

## Schedule for *GEOM08*, 15 hp (15 credits) Spring-1 2021\_ vs. 2020-01\_13 Metamorphic Petrology

Course coordinator: Charlotte Möller

### Teachers:

CM = Charlotte Möller, CU = Cindy Urueña, CA = Carl Alwmark, US= Ulf Söderlund

E-mail to teachers: [name.surname@geol.lu.se](mailto:name.surname@geol.lu.se)

Guest lecturer Virtual field excursion: Jenny Andersson, Geological Survey of Sweden

Guest lecture Concrete petrology: **Prel:** Birgit Fredrich, Sweco

*Italic = compulsory participation*

Day	Date	Hours	Activity	Grp	Room	Teacher
<b>PART I: The fundament</b>						
Mon	18/1	09.15-10.00 10.15-12 13.15-15	<b>Introduction</b> <b>Lecture 1:</b> Metamorphism: concepts, controlling factors, environments, P-T-t paths. <b>Lecture 2:</b> Chemical equilibrium, disequilibrium, and metamorphic reactions. Assigned readings		Zoom Zoom Zoom -	CM CM CM
Tue	19/1	9.15-12 13.15-15	<b>Lecture 3:</b> Graphical analysis of metamorphic mineral assemblages. Metamorphic facies and mafic rocks. Assigned readings		Zoom Zoom -	CM CM
Wed	20/1	09.15-12	<b>Lab 1: Microscopy Mafic rocks</b> Assigned readings		Zoom -	CU
Thu	21/1	9.15-12	<b>Lab 1 ctd.: Microscopy Mafic rocks</b> Assigned readings		Zoom -	CU
Fri	22/1	9.15-12	<b>Lecture 4:</b> Follow-up + Metapelitic rocks and metamorphic zones. Assigned readings		Zoom -	CM
Mon	25/1	09.15-12	<b>Lab 2: Microscopy Pelitic rocks</b> Assigned readings		Zoom -	CU
Tue	26/1	10.15-12 13.15-15 15.15-18	<b>Lecture 5:</b> Mineral reactions and solid solution. P-T determination. <b>Assignment for Lab 3: Mineral compositions &amp; PT calculation</b> <b>Independent group work Lab 3a: Mineral compositions</b>		Zoom Zoom -	CM CM
Wed	27/1	9.15-10 10.15-12 13.15-17	<b>Lab 3a Mineral compositions: question time</b> <b>Independent group work Lab 3a: Mineral compositions</b> <b>Independent group work Lab 3a: Mineral compositions</b>		Zoom - -	CM - -
Thu	28/1	09.15-11 11-12 13.15-17	<b>Lab 3b PT calculation: Introduction to softwares</b> <b>Independent group work Lab 3b: PT calculation</b> <b>Independent group work Lab 3b: PT calculation</b>		Zoom - -	CU - -
Fri	29/1	9.15-12 13.15-17	<b>Lab 3b: PT calculation ctd. – question time</b> <b>Independent group work Lab 3: Mineral comp &amp; PT calculation</b>		Zoom -	CU -
Mon	1/2	09.15-12	<b>Seminar and discussion Lab 3: Mineral compositions, graphical analysis &amp; PT calculation</b>		Zoom	CM
Tue	2/2	09.15-12	<b>Lecture 6:</b> Mineral reactions involving H <sub>2</sub> O and CO <sub>2</sub> . Assigned readings		Zoom -	CM
Wed	3/2	09.15-12	<b>Lab 4: Microscopy Calcareous rocks</b> Assigned readings		Zoom -	CU

PART II: The imprint of processes						
Thu	4/2	9.15-12 13.15-15 15.15-17	<b>Lecture 7:</b> Metamorphic textures. Reaction textures + <b>assignment for Lab 5: Metamorphic reaction textures</b> <i>Lab 5a: Microscopy Metamorphic textures: intro</i> <i>Lab 5a: Microscopy Metamorphic textures group work</i>		Zoom Zoom -	CM CU -
Fri	5/2	9.15-12.00 13.00-15.00 15.00-17.00	<i>Independent group work Lab 5</i> <i>Lab 5b: SEM Metamorphic reaction textures</i> <i>Lab 5b: SEM Metamorphic reaction textures</i>	1 2	- Zoom Zoom	- CA CA
Mon	8/2	13.00-15.00 15.00-17.00	<i>Lab 5b: SEM Metamorphic reaction textures</i> <i>Lab 5b: SEM Metamorphic reaction textures</i>	3 4	Zoom Zoom	CA CA
Tue	9/2	9.00-12 13.00-17	<i>Independent group work Lab 5</i> <i>Independent group work Lab 5</i>		- -	- -
Wed	10/2	10.15-12 13.15-17.00	<b>Lecture 8:</b> Chemical zoning in minerals. Assigned readings & independent work on lab 5		Zoom -	CM -
Thu	11/2	09.15-12 13.15-17.00	<b>Lecture 9:</b> Introduction to fluids. Assigned readings & independent work on lab 5		Zoom -	CM -
Fri	12/2	9.15-12.00 13.15-14.00	<i>Seminar &amp; discussion Lab 5: Metamorphic reaction textures</i> Assigned readings		Zoom Zoom -	CM CM -
PART III: The dynamic context						
Mon	15/2	09.15-12 13.15-15	<b>Lecture 10:</b> Deformation under metamorphic conditions. Micro-scale processes & fabric development. Porphyroblast systems. Assigned readings		Zoom Zoom -	CM CM -
Tue	16/2	09.15-12	<i>Lab 6: Microscopy Fabrics</i> Assigned readings		Zoom -	CU -
Wed	17/2	9.15-12 13.15-16	<b>Lecture 11:</b> Metamorphic geochronology <i>Lab 7: Geochronology (group work)</i>		Zoom -	US -
Thu	18/2	9.15-12 13.15-16	<i>Lab 7: Geochronology (group work)</i> <i>Seminar &amp; discussion Lab 8: Geochronology</i>		- Zoom	- US
Fri	19/2	09.15-12 13.15-14 14.15-16	<b>Lecture 12:</b> Competency effects. Strain partitioning & tectonic transposition. Shear zones and tectonites. <b>Lecture 12 ctd.</b> <i>Lab 6 ctd: Microscopy Fabrics</i>		Zoom Zoom Zoom	CM CM CU
Mon	22/2	9.15-12	<b>Lecture 13:</b> Shear sense indicators. Assigned readings		Zoom -	CM -
Tue	23/2	09.15-12	<i>Lab 8: Microscopy Mylonitic rocks</i> Assigned readings		Zoom -	CU -
Wed	24/2	09.15-12	<b>Lecture 14:</b> Partial melting and migmatites. Assigned readings & individual study		Zoom -	CM -
Thu	25/2	09.15-12	<b>Lecture 15:</b> Metamorphic P-T-t paths and tectonic evolution. Assigned readings & individual study		Zoom -	CM -
Fri	26/2		Individual study		-	-
Mon	1/3		Individual study		-	-
Tue	2/3	10.15-12	Question time before exam Individual study		Zoom -	CM + US -
Wed	3/3	9.00-14.00	<i>Written examination</i>		Baltica & Rodinia	
Thu	4/3	10.15-11.00	<i>Assignments for independent studies</i>		Zoom	CM

		11-17	Independent study ctd: Structural-tectonic context of metamorphism		-	-
Fri	5/3	9-17	Independent study ctd: Structural-tectonic context of metamorphism		-	-
Mon	8/3	9-17	Independent study ctd: Structural-tectonic context of metamorphism		-	-
Tue	9/3	9-17	Independent study ctd: Structural-tectonic context of metamorphism. <i>Student feedback sessions.</i>		-	-
Wed	10/3	9-16 16.00	Independent study ctd: Structural-tectonic context of metamorphism <i>Deadline hand-in report to CM</i>		-	-
Thu	11/3	9-17	Independent study ctd: Structural-tectonic context of metamorphism		-	-
Fri	12/3	9.15-12 13.15-14	<i>Seminar and discussion Structural-tectonic context of metamorphism</i>		Zoom Zoom	CM CM
Mon	15/3	9.15-12 13.15-14	<i>Seminar and discussion Structural-tectonic context of metamorphism</i>		Zoom Zoom -	CM CM CM
			<b>PART IV: Metamorphic field geology Virtual excursion incl. applied geology</b>			
Tue	16/3	9-17	<i>Assigned readings: Geology SW Sweden+ rock quality Preparation tasks for Virtual field excursion in SW Sweden</i>		-	-
Wed	17/3	9-17	<i>Preparation tasks for Virtual field excursion in SW Sweden</i>		-	-
Thu	18/3	9.15-12	<i>Virtual field excursion in SW Sweden</i>		Zoom	CM
Fri	19/3	9.15-12	<i>Virtual field excursion in SW Sweden</i>		Zoom	CM
Mon	22/3	9.15-12	<i>Virtual field excursion in SW Sweden</i>		Zoom	CM + JA
Tue	23/3	9.15-12 13.15-15	<i>Guest lecture Applied Geology &amp; Microscopy of concrete materials Course evaluation</i>		Zoom Zoom	BF CM + US