**Course Details**

<table>
<thead>
<tr>
<th>Course Title &amp; Number:</th>
<th>BME 7016 Introduction to Biochemistry and Microbiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRN:</td>
<td>58121</td>
</tr>
</tbody>
</table>
| Class Times & Days of Week: | Lectures: MWF 12:30 - 1:20 pm  
|                        | Tutorials: T 11:30 am - 12:45 pm                     |
| Class location:        |                                                      |
| Tutorial location:     | E2-150 EITC                                         |
|                        | E2-160 EITC                                         |

**Course Description**

BME 7016 provides theories and principles of Biology to biomedical engineering students and presents applications of biological principles to engineering problems. The course will cover the fundamentals of organic chemistry and biochemistry, the laws of thermodynamics and how they apply to biological systems, basic cell structure and function, metabolism, genetics and heredity, and the structure and function of bacteria and viruses. Guest lectures in tutorial sessions provide insight into how biochemistry and microbiology may be applied to real-world problems.

**Instructor Information**

<table>
<thead>
<tr>
<th>Instructor(s) Name:</th>
<th>Dr. David Levin, Professor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office Location:</td>
<td>E1-354 EITC</td>
</tr>
</tbody>
</table>
| Office Hours or Availability: | By appointment: Send me an e-mail message any time (24/7).  
|                      | I will respond within 24 hours with a day and I that I can meet with you. |
| Office Phone No.     | 204-474-7429              |
| Email:               | david.levin@umanitoba.ca  |

**Textbook, Readings, Materials**

**Required Text Book and Additional Material**


1) Purchase a new, hardcopy of Campbell Biology: $166.95
2) Purchase only the eBook: $115.00
General Course Information

Instructional Methods

Learning is most effective when both the teacher and the student are engaged in the subject material. The role of the teacher, therefore, is to create an environment that facilitates student engagement (and therefore learning). In this course, some dissemination of information will occur using the traditional lecture format. Students are expected to prepare for class by reviewing the lectures uploaded to UMLearn, and by reading the relevant chapters in the textbook.

Course Goals

The intent of this course is to:

- Introduce students to the basic biological principles of cell structure and function, metabolism, genetics and heredity, bacteria and virus structure and function, and animal structure, function, and evolution.

Why this course is useful: This course is the “Bio” in Biomedical Engineering. As biomedical engineers, you will need a basic understanding of the structure, function, and energy transformations of biological systems at the cellular and organismal levels, and how these processes are affected by both internal and external environmental parameters.

Who should take this course?: This is a required course in the Biomedical Engineering program.

Course Evaluation Methods

The grading system for this course is based on a combination of on-line assignments, participation in class tutorials, a Mid-term exam, and a Final Exam.

Evaluation Summary:

1) In Class Module Tests: 60% (3 x 20% each)
2) Final Exam (Cumulative): 40%
Total: 100%

Grading

The grading scale used for this course is shown below:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage out of 100</th>
<th>Grade Point Range</th>
<th>Final Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>90 – 100</td>
<td>4.25-4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>A</td>
<td>80 – 89.5*</td>
<td>3.75-4.24</td>
<td>4.0</td>
</tr>
<tr>
<td>B+</td>
<td>75 – 79.5*</td>
<td>3.25-3.74</td>
<td>3.5</td>
</tr>
<tr>
<td>B</td>
<td>70 -74.5*</td>
<td>2.75-3.24</td>
<td>3.0</td>
</tr>
<tr>
<td>C+</td>
<td>65 – 69.5*</td>
<td>2.25-2.74</td>
<td>2.5</td>
</tr>
<tr>
<td>C</td>
<td>60 – 64.5*</td>
<td>2.0-2.24</td>
<td>2.0</td>
</tr>
<tr>
<td>D</td>
<td>50 – 59.5*</td>
<td>Less than 2.0</td>
<td>1.0</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 50</td>
<td></td>
<td>0</td>
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</table>

- Scores between 0.6 and 0.9 of a grade percentage will be rounded up to the next whole number and the next Letter Grade as appropriate
**Important Dates**

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>Last day to drop fall/winter term courses without penalty</td>
<td>Friday, January 18&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Voluntary withdrawal date</td>
<td>Wednesday, March 20&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; In-class Test: Module 1 - Thermodynamics &amp; Chemistry</td>
<td>Wednesday, January 23&lt;sup&gt;rd&lt;/sup&gt;</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; In-class Test: Module 2 - Cell Biology</td>
<td>Wednesday, February 6&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; In-class Test: Module 3 - Genetics &amp; Molecular Biology</td>
<td>Wednesday, March 13&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Monday, April 8&lt;sup&gt;th&lt;/sup&gt;</td>
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**Class Tutorials & Module Reviews**

**Class tutorials/Module Reviews**

On specified Monday afternoons, from 2:30 to 4:20 pm, we will have class tutorials in which we will review the course material leading up to the Module test.

*Module Review Dates:*

<table>
<thead>
<tr>
<th>Tutorial Date</th>
<th>Module Review</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Tuesday, January 22&lt;sup&gt;cd&lt;/sup&gt;</td>
<td>1</td>
<td>Review of Lectures 1 - 7</td>
</tr>
<tr>
<td>Tuesday, February 5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>2</td>
<td>Review of Lectures 6 - 12</td>
</tr>
<tr>
<td>Tuesday, March 12&lt;sup&gt;th&lt;/sup&gt;</td>
<td>3</td>
<td>Review of Lectures 13 - 23</td>
</tr>
</tbody>
</table>

**Guest Lectures**

There will be a series of guest lectures on various aspects of biology and biosystems engineering. These lectures will be presented by graduate students and will highlight the interface between microbiology, biotechnology, and genome sciences with biosystems and bioprocess engineering. Attendance of these lectures is obligatory, and there will be questions on the Module tests on the lectures. The dates, presenter names, and topics are as follows:

<table>
<thead>
<tr>
<th>Guest Lecture</th>
<th>Lecture Date</th>
<th>Presenter</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>January 29&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Warren Blunt</td>
<td>Microbial Fermentation for PHA Production</td>
</tr>
<tr>
<td>2</td>
<td>February 12&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Nisha Mohanan</td>
<td>Biodegradation of PHA Polymers</td>
</tr>
<tr>
<td>3</td>
<td>February 26&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Chris Dartiaillh</td>
<td>Properties of PHA Polymers</td>
</tr>
<tr>
<td>4</td>
<td>March 5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Irene Fakankun</td>
<td>Microbial Production of Carotenoids</td>
</tr>
</tbody>
</table>
UNIVERSITY & COURSE POLICIES

Using Copyrighted Material

Please respect copyright. We will use copyrighted content in this course. The content used is appropriately acknowledged and is copied in accordance with copyright laws and University guidelines. Copyrighted works, including those created by us, are made available for private study and research and must not be distributed in any format without permission.

Recording Class Lectures

Dr. Levin and the University of Manitoba hold copyright over the course materials, presentations and lectures that form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission from Dr. Levin. Course materials (both paper and digital) are for the participant’s private study and research.

Course Technology

As a courtesy to both the instructors and your classmates, use of cell phones is not permitted during class time. Please remember to switch your cell phone to vibrate mode to avoid interruptions. Laptops may be used during lectures only for the purpose of taking notes. Some course materials will be available through UM Learn.

Class Communication

The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit: http://umanitoba.ca/admin/governance/media/Electronic_Communication_with_Students_Policy_-_2014_06_05.pdf

Please note that all communication between you as a student and your instructors/TAs must comply with the electronic communication with student policy (http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html). You are required to obtain and use your U of M email account for all communication between yourself and the university.

Academic Integrity

Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty. Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room. Exam cheating can also include exam impersonation. A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty. Students should acquaint themselves with the University’s policy on plagiarism, cheating, exam impersonation and duplicate submission. Electronic detection tools may be used to screen assignments in cases of suspected plagiarism.

Expectations: You Can Expect Us To

Learning is most effective when both the teacher and the student are engaged in the subject material. The role of the teacher, therefore, is to create an environment that facilitates student engagement and learning. In this course, some dissemination of information will occur using the traditional lecture format. However, a substantial portion of the content will be distributed as reading materials, which will be covered using classroom discussion or other learning activities. You can expect us to endeavour to create an active learning environment.
Expectations: We Expect You To

We expect you to be in attendance, and on time, for all scheduled lectures and labs. If you must be absent, please show us the courtesy of sending an e-mail notifying us of your absence. To benefit the most from this class, you must be willing to participate in class discussions. Therefore, you will be expected to prepare for class by reading the assigned materials.

Student Accessibility Services

If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services [http://umanitoba.ca/student/saa/accessibility/](http://umanitoba.ca/student/saa/accessibility/)
520 University Centre
204 474 7423
Student_accessibility@umanitoba.ca