Prerequisite Requirements

Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites. The prerequisite for this class is Biology 2601A/B or the former Biology 2660A/B, or permission of the Department.

Accessibility

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

Support Services

Learning-skills counsellors at the Student Development Centre (http://www.sdc.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, http://westernusc.ca/services.

The website for Registrarial Services is http://www.registrar.uwo.ca.
**Course Materials**

**Textbook:**

No one textbook covers the scope of material presented in Biology 3660B. Several aspects of the course are covered in basic biochemistry textbooks and are available at the Taylor Library or through various online options.

One inexpensive option is *Plant Biology* by Smith et al, 2010 (ISBN978-0-8153-4025-6). Individual e-chapters can be purchased online at [https://store.vitalsource.com/show/978-1-1369-7745-9](https://store.vitalsource.com/show/978-1-1369-7745-9). We will cover material from Chapter 4, 7 & 8.

Additional material and readings will be posted on the Bio 3660B OWL site.

**Course Website**

Students should check OWL (http://owl.uwo.ca) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

**Lecture and Instructor Information**

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
<th>Room</th>
<th>Instructor</th>
<th>Office</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>M 10:30−11:20 am</td>
<td>AHB 1B06</td>
<td>Prof. Mark Bernards</td>
<td>B&amp;GS 2025E</td>
<td><a href="mailto:bernards@uwo.ca">bernards@uwo.ca</a></td>
</tr>
<tr>
<td>001</td>
<td>WF 10:30−11:20 am</td>
<td>PAB 34</td>
<td>Prof. Mark Bernards</td>
<td>B&amp;GS 2025E</td>
<td><a href="mailto:bernards@uwo.ca">bernards@uwo.ca</a></td>
</tr>
</tbody>
</table>

If you are contacting your instructor, please use your Western email address.
Anticipated Lecture Topics

Biology 3660B is a course about plant metabolism, and the ways in which plants use metabolites to interact with their environment. The main topics include:

1. Bioenergetics

   Driving Forces - basic principles of bioenergetics in metabolism
   Light absorption and energy transfer in photosynthesis
   Photosynthetic electron transport

2. Enzymes, Metabolic Pathways & Metabolic Regulation

   Enzymes and Enzyme Regulation
   General Principles of Pathway Organization and Regulation
   Basic Organic Chemistry of Biosynthesis

3. Primary Metabolism

   Reductive metabolism - C3 Photosynthesis
   Oxidative Pentose-P Cycle and Photorespiration
   Respiratory C-metabolism
   Respiratory Electron Transport
   N- assimilation and C/N balance
   S- assimilation
   P- assimilation

4. Plant Secondary Metabolism

   Secondary Metabolism: An Overview
   Roles in Biotic Stress Response
Learning Objectives

In general, Biology 3660B is a course about plant metabolism. By the end of the course, you should be able to:

Summarize the major bioenergetics driving forces governing biological processes.

Describe how metabolic pathways can be organized and regulated in both the long and short term.

Describe how enzymes are regulated at both fine and course scales.

Integrate knowledge and concepts about bioenergetics and the organization and control (regulation) of metabolism.

Classify the basic chemical reactions exploited during metabolism, and demonstrate how they are used to build complex structures from simple building blocks.

Classify enzymes and summarize how they catalyze basic chemical reactions.

Describe how plants convert light energy into chemical energy, and the mechanisms used to regulate the process.

Describe the basic pathways of C, N, S and P assimilation in plants and summarize their regulation and inter-relationships.

Distinguish between primary and secondary metabolism and describe the interrelatedness of the two.

Describe and draw out the metabolic origins and general biosynthesis of representative alkaloid, isoprenoid and phenylpropanoid compounds.

Draw and identify representative structures of common alkaloids, isoprenoids and phenylpropanoids.

Demonstrate how plants utilize secondary metabolites, especially alkaloids, isoprenoids and phenylpropanoids, to interact with their environment and relate the control of these processes to the main concepts of metabolic regulation.
**Evaluation**

**Components**

The overall course grade, out of 100, will be calculated as listed below. Listed next to the respective components are their maximum contributions toward the course grade.

<table>
<thead>
<tr>
<th>Component</th>
<th>Notes</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take Home Assignment 1</td>
<td>Due January 22, 2016</td>
<td>10</td>
</tr>
<tr>
<td>Take Home Assignment 2</td>
<td>Due February 5, 2016</td>
<td>10</td>
</tr>
<tr>
<td>Take Home Assignment 3</td>
<td>Due March 11, 2016</td>
<td>10</td>
</tr>
<tr>
<td>Written Assignment</td>
<td>Due April 4, 2016</td>
<td>30</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Scheduled by the Registrar</td>
<td>40</td>
</tr>
</tbody>
</table>

1Take Home Assignments will be available through the course OWL site one week before they are due. The Written Assignment will be discussed in class early in the term.

Only approved electronic devices may be in your possession during tests and exams.

It is Faculty of Science policy that a student who chooses to write a test or exam deems themselves fit enough to do so, and the student must accept the mark obtained. Claims of medical, physical, or emotional distress after the fact will not be considered.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at this website: [http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com ([http://www.turnitin.com](http://www.turnitin.com)).
Missed Course Components

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or supporting documentation to the Academic Counselling Office of your home faculty as soon as possible.

If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in WSC 140, and can be contacted at 519-661-3040 or scibmsac@uwo.ca. Their website is http://www.uwo.ca/sci/undergrad/academic_counselling/index.html.

A student requiring academic accommodation due to illness must use the Student Medical Certificate (https://studentservices.uwo.ca/secure/medical_document.pdf) when visiting an off-campus medical facility.

For further information, please consult the university’s medical illness policy at http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

IMPORTANT: The Final Exam is cumulative. With proper medical documentation, the grade value for the final exam will be pro-rated for missed assignments.

If you miss the Final Exam, please contact your faculty’s Academic Counselling Office as soon as you are able to do so. They will assess your eligibility to write the Special Exam (the name given by the university to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).