KZ8022 Chemistry of Renewable Materials (7.5 ECTS)

Course outline and schedule – autumn 2023

day Week	Monday	Tuesday	Wednesday	Thursday	Friday
44 30/10–03/11	**L1-intro** **Assign 1** **Poster topics**	**L2-lignochem** **Assign 2**	**L3-polyphen** **Assign 3**	**Lab 1** **LNPs**	**Lab 2** **DLS**
45 06/11–10/11	**L4-polysacch** **Assign 4**	**L5-charact** **Assign 5**	**L6-lipid&prot** **Assignment 6**	**L7-composites & blends** **Assign 7**	**Lab 3** **Nanocomp**
46 13/11–17/11	**L8-thermochem transf** **Assign 8**	**Lab 4** **Antiox.**	**Lab 5** **AFM**	**L9- biochem transf** **Lab 6** **Enz. hydrol.**	**Lab 7** **Sugar anal.**
47 20/11–24/11	**Assign 9** **L10-circularity**	Prep for posters, lab reports, exam	Prep for posters, lab reports, exam	**Lab reports due**	**L11-summary** **Poster presentations**
48 27/11–01/12	Prep for posters, lab reports, exam	Prep for posters, lab reports, exam	**Written exam** 29/11 at 9-13		

L = lectures, Lab = laboratory exercises, Assign = pre-class assignments

Teachers:

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L: MS, AM, JS
La: MM, JIN, JL
PP: MS, MM, JIN

Literature:

Course book: Introduction to Renewable Biomaterials: First Principles and Concepts Ali S. Ayoub (Editor), Lucian A. Lucia (Editor); ISBN: 978-1-119-96229-8; November 2017, 288 Pages, available from SU library as e-book (PDF)

Additional course material

Lecture slides
Reading material and other resources for pre-class assignments

Date		Room	AM (9:15-12:00)	Room	PM (13:00-16:00)
Mon	Oct-30	C516	L1: Introduction to Chemistry of Renewable Materials (MS)	C513	Assignment 1
Tue	Oct-31	C516	L2: Lignocellulose structure and chemistry (MS)	C513	Assignment 2
Wed	Nov-1	C516	L3: Chemistry of polyphenols (JS)	C513	Assignment 3
Thu	Nov-2	C459	Lab 1: Preparation of colloidal lignin particles (group A)	C459	Lab 1: Preparation of colloidal lignin particles (group B)
Fri	Nov-3	C419b	Lab 2: Characterization of colloidal lignin particles: DLS and zeta potential (group A)	C419b	Lab 2: Characterization of colloidal lignin particles: DLS and zeta potential (group B)
Mon	Nov-6	C516	L4: Chemistry and applications of polysaccharides (AM)	C513	Assignment 4
Tue	Nov-7	C516	L5: Characterization techniques for renewable materials (MS)	C513	Assignment 5
Wed	Nov-8	C516	L6: Lipids and proteins	C513	Assignment 6
Thu	Nov-9	C516	L7: Composites and blends (AM)	C513	Assignment 7
Fri	Nov-10	C459	Lab 3: Preparation of nanocomposite films (group A)	C459	Lab 3: Preparation of nanocomposite films (group B)
Mon	Nov-13	C516	L8: Thermochemical biomass transformations (MS)	C513	Assignment 8
Tue	Nov-14	C459	Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group A)	C459	Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B)
Wed	Nov-15	C268	Lab 5: Characterization of the nanocomposite films by AFM	C268	Lab 5: Characterization of the nanocomposite films by AFM
Thu	Nov-16	C516	L9: Biochemical biomass transformations (MS)	C459	Lab 6: Enzymatic hydrolysis (groups A&B)
Fri	Nov-17	C459	Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A)	C459	Lab 7a: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group B)
Mon	Nov-20	C513	Assignment 9	C516	L10: Recycling, degradation and biodegradation (MS)
Tue	Nov-21		Lab reports		Posters
Wed	Nov-22		Lab reports		Posters
Thu	Nov-23		**Lab reports due**		Exam preparation
Fri	Nov-24	C516	L11: Summary	Magneli	Poster presentations
Mon	Nov-27		Exam preparation		Exam preparation
Tue	Nov-28		Exam preparation		Exam preparation
Wed	Nov-29	C516	Written exam (9:00-13:00)		

* See Athena course site for details

Lectures
L1: Introduction (MS)
L2: Lignocellulose chemistry (MS)
L3: Polyphenols (JS)
L4: Characterization techniques (MS)
L5: Polysaccharides (AM)
L6: Lipids and proteins (MS)
L7: Composites and blends (AM)
L8: Thermochemical biomass transformations (MS)
L9: Biochemical biomass transformations (MS)
L10: Recycling, degradation and biodegradation (MS)
L11: Summary and poster presentations (MS)

Labs
Lab 1: Preparation of colloidal lignin particles
Lab 2: Characterization of colloidal lignin particles: DLS and zeta potential
Lab 3: Preparation of nanocomposite films
Lab 4: Characterization of the nanocomposite films: Antioxidant activity
Lab 5: Characterization of the nanocomposite films by AFM
Lab 6: Characterization of the nanocomposite films by Enzymatic hydrolysis
Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films

Assignments
Reading, videos and questions to be completed prior to the lectures