1 INSTRUCTIONAL SUPPORT

1.1 Instructor
Instructor: Manju Misra, Ph.D. (School of Engineering and the Department of Plant Agriculture)
Office: RICHARDS 2511, Tel: 519-824-4120 Ext. 58935, 56766.
Contact: mmisra@uoguelph.ca
Office Hours: TBA on CourseLink or by appointment

2 LEARNING RESOURCES

2.1 Course Website
Course material, news, announcements, and grades will be regularly posted to the ENGG*6130 CourseLink site. You are responsible for checking the site regularly.
Login to CourseLink (https://courselink.uoguelph.ca)

2.2 Required Resources
There is no required textbook for this course. The instructors will provide weekly reading materials related to specific lecture topics. All students are expected to study the assigned readings prior to each lecture.
2.3 Recommended Resources


3) More recommended resources will be posted on the Courselink.

2.4 Additional Resources

**Lecture Information:** All the lecture notes will be posted on the web page.

**Assignments:** Download the assignments according to the schedule notified.

**Miscellaneous Information:** Other information related to this course may also be posted on the web page.

2.5 Communication & Email Policy: Please use lectures and tutorial help sessions as your main opportunity to ask questions about the course. Major announcements will be posted to the course website. It is your responsibility to check the course website regularly. As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its student.

3 ASSESSMENT

3.1 Distributions and Grades (Course passing grade = 65%)

<table>
<thead>
<tr>
<th>Distribution</th>
<th>Grades %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>5</td>
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<tr>
<td>Assignment 2</td>
<td>5</td>
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<tr>
<td>Assignment 3 (Guest Lecture)</td>
<td>5</td>
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<tr>
<td>Assignment 4 (Industry study tour related)</td>
<td>5</td>
</tr>
<tr>
<td>Term Project Oral Presentation (individual)</td>
<td>10</td>
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<tr>
<td>Term Project Written Report (individual)</td>
<td>20</td>
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<tr>
<td>Final Examination</td>
<td>50</td>
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</tbody>
</table>
Assignments: Assignments will be handed out through Courselink. Students are encouraged to complete all of these assignments. Late assignments will receive a grade of 0. The questions will be marked rigorously – i.e. solutions should be thoroughly and professionally presented.

Term Project Oral Presentation: All students will participate in oral presentation related to their term project (Date TBD). The presentation should be structured for an audience with a wide range of expertise, while at the same time containing adequate depth to show the development of novel approaches or ideas.

3.2 Course Grading Policies

Missed Assessments:
When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course in writing, with your name, id#, and e-mail contact. See the graduate calendar for information on regulations and procedures for Academic Consideration:
https://www.uoguelph.ca/registrar/calendars/graduate/2014-2015/genreg/sec_d0e1810.shtml

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations:
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

4 AIMS & OBJECTIVES

4.1 Suggested Calendar Description:
This course deals with biobased plastics, composites/nanocomposites; their processing, characterization and structure-property correlation. Moreover, the applications of biobased materials in automotive, packaging, consumer products, electronics, building products and biomedical will be presented.

4.2 Course Aims:
This course aims to:
1. Introduce students to biomaterials including biobased polymers, polymer composites and nanocomposites, natural fibers and their physical properties.
2. Explore processing of biomaterials through extrusion, injection molding, compression moulding, thermoset resin processing for different applications, such as consumer products, automotive, building products, packaging, biomedical and agriculture.
3. Study various techniques of characterization of biomaterials including mechanical, thermal and advanced biomedical applications.

4.3 Learning Objectives

Upon successful completion of this course, students will be able to:

1. Understand the chemical, physical and engineering aspects of biobased materials
2. Understand processing and manufacturing of biobased blends, biocomposites and bionanocomposites
3. Design and engineer biobased materials for various applications, such as for agriculture, consumer products, automotive, building products, packaging and biomedical.

4.4 Instructor’s Role and Responsibility to Students

The instructor’s role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected lecture notes will be made available to students on Courselink/D2L but these are not intended to be stand-alone course notes. During lectures, the instructor will expand and explain the content of notes and provide example problems that supplement posted notes. Scheduled classes will be the principal venue to provide information and feedback for tests and project.

4.5 Students’ Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures and tutorials. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who do (or may) fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

5 Teaching and Learning Activities

5.1 Lectures Timetable

Thursday: 9:30 AM – 12:30 PM (THRN 1006)
5.2 Course Topics and Schedule

Please note that this is a tentative course topics and schedule. Instructors reserve the right to change some of the topics or the schedule as needed.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td><strong>Introduction</strong> (Introduction to the course, bioproducts, bioplastics, biobased blends, bio-composites and bio-nanocomposites)</td>
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<td>2 and 3</td>
<td><strong>Bioplastics: Classifications and Importance</strong> (Bioproducts and their importance, basics of bioeconomy, bioplastics current status, bioplastics and sustainability, bioplastics from plants, bacterial polymers, poly(lactide), cellulosic bioplastics, biobased nylon, and CO\textsubscript{2} based bioplastics)</td>
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<tr>
<td>4 and 5</td>
<td><strong>Biorefinery and Sustainability</strong> (Biofuels, biofuel co-products and by-products, sustainable bioeconomy, value added uses of biofuel co-products, sustainable development, green guide, green chemistry, and recycling)</td>
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<tr>
<td>6</td>
<td><strong>Biofiber and Biocomposites</strong> (The American biocomposites market, structural aspects of natural fiber, challenges of biofibers, surface modification of biofibers, and powder biocomposite processing)</td>
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<tr>
<td>7</td>
<td><strong>Bionanocomposites: Nano-enhanced Bioplastics and Hybrid Bionanocomposites</strong> (Past and present nanotechnology, nanotechnology classification, polymer nanocomposites, bionanocomposites)</td>
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<td>8</td>
<td><strong>Biodegradation of Plastics</strong> (Biodegradability, plastics waste management options, biodegradable vs compostable plastics, methods of assessment of polymer degradation)</td>
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<td>9</td>
<td>External guest lecture -1</td>
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<tr>
<td>10</td>
<td><strong>Industrial study tour</strong> (1 full day including travel time)</td>
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<tr>
<td>11</td>
<td>External guest lecture -2</td>
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<tr>
<td>12</td>
<td>Term project presentations</td>
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5.3 Other Important Dates

Drop Date: The last date to drop summer session courses, without academic penalty, is June 4, 2015. Refer to the Graduate Calendar for the schedule of dates: 
[https://www.uoguelph.ca/registrar/calendars/graduate/current/sched/sched-dates-w11.shtml](https://www.uoguelph.ca/registrar/calendars/graduate/current/sched/sched-dates-w11.shtml)
6  **ACADEMIC MISCONDUCT**

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University’s policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member.

The Academic Misconduct Policy is detailed in the Graduate Calendar:  
https://www.uoguelph.ca/registrar/calendars/graduate/2014-2015/genreg/sec_d0e2097.shtml

6.1  **Resources**

A tutorial on Academic Misconduct produced by the Learning Commons can be found at:
http://www.academicintegrity.uoguelph.ca/

The School of Engineering has adopted a Code of Ethics that can be found at:
http://www.uoguelph.ca/engineering/undergrad-counselling-ethics

The Graduate Calendar is the source of information about the University of Guelph’s procedures, policies and regulations which apply to graduate programs:
http://www.uoguelph.ca/registrar/calendars/graduate/current/

7  **ACCESSIBILITY**

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or
accommodation, whether due to an identified, ongoing disability for a short-term disability should contact the Centre for Students with Disabilities as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca, or see the website: https://www.uoguelph.ca/csd/

8 RECORDING OF MATERIALS

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

9 RESOURCES

The Academic Calendars are the source of information about the University of Guelph’s procedures, policies and regulations which apply to undergraduate, graduate and diploma programs: http://www.uoguelph.ca/registrar/calendars/index.cfm?index