

GLY 427 FOSSIL FUELS COURSE OUTLINE SP-15

TEXT: *Elements of Petroleum Geology*, R. C. Selley, 2nd ed., 1998
+ many other readings (p. 3) will be made available from a variety of sources due to the multidisciplinary nature of the course.

LECTURES: Tuesday 4:00 PM to 5:30 PM and Thursday, 4:45 PM to 6:15 PM.

LAB: Tuesday, 5:30 PM to 7:30 PM.

INSTRUCTOR: Ed Rothman

Office: Room 176

Office Hours: by appointment

Phone: 304-539-3537

Email: rothmane@marshall.edu or erothman@ediwv.com

COURSE DESCRIPTION: Fossil Fuels GLY 427 (4 hours)

Origin and distribution of coal, oil, and gas and methods of exploration and reserve evaluation.

Prerequisite Courses (or permission):

GLY 313-Structural Geology and

GLY 325-Stratigraphy & Sedimentation

COURSE OBJECTIVES

To develop an understanding of :

- 1) the composition of coal, coal quality parameters, and coal-forming depositional environments
- 2) coal mining methods, reserve estimates, causes and nature of coal seam discontinuities, roof rock quality and problems
- 3) the composition of petroleum and natural gas, the nature of precursors and necessary depositional and diagenetic conditions for their preservation and maturation
- 4) hydrocarbon migration, and various structural, stratigraphic and combination trapping mechanisms
- 5) primary, secondary and tertiary recovery methods
- 6) exploration methods including subsurface stratigraphic and structural analysis
- 7) the basic elements of well logging; determination of rock type and fluid content from borehole data
- 8) economic factors controlling petroleum development
- 9) petroleum and coal geology of West Virginia and vicinity

ATTENDANCE POLICY

A daily record of class and lab attendance will be maintained by calling roll. If a student is late, it is their responsibility to notify instructor at end of class that they were present. Excessive unexcused lateness or absences will have a negative impact on attendance/participation component of grade calculation.

Attendance during exams is mandatory. Only serious personal illness, death in the immediate family, military service, or university activities excused by the academic deans will be considered as acceptable reasons for missing a test; all excuses must be verifiable.

Any form of academic dishonesty that occurs will result in dismissal from the course up until the add/drop deadline, and an automatic final grade of "F" after this date. In both cases, a letter outlining the offense will be forwarded to the academic dean for consideration of further action. (see p. 67-71, Undergraduate Catalog: http://www.marshall.edu/catalog/undergraduate/UG_12-13_published.pdf).

GRADING

Exam # 1	20 %
Exam # 2	20 %
Exam # 3	20 %
Lab Av	30 %
Att/Part	10 %

Grading scale: > 90% A, 80 - 89% B, 70 - 79% C, 60 - 69% D, < 59% F.

COURSE OUTLINE (tentative)

<u>Week</u>	<u>Lecture Topic</u>	<u>Reading Assignment</u>
1	Introduction to Petroleum Geology	C. 1
2	Properties of Oil and Gas	C. 2
3	Exploration Methods	C. 3
4-5	Origin, Migration, and Accumulation	C. 5

EXAM # 1 _____

6-7	The Reservoir	C. 6
8-9	The Trap	C. 7
10	Enhanced Recovery	TBA

EXAM # 2 _____

11-12	Coal Occurrence and Composition	TBA
13	Pennsylvanian Coal Formation: Appalachian Basin	"
14	Coal Exploration Models	"
15	Coal Mining Techniques and Hazards	"

EXAM # 3 (Final Exam) TBA

LAB EXERCISES

Coal Lithotypes
Coal Petrology
Outcrop Analysis of Coal (tentative)
Reserve Estimates
Geophysical Logs – recognition of rock types, porosity, fluids, coal quality
Coal Geology of Southern WV Field Trips (tentative)
1) Mining
2) Pennsylvanian Coals: stratigraphy and depositional context
Oil Game Project: Basin Analysis, Exploration, Economics
Oil Prospect Development (Petra)
Visit to Drilling Rig & Mudlogging Unit (tentative)

Coal References (Partial listing):

Martino, R.L., Blake, B. M. Jr., Grady, W. C., and Eble, C. F., 1998, Coal Geology, Paleobotany and Regional Stratigraphy of the Middle Part of the Kanawha Formation, Southern West Virginia. Geological Society of America, Coal Division Field Trip Guidebook, 135 p.

McCabe, P. J., 1984, Depositional Environments of Coal and Coal-bearing Strata. International Association of Sedimentologists Special Publication 7, p. 13-42.

Ward, C. R., 1984, Coal Geology and Coal Technology, Blackwell Scientific Publications
Ch. 3 (p. 74-105) Coal Petrology and Petrographic Analysis
Ch. 7 (p. 220-261) Coal Mining Geology

Williamson, I. A., 1967, Coal Mining Geology, Oxford University Press.
Ch. 18 (p. 218-235) Origin and Properties of Coal
Ch. 19 (p. 236-255) Rank and Classification of Carbonaceous Sediments

CD – Atlas of Coal Geology (editors A. R. Papp, J. C. Hower, and D. C. Peters)
AAPG Studies in Geology # 45 ~ 1998 ISBN 0-89181-141-9
V. 1 Coal Geology
V. 2 Coal Petrology

Students with disabilities:

Policy for Students with Disabilities: Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard

Hall 117, phone 304 696-2271 to provide documentation of their disability. Following this, the DSS Coordinator will send a letter to each of the student's instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignment, testing and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, please visit <http://www.marshall.edu/disabled> or contact Disabled Student Services Office at Prichard Hall 11, phone 304-696-2271."

University Policies/ Resources: By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802

Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment.