

metamorphic rocks ranging in age from 1.1 to over 2.7 billion years old. More details will be provided later in the semester on the logistics and costs of the field trip. We will be camping during the duration of the trip. Those of you that choose not to participate will be given a challenging assignment in lieu of making the trip. The trip/assignment is worth 50 points.

Oral tray reports will be completed during the course of the semester. Tray reports consist of individual efforts identifying unknown mineral and/or rock samples. The tray reports essentially provide you with an opportunity to obtain a limited number of additional points in the course. There will be a limit of 8 tray reports per person (160 points) during the semester. There will be a sliding scale in terms of the points available for each tray report. The following sliding scale will be used:

Tray Reports 1, 2, and 3	15 points each
Tray Reports 4 and 5	20 points each
Tray Reports 6, 7, 8	25 points each

The purpose of the sliding scale is to emphasize the importance of understanding and applying the materials covered in the lecture and lab parts of this course. The more of these you complete, the more points the tray reports are worth! **You must successfully complete at least two tray reports during the semester to pass the course (there will be absolutely no exceptions).**

Total Points: A summary of the total points possible in this course, based on the materials covered in the previous section of this syllabus, is summarized below:

		<u>Points</u>
Lecture Exams	4 exams @ 150 points each	600
Weekly Homework Assignments	2 @ 150 points each	300
Weekly Rock/Mineral Lab quizzes	11 quizzes @ 50 points each	550
Laboratory Projects	8 projects	300
Field Trip Field Book/Assignment	1 @ 50 points	150
Final Lab Exam	1 exam @ 100 points	100
	<i>Total</i>	<i>2000</i>

Grades: Your grade is based on your *total points* earned in the course. The grade is weighted approximately 50% on the lecture materials and the field trip, and 50% on the lab assignments and quizzes. Tray reports give you an opportunity to gain up to 8% additional points in the class. Grades for this course will be given for achieving the following point totals:

A = 95% and above	AB = 90% and above
B = 85% and above	BC = 80% and above
C = 75% and above	CD = 70% and above
D = 60% and above	F = less than 60%

Laboratories: Lithology, by nature, is a very laboratory intensive course. **Considerable amounts of lab time will be necessary to evaluate and comprehend the materials presented in this course.**

The laboratory phase of this course is essentially broken into three topics: a) igneous rocks; b) sedimentary rocks; and c) metamorphic rocks. A tentative schedule for the subjects that I will cover in lab is listed on the attached topical outline.

Reference collections for you to study are located in the metal cabinets in the lab marked **ROCKS**. A guide to the locations of the various rock samples will be kept in the Mineralogy/ Lithology Lab List and Database that will be stored in a three-ring binder in the lab. This guide will also direct you to the correct locations for the mineral samples you will also need to study. **Considerable time has been spent by both Faculty and Students organizing this extensive collection...IT MUST REMAIN ORGANIZED.**

Due Dates: All assignments are due on the dates that I have assigned as the due date. **Late assignments will not be accepted unless individual arrangements have been made with me prior to the due date. Assignments turned in late will be given a "0" (no exceptions).**

Important Due Dates for Selected Course Assignments*

Assignment	Date Given	Date Due
Homework 1 - Phase Diagrams/Igneous Classification	February 4	February 11
Homework 2 - IGPET PROJECT	February 11	February 25
IGNEOUS EXAM 1	February 22	February 22
<i>Igneous Project</i>	<i>March 4</i>	<i>March 28</i>
IGNEOUS EXAM 2	March 14	March 14
<i>Sedimentary Project</i>	<i>April 8</i>	<i>April 25</i>
SEDIMENTARY EXAM	April 11	April 11
MINNESOTA FIELD TRIP	May 1	May 4
METAMORPHIC EXAM	May 9	May 9
FINAL LAB EXAM	May 13	May 13

* Lab due dates will be given when assigned.

Additional Readings Sources

- B5 Barnes, H. L., 1975. Chapter 5 – “Hydrothermal Alteration” (pages 173-235), in Barnes, H. L., 1975, Geochemistry of Hydrothermal Ore Deposits: John Wiley and Sons, New York, 798 pages.
- B95 Best, M. G., 1995, Igneous and Metamorphic Petrology: Blackwell Science, Cambridge, MA, 630 p.
- BT96 Blatt, H. and Tracy, R. J., 1996. Petrology: Igneous, Sedimentary and Metamorphic Rocks, 2nd Edition: W. H. Freeman and Co., New York, 529 pages.
- CW13 Cas, R. A. F., and Wright, J. V., 1987. Chapter 13 – Modern Volcanoes and Volcanic Centres (pages 363-412), in Cas, R. A. F., and Wright, J. V., 1987, Volcanic Successions: Allen & Unwin Publishing, London, 528. Pages.
- EJ1 Easton, R. M., and Johns, G. W., 1986. Volcanology and Mineral Exploration: The Application of Physical Volcanology and Facies Studies: Ontario Geological Survey Special Paper 129, p. 2-40.
- W01 Winter, J. D., 2001. An Introduction to Igneous and Metamorphic Petrology: Prentice Hall, Upper Saddle River, N. J., 697 p.

Other Useful References

- BF94 Bucher, K., and Frey, M., 1994. Petrogenesis of Metamorphic Rocks: Springer – Verlag, Berlin, 318 pages.
- K01 Klein, C., 2001. The 22nd Edition of the Manual of Mineral Science: John Wiley and Sons, New York, 641 pages.
- M94 Miyashiro, A., 1994. Metamorphic Petrology: Oxford University Press, New York, 404 pages (specifically see Appendix 3 – Glossary of Metamorphic Petrogenesis).
- R95 Raymond, L. A., 1995. Petrology – The Study of Igneous, Sedimentary, and Metamorphic Rocks: Wm. C. Brown Publishing, Dubuque, IA, 742 pages.

Other Useful References

Hudak, G. J., Lithology Lecture Notes, Spring Semester, 2007 (kept in Mineralogy/Lithology Lab).

A liberal arts education allows people to carefully observe, evaluate, interpret, and improve their world.