lecture topics  

readings

BFtL = Bringing Fossils to Life
Pb = Palaeobiology II (on e reserve)
GLR = Geology Library reserve

Sep. 8 introduction  
BFTL chap 5

the study of form

13 functional & constructional morphology  
BFTL chap 7

15 criticism of the study of form  
GLR Gould & Lewontin 1979
GLR Mayr 1983

20 theoretical morphology  
Pb 157-161 (Swan, Occupation of Morphospace)

22 case studies  
Pb 147-152 (Wray, Developmental Genes and the Evolution of Morphology)

interpreting the fossil record

27 resolution in the fossil record  
BFTL chap 1 & 10
Pb 292-296 (Flesss, Time-averaging)
Pb 289-292 (Anderson, Transport and Spatial Fidelity)
Pb 542-545 (Marshall, Confidence Limits in Stratigraphy)

29 bias, completeness  
Pb 297-303 (Kidwell, Major Biases in the Fossil Record)
Pb 500-504 (Foote, Estimating Completeness of the Fossil Record)

Oct. 4 character variation; species concepts  
BFTL p. 30-37
BFTL chap 3
Pb 492-494 (Hughes, Morphometrics and Intraspecific Variation)

6 reconstructing phylogeny  
BFTL chap 4
Pb 509-515 (Wilkinson, Phylogenetic Analysis)
chemical approaches to paleobiology BFTL p. 131-135
Pb 473-475 (Beerling, Carbon Isotopes in Plants)

more on chemical approaches

exam 1

the pace of evolution

microevolution; speciation Pb 133-137 (Lazarus, Speciation and Morphological Change)
Pb 137-142 (Cheetham, Evolutionary Stasis Vs. Change)
punc eq & gradualism Pb 143-146 (McCune, Rapid Speciation in Species Flocks)
rates of evolution Pb 166-171 (Stanley, Controls on Rates of Evolution)

macroevolution: hierarchy Pb 188-192 (Grantham, Hierarchies in Evolution)

driving or directing evolutionary change

growth and allometry BFTL p. 21-30
heterochrony Pb 180-188 (McNamara, Importance of Heterochrony)

environment, ecology, and evolution BFTL p. 138-141
Pb 171-176 (Sepkoski, Competition in Evolution)

case studies

even 2

extinction

questions about extinction BFTL chap 6
Pb 198-202 (McKinney, Selectivity During Extinction)
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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
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<tr>
<td>24</td>
<td>causes of extinction</td>
<td>Pb 202-206 (Bottjer, Biotic Recovery from Mass Extinctions)</td>
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<tr>
<td>29</td>
<td>case studies</td>
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<td>diversity, diversification, &amp; other large scale patterns</td>
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<td>Dec. 1</td>
<td>the history of diversity</td>
<td>B FtL p.141-147</td>
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<td>Pb 211-220 (Benton, Biodiversity Through Time)</td>
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<td>Pb 504-509 (Smith, Analysis of Diversity)</td>
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<td>6</td>
<td>disparity &amp; diversity</td>
<td>B FtL p. 99-102</td>
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<td>Pb 494-500 (Wills, Disparity vs. Diversity)</td>
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<td>8</td>
<td>discussion: biodiversity forum</td>
<td>Paleobiology 29(1)</td>
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<td>evolutionary trends</td>
<td>Pb 206-211 (McShea, Evolutionary Trends)</td>
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<td>Pb 162-166 (Jablonski, Origin of Evolutionary Novelties)</td>
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<td>13</td>
<td>large scale patterns</td>
<td>Pb 432-437 (Droser, Ecological Changes through Geological Time)</td>
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<td>Pb 25-31 (Erwin, Metazoan Origins and Early Evolution)</td>
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<td>Pb 94-97 (Kelley &amp; Hansen, Mesozoic Marine Revolution)</td>
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<td>15</td>
<td>paleontology &amp; society</td>
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<tr>
<td>21</td>
<td>exam 3</td>
<td>7:45 a.m. Tuesday, December 21st</td>
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Readings
Both of these books, as well as several additional readings, are on reserve in the Geology Library.
The relevant parts of Palaeobiology II will also be on electronic reserve.

Grading
We will have three exams, each covering two sections of the course. Exams will be in short essay format. You will also be expected to do four written paper reviews (explained below), two of which will also be presented orally. Grading will be proportioned in this way:

<table>
<thead>
<tr>
<th>Exam</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>21%</td>
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<td>Exam 2</td>
<td>21%</td>
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<td>Exam 3</td>
<td>25%</td>
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<tr>
<td>Paper reviews and class participation</td>
<td>33%</td>
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</table>

Included in the 33% of your grade devoted to paper reviews and class participation is 5% for each of 4 written paper reviews, 4% for each of 2 oral paper reviews, and 5% for overall class participation.

Paper reviews
Each person will pick four case studies (papers from the primary literature) from four different subject areas listed below. For each paper, you will provide a written summary and critique of roughly 1000 words. For two of the papers, you will also present your summary/critique to the class. Oral presentations will be limited to 6 minutes with 4 minutes for discussion and comment. You should cover the major points of the paper and provide a brief critique based on our previous discussion of these topics. Suggested papers for each area are provided on separate sheets. It is possible to do a paper that is not on the list, but you MUST check it with me first. To avoid overspecialization, each of the four papers that you choose must be from a different subject area, and each must be about a different taxonomic group. Written paper reviews are due on the day you give your oral presentation, OR one week after the date given below (for the two reviews that you are not presenting orally).

- functional and theoretical morphology - September 22
- taphonomy and bias - October 4
character variation - October 6
reconstructing phylogeny - October 6
chemical approaches to paleobiology - October 13
tempo and mode - November 1
environment, ecology, and evolution - November 15
extinction - November 29
disparity and diversity - December 6
trends and patterns - December 13