**GLY 418 INVERTEBRATE PALEONTOLOGY COURSE OUTLINE SP-18**

**Instructor**: Dr. R. L. Martino

Office: Room S174

 Hours: M: 3-4, T: 11-12, 3-4, W: 1-4, Th: 11-12 (appointment recommended)

 Phone: 304-696-2715; E-mail: martinor@marshall.edu

**Textbook**: *Invertebrate Paleontology and Evolution*. E.N.K. Clarkson, 4rth ed.

 ISBN: 978-1-118-68516-7. Wiley Publishing.

**Course Description**: 4 credit hours, Taxonomy, morphology, and paleoecology of body and trace fossils representing the major invertebrate phyla; analysis and interpretation of faunal

assemblages; evolution and extinction of species.

**Policy Statement**

The main goal of this course is to help students to become competent at recognizing and interpreting the remains or traces of organisms preserved in sedimentary rocks. Fossils are an invaluable attribute of many sedimentary rocks. Their uses include 1) age dating of rock layers, 2) paleoenvironmental interpretation, and 3) reconstruction of the history of life on earth.

Since sedimentary rocks cover about 70-75% of the land area and most of the seafloor, geologists dealing with environmental, engineering, and resource extraction companies or regulatory agencies need to have a comprehensive understanding of sedimentary rocks since they are the most likely rock type that these companies will be dealing with. You will be treated with respect and encouragement and you will be provided with the necessary tools to succeed just as you would if hired by a company. The rest is up to you. If you want to keep a job and move on to more advanced, better paying positions, you need to demonstrate interest, motivation, and reliability. You will succeed in this course if you adhere to these professional guidelines, and will not if you don’t. I want every student in this course to do well and I am here to help.

**Attendance**

Students should report to class **before** 11:00 for lecture and **before** 1:00 for lab. Attendance will be taken in the 5 minutes that precede class. Students who arrive after 11 or 1 will not be admitted without prior permission from me. It is disruptive to come to class late and it is not fair or respectful to other students who are trying to learn. To protect their interests, the door(s) will be locked at 11:00 for lecture and 1:00 for lab. Any student who opens the door to another student arriving after class has started will also be counted absent. If you arrive late, go to the library and study, and get the notes from someone who was present. I-phones or other similar devices are not permitted in lecture or lab. Those who have them out during the lecture or lab will be dismissed and receive a 0 for attendance and participation for that lecture or lab. Students will be allowed 2 unexcused absences without penalty. Subsequent missed classes without a university excuse will reduce attendance/participation by 5 % per class.

**Participation/Preparation**

Student participation/preparation will be based on homework, pop-quizzes, ability to participate in class or lab discussions, careful handling of specimens and equipment, and attitude toward and consideration for others.

**Grading**

 Lecture Grade

 Midterm and Final Exam = 40 % each; attendance =10%, participation = 10%

 Lab Grade

 Exercise Average= 30%, Lab Final = 60%, attendance = 10%

 Final Grade will be based on 65% lecture grade and 35% lab grade:

 90-100 = A, 80-89 = B 70-79 = C 60-69 = D less than 60 = F

Exams and lab work can be made up provided you obtain a University excuse. Absences may be excused by the University for serious medical or legal reasons, military obligation, or university activities. Attendance will be taken at the beginning of each class/lab. Discussion/review questions will be assigned for lecture. It is the student's responsibility to 1) complete any assigned reading or other homework before coming to class, 2) be prepared for pop-quizzes, and 3) participate effectively in class discussions.

# Course Objectives/Methods of Assessment

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| **Course Objective** | **Student Activity** | **Assessment Tool** |
| Become familiar with the major taxonomic divisions of invertebrates and their distinguishing morphologic characteristics | Reading, lab demonstration, hands-on lab experience; homework | Lab Exercises Lab Final Exam Lecture Exams |
| Develop a working knowledge of the anatomical components of the invertebrate groups and their function | Readings, lab demonstration, lecture interaction, hands-on lab experience. homework | Lab ExercisesLabs, Exams |
| Acquire an understanding of the various taphonomic processes that filter and limit the completeness of the fossil record | Laboratory Analysis, FieldworkReadings | Lab ExercisesLab Final |
| Review current scientific explanations and for microevolution and macroevolution and the degree to which they are supported by the fossil record  | Class Preparation, Participation, lab reports | quizzes, homework, exams |

**Outline of Lecture Topics**

Week No. Topic Assignment

1 Principles of Paleontology C. 1

2 Evolution and the Fossil Record C. 2

3 Origin and Diversification pf Metazoans C 3

4 Sponges C. 4

5 Cnidarians C. 5

6 Bryozoans C. 6

7 Brachiopods C.7

**Mid-Term Exam**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8 Molluscs – Bivalves C. 8

9 Molluscs – Gastropods C. 8

10 Molluscs – Cephalopods C. 8

11 Echinoderms – Echinoids C. 9

12 Echinoderms – Crinoids/Blastoids C. 9

13 Graptolites C. 10

14 Arthropods C. 11

15 Trace Fossils TBA

 **FINAL EXAM**\_\_Tuesday\_May 1, 10:15\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Lab Topics (tentative)**

Week Topic Chapter

 1 Taphonomy 1

 2 MLK – no lab

 3 Protista 3

 4 Porifera 4

 5 Cnidaria 5

 6 Bryozoa 12

 7 Brachiopoda 7

 8 Mollusca-Bivalvia 9

 9 Mollusca –Gastropoda 8

 10 Mollusca-Cephalopoda 10

 11 Echinodermata -Echinoid 13

 12 Echinodermata- Crin/Blas 14

 13 Hemichordata 15

 14 Arthropoda/Trilobita 7

 **15 Lab Final**

Lab Exercises must be turned in on time. A lateness penalty (10 pts/day) will be assessed. Exercises will not be accepted from individuals after they have been returned to class. Though students may work together, **the collection of data, description of rock properties, and answers to discussion questions on lab reports must be an individual effort**. Copying another’s work or allowing another student to copy yours constitutes *academic dishonesty*. Any form of *academic dishonesty* that occurs will result in dismissal from the course and an automatic final grade of “F” . A letter outlining the offense will be forwarded to the academic dean for consideration of further action. See academic dishonesty <http://www.marshall.edu/catalog/files/UG_17-18_published_09-15-17.pdf>.

 **Useful References/Links**

Moore, R. C., Lalicker, C. G. and Fischer, A. G., 1952. *Invertebrate Fossils.* McGraw-Hill.

Good summary of treatise on major groups of invertebrates.

*Treatise of Invertebrate Paleontology*

published by the [Geological Society of America](https://en.wikipedia.org/wiki/Geological_Society_of_America) and the [University of Kansas](https://en.wikipedia.org/wiki/University_of_Kansas) Press, is a definitive multi-authored work of some 50 [volumes](https://en.wikipedia.org/wiki/Volume), written by more than 300 [paleontologists](https://en.wikipedia.org/wiki/Paleontologist), and covering every [phylum, class, order, family](https://en.wikipedia.org/wiki/Scientific_classification), and [genus](https://en.wikipedia.org/wiki/Genus) of [fossil](https://en.wikipedia.org/wiki/Fossil) and [extant](https://en.wikipedia.org/wiki/Extant_taxon) (still living) [invertebrate](https://en.wikipedia.org/wiki/Invertebrate) animals. The prehistoric invertebrates are described as to their [taxonomy](https://en.wikipedia.org/wiki/Taxonomy_%28biology%29), [morphology](https://en.wikipedia.org/wiki/Morphology_%28biology%29), [paleoecology](https://en.wikipedia.org/wiki/Paleoecology), [stratigraphic](https://en.wikipedia.org/wiki/Stratigraphy) and [paleogeographic](https://en.wikipedia.org/wiki/Paleogeography) range. However, genera with no [fossil record](https://en.wikipedia.org/wiki/Fossil_record) whatsoever have just a very brief listing. (MU Library has hard copies and digital access).

The Paleobiology Database <https://paleobiodb.org/#/>.

<http://www.fossilmuseum.net/PaleobiologyVFM.htm>.

The Paleontology Portal. <http://preparation.paleo.amnh.org/1/home>.