KZ7020 Experimental characterization methods in sustainable materials chemistry (7.5 ECTS)

VT2024 (02.05.2024 – 02.06.2024)

day week	Monday	Tuesday	Wednesday	Thursday	Friday
18 29/04-03/05				L1 E1	L2 E2
19 06/05-10/05	L3 E3	L4 E4	Lab1	Kristi himmelfärds dag	L5 E5
20 13/05-17/05	Lab2	L6 E6	Lab3	L7 E7	Lab4
21 20/05-24/05	L8 E8	Lab5	L9 E9	Lab6	Lab6
22 27/05-31/05					Exam

L = lectures, **E** = exercise, **Lab** = labs,
Times F: 9:15–12:00; E: 13:00–16:00; Lab: 10:00 – 17
Lecture room: C516 North

L1-3, E1-3: Ulrich Häussermann (ulrich.haussermann@mmk.su.se) (UH)
L4, E4, Lab1: Kjell Jansson (kjell.jansson@mmk.su.se) (KJ)
L5, E5, Lab2: Ken Inge (andrew.inge@mmk.su.se) (AKI)
L6, E6, Lab3: Aleksander Jaworski (aleksander.jaworski@mmk.su.se) (AJ)
L7, E7, Lab4: Alexander Iles (Alexander.Iles@mmk.su.se) (AI)
L8, E8, Lab5: Mirva Eriksson (mirva.eriksson@mmk.su.se) (ME)
L9, E9, Lab6: Claudia Möckel (claudia.mockel@mmk.su.se) (CM)

Selected reading from:
'Green Chemistry and Technologies', L. Zhang, Ch. Gong, B. Dai (Eds.) https://www-degruyter-com.ezp.sub.su.se/view/title/521120.
'Green Chemistry – Theory and Practice', P. T. Anastas, J.C. Warner

Lecture handouts, reading materials, instructions for laboratory projects (electronic format)

	AM (9:15-12:00)	**PM (13:00-16:00)**
May 02	**L1**: Reinforcing principles of green (materials) chemistry: materials needs and green synthesis (UH)	**E1**: Exercises green chemistry (UH)
May 03	**L2**: Oversight of physical characterization methods: diffraction and spectroscopic methods, microscopy, thermal analytical methods, chromatography/mass spectrometry (UH)	**E2**: Exercises/reading assignment physical characterization methods (UH)

May 06	**L3**: Presentation of materials for lab project (UH)	**E3**: prep for project; Exercises/reading assignment porous materials & emerging organic contaminants in waste/drinking water (UH)
May 07	**L4**: Principles of scanning electron microscopy (KJ)	**E4**: Exercises/reading assignment SEM and elemental mapping, sample preparation (KJ)
May 08	**Lab1:** Scanning electron microscopy (KJ)	
May 09	Holiday	
May 10	**L5**: Principles of powder-Xray diffraction (AKI)	**E5**: Working with PXRD patterns, interpretation of PXRD patterns (AKI)

May 13	**Lab2:** Powder X-ray diffraction (AKI)	
May 14	**L6**: Principles of NMR spectroscopy (AJ)	**E6**: Working with NMR spectra, interpretation of spectra (AJ)
May 15	**Lab 3**: NMR spectroscopy (AJ)	
May 16	**L7**: Principles of vibrational and UV-VIS spectroscopy (AI)	**E7**: Working with IR, Raman, UV-VIS spectra, interpretation of spectra (AI)
May 17	**Lab 4**: vibrational spectroscopy and UV-VIS spectroscopy (AI)	

May 20	**L8**: Principles of thermal analysis: TG, DTA, DSC (ME)	**E8:** Working with TG/DTA traces, Interpretation of TG/DTA traces (ME)
May 21	**Lab 5**: Thermal analysis (ME)	
May 22	**L9**: Principles of (liquid) chromatography-mass spectrometry (CM)	**E9**: Working with mass spectra, evaluation of mass spectra (CM)
May 23	**Lab6**: Mass Spectrometry (CM)	
May 24	**Lab6**: Mass Spectrometry (CM)	

May 27	9:15 – 10:30 **wrap-up** (UH)	Lab reports/Exam preparation
May 28	Lab reports/Exam preparation	
May 29	Lab reports/Exam preparation	
May 30	Lab reports/ Exam preparation	
May 31	**Exam**: 10 - 15	