

2016 Unit Guide

CHE5292 Bioresources Chemistry

This unit will equip students with the ability to evaluate new developments in biorefining, and pulping and bleaching from a chemistry perspective, and to analyse the chemistry of current operations. This will require the development of detailed knowledge and understanding of the chemistry of cellulose, of the various lignins and hemicelluloses and of wood extractives. This unit will examine the detailed chemistry of the various chemical pulping, bleaching and recovery processes, of the production of byproducts from pulping and bleaching operations, of the production of energy from biomass and the production of specialty chemicals and materials from biomass. It will also study the detailed chemistry of the interaction between fibres and 'wet-end' chemicals in an aqueous environment.

Mode of Delivery	On-campus
Workload	150 hrs
Unit Relationships	None
Prerequisites	None
Chief Examiner	Karen Hapgood
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SEMESTER 1
2016



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ACADEMIC OVERVIEW

Learning Objectives

Learning objectives of this unit are that the student will:

- a) Acquire an increased knowledge and understanding of:
 - The lignin, cellulose and hemicellulose chemistry of hardwood and softwoods
 - The minor chemical components of wood and of non-wood sources of cellulose
 - The chemistry of pulping and bleaching processes, with an emphasis on the kraft pulping process
 - The chemistry of the production of chemical byproducts of pulping processes
 - The chemistry of suspensions of cellulosic fibres and additives (wet-end chemistry)
 - The chemistry of the production of energy from biomass
 - The chemistry of the production of specialty chemicals from biomass
 - The chemistry of the production of materials from biomass

- b) Develop the skills required to:
 - Understand and analyse new findings in the chemistry of biomass and bioprocessing, and the chemistry of fibre suspensions, and assess the importance of these findings
 - Keep up to date with developments in the chemistry of biomass and bioprocessing, and the chemistry of fibre suspensions, and assess their relevance for specific commercial operations.

- c) Demonstrate the ability to:
 - Undertake in depth research of the literature on a specific aspect of the chemistry of a biomass conversion process or fibre suspensions, analyse the information obtained and produce a report which demonstrates understanding and insight
 - Organise practical experiments, make detailed observations of experiments, analyse the results and produce an accurate and detailed report

Graduate Attributes

Monash prepares its graduates to be:

1. responsible and effective global citizens who:
 - a. engage in an internationalised world
 - b. exhibit cross-cultural competence
 - c. demonstrate ethical values
2. critical and creative scholars who:
 - a. produce innovative solutions to problems
 - b. apply research skills to a range of challenges
 - c. communicate perceptively and effectively

Assessment Summary

Assessment Task	Value	Due Date
1. Initial Exam	10%	11/04/16
2. Preliminary Assignment	10%	15/04/16
3. Prac Report	10%	TBA
4. Major Assignment	20%	30/04/16
5. Final Exam	50%	22/04/16

Teaching and Learning Method

The unit consists of lectures, reading, assignments and a practical class

- The lectures introduce students to the main subject matter of this unit, increasing their knowledge of the topics covered and increasing their understanding through interaction with the lecturers.
- The initial reading increases skills in self-acquisition of knowledge and provides a greater knowledge of some topics which will be briefly revised in lectures.
- The preliminary assignment provides students with practical experience in evaluating publications and conducting a technical investigation in an area relevant to this unit.
- The practical class and report will provide students with hands on experience in areas relevant to the topic, increasing understanding of chemical engineering aspects of pulping and bleaching, and increase their ability to communicate the outcomes of their work in a structured report.
- The major assignment will provide students with experience in undertaking in-depth research on a specific topic related to this unit, to analyse the information obtained and to produce a report which is logical, readable and informed and which demonstrates understanding and insight.

Communication, participation and feedback

- Monash aims to provide a learning environment in which students receive a range of ongoing feedback throughout their studies. In this unit it will take the form of individual feedback, verbal and written feedback, discussions in class, as well as more formal feedback related to assignment marks and grades.

You can also find information on inclusive teaching practices for students with learning disabilities or mental health conditions at: <http://www.monash.edu.au/lls/inclusivity/>

Feedback

Our Feedback to You

- Written feedback, both individual and general, will be provided on assignments and reports.
- Opportunity will be provided for discussion group feedback on the preliminary assignment during the week of lectures.
- Feedback will also be provided in response to student requests via email and one-on-one discussion

Your Feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through SETU, Student Evaluation of Teacher and Unit. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, and on student evaluations, see: <http://www.monash.edu.au/about/monash-directions/directions.html>

<http://www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html>

Previous Student Evaluations of this unit

This unit has not been delivered previously.

Additional unit costs

None

Examination material or equipment

Any make and model of calculator is permitted to be used in this examination.

UNIT SCHEDULE

ASSESSMENT REQUIREMENTS

Assessment Tasks

Participation

Assessment Task 1: Initial Exam

Due Date: 11/04/16

Details of task: Examination of set preliminary reading material

Value: 10%

Estimated return date: 15/04/16

Assessment Task 2: Preliminary Assignment

Due Date: 30/04/16

Details of task: Undertake the work and prepare a report on the set assignment

Word limit: 3,000

Value: 10%

Estimated return date: 06/05/16

Assessment Task 3: Prac Report

Due Date: 15/04/16

Details of task: Prepare a report on the set practical assignment

Word limit: 3,000

Value: 10%

Estimated return date: 30/04/16

Assessment Task 4: Major Assignment

Due Date: 30/04/16

Details of task: Prepare a report on an assignment

Word limit: 12,000

Value: 20%

Estimated return date: 06/05/16

Assessment Task 3: Final Exam

Due Date: 22/04/16

Details of task: Examination of lecture and reading material

Value: 50%

Estimated return date: 30/04/16

Criteria for Marking the Major Assignment. Criteria for the Preliminary Assignment are similar but the scale of the task is much smaller:

High Distinction

The report shows clear evidence of understanding, critical analysis, original thinking and reflection on a wide selection of relevant literature including all the major documents on the topic. Conclusions reached are comprehensive, logical and well supported by the reviewed literature. All assignment-writing requirements are met to the highest standard (eg presentation, coherency, spelling, referencing, grammar).

Distinction

The report shows clear evidence of critical analysis and reflection on the documents that were reviewed. There is some original thinking evident in the discussion. Familiarity with a range of documents is evident. Conclusions are relevant, logical and well supported by the reviewed literature. All assignment-writing requirements are of a very good standard (presentation, coherency, spelling, referencing, and grammar).

Credit

The report is focused on a description of the material reviewed, although there is some attempt at critical analysis. An adequate collection of articles has been read and understood but the range is not comprehensive. While the discussion shows that there is a good understanding of the topic, there is a lack of originality of thinking. The standard of writing of the assignment is satisfactory.

Pass

Overall, the report is focused on description with scant evidence of critical analysis or reflection. The discussion reveals a limited understanding of the topic and of the literature reviewed. The range of literature reviewed is limited. The standard of writing of the assignment is satisfactory.

Assignment submission

Assignments may be submitted as hard copy or electronically. Unless advised otherwise, they should be submitted to the APPI secretary in the Secretary's Office in Building 59 or to janette.anthony@monash.edu.

- Unless you have made prior arrangements with your lecturer, only the following file formats will be accepted: .doc, docx, rtf, .pdf;
- You will receive a confirmation message by email advising that your report has been received.
- Comments and grading of your assessments will be communicated to you either by email, or post.

Extensions and penalties

University and faculty policy on assessment

Due dates and extensions

The due dates for the submission of assignments are given in the previous section. Please make every effort to submit work by the due dates. Students are advised to NOT assume that granting of an extension is a matter of course.

If you need an extension for any of the assignments, you must submit a written request 48-hours *before* the due time and date, and attach supportive evidence such as medical certificate.

Note that other lecturers cannot grant extensions. Lecturer-in-charge (unit coordinator) will indicate at the time of granting the extension whether any penalty in marks will apply to the submitted work.

If an extension is granted, the approval must be attached to the assignment.

Deferred tests and examinations may be granted in cases of extenuating personal circumstances such as serious personal illness or bereavement.

Remember, you are required to keep an up-to-date copy of all submitted assignments to safeguard against the loss of work through accident or error.

Assessment for the unit as a whole is in accordance with the provisions of the Monash University Education Policy at:

<http://www.policy.monash.edu/policybank/academic/education/assessment/index.html>

Returning assignments

Market assignments with comments will be returned in person for full time students and comments only will be returned by email to other students.

Resubmission of assignments

Assignments may not be resubmitted.

Referencing requirements

Refer to the Unit Coordinator for details of acceptable formats for references.

OTHER INFORMATION

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at: <http://policy.monash.edu.au/policy-bank/academic/education/index.html>

Key educational policies include:

- Plagiarism (<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-policy.html>)
- Assessment (<http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html>)
- Special Consideration (<http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.html>)

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- Grading Scale (<http://www.policy.monash.edu/policy-bank/academic/education/assessment/grading-scale-policy.html>)
- Discipline: Student Policy (<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-discipline-policy.html>)
- Academic Calendar and Semesters (insert URL);
- Orientation and Transition (insert URL); and
- Academic and Administrative Complaints and Grievances Policy (<http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy.html>)
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Student Services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at www.monash.edu.au/students

The Monash University Library provides a range of services and resources that enable you to save time and be more effective in your learning and research. Go to <http://www.lib.monash.edu.au> or the library tab in my.monash portal for more information.

Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis

- a) Website: <http://adm.monash.edu/sss/equity-diversity/disability-liaison/index.html>;
- b) Telephone: 03 9905 5704 to book an appointment with a DLO;
- c) Email: dlu@monash.edu
- d) Drop In: Equity and Diversity Centre, Level 1 Gallery Building (Building 55), Monash University, Clayton Campus.