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### BIOL 306.01: Mammalogy

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## BIOLOGY 306 - MAMMALOLOGY

Fall 2001

Kerry R. Foresman

The lecture will be primarily devoted to generalized topics which pertain to mammalian diversity and ecology as a whole. Specific studies will be presented from recent literature to detail many topics. When this is done, reprints of the research will be available in the lab for your use and copies will be placed on reserve in the library.

The laboratory is, in part, designed to stress identification of species by learning skeletal and pelage characteristics. As you study each group of mammal you should not only learn these characteristics but should develop a knowledge of the generalized life history of each species. Specimens of mammals not native to Montana or too rare or fragile to put out for general lab use will be displayed in the hall case next to room HS 202. These specimens will be changed periodically so you should check this display as you go to lab. You will not be held responsible for any taxonomic information presented in the hall display case. Unless otherwise noted you will be held responsible for all of the taxonomic information presented in lecture and lab, as well as all material detailed in the lab handouts. Additionally, we are establishing a web page for this course which will contain important information for which you are responsible. The address will be given to you when it is established. Most specimens identified in the laboratory will be taken to genus and species. Correct spelling of taxonomic nomenclature is expected.

There are three exams which cover the lecture portion of the course, Exams I and II will be worth 100 points, Exam III will be worth 150 points. These exams will be essay in nature and comprehensive. Examples of last years exams will be placed on reserve in the library. There will be three laboratory exams each worth 100 points, and a laboratory quiz worth 25 points. These exams will be of a practical nature where specimens will be placed out for identification and additional questions. Additionally each student will produce a term paper for the semester which will be worth 100 points and give a presentation to the their lab section worth 25 points. No makeup exams will be given and no additional work or papers will be accepted for credit. Questions on the grading of an exam must be brought to my attention within one week of their return.

Materials placed out during each laboratory period will remain available until each exam is completed. Room HS 202 is open until midnight Monday through Friday, but will not be open on weekends. Most students find that additional time outside of the scheduled lab period is required to master this material. Teaching assistants will be available during the labs and will have scheduled office hours if additional help is needed.

University policy does not allow for a change in grade option (grade vs. P/NP) or status (grade vs. audit) after the mid-semester deadline (October 15th) for such changes.

My office hours are MWF 9:00 - 10:00 a.m. or by appointment: Room HS 309.

Lecture Text: I will place a copy of Mammalogy: Adaptation, Diversity and Ecology (1998); G. Feldhamer L. Drickhamer, S. H. Vessey, and J. F. Merritt, on reserve in the library as a reference source.

Faculty Pack: Contains copies of the slides used during lecture, techniques papers to be discussed, and current taxonomic information.

Laboratory Manual: The Wild Mammals of Montana, K.R. Foresman (2001) and Key to the Mammals of Montana, K.R. Foresman (2001).

Mammalogy Lecture - Tentative Schedule

Lecture Topic	Readings(*)	Date
September	5 W Introduction - Mammalian Characteristics	
September	7 F Mammalian Characteristics; Evolution	
	10 M Evolution/Zoogeography	
	12 W Evolution/Zoogeography	
	14 F Evolution/Zoogeography	
	17 M Recent Zoogeography	
19 W	Techniques: Morphometrics/Electrophoresis	Tech. Paper #1
	21 F Mammalian Systematics	Readings
	24 M Mammalian Systematics	" "
	26 W Mammalian Systematics	" "
	28 F Paper Discussion - Systematics	
October	1 M Skin & Derivatives	
	3 W Skin & Derivatives	
	5 F Skin & Derivatives	

	8 M	Antler & Horn Development		
	10 W	*** EXAM I ***		
	12 F	Techniques: Aging Methods		Tech. Paper #2
	15 M	Techniques: Trapping/Marking/Radiotelemetry		
		[Last day to add/drop course or change grading option]		Tech. Paper #3
17 W		Home Range & Territoriality		Readings
	19 F	Home Range & Territoriality	" "	
	22 M	Home Range & Territoriality	" "	
	24 W	Home Range & Territoriality	" "	
	26 F	Paper Discussion - Home Range		
	29 M	Reproduction/Reproductive Strategies		
	31 W	Reproduction/Reproductive Strategies		
November	2 F	Reproduction /Reproductive Strategies		Readings
	5 M	Paper Discussion - Reproduction	" "	
	7 W	*** EXAM II ***	" "	
	9 F	Metabolism & Temperature Regulation		
	12 M	*** HOLIDAY ***		
	14 W	Metabolism & Temperature Regulation		
	16 F	Metabolism & Temperature Regulation		
	19 M	Metabolism & Temperature Regulation		Readings
	21 W	*** THANKSGIVING HOLIDAY ***		
	23 F	*** THANKSGIVING HOLIDAY ***		
	26 M	Paper Discussion - Hibernation		
	28 W	Echolocation		
	30 F	Echolocation December		

3 M Echolocation

5 W Echolocation

7 F Echolocation

10 M Echolocation

12 W Remote Detection Methods

14 F Review

17 M FINAL EXAM 8:00 - 10:00 a.m. \*\*\*No early final exams will be given\*\*\*

Mammalogy: Adaptation, Diversity and Ecology (1998); G. Feldhamer L. Drickhamer, S. H. Vessey, and J. F. Merritt is on reserve in the library as a reference source. Copies may be purchased in the bookstore but are not required. Readings will be assigned from the literature with copies of articles made available in the laboratory and in the library reserve room.

Summary of Grading:

Lecture Exam I .....100

Lecture Exam II .....100

Lecture Exam III (Final) ...150

Lab Quiz ..... 25

Lab Practical I .....100

Lab Practical II .....100

Lab Practical III .....100

Lab Presentation ..... 25

Lab Term Paper .....100

Total Points Possible = 800

Fall 2001 Biology 306 - Mammalogy Laboratory

Date Laboratory # Topic(\*)

September 11 1 Mammalian Skeleton: Order Carnivora - Families Ursidae and Procyonidae;

18 2 O. Carnivora: Family Mustelidae;\*\*\*Deadline for Term Paper

Topics\*\*\*

Optional Field Trip - McKlay Flats: Thursday 20th 7-10am/6:30-9:30pm

Optional Field Trip - McKlay Flats: Friday 21st - 6:30-9:30pm

Optional Field Trip - McKlay Flats: Saturday 22nd - 7-10am/6:30-9:30pm

Optional Field Trip - McKlay Flats: Sunday 23rd - 7-10am/6:30-9:30pm

25 3 Quiz; O. Carnivora: Families Canidae and Felidae; Term Paper

Outline Due - Including Preliminary Reference List

October 2 4 Exam #1: Covers Labs 1-3

9 5 Order Insectivora and Order Lagomorpha

16 6 Order Chiroptera

23 7 Order Artiodactyla: Families Cervidae, Bovidae, and Antilocapridae

30 8 Exam #2: Covers Labs 5-7

November 6 \*\*\* HOLIDAY \*\*\*

9 Term Paper Due (No exceptions)

13 9 Order Rodentia: Families, Sciuridae, Castoridae, and Geomyidae;

20 10 Order Rodentia continued: Families Dipodidae, Muridae, and Erethizontidae;

27 11 Exam #3: Covers Labs 10 & 11; Term Papers returned for Revisions

December 4 12 \*\*\*Begin Group Presentations\*\*\*  
11 13 Group Presentations; Final Term Papers Due

\* For each species studied, you will be responsible for the basic natural history information provided in The Wild Mammals of Montana (2001).

#### Term Paper Project:

You will be expected to work in a group of 3 on a semester project which details the characteristics of a Montana mammal species of your group's choice. The product of this project will be in two forms, (1) an individual paper which each member of the group will write on their own topic related to the chosen species, and (2) a group presentation tying together each member's contribution and presenting an overview of the species' life history. Mammalian Species accounts and The Wild Mammals of Montana can be used as a starting framework for project information but all presentations and papers must be as up-to-date as possible and must reflect what is known about the species in Montana. Individual papers must not exceed 10 pages (including references), with double-spaced lines and 12 pt. font. Outlines of your term paper topic are due October 25th - a preliminary list of references that you have found should be included with your outline. Though there is no magic number of references that must be included, a strong manuscript would be supported by 15-20+ references. References to be included must come from solid, peer-reviewed journals, professional books, or well-documented agency reports. No materials from Web-site reports or lay books will be accepted. References should be cited following the guidelines for the Journal of Mammalogy (see the references in The Wild Mammals of Montana which follows this convention). Each individual's paper will bear a primary author and the names of the other members of the group as co-authors. The primary author is solely responsible for researching and writing the paper. The other members of the group will be responsible for editing this paper prior to its submission so that the manuscript is succinct, accurate, and well-written. The primary author will receive 75% of the grade given for the paper and the co-authors will receive 12.5%. In other words if the grade is 90 points (out of a possible 100) the primary author will receive  $.75 \times 90 = 67.5$  points and each co-author will receive  $12.5 \times 90 = 11.25$  points. Each member of the group will thus produce their own research paper and be responsible for editing two others. Term papers will be due November 9th (NO EXCEPTIONS). Your paper will be edited and returned for revisions; a final manuscript will be due December 11th.

Group presentation:

Each group will be expected to give a 20 minute presentation to their lab describing their chosen species. Included in this presentation should be an overview of the following topics:

Taxonomic status

Distribution in U.S. and Montana

Distinguishing characteristics

Ecology (Anatomy/Physiology....)

Reproductive Biology

Obviously much of this information is summarized in *The Wild Mammals of Montana*. I will pay particular attention to any additional information which you may present.

Individual term paper topics should be more specialized, expanding upon one or another of these areas. Thus the group will spend approximately 5 minutes providing an overview to their species and then each member will give a 5 minute presentation on their own topic.

Materials from the museum can be used for these presentations (with prior approval); Each group will develop a PowerPoint presentation (computer presentation) for the class.

\*\*\* Each group must choose a different species thus species are taken on a "first-come, first-served" basis. Get your group organized and be the first to choose a species! I will post a running list of species that have been chosen outside my office. Once you have made your choice you must notify me of this choice, who the members of your group are, and what individual topics each member has chosen to write upon - NO LATER THAN SEPTEMBER 18TH .

Grading for lab:

1 25-point lab quiz

3 100-point lab practicals

Group presentation - 25 points

Paper - 100 points [75% for primary author = 12.5% x 2 for editing as co-author]

Total lab points possible = 450 points



## PowerPoint Presentations:

The student computer labs on campus are equipped with PowerPoint Presentations software (found within the Office software suite of programs). This includes the lasernet computer lab in the Mansfield library. Most of these computers (\*\*with the exception of those in the library) also have internal zip drives so you will be able to create a slide show and save it to a zip disk (these are available in the bookstore). If you chose to use the library computers you can still save your files through the "pack and go" Save option which will compress this data on to one or more 3.5" diskettes.

If you chose to use the computer in the mammalogy lab you should save your file to a zip disk. These types of files can become quite large and they take up too much space on the hard drive so they must be saved elsewhere. ALWAYS BACK UP YOUR FILE TO A ZIP DISK!!!!

When you first pull up the PowerPoint program you will see a form which gives you several options among which are to create a blank presentation or open an existing file. The first time you will want to chose to create a blank presentation. When you chose this option you will then be faced with several new options. Each of these provides you with a standard template (i.e., the template for a title slide, for presenting a list, for presenting a list along with a picture, a blank template so that you can create your own style, etc.). You will just have to open several of these options to see what they appear like and then chose one that suits your purpose. I generally chose the blank option (the clear slide) and create my own text material.

To type in text, click on the text page icon in the bottom bar. Click on Format in the bar which appears at the top of the screen to chose the font type and size. Generally fonts should be 25 to 32 pts for lines of text; headers may be 36-40 pts. Most often you will also want to bold these fonts to highlight them. You can create text with bullets by clicking on Format again and choosing "Bullets and Numbering". Here you can then determine what type of bullet you want to use.

You can chose the background color of your slide by clicking on Format and then Slide Color Scheme (which gives you standard options that some graphics designer has decided are visually correct) or Background which allows you to create your own color scheme. Don't get too creative here (see more detailed comments below). In this assignment you are trying to convey scientific information, not demonstrate how artistic you are.

If you wish to insert a picture, click Insert and chose Picture. You then chose the file where this picture is stored and bring it in. The internet provides a wealth of images that you can retrieve. Simply type in the species that you wish to find pictures of and search the web sites that are available. Once you have found an image that you want, click on it with the right mouse button. This brings up the option of saving the file to a disk or the hard drive, or copying the picture directly to your PowerPoint slide using the Copy and Paste option. Once the picture is in your slide you can position it anywhere on the slide and size it. Additional pictures can also be placed on the same slide. Here, text can be overlain on the picture (sized and colored), arrows can be inserted (sized and colored), boxes can be created around the

pictures or text, all by using the options provided in the icon bar at the bottom of the screen. You will just have to spend a little time trying each of these options to see the possibilities. If you absolutely, positively must have an image (photo, table or graph) for your talk that you have found in a book, we might be able to scan it for you.

Once you have created one slide you can start on the next by clicking on Insert (top icon bar) and choosing Slide. To see all of the slides that you have created in your show, click on the icon at the bottom that says slide sorter viewer (it looks like four boxes). To return to a particular slide click on it and click on the single slide icon image (slide view) at the bottom. To play your slide show, click on the screen icon in the bottom bar. Hit enter or the left mouse button to advance through each slide.

If you want to be a little creative (just a little!) click on the Slide Show bar at the top of the screen, chose Custom Animation, and look at the options provided.

General Comments about creating a PowerPoint file:

1) Though this is a powerful program which will allow you to be very creative, you must constrain your imagination; don't get drawn in to using all of the "bells and whistles" that are available. Remember, a little creativity goes a long ways. What you are trying to do is convey meaningful, scientific information, not wow your audience with computer technology. (e.g., don't have all of your arrows or text flying in from all over the slide or exploding into view);

2) Keep your color schemes consistent throughout the presentation; don't have one slide with a blue background, another with a red background, another with a green background etc.. You don't want to draw your audience's attention away from what you are trying to say.

3) Keep the amount of information per slide to a minimum and be sure that the fonts that you use are both large enough and clean enough to be easily seen. A general rule of thumb is to have no more than 8 lines of type per slide, no more than 50 words per slide (generally fewer), block font forms such as Arial rather than script fonts (see the examples below), and leave space between lines (at least double-spaced).

This is an example of 12 pt arial font which has been bolded.

This is an example of 12 pt script font such as courier.

**THIS IS ARIAL 12 PT FONT, BOLDED AND CAPITALIZED.**

4) Keep the information on graphs or within tables to a minimum.

5) It is difficult to present more than 1 slide per minute. If your slides have data which needs to be interpreted you may not want to present more than 1 slide per 2-3 minutes. In other words, if you have a 20 minute presentation you may only be able to effectively show 10-12 slides.

6) Practice your presentation. Practice your presentation. Practice your presentation. See how much time it takes for you to present your talk and adjust your slides accordingly.

#### Grading Guidelines for the Presentation:

You will be graded on your presentation based upon the criteria set forth in the appended sheet excerpted from Pickett, S. T. A., B. E. Hall, and M. L. Pace. 1991. Strategy and checklist for effective scientific talks. *Ecological Society Bulletin* 72(1):8-12. This should be used as a guideline as you prepare your talk.

The teaching assistants and I will be more than willing to help you with the development of your term paper and PowerPoint presentation. Come in individually or with your group if you would like help learning how to use the Lasernet bibliographic search programs or the PowerPoint software.