KZ8022 Chemistry of Renewable Materials (7.5 ECTS)

Course outline and schedule - HT24

day	Monday	Tuesday	Wednesday	Thursday	Friday
Week					
04/11–08/11	L1-Intro (MS)	L2-Lignochem (MS) Poster topics	L3- polyphenols (JS)	Lab 1 LNPs	Lab 2 DLS
45 11/11–15/11	L4-polysacch (MX)	L5-charact (MS)	Prep for posters and lab reports	L6-Lipids (MS)	Lab 3 Nanocomp
46 18/11–22/11	L7- Proteins (MS) Lab 4 Antiox.	Lab 4 Antiox. L8- thermochem transform. (MS)	Lab 5 AFM	L9- biochem transf (MS) Lab 6 Enz. hydrol.	Lab 7 Sugar anal.
47 25/11–29/11	Assign 9 L10- circularity (MS) poster DL 14:00	Prep for lab reports & exam	Prep for lab reports & exam	Lab reports due	L11- summary (MS) Poster pres.
48 02/12–06/12	Prep for exam	Prep for exam	Written exam 04/11 at 9-13		

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

Teachers:

(MS)	Mika Sipponen	mika.sipponen@mmk.su.se
(JS)	Joseph Samec	joseph.samec@su.se
(MX)	Maria Ximena Ruiz Caldas	mariaximena.ruizcaldas@mmk.su.se
(JL)	Jing Li	jing.li@mmk.su.se
(CC)	Carla Caponio	carla.caponio@mmk.su.se
(JIN)	Unnimaya Thalakkale Veettil	unnimaya.thalakkaleveettil@mmk.su.se

L: MS, JS, MXRC, AM

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 Stockholm University library as e-book (PDF)

Additional course material

Lecture slides

Reading material and other resources for pre-class assignments

Mon	Date		Room	AM (9:00-12:00)	Room	PM (13:00-16:00)
Tue Nov-5 Library Assignment 2 C516 L2: Lignocellulose structure and chemistry (MS) Wed Nov-6 C516 L3: Chemistry of polyphenols (JS) Library Assignment 3 Thu Nov-7 C459 Lab 1: Preparation of colloidal lignin particles (group A) Fri Nov-8 C419b Lab 2: Characterization of colloidal lignin particles (group A) Fri Nov-8 C419b Lab 2: Characterization of colloidal lignin particles (group B) Mon Nov-11 C516 L4: Chemistry and applications of polysaccharides (MX) Tue Nov-12 Library Assignment 5 C516 L5: Characterization techniques for renewable materials (MS) Wed Nov-13 Library Lab reports Library Posters Thu Nov-14 C516 L6: Lipids (MS) Library Assignment 6 Fri Nov-15 C459 Lab 3: Preparation of nanocomposite films (group A) Mon Nov-18 C516 L7: Proteins (MS) Tue Nov-19 C459 Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) Wed Nov-20 C268 Lab 4: Characterization of the nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Mon Nov-26 Lab reports and exam prep. Tue Nov-27 Lab reports and exam prep. Wed Nov-29 C516 L1: Summary Mon Dec-02 Exam preparation Mon Dec-02 Exam preparation Exam preparation Exam preparation	Mon	Nov-4	C516	L1: Introduction to Chemistry of	Library	Assignment 1
Wed Nov-6 C516 L3: Chemistry of polyphenols (JS) Library Assignment 3 Thu Nov-7 C459 Lab 1: Preparation of colloidal lignin particles (group A) Lab 1: Preparation of colloidal lignin particles: (group B) Lab 1: Preparation of colloidal lignin particles: (group B) Lab 1: Preparation of colloidal lignin particles: (group B) Fri Nov-8 C419b Lab 2: Characterization of colloidal lignin particles: DLS and zeta potential (group B) Lab 2: Characterization of colloidal lignin particles: DLS and zeta potential (group B) Mon Nov-11 C516 L4: Chemistry and applications of polysaccharides (MX) Library Assignment 4 Tue Nov-12 Library Assignment 5 C516 L5: Characterization techniques for renewable materials (MS) Wed Nov-13 Library Library Posters Tu Nov-14 C516 L6: Lipids (MS) Library Library Lab 3: Preparation of nanocomposite films (group A) Mon Nov-15 C459 Lab 3: Preparation of the nanocomposite films (group A) Library Lab 4: Characterization of the nanocomposite films (group B) Wed Nov-20 C268 Lab 5:				Renewable Materials (MS)		
Wed Nov-6 C516 L3: Chemistry of polyphenols (JS) Library Assignment 3 Thu Nov-7 C459 Lab 1: Preparation of colloidal lignin particles (group A) C459 Lab 1: Preparation of colloidal lignin particles (group A) 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-12 Library L4: Chemistry and applications of polysaccharides (MX) Library Assignment 4 Tue Nov-12 Library Assignment 5 C516 L5: Characterization techniques for renewable materials (MS) Wed Nov-13 Library Lab reports Library Posters Thu Nov-14 C516 L6: Lipids (MS) Library Assignment 6 Fri Nov-15 C459 Lab 3: Preparation of nanocomposite films (group A) Library Lab 3: Preparation of nanocomposite films (group A) Mon Nov-18 C516 L7: Proteins (MS) Library Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group A) Tue Nov-20 C268 L	Tue	Nov-5	Library	Assignment 2	C516	L2: Lignocellulose structure and
Thu Nov-7 C459 Lab 1: Preparation of colloidal lignin particles (group A) C459 Lab 1: Preparation of colloidal lignin particles (group B) Fri Nov-8 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-11 C516 L4: Chemistry and applications of polysaccharides (MX) Library Assignment 4 Tue Nov-12 Library Assignment 5 C516 L5: Characterization techniques for renewable materials (MS) Wed Nov-13 Library Lab reports Library Posters Tue Nov-14 C516 L6: Lipids (MS) Library Assignment 6 Fri Nov-15 C459 Lab 3: Preparation of ananocomposite films (group A) Lab 4: Characterization of manocomposite films (group B) Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) Lab 4: Characterization of the nanocomposite films by AFM (JL) L258 Lab 5: Characterization of the nanocomposite films by AFM (JL) L3 bis: Characterization of the nanocomposite films by AFM (JL) L3 bis: Characterization of the nanocomposite films (group B) L3 bis: Characteri						chemistry (MS)
Fri Nov-8 C419b Lab 2: Characterization of colloidal lignin particles (group B) Lab 2: Characterization of colloidal lignin particles: DLS and zeta potential (group A) Lab 2: Characterization of colloidal lignin particles: DLS and zeta potential (group A) Lab 2: Characterization of colloidal lignin particles: DLS and zeta potential (group B)	Wed	Nov-6	C516	L3: Chemistry of polyphenols (JS)	Library	Assignment 3
Fri Nov-8	Thu	Nov-7	C459	Lab 1: Preparation of colloidal	C459	Lab 1: Preparation of colloidal
Mon Nov-11 C516				lignin particles (group A)		lignin particles (group B)
Mon Nov-11 C516 L4: Chemistry and applications of polysaccharides (MX) Library polysaccharides (MX) Assignment 4 Tue Nov-12 Library polysaccharides (MX) C516 L5: Characterization techniques for renewable materials (MS) Wed Nov-13 Library Lab reports Library Posters Thu Nov-14 C516 L6: Lipids (MS) Library Assignment 6 Fri Nov-15 C459 Lab 3: Preparation of nanocomposite films (group A) Lab 3: Preparation of the nanocomposite films (group B) Mon Nov-18 C516 L7: Proteins (MS) Library Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group A) Wed Nov-19 C459 Lab 4: Characterization of the nanocomposite films by AFM (JL) C516 L8: Thermochemical biomass transformations (MS) Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) C459 Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) C459 Lab 5: Characterization of the nanocomposite films by AFM (JL)	Fri	Nov-8	C419b	Lab 2: Characterization of colloidal	C419b	Lab 2: Characterization of
Mon Nov-12 Nov-12 Library polysaccharides (MX) Library polysaccharides (MX) Library polysaccharides (MX) Assignment 4 Tue Nov-12 Nov-12 Library Library polysaccharides (MX) C516 L5: Characterization techniques for renewable materials (MS) Wed Nov-13 Library Library posters Library Posters Thu Nov-14 C516 L6: Lipids (MS) Library Assignment 6 Fri Nov-15 C459 Lab 3: Preparation of nanocomposite films (group A) Lab 3: Preparation of nanocomposite films (group B) Mon Nov-18 C516 L7: Proteins (MS) Library Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) L8: Thermochemical biomass transformations (MS) Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) LB Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) C455 Lab 6: Enzymatic hydrolysis (group A) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group B) <t< td=""><td></td><td></td><td></td><td>lignin particles: DLS and zeta</td><td></td><td>colloidal lignin particles: DLS</td></t<>				lignin particles: DLS and zeta		colloidal lignin particles: DLS
Tue Nov-12 Library Assignment 5 C516 L5: Characterization techniques for renewable materials (MS) Wed Nov-13 Library Lab reports Thu Nov-14 C516 L6: Lipids (MS) Library Posters Thu Nov-15 C459 Lab 3: Preparation of nanocomposite films (group A) Mon Nov-18 C516 L7: Proteins (MS) Tue Nov-19 C459 Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Tue Nov-26 Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Wed Nov-28 C516 L11: Summary Mon Dec-02 Exam preparation				potential (group A)		and zeta potential (group B)
Tue Nov-12 Library (and the proper) Assignment 5 (and the proper) C516 (and the proper) L5: Characterization techniques for renewable materials (MS) Wed Nov-13 Library Posters Thu Nov-14 C516 L6: Lipids (MS) Library Assignment 6 Fri Nov-15 C459 Lab 3: Preparation of nanocomposite films (group A) Library Lab 3: Preparation of nanocomposite films (group B) Mon Nov-18 C516 L7: Proteins (MS) Library Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) Lab 5: Characterization of the nanocomposite films by AFM (JL) Lab 5: Characterization of the nanocomposite films by AFM (JL) Lab 5: Characterization of the nanocomposite films by AFM (JL) Lab 5: Characterization of the nanocomposite films by AFM (JL) Lab 6: Enzymatic hydrolysis of (group A) Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group B) Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group B) Lab reports and exam prep. <	Mon	Nov-11	C516	L4: Chemistry and applications of	Library	Assignment 4
Wed Nov-13 Library Lab reports Library Posters Thu Nov-14 C516 L6: Lipids (MS) Library Assignment 6 Fri Nov-15 C459 Lab 3: Preparation of nanocomposite films (group A) Lab 3: Preparation of nanocomposite films (group B) Mon Nov-18 C516 L7: Proteins (MS) Library Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group A) Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) Lab 5: Characterization of the nanocomposite films by AFM (JL) C516 L8: Thermochemical biomass transformations (MS) Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) C458 Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Nov-20 C516 L9: Biochemical transformations (MS) C455 Lab 6: Enzymatic hydrolysis (groups A&B) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Lab 7a: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group B) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Library Last day to				polysaccharides (MX)		
Wed Nov-13 Library Lab reports Library Posters Thu Nov-14 C516 L6: Lipids (MS) Library Assignment 6 Fri Nov-15 C459 Lab 3: Preparation of nanocomposite films (group A) Lab 3: Preparation of nanocomposite films (group B) Mon Nov-18 C516 L7: Proteins (MS) Library Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group A) Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) Lab 5: Characterization of the nanocomposite films by AFM (JL) L8: Thermochemical biomass transformations (MS) Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) Lab 6: Enzymatic hydrolysis (group A) Thu Nov-21 C516 L9: Biochemical transformations (MS) C455 Lab 6: Enzymatic hydrolysis (groups A&B) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Lab 7 a: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Library Lab reports and exam prep. Wed	Tue	Nov-12	Library	Assignment 5	C516	L5: Characterization techniques
Thu Nov-14 C516 L6: Lipids (MS) Library Assignment 6 Fri Nov-15 C459 Lab 3: Preparation of nanocomposite films (group A) Lab 3: Preparation of nanocomposite films (group B) Mon Nov-18 C516 L7: Proteins (MS) Library Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group A) Tue Nov-19 C459 Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) C516 L8: Thermochemical biomass transformations (MS) Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) C455 Lab 6: Enzymatic hydrolysis of group A) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group B) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Lab reports and exam prep. Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Lab r						for renewable materials (MS)
Fri mode Nov-15 C459 C459 nanocomposite films (group A) C459 nanocomposite films (group B) Lab 3: Preparation of nanocomposite films (group B) Mon Mon Position Nov-18 Nov-19 C516 C459 L7: Proteins (MS) Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) Library Antioxidant activity (group A) Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) C516 C516 L8: Thermochemical biomass transformations (MS) Wed Pow-20 Nov-20 C268 C516 Lab 5: Characterization of the nanocomposite films by AFM (JL) C268 C459 Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Pri Pri Nov-22 C516 C459 Nov-22 L29: Biochemical transformations (MS) C455 C459 <td>Wed</td> <td>Nov-13</td> <td>Library</td> <td>Lab reports</td> <td>Library</td> <td>Posters</td>	Wed	Nov-13	Library	Lab reports	Library	Posters
Mon Nov-18 C516 L7: Proteins (MS)	Thu	Nov-14	C516	L6: Lipids (MS)	Library	Assignment 6
Mon Nov-18 C516 L7: Proteins (MS) Library nanocomposite films: Antioxidant activity (group A) Tue Nov-19 C459 Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) C516 L8: Thermochemical biomass transformations (MS) Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) C455 Lab 6: Enzymatic hydrolysis (groups A&B) Fri Nov-22 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-25 C516 L10: Recycling, degradation and biodegradation (MS) Library Last day to hand in posters (PDF) at 14:00 Tue Nov-26 Lab reports and exam prep. Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Lab reports and exam prep. Thu Nov-28 Lab reports due Exam preparation Fri Nov-29 C516 L11: Summary Outside of Magneli Hall Poster presentations <t< td=""><td>Fri</td><td>Nov-15</td><td>C459</td><td></td><td>C459</td><td>Lab 3: Preparation of</td></t<>	Fri	Nov-15	C459		C459	Lab 3: Preparation of
Tue Nov-19 C459 Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group A) Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Tue Nov-26 Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Thu Nov-28 C516 L1: Summary Mon Dec-02 Exam preparation Exam preparation Exam preparation Tue Dec-03 Exam preparation Exam preparation Exam preparation Exam preparation				nanocomposite films (group A)		nanocomposite films (group B)
Tue Nov-19 C459 Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group A) Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Tue Nov-26 Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Thu Nov-28 Lab reports due Fri Nov-29 C516 L11: Summary Mon Dec-02 Exam preparation Exam preparation Exam preparation Antioxidant activity (group A) L8: Thermochemical biomass transformations (MS) L8: Thermochemical biomass transformations (MS) Lab 5: Characterization of the nanocomposite films by AFM (JL) C458 Lab 5: Characterization of the nanocomposite films by AFM (JL) Lab 6: Enzymatic hydrolysis of enzymatic hydrolysis o	Mon	Nov-18	C516	L7: Proteins (MS)	Library	Lab 4: Characterization of the
Tue Nov-19 C459 Lab 4: Characterization of the nanocomposite films: Antioxidant activity (group B) C516 L8: Thermochemical biomass transformations (MS) Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) C455 Lab 6: Enzymatic hydrolysis (group A&B) Fri Nov-22 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-25 C516 L10: Recycling, degradation and biodegradation (MS) Library Last day to hand in posters (PDF) at 14:00 Tue Nov-26 Lab reports and exam prep. Lab reports and exam prep. Lab reports and exam prep. Wed Nov-27 Lab reports due Exam preparation Fri Nov-29 C516 L11: Summary Outside of Magneli Hall Poster presentations Mon Dec-02 Exam preparation Exam preparation Exam preparation						nanocomposite films:
Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL)						Antioxidant activity (group A)
Wed Nov-20 C268 Lab 5: Characterization of the nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Tue Nov-26 Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Thu Nov-28 Lab reports due Fri Nov-29 C516 L11: Summary Mon Dec-02 Exam preparation	Tue	Nov-19	C459	Lab 4: Characterization of the	C516	L8: Thermochemical biomass
WedNov-20C268Lab 5: Characterization of the nanocomposite films by AFM (JL)C268Lab 5: Characterization of the nanocomposite films by AFM (JL)ThuNov-21C516L9: Biochemical transformations (MS)C455Lab 6: Enzymatic hydrolysis (groups A&B)FriNov-22C459Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A)C459Lab 7a: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group B)MonNov-25C516L10: Recycling, degradation and biodegradation (MS)LibraryLast day to hand in posters (PDF) at 14:00TueNov-26Lab reports and exam prep.Lab reports and exam prep.WedNov-27Lab reports and exam prep.Lab reports and exam prep.ThuNov-28Lab reports dueExam preparationFriNov-29C516L11: SummaryOutside of Magneli HallPoster presentationsMonDec-02Exam preparationExam preparationTueDec-03Exam preparationExam preparation				nanocomposite films: Antioxidant		transformations (MS)
nanocomposite films by AFM (JL) Thu Nov-21 C516 L9: Biochemical transformations (MS) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Tue Nov-26 Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Thu Nov-28 Lab reports due Fri Nov-29 C516 L11: Summary Mon Dec-02 Exam preparation Exam preparation Exam preparation Tue Dec-03 Exam preparation Exam preparation Exam preparation Exam preparation Exam preparation						
Thu Nov-21 C516 L9: Biochemical transformations (MS) Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Tue Nov-26 Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Thu Nov-28 Lab reports due Fri Nov-29 C516 L11: Summary Mon Dec-02 Exam preparation	Wed	Nov-20	C268	Lab 5: Characterization of the	C268	Lab 5: Characterization of the
ThuNov-21C516L9: Biochemical transformations (MS)C455Lab 6: Enzymatic hydrolysis (groups A&B)FriNov-22C459Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A)C459Lab 7a: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group B)MonNov-25C516L10: Recycling, degradation and biodegradation (MS)Library (PDF) at 14:00TueNov-26Lab reports and exam prep.Lab reports and exam prep.WedNov-27Lab reports and exam prep.Lab reports and exam prep.ThuNov-28Lab reports dueExam preparationFriNov-29C516L11: SummaryOutside of Magneli HallPoster presentationsMonDec-02Exam preparationExam preparationTueDec-03Exam preparationExam preparation				nanocomposite films by AFM (JL)		_
Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Tue Nov-26 Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Thu Nov-28 Lab reports due Fri Nov-29 C516 L11: Summary Mon Dec-02 Exam preparation						` '
Fri Nov-22 C459 Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Tue Nov-26 Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Thu Nov-28 Lab reports due Fri Nov-29 C516 L11: Summary Mon Dec-02 Exam preparation Exam preparation C459 Lab 7a: Sugar analysis from enzymatic hydrolysis of nanocomposite films (group B) Lab quantic hydrolysis of nanocomposite films (group B) Lab tab quantic hydrolysis	Thu	Nov-21	C516		C455	
enzymatic hydrolysis of nanocomposite films (group A) Mon Nov-25 C516 L10: Recycling, degradation and biodegradation (MS) Tue Nov-26 Lab reports and exam prep. Wed Nov-27 Lab reports and exam prep. Thu Nov-28 Lab reports due Fri Nov-29 C516 L11: Summary Mon Dec-02 Exam preparation						
MonNov-25C516L10: Recycling, degradation and biodegradation (MS)LibraryLast day to hand in posters (PDF) at 14:00TueNov-26Lab reports and exam prep.Lab reports and exam prep.WedNov-27Lab reports and exam prep.Lab reports and exam prep.ThuNov-28Lab reports dueExam preparationFriNov-29C516L11: SummaryOutside of Magneli HallPoster presentationsMonDec-02Exam preparationExam preparationTueDec-03Exam preparationExam preparation	Fri	Nov-22	C459	T	C459	•
MonNov-25C516L10: Recycling, degradation and biodegradation (MS)LibraryLast day to hand in posters (PDF) at 14:00TueNov-26Lab reports and exam prep.Lab reports and exam prep.WedNov-27Lab reports and exam prep.Lab reports and exam prep.ThuNov-28Lab reports dueExam preparationFriNov-29C516L11: SummaryOutside of Magneli HallMonDec-02Exam preparationExam preparationTueDec-03Exam preparationExam preparation						, ,
TueNov-26Lab reports and exam prep.Lab reports and exam prep.WedNov-27Lab reports and exam prep.Lab reports and exam prep.ThuNov-28Lab reports dueExam preparationFriNov-29C516L11: SummaryOutside of Magneli HallMonDec-02Exam preparationExam preparationTueDec-03Exam preparationExam preparation				nanocomposite films (group A)		nanocomposite films (group B)
TueNov-26Lab reports and exam prep.Lab reports and exam prep.WedNov-27Lab reports and exam prep.Lab reports and exam prep.ThuNov-28Lab reports dueExam preparationFriNov-29C516L11: SummaryOutside of Magneli HallPoster presentationsMonDec-02Exam preparationExam preparationTueDec-03Exam preparationExam preparation	Mon	Nov-25	C516	, , ,	Library	*
Wed Nov-27 Lab reports and exam prep. Lab reports and exam prep. Thu Nov-28 Lab reports due Exam preparation Fri Nov-29 C516 L11: Summary Outside of Magneli Hall Poster presentations Mon Dec-02 Exam preparation Exam preparation Tue Dec-03 Exam preparation Exam preparation		<u> </u>		` '		
Thu Nov-28 Lab reports due Exam preparation Fri Nov-29 C516 L11: Summary Outside of Magneli Hall Poster presentations Mon Dec-02 Exam preparation Exam preparation Tue Dec-03 Exam preparation Exam preparation		1		· · · · · · · · · · · · · · · · · · ·		
Fri Nov-29 C516 L11: Summary Outside of Magneli Hall Mon Dec-02 Exam preparation Tue Dec-03 Exam preparation C516 L11: Summary Outside of Magneli Hall Exam preparation Exam preparation Exam preparation		1		· · · · · · · · · · · · · · · · · · ·		
Mon Dec-02 Exam preparation Tue Dec-03 Exam preparation Exam preparation Exam preparation Exam preparation Exam preparation		1		i • • • • • • • • • • • • • • • • • • •		* *
Magneli Hall Mon Dec-02 Exam preparation Exam preparation Tue Dec-03 Exam preparation Exam preparation	Fri	Nov-29	C516	L11: Summary		Poster presentations
MonDec-02Exam preparationExam preparationTueDec-03Exam preparationExam preparation						
MonDec-02Exam preparationExam preparationTueDec-03Exam preparationExam preparation					_	
Tue Dec-03 Exam preparation Exam preparation	Mon	Dec-02		Exam preparation		Exam preparation
				.		* *
	Wed	Dec-04	C516	Written exam (9:00-13:00)		FF

^{*} See Athena course site for details

Lectures

- L1: Introduction (MS)
- L2: Lignocellulose chemistry (MS)
- L3: Polyphenols (JS)
- L4: Polysaccharides (MX)
- L5: Characterization techniques (MS)
- L6: Lipids (MS)
- L7: Proteins (MS)
- L8: Thermochemical biomass transformations (MS)
- L9: Biochemical biomass transformations (MS)
- L10: Recycling, degradation and biodegradation (MS)
- L11: Summary (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: AFM for characterization of the nanocomposite films
- Lab 6: Enzymatic hydrolysis of the nanocomposite films
- Lab 7: Sugar analysis from enzymatic hydrolysis of nanocomposite films

Assignments

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