GEOS 320 PETROLOGY

Spring, 2016

Instructor: Prof. Jim Mills
E-mail: jmills@depauw.edu
Office: JSC 214
Phone: 658-4669 or 658-4654
Office Hours: 10:00-11:00 MWF or by appointment

Required Text: ***Principles of Igneous and Metamorphic Petrology, 2nd ed.***
Winter, J.D., 2010, Pearson/Prentice Hall Publishers,
ISBN 978-0-32-159257-6

Recommended Text: ***Petrography of Igneous and Metamorphic Rocks***, 2003,
Philpotts, A., Waveland Press Inc., ISBN 1577662954, 192 p.

Class Times: Lecture, JSC 226, 8:00 – 9:00 am MWF: **Lab**, JSC 226, 12:40-3:30 pm Thursday

Attendance: Regular attendance is required for all lectures and labs.

Laboratory: Labs will be assigned on a weekly basis and will be due at the beginning of the following lab period. Late labs will be downgraded 20% for every day they are late. *Failure to turn in three or more labs will result in an 'F' in the course regardless of your performance on exams, homework, and projects.*

Laboratory Equipment: Please bring to lab the following materials: Coloring pencils, an inexpensive compass for drawing circles, hand lens (10x), and calculator.

Homework, Quizzes: There will be several homework assignments over the course of the semester. Late homework will not be accepted. Over the semester, I will give several quizzes that may relate to the reading, lecture material, or other topics I specify (e.g., Geologic Time Scale).

Field Trip: If we can find a common time, we will take a three-day trip to examine the Precambrian geology of Missouri. You are strongly encouraged to participate on this trip.

Grade Scale: Grades will be determined based on the following criteria:

Exams (2)	40%	A 100-93%	B- 82-80%	D+ 69-67%
Final Exam	20%	A- 92-90%	C+ 79-77%	D 66-63%
Labs	20%	B+ 89-87%	C 76-73%	D- 62-60%
Homework, Projects, Quizzes	20%	B 86-83%	C- 72-70%	F <60%

Academic Integrity: Any act that places a student in unfair advantage with respect to the rest of the class will be treated according to the University procedures outlined in the Student Handbook.

Americans with Disabilities Act and Amendments (ADAAA) Policy

DePauw University is committed to providing equal access to academic programs and university administered activities with reasonable accommodations to students with disabilities, in compliance with the Americans With Disabilities Act and Amendments (ADAAA). Any student who feels she or he may need an accommodation based on the impact of a disability or learning challenge is strongly encouraged to contact:

Pamela Roberts, Director of Student Disability Services and ADA Compliance for further information on how to receive accommodations and support.

Student Disability Services:
408 S. Locust Street, Suite 200, Memorial Student Union Building (765-658-6267).

Student Responsibilities:
It is the responsibility of the student to share the letter of accommodation with faculty and staff members. Accommodations will not be implemented until the faculty or staff member has received the official letter. Accommodations are not retroactive. It is the responsibility of the student to discuss implementation of accommodations with each faculty and staff member receiving the letter.

WEEKLY LECTURE SYLLABUS

Date		Topic	Readings
Feb.	1	Introduction to Petrology, Syllabus Review The Earth – An Overview; Igneous Structures	W 1, 4
	8	Phase Diagrams – One and Two Component Phase Diagrams – Multi-component	W 5, 6, 7
	15	Chemical Petrology	W 8, 9
	22	Basalts, Diversification of Magmas	W 10, 11
	29	Layered Ultramafic Intrusions, Mid-Ocean Ridges	W 12, 13
		Friday, March 4 EXAM #1	
March	7	Mid-Ocean Ridges	W 13
		No Class (Class Project) MARCH 11, 14-18	
	28	Flood Basalts, Island Arcs	W 15, 16
		SPRING BREAK MARCH 19 – 27	
April	4	Island Arcs, Continental Arcs	W 16, 17
	11	Continental Arcs, Granitoids, Metamorphism	W 17, 18, 21
	18	Stable Mineral Assemblages, Metamorphic Facies	W 24, 25
		Friday, April 22 EXAM #2	
	25	Metamorphic Facies – Mafic Metamorphic Reactions/Thermodynamics	W 25, 26, 27
May	2	Metamorphic Facies - Pelitic Rocks Metamorphic Facies – Calcareous/Ultramafic Rocks	W 28, 29
	9	Metamorphic Fluids	W 30

Last Day of Classes: Thursday, May 12th
Final Exam: May 18th, Wednesday, 8:30 - 11:30 am

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WEEKLY LABORATORY SYLLABUS*

Date		*Topic*
February	4	Igneous Minerals and Textures in Thin Section
	11	Modal Analysis
	18	Mafic Volcanic Rocks
	25	Mafic Plutonic Rocks
March	3	An Introduction to Petrogenetic Modeling
	10	Intermediate Volcanic and Plutonic Rocks
	17	Project
	24	SPRING BREAK
	31	Felsic Volcanic and Plutonic Rocks
April	7	Miscellaneous Igneous Rocks
	14	Metamorphic Minerals and Textures
	21	Regional Metamorphism - The Littleton Suite
	28	Contact Metamorphism
May	5	High Pressure, Low Temperature Metamorphism
	12	Lab Practical

*Lab Topics may change – you will be notified as necessary.

Prof. Jim Mills

Dept. of Geosciences

Spring, 2016

Phone: x4669 Mary (Maggie) Donohue, Secretary, x4654

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	Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
8-9:00	**Geos 320** 8:00-9:00	**Geos 110A Lab**	**Geos 320** 8:00-9:00	**Geos 110B Lab**	**Geos 320** 8:00-9:00
9-10:00		**8:00-9:50**		8:00-9:50	
10-11:00	**Office Hour** 10:00-11:00		**Office Hour** 10:00-11:00		**Office Hour** 10:00-11:00
11-12:00					
12-1:00		Committee Meeting		Geos 320 Lab	
1-2:00	**Geos 110** 1:40-2:40	12:40-2:00	**Geos 110** 1:40-2:40	12:40-3:30	**Geos 110** 1:40-2:40
2-3:00					
3-4:00					
4-5:00	Dept./Faculty Meeting	Committee Meeting			
5-6:00		4:00-6:00			
6-7:00					
7-8:00					
8-9:00					

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DAILY SYLLABUS

Date		Topic
Feb.	1	Introduction to Petrology, Syllabus Review
	3	Igneous Structures
	5	Igneous Structures, Phase Diagrams: One Component
1		
	8	Phase Diagrams: Two Component
	10	Phase Diagrams: Two Component, Multicomponent
	12	Phase Diagrams: Multicomponent
2		
	15	Chemical Petrology
	17	Chemical Petrology
	19	Chemical Petrology
3		
	22	Basalts
	24	Basalts, Diversification of Magma
	26	Diversification of Magma
4		
	29	Layered Ultramafic Intrusions
Mar.	2	Layered Ultramafic Intrusions
	4	**EXAM #1**
5		
	7	Mid-Ocean Ridges
	9	Mid-Ocean Ridges
	11	New Zealand
6		
	14	New Zealand
	16	New Zealand
	18	New Zealand
7		
		SPRING BREAK MARCH 19 – 27
	28	Oceanic Intraplate Volcanism
	30	Oceanic Intraplate Volcanism
April	1	Flood Basalts
8		
	4	Island Arcs
	6	**Day of Inclusion**
	8	Island Arcs, Continental Arcs
9		

DAILY SYLLABUS

Date		Topic
April	11	Continental Arcs, Granitoids
	13	Granitoids
	15	Metamorphism
10		
	18	Stable Mineral Assemblages
	20	Stable Mineral Assemblages, Metamorphic Facies - Mafic
	22	**EXAM #2**
11		
	25	Metamorphic Facies - Mafic
	27	Metamorphic Reactions
	29	Metamorphic Reactions - Thermodynamics
12		
May	2	Metamorphic Facies - Pelitic Rocks
	4	Metamorphic Facies - Pelitic Rocks
	6	Metamorphic Facies - Calcareous and Ultramafic Rocks
13		
	9	Metamorphic Fluids
	11	Open

FINAL EXAM Wednesday, May 18, 8:30 – 11:30 am