e.g., pre-health professional) student to disease processes at the individual animal and population levels. This course is intended to impart a basic understanding of disease processes and a basic knowledge of some common disease entities with a focus on the Arctic and sub-arctic regions (marine and terrestrial). Effects on populations and diseases of human health significance are emphasized. There are numerous taxa to consider and in this course the bias is towards mammals.

The objectives for the laboratory include: 1) To develop a standard technique for the post-mortem examination & sampling (necropsy) of vertebrates (there is no intent to make pathologists out of anyone). 2) To become familiar with the instruments needed to conduct a satisfactory field necropsy and field sampling (capture, biosampling and release). 3) To learn how to collect and preserve suitable specimens for submission to a diagnostic and/or research laboratory. 4) To develop an understanding of zoonotic diseases and the importance of a "clean" technique while handling diseased and decomposing tissues.

**APPROACH**
The course starts out with a lecture series introducing the mechanisms of disease ending with a discussion on epidemiology. This is followed by lectures on common diseases of mammals and birds using a structure based on disease causing agents (etiology). Using a variety of diseases occurring in wildlife we will discuss the cause, species affected, occurrence, ecology, clinical disease, pathology, differential diagnoses, specimens for diagnosis, and the significance
to the animal and population. It is impossible to discuss all causes of disease but our review of
certain disease causing agents will emphasize the importance of proper diagnostics and how the
biologist can facilitate this. The focus is on mammals with some time spent on avian species
(mostly waterfowl).

The laboratory is divided into 2 parts allowing students to obtain hands on experience in
the necropsy suite and to better understand basic biosampling and laboratory techniques (e.g.,
hematology). Due to limited space for necropsies the class will be split into two groups. One
group will meet in the necropsy suite with one of the instructors and the others will meet in the
designated room for the laboratory (non-necropsy sessions). [Please note this does not apply
this year!]

Presentations (oral) and written reports (reviewed) will be conducted during the course as
part of the laboratory. This involves direct mentoring by the instructor during the laboratory
(early in semester) as well as presented as outlined in the Laboratory Schedule towards the end
of the semester. The student is encouraged to select topics of interest to them and then
adequately convey this subject matter via oral presentation to the entire group (class). The
student is also expected to prepare a report 3-8 pages (double spaced text, additional pages
allowed for figures, images, tables, citations, etc.) that is handed in prior to the oral presentation
and reviewed by the instructor and the TA [no TA this year]. The final paper is due at the time
of the presentation (see Laboratory Schedule). The initial draft is not graded, only the final
version.

Graduate students will be expected to have a higher level of participation in this course
(including an additional presentation, conduct specific laboratories, etc.). Graduate students will
be graded and evaluated separately from undergraduates with respect to rigor and quality.

WHAT THE COURSE CANNOT DO:

A single semester course in wildlife diseases cannot impart diagnostic skills or research
capacity to address wildlife diseases for an individual. Work that requires diagnostics or research
tools must involve trained diagnosticians/researchers. For diagnostics usually veterinary
pathologists with wildlife experience and consultation from experienced wildlife biologists is
needed. This by no means limits wildlife disease work to individuals with diagnostic training.
Wildlife diagnostics is only one part of wildlife disease work and may or may not be necessary
in all research projects. In fact, the best wildlife disease work is generally done by teams that
include wildlife biologists, population biologists, ecologists, pathologists, toxicologists,
microbiologists, parasitologists, etc! We hope to emphasize that with guest lecturers/laboratory
visitors and examples for discussion.

Wildlife Disease – WLF 305 - Grades

Laboratory performance and lecture attendance/participation: 10% (50 points)
Presentations (oral and written): 30% (150 points, 75 points each)
[Graduate students will have addition demands and higher expectations with respect to
presentations]
Midterm Examination: 30% (150 points)
Final examination: 30% (150 points)

Total Points = 500
Letter grades: no +/- grades given.
A = 85-100%, B = 75-84%, C = 60-74%, D = 50-59%, F <50%
### WILDLIFE DISEASES - WLF 305 (Sept 8 2013 version)

**FALL 2013 LECTURE SERIES**

**Lecture:** Tuesdays 2:00 – 4:00, Margaret Murie Building 330 (2 lectures/day presented)

**Lab:** Thursdays 2:00 – 5:00, Margaret Murie Building 303 or BiRD Necropsy Suite

<table>
<thead>
<tr>
<th>Lecture #</th>
<th>Date</th>
<th>Topic for Lecture (Tuesdays)</th>
<th>Wobeser 2006/ USGS Field Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Sept 10, 2013 (Tu)</td>
<td>Introduction to course (no ppt), review syllabus/schedules, answer questions</td>
<td>Intro/Chapter 1</td>
</tr>
<tr>
<td>1-2</td>
<td>Sept 17, 2013 (Tu)</td>
<td>Mechanisms of Disease: Intro</td>
<td>Intro/Chapter 1, Chapter 2</td>
</tr>
<tr>
<td>3-4</td>
<td>Sept 24, 2013 (Tu)</td>
<td>Mechanisms of Disease: Diagnostic process, agents and injury</td>
<td>Chapters 3, 4, 5</td>
</tr>
<tr>
<td>5-6</td>
<td>Oct 1, 2013 (Tu)</td>
<td>Mechanisms of Disease: Blood, inflammation, neoplasia &amp; defense</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>7-8</td>
<td>Oct 8, 2013 (Tu)</td>
<td><strong>Mammalian Diseases:</strong> Introduction to viruses. Selected viruses <em>[Karsten Hueffer Guest Lecturer]</em></td>
<td>Chapters 7, 11, 12</td>
</tr>
<tr>
<td>9-10</td>
<td>Oct 15, 2013 (Tu)</td>
<td><strong>Mammalian Diseases:</strong> Virus con’d CWD-prions</td>
<td>Ch. 3 &amp; p. 32-33 Science paper &amp; video</td>
</tr>
<tr>
<td><strong>Exam</strong></td>
<td>Oct 29, 2013 (Tu)</td>
<td><strong>Examination Midterm:</strong> Mechanisms of disease &amp; Mammalian viruses (lectures 1-12) and laboratories; written only, includes material from lab.</td>
<td><strong>Examination Midterm</strong></td>
</tr>
<tr>
<td>13 - 16</td>
<td>Nov 5, 2013 (Tu)</td>
<td><strong>Mammalian Diseases:</strong> Introduction bacterial diseases&lt;br&gt;Brucellosis, Tularemia, etc.&lt;br&gt;Introduction to fungal diseases</td>
<td>Chapter 3 p. 33-35</td>
</tr>
<tr>
<td>17-18</td>
<td>Nov 12, 2013 (Tu)</td>
<td><strong>Mammalian Diseases:</strong> Introduction to parasites&lt;br&gt;Selected parasitic diseases&lt;br&gt;Protozoa – Giardia,&lt;br&gt;Cryptosporidium and T. gondii&lt;br&gt;“Worms” – Echinococcus</td>
<td>Chapter 3 p. 35-40</td>
</tr>
<tr>
<td>Date</td>
<td>Date</td>
<td>Course Content</td>
<td>Reference</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
<td>-------------------------------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>19-20</td>
<td>Nov 19, 2013 (Tu)</td>
<td><strong>Mammalian Diseases:</strong> Selected parasitic diseases (lecture 19). Non-infectious diseases</td>
<td>Chapter 3 p. 35-40, Chapter 9</td>
</tr>
</tbody>
</table>
| 21-22     | Nov 26, 2013 (Tu) | **Mammalian Diseases:** Non-infectious diseases  
**Avian Diseases:** L22: Selected viral diseases | Chapter 9     |
|           | Dec 10, 2013 (Tu) | **Avian Diseases:**  
L26: Selected parasitic diseases  
L27: Non-infectious diseases; Botulism, Algal toxins, Mycotoxins, & OP/Carbams, Pb poisoning | Chapter 16 USGS Field Manual, Chapter 9, Wobeser, Chapter 16, 38, 36, 37, 39 USGS Field Manual |
| Final     | Dec 12, 2013 (Th) | **Final Examination,** focused on lectures & labs since mid-term (lectures 12 - 24) | 2-5PM, Last Lab session is Final |
| Finals Week | Dec. 17, 2013 (Tu) 1-3PM | Review of Final Exam  
Final Exams Week; Meet to discuss final | Final exam week is Dec 16-19 |
<table>
<thead>
<tr>
<th>Lab</th>
<th>Date</th>
<th>Group</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Email Class</td>
<td>No Lab; get gear/books purchased.</td>
</tr>
<tr>
<td>1</td>
<td>Sept 5, 2013 (Th)</td>
<td>Murie Bldg 303</td>
<td>Laboratory and field safety, zoonotic disease Necropsy procedures and specimen collection.</td>
</tr>
<tr>
<td>2</td>
<td>Sept 12, 2013 (Th)</td>
<td>Murie Bldg 303 Nina Hansen &amp; Maggie Castellini to assist</td>
<td><strong>Simulated Dolphin Capture Exercise:</strong> Clinical Pathology (non-lethal sampling) Animal handling (physical restraint) Anatomical landmarks (sampling) Blood collection and handling Clinical assays (hematology) Uses and limitations Reference Fair et al. 2006 (provided as pdf)</td>
</tr>
<tr>
<td>3</td>
<td>Sept 19, 2013 (Th)</td>
<td>LARS</td>
<td><strong>Methods used in wildlife disease investigations:</strong> Immobilizing agents: Routes of administration/dart assembly/dart projection</td>
</tr>
<tr>
<td>4</td>
<td>Sept 26, 2013 (Th)</td>
<td>BiRD</td>
<td><strong>Steller sea lion pup necropsy</strong> – hands-on, actual specimen collection for body burden study.</td>
</tr>
<tr>
<td>5</td>
<td>Oct 3, 2013</td>
<td>Murie Bldg 303</td>
<td><strong>Methods used in wildlife disease investigations:</strong> Immobilizing agents: Pharmacology/toxicology – very basic; review of dart safety and handling</td>
</tr>
<tr>
<td>6, 7</td>
<td>Oct 10 and 17</td>
<td>TBD</td>
<td><strong>Andrew's NPS sampling effort</strong>! Part of graduate credit.</td>
</tr>
<tr>
<td>8</td>
<td>Oct.24, 2013</td>
<td>Murie Bldg 303</td>
<td><strong>Student Presentations #1. Graduate Students only.</strong></td>
</tr>
<tr>
<td>9</td>
<td>Oct 31, 2013 (Th)</td>
<td>Necropsy</td>
<td><strong>Avian necropsy</strong> (use pigeons)–Review of anatomy, specimen collection. Two to 4 birds needed. Ch. 1 and 2 USGS manual hand out [flexible based on carcass availability]. Birds are in prep area (307), between the chest freezer &amp; mop sink.</td>
</tr>
<tr>
<td>10</td>
<td>Nov. 7, 2013</td>
<td>Necropsy</td>
<td>TBD</td>
</tr>
<tr>
<td>11</td>
<td>Nov 14, 2013 (Th)</td>
<td>Necropsy</td>
<td><strong>Monogastric (canid, ursid, etc.) necropsy</strong> Depends on availability from ADF&amp;G/laboratory rodents</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>----------------</td>
<td>----------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Things to cover- 1) zoonotic diseases in rodents and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>proper protection. 2) proper restraint and handling. 3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>demonstration of anesthesia/euthanasia 4) cursory</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>anatomy of the small rodent relative to biology and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>wildlife sampling/diseases.</td>
</tr>
<tr>
<td>12</td>
<td>Nov 21, 2013 (Th)</td>
<td>Necropsy</td>
<td>Necropsy – Moose + 1(2) reindeer, review of anatomy,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>specimen collection. Ruminant emphasis.</td>
</tr>
<tr>
<td>Off</td>
<td>Nov 28</td>
<td>Holiday</td>
<td>Thanksgiving Holiday (no classes)</td>
</tr>
<tr>
<td>13</td>
<td>Dec 5, 2011</td>
<td>Murie Bldg 303</td>
<td>Students Presentations. All students. 15 minutes + 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>minutes for questions/per student.</td>
</tr>
<tr>
<td>Fina</td>
<td>Dec 12, 2013 (Th)</td>
<td>Final Exam</td>
<td>2-5PM, Last Lab session is Final Exam</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>lectures &amp; labs since mid-term (lectures 12 - 24)</td>
</tr>
<tr>
<td>Final</td>
<td>Dec. 17, 2013 (Tu)</td>
<td>Review of</td>
<td>Final exam week is Dec 16-19; Meet to discuss final.</td>
</tr>
<tr>
<td></td>
<td>1-3PM</td>
<td>Final Exam</td>
<td></td>
</tr>
</tbody>
</table>

Students need to provide personal cover-alls, rubber boots (no Bunny boots, no Xtra Tufs, no Sorels, etc.), and plastic gloves (i.e., heavy duty dish washing gloves). These must meet the approval of Dr. O’Hara.

_Students are required to wash these after use and the Animal Quarters staff has graciously allowed access to the BiRD washer/dryer. Be respectful and do not abuse this generosity. Be sure there are multiple, large and easy to read identifiers on coveralls (your name and “Wildlife Diseases”). Boots and gloves should be disinfected and stay with the student._

Students are required to help with clean-up.

Required reading includes: syllabus and all hand outs, Field Manual of Wildlife Diseases, Section 1 General Field Procedures (provided as pdf), and other assignments.

Laboratory material will be covered on all exams.