

Schedule 2018-12-17

for *GEOM08*, 15 hp (15 ECTS credits) Spring-1 2019

Metamorphic Petrology

Course leader: Charlotte Möller

Teachers:

CM = Charlotte Möller, MH = Maria Herrmann, CA = Carl Alwmark, US= Ulf Söderlund

E-mail to teachers: name.surname@geol.lu.se

Guest teachers: Jenny Andersson, Geological Survey of Sweden (Field excursion), Prel: Birgit Fredrich and Jan Erik Lindqvist, RISE (Research Institutes of Sweden; Guest lecture)

Italic = compulsory participation

* = Excursion (assembly: parking lot north of Geology building)

Day	Date	Hours	Activity	Grp	Room	Teacher
			PART I: The fundament			
Mon	21/1	09.15-10.00 10.15-12 13.15-15	Introduction Lecture 1: Metamorphism: concepts, controlling factors, environments, P-T-t paths. Lecture 2: Chemical equilibrium, disequilibrium, and metamorphic reactions. Assigned readings		224 224 224 -	CM CM CM
Tue	22/1	9.15-12 13.15-15	Lecture 3: Graphical analysis of metamorphic mineral assemblages. Metamorphic facies and mafic rocks. Assigned readings		224 224 -	CM CM
Wed	23/1	09.15-12	Lab 1: Microscopy Mafic rocks Assigned readings		236 -	MH
Thu	24/1	9:15-12	Lab 1 ctd.: Microscopy Mafic rocks Assigned readings		236 -	MH
Fri	25/1	10.15-12 13.15-16	Lecture 4: Metapelitic rocks and metamorphic zones. Assigned readings		224 -	CM
Mon	28/1	09.15-12	Lab 2: Microscopy Pelitic rocks Assigned readings		236 -	MH
Tue	29/1	10.15-12 13.15-15 15-18	Lecture 5: Mineral reactions and solid solution. P-T determination. Assignment for Lab 3: Mineral compositions & PT calculation Independent work Lab 3a: Mineral compositions		224 224 238	CM CM -
Wed	30/1	9.15-10 10-12 13-17	Lab 3a Mineral compositions: question time Independent work Lab 3a: Mineral compositions Independent work Lab 3a: Mineral compositions		244 244 244	CM - -
Thu	31/1	09.15-11 11-13 13.15-17	Lab 3b PT calculation: Introduction to software Independent work Lab 3b: PT calculation Independent work Lab 3b: PT calculation		244 244 244	MH - -
Fri	1/2	9.15-13 13-17	Lab 3b: PT calculation ctd – question time Independent work Lab 3: Mineral comp & PT calculation		244 244	MH -
Mon	4/2	9-17	Independent work Lab 3: Mineral comp & PT calculation		244	-
Tue	5/2	09.15-12	Seminar and discussion Lab 3: Mineral compositions, graphical analysis & PT calculation		224	CM

Wed	6/2	09.15-12	Lecture 6: Mineral reactions involving H ₂ O and CO ₂ . Assigned readings		224 -	CM
Thu	7/2	09.15-12	Lab 4: Microscopy Calcareous rocks Assigned readings		236 -	MH
PART II: The imprint of processes						
Fri	8/2	9.15-12	Lecture 7: Metamorphic textures. Reaction textures + assignment for Lab 5: Metamorphic reaction textures Lab 5a: Microscopy Metamorphic textures: intro Lab 5a: Microscopy Metamorphic textures Lab 5a ctd: summary		224	CM
		13.15-14			236	MH
		14-16			236	-
		16.15-17			236	MH
Mon	11/2	9.00-12.00 13.00-15.00	Independent work Lab 5 Lab 5b: SEM Metamorphic reaction textures	B	236 258	- CA
Tue	12/2	9.00-11.00 13.00-15.00	Lab 5b: SEM Metamorphic reaction textures Lab 5b: SEM Metamorphic reaction textures	C A	258 258	CA CA
Wed	13/2	9.00-11.00 9-17	Lab 5b: SEM Metamorphic reaction textures Independent work Lab 5	D	258 244	CA -
Thu	14/2	10.15-12 13.00-17.00	Lecture 8: Chemical zoning in minerals. Assigned readings & independent work on lab 5		224 244	CM
Fri	15/2	09.15-12 13.00-17.00	Lecture 9: Introduction to fluids. Assigned readings & independent work on lab 5		224 244	CM
Mon	18/2	9.15-12.00 13.15-14.00	Seminar & discussion Lab 5: Metamorphic reaction textures Assigned readings		224 224 -	CM CM
PART III: The dynamic context						
Tue	19/2	09.15-12 13.15-15	Lecture 10: Deformation under metamorphic conditions. Micro-scale processes & fabric development. Porphyroblast systems. Assigned readings		224 224 -	CM CM
Wed	20/2	09.15-10 10-12 13.15-15	Lab 6: Microscopy Fabrics: Intro Lab 6: Microscopy Fabrics Lab 6: Microscopy Fabrics Assigned readings		236 236 236 -	MH - -
Thu	21/2	9.15-12 13.15-16	Lecture 11: Metamorphic geochronology Lab 7: Geochronology (independent work)		224 236	US -
Fri	22/2	9.15-12 13.15-16	Lab 7: Geochronology (independent work) Seminar & discussion Lab 8: Geochronology		236 224	- US
Mon	25/2	09.15-12 13.15-14 14.15-16	Lecture 12: Competency effects. Strain partitioning & tectonic transposition. Shear zones and tectonites. Lecture 12 ctd. Lab 6 ctd: Microscopy Fabrics		224 224 236	CM CM -
Tue	26/2	9.15-12 13.15-14 14.15-16	Lecture 13: Shear sense indicators. Lab 6 ctd: Microscopy Fabrics Lab 6 ctd: Microscopy Fabrics: summary Assigned readings		224 236 236 -	CM - MH -
Wed	27/2	09.15-10 10-12 13.15-14 14.15-16	Lab 8: Microscopy Mylonitic rocks: intro Lab 8: Microscopy Mylonitic rocks Lab 8: Microscopy Mylonitic rocks Lab 8: Microscopy Mylonitic rocks: summary Assigned readings		236 236 236 236 -	MH - - MH -
Thu	28/2	09.15-12	Lecture 14: Partial melting and migmatites. Assigned readings & individual study		224 -	CM -

Fri	1/3	09.15-12	Lecture 15: Metamorphic P-T-t paths and tectonic evolution. Assigned readings & individual study		224 -	CM
Mon	4/3		Individual study		-	-
Tue	5/3	13.15-15	Individual study Question time before exam		- 224	- CM+ US
Wed	6/3		Individual study		-	-
Thu	7/3	9.00-14.00	Written examination (tentamen)		243	
Fri	8/3	09.15-10.00 10.15-12 13.15-17	Assignments for independent studies Independent study & microscopy ctd : Structural-tectonic context of metamorphism		236 236 236	- - -
Mon	11/3	08.15-12 13.15-17	Independent study & microscopy ctd : Structural-tectonic context of metamorphism		236 236	- -
Tue	12/3	08.15-12 13.15-15	Student feedback sessions Student feedback sessions		224 224	- -
Wed	13/3	08.15-12 13.15-16 16.00	Independent study ctd: Structural-tectonic context of metamorphism Deadline report to CM		236 236	- -
Thu	14/3		Independent study ctd: Structural-tectonic context of metamorphism			-
Fri	15/3	9.15-12 13.15-16	Seminar and discussion Structural-tectonic context of metamorphism Assigned readings: Field guide SW Sweden+ rock quality		224 224 -	CM CM
PART IV: Metamorphism and deformation, field + applied geology						
Mon	18/3	8.00*	Field excursion in SW Sweden*		*	CM
Tue	19/3		Field excursion in SW Sweden		*	CM
Wed	20/3		Field excursion in SW Sweden		*	CM
Thu	21/3	-18*	Field excursion in SW Sweden		*	CM JA
Fri	22/3	9-12 12-15	Prel: Guest lecture Applied Geology Lunch & Course evaluation		330 330	BF, JEL CM
Wed	28/3	16.15-17	Handout & question time of graded written examinations		224	CM