

Syllabus

BIOLOGY 570/670, 2005

Required chapters in your textbook (McCune & Grace 2002) are listed for each week. Readings on reserve in the library are optional. "T&F" = Tabachnik and Fidell (2001).

	Chapter	Topic	Optional reserve readings
Week 1	1,2	Class structure; get assignment for project; kinds of variables; data structures; read "Course Mechanics" in packet	Yoccoz (1991)
Jan 3	App.1		
Jan 3	App.1	<i>Lab: Elementary matrix algebra.</i> Do problems in packet. Answers are on following page. For problems 11 and 12 you will need a computer. Use MATLAB in computer labs in Milne Computer Center	
Jan 5	2	Overview of community matrices; distance measures in brief	
Jan 7	10	Finish distance measures in brief; begin cluster analysis	
Week 2			
Jan 10	Ch.6 p.45, Ch.10, Ch.24, p.188- 192	Cluster analysis & MRPP in brief. (If the subject is new to you, this is a lot of reading to digest all at once. Stay calm. We will return to these topics. The problem is that for us to do something interesting in lab, you need to have the basic idea about distance measures as well as understand a bit of the analytical techniques. For now try to appreciate the essence of what we are doing, foregoing some of the details.)	
Jan 10		<i>*Lab: Cluster analysis and testing for group differences</i>	
Jan 12	5, 6	Single species on environmental gradients; distance measures	Beals 1984, p.21-29
Jan 14	6	PROJECT PROPOSAL DUE; distance measures, continued	
Week 3			
Jan 17		MLK HOLIDAY	
Jan 17		MLK LAB HOLIDAY	
Jan 19	10, 11	Finish distance measures and finish cluster analysis, if necessary; introduction to ordination	
Jan 21	13	Introduction to ordination	Beals 1984, p. 1-8, p. 9-11
Week 4			
Jan 24	14	Principal components analysis	Beals 1984, p.18-21, 33-44; T&F, ch. 13
Jan 24	8	<i>*Lab: Ordination of eating habits</i>	
Jan 26	16	Principal components analysis, cont.; nonmetric multidimensional scaling	Beals 1984, p.17-18; Clarke (1993)
Jan 28	16	Nonmetric multidimensional scaling, cont.	Tenenbaum (2000)
Week 5			
Jan 31	7, 9	Data screening; data transformations. (Note: Understanding data transformation is critical for successful community analysis. Data	T&F, ch. 4

transformation typically precedes data analysis, but pedagogically it is important for you to have used a few analytical methods, to provide a context for understanding data transformation.)

Jan 31		<i>*Lab: Are conclusions based on NMS reliable?</i>	
Feb 2		MIDTERM EXAM	
Feb 4	9	Data transformation, cont.	
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Week 6			
Feb 7	15	Data transformation, cont.; rotating ordinations	
Feb 7		<i>Lab: Data Transformations; report orally on results in lab</i>	
Feb 9	18	Finish data transformation; weighted averaging	
Feb 11	19, 20	Correspondence analysis; detrended correspondence analysis	Beals 1984, p. 13-17
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Week 7			
Feb 14	12, 21	Twinspan; canonical correspondence analysis (CCA); sign up for afternoon slot to meet with McCune	
Feb 14		<i>Lab: work on and get help with your project.</i>	
Feb 16	21, 25	Finish CCA; indicator species analysis	
Feb 18	23	Finish ISA; multivariate experiments,	Anderson 2001
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Week 8			
Feb 21	24, 26	MRPP; discriminant analysis	T&F, Ch. 11
Feb 21		<i>*Lab: Detecting outliers and their consequences</i>	
Feb 23	27, 22	FIRST DRAFT OF PROJECT REPORT DUE – 12 Noon. Mantel test; reliability of ordination results	
Feb 25	28	Nested designs; catch-up day	
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Week 9			
Feb 28		Summary: choosing an ordination technique. Return draft project reports	
Feb 28		<i>Lab: work on and get help with your project</i>	
Mar 2	4	Species diversity	
Mar 4	4	Finish species diversity; begin habitat models	
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Week 10			
Mar 7	handout	Habitat models; SUBMIT FINAL PDF ELECTRONICALLY before 5 pm to Bruce.McCune@science.oregonstate.edu	
Mar 7		<i>Lab: none</i>	
Mar 8		Tuesday at Noon: McCune posts all PDFs on Blackboard by noon. Get reviewing assignment by email if you don't have it already.	
Mar 9	29	Classification and regression trees (CART)	De'ath (2002)
Mar 11	30	Structural equation modeling (SEM); PDF REVIEWS DUE 5 pm. Submit to Bruce.McCune@science.oregonstate.edu	

* Hand in your lab work at the end of these labs.

Final exam: Friday, March 18, 7:30 a.m.!