Macronutrient Metabolism in Health and Disease

Course description

Metabolism of the macronutrients, carbohydrate, lipid and protein in humans integrating physiology, biochemistry, and nutrition with a focus on maintaining optimal health and preventing disease.

Prerequisites

Biochemistry (Undergraduate level BCHM30700 Minimum Grade of D- or Undergraduate level BCHM 56100 Minimum Grade of D- or Undergraduate level CHM 33300 Minimum Grade of D- or Undergraduate level MCMP30400 Minimum Grade of D-) and Anatomy and Physiology (Undergraduate level BIOL20400 Minimum Grade of D- or Undergraduate level BIOL30200 Minimum Grade of D-) and Fundamentals of Nutrition (Undergraduate level FN31500 Minimum Grade of D- or Undergraduate level NUTR31500 Minimum Grade of D-).

Course website

Blackboard Learn is our course management system. You can access the course website at http://mycourses.purdue.edu. It is strongly suggested that you explore and become familiar not only with the site navigation, but with content and resources available for this course.

Course Goals/Outcomes

Metabolism refers all processes involved in life maintenance. Macronutrients include carbohydrates, lipids, and protein. We will integrate knowledge from previous physiology,
chemistry, biochemistry, biology, and nutrition courses to understand the pathways and regulation of cellular and physiological macronutrient metabolism. The overall objective will be to apply these concepts to human nutrition in health and disease.

## Learning Objectives

At end of course students will be able to:

- To describe the processes of digestion, absorption, utilization and function of macronutrients in humans.
- To explain several cellular and molecular mechanisms related to macronutrient metabolism.
- To interpret the role of macronutrient metabolism in the etiology and pathophysiology of several disease

For Dietetics students (DPD or CPD), this course provides the following required components for ACEND accreditation:

- Organic chemistry,
- Biochemistry,
- Anatomy,
- Physiology,
- Genetics,
- Microbiology,
- Pharmacology,
- Statistics,
- Logic,
- Nutrient metabolism,
- Integrative and functional nutrition,
- and Nutrition across the lifespan.

## Learning Resources & Texts

  - This textbook is used for this course and NUTR 43800.
  - Purchase options for this book: hardcover, rental, eBook, and eChapter from Cengage Learning
  - Several online resources are available to go with the text book, but most require purchase for access. These resources include tutorial quizzes, etc.
  - The 5th edition of this textbook also has some online resources available that are free and good. These include tutorial quizzes and a study guide for each chapter. The website is: [http://www.cengagebrain.com/cgi-wadsworth/course_products_wp.pl?fid=M20b&product_isbn_issn=9780495116578&token](http://www.cengagebrain.com/cgi-wadsworth/course_products_wp.pl?fid=M20b&product_isbn_issn=9780495116578&token)
  - This book may also be purchased or rented via Purdue University Bookstore or Follett's Bookstore.
  - This book is also on reserve at the Purdue Library in Lily Hall.
- Additional Readings: May be provided via Blackboard
Course Logistics

- The Calendar function in Blackboard is being used to help you stay on top of important dates in this course. In addition, all dates are also listed in the course schedule.
- When assignments are due, they are due in class on the due date listed in the course schedule.
- Deadlines are an unavoidable part of being a professional and this course is no exception. Course requirements must be completed and submitted on or before specified due date and delivery time deadline. Due dates and delivery time deadlines are defined as Eastern Standard Time (as used in West Lafayette, Indiana).
- Avoid any inclination to procrastinate.

Instructor’s online hours

I will be available via email and will respond as soon as I am available (generally within 24-48) hours. When I receive a similar question from multiple students I often wait until the next class period to address the class as a whole. If your questions are not responded to individually or in class in this time frame, please do not hesitate to resend your questions to me in a timely manner.

Assignments (Course Requirements)

You will have four concept map assignments throughout the semester. Details on these assignments, along with rubrics to guide evaluation will be posted on the course Blackboard website.

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Due</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Concept Map #1 Carbohydrate Metabolism</td>
<td>Feb 17, 2017</td>
<td>25</td>
</tr>
<tr>
<td>Concept Map #2 Lipid Metabolism</td>
<td>March 10, 2017</td>
<td>25</td>
</tr>
<tr>
<td>Concept Map #3 Protein Metabolism</td>
<td>April 7, 2017</td>
<td>25</td>
</tr>
<tr>
<td>Concept Map #4 Integration of Macronutrient Metabolism</td>
<td>April 26, 2017</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>
Participation policies

If you want to be a successful student, be sure the following qualities:

- Be self-motivated and self-disciplined.
- Be willing to “speak up” if problems arise.
- Be willing and able to commit at least 10 hours per week.
- Be able to communicate orally and through writing.
- Be able to meet the minimum requirements for the course.
- Accept critical thinking and decision making as part of the learning process.

In contrast, here are some common behaviors that lead to failing the course.

- Don’t read until the night before the exam.
- Don’t attend class on a regular basis.
- Wait until the last day to complete the Concept Map Assignment.
- Forget about deadlines.
- Ignore emails from the instructor.
- Don’t get familiar with the grade book, course schedule and syllabus.

Course etiquette

Your instructor and fellow students wish to foster a safe learning environment. All opinions and experiences, no matter how different or controversial they may be perceived, must be respected in the tolerant spirit of academic discourse. You are encouraged to comment, question, or critique an idea but you are not to attack an individual. Our differences, some of which are outlined in the University’s nondiscrimination statement below, will add richness to this learning experience. Working as a community of learners, we can build a polite and respectful course ambience. Please read the Course Etiquette rules for this course:

- Do not dominate any discussion. Give other students the opportunity to join in the discussion.
- Do not use offensive language. Present ideas appropriately.
- Avoid using vernacular and/or slang language. This could possibly lead to misinterpretation.
- Keep an “open-mind” and be willing to express even your minority opinion.
- Think before you speak.
- Do not hesitate to ask for feedback.
<table>
<thead>
<tr>
<th>Grades</th>
<th></th>
<th>Points</th>
<th>DUE DATE</th>
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</thead>
<tbody>
<tr>
<td><strong>Exams:</strong></td>
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</tr>
<tr>
<td>EXAM 1 (Review)</td>
<td></td>
<td>100</td>
<td>Jan 27</td>
</tr>
<tr>
<td>EXAM 2 (CHO)</td>
<td></td>
<td>100</td>
<td>Feb 24</td>
</tr>
<tr>
<td>EXAM 3 (LIPID)</td>
<td></td>
<td>100</td>
<td>Mar 24</td>
</tr>
<tr>
<td>EXAM 4 (PRO)</td>
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<td>100</td>
<td>April 14</td>
</tr>
<tr>
<td>Final (Comprehensive)</td>
<td></td>
<td>100</td>
<td>TBD May 1 - 6</td>
</tr>
<tr>
<td><strong>Project:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concept Map 1 (CHO)</td>
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<td>25</td>
<td>Feb 17</td>
</tr>
<tr>
<td>Concept Map 2 (LIPID)</td>
<td></td>
<td>25</td>
<td>Mar 10</td>
</tr>
<tr>
<td>Concept Map 3 (PRO)</td>
<td></td>
<td>25</td>
<td>April 7</td>
</tr>
<tr>
<td>Concept Map 4 (INTEGRATION)</td>
<td></td>
<td>25</td>
<td>April 26</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
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### Grading Scale

<table>
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<tr>
<th>Grade</th>
<th>Percentages</th>
<th>Points</th>
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<tbody>
<tr>
<td></td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>A+</td>
<td>97</td>
<td>100</td>
</tr>
<tr>
<td>A</td>
<td>93</td>
<td>97</td>
</tr>
<tr>
<td>A-</td>
<td>90</td>
<td>93</td>
</tr>
<tr>
<td>B+</td>
<td>87</td>
<td>90</td>
</tr>
<tr>
<td>B</td>
<td>83</td>
<td>87</td>
</tr>
<tr>
<td>B-</td>
<td>80</td>
<td>83</td>
</tr>
<tr>
<td>C+</td>
<td>77</td>
<td>80</td>
</tr>
<tr>
<td>C</td>
<td>73</td>
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<tr>
<td>C-</td>
<td>70</td>
<td>73</td>
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<tr>
<td>D+</td>
<td>67</td>
<td>70</td>
</tr>
<tr>
<td>D</td>
<td>63</td>
<td>67</td>
</tr>
<tr>
<td>D-</td>
<td>60</td>
<td>63</td>
</tr>
</tbody>
</table>

### Attendance

Students are expected to be present for every meeting of the classes in which they are enrolled. Only the instructor can excuse a student from a course requirement or responsibility. When conflicts or absences can be anticipated, such as for many University sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency absences when advance notification to an instructor is not possible, the student should contact the instructor as soon as possible by email, or by contacting the main office that offers the course. When the student is unable to make direct contact with the instructor and is unable to leave word with the instructor’s department because of circumstances beyond the student’s control, and in cases of bereavement, the student or the student’s representative should contact the Office of the Dean of Students.

The link to the complete policy and implications can be found at:
[http://www.purdue.edu/studentregulations/regulations_procedures/classes.html](http://www.purdue.edu/studentregulations/regulations_procedures/classes.html)

### Incompletes

A grade of Incomplete (I) will be given only in unusual circumstances. To receive an “I” grade, a written request must be submitted and approved by the instructor. Requests are accepted for consideration but in no way ensure that an incomplete grade will be granted. The request must describe the circumstances, along with a proposed timeline for
You will be required to fill out and sign an “Incomplete Contract” form that will be turned in with the course grades. Any requests made after the course is completed will not be considered for an incomplete grade.

## Course Evaluation

During the last two weeks of the course, you will be provided with an opportunity to evaluate this course and your instructor. Purdue now uses an online course evaluation system. You will receive an official e-mail from evaluation administrators with a link to the online evaluation site. You will have up to two weeks to complete this evaluation. Your participation is an integral part of this course, and your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

## Academic Dishonesty

Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, University Regulations] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

Please review the following resource page on academic integrity:

http://www.purdue.edu/odos/osrr/academicintegritybrochure.php

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

## Grief Absence Policy for Students

Purdue University recognizes that a time of bereavement is very difficult for a student. The University therefore provides the following rights to students facing the loss of a family member through the Grief Absence Policy for Students (GAPS). GAPS Policy: Students will be excused for funeral leave and given the opportunity to earn equivalent credit and to demonstrate evidence of meeting the learning outcomes for misses assignments or assessments in the event of the death of a member of the student’s family.
See the University’s website for additional information: http://www.purdue.edu/studentregulations/regulations_procedures/classes.html

**Violent Behavior Policy**

Purdue University is committed to providing a safe and secure campus environment for members of the university community. Purdue strives to create an educational environment for students and a work environment for employees that promote educational and career goals. Violent Behavior impedes such goals. Therefore, Violent Behavior is prohibited in or on any University Facility or while participating in any university activity.

See the University’s website for additional information: http://www.purdue.edu/policies/facilities-safety/iva3.html

**Emergency Statement**

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. *You are expected to read your @purdue.edu email on a frequent basis.*

See the University’s website for additional information: https://www.purdue.edu/ehps/emergency_preparedness/

**Disabilities Statement**

Students with disabilities must be registered with Disability Resource Center in the Office of the Dean of Students before classroom accommodations can be provided. If you are eligible for academic accommodations because you have a documented disability that will impact your work in this class, please schedule an appointment with me as soon as possible to discuss your needs.

**Nondiscrimination**

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the
University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University prohibits discrimination against any member of the University community on the basis of race, religion, color, sex, age, national origin or ancestry, genetic information, marital status, parental status, sexual orientation, gender identity and expression, disability, or status as a veteran. The University will conduct its programs, services and activities consistent with applicable federal, state and local laws, regulations and orders and in conformance with the procedures and limitations as set forth in Executive Memorandum No. D-1, which provides specific contractual rights and remedies. Any student who believes they have been discriminated against may visit www.purdue.edu/report-hate to submit a complaint to the Office of Institutional Equity. Information may be reported anonymously.

You may want to refer students to Purdue’s nondiscrimination statement: http://www.purdue.edu/purdue/ea_eou_statement.html

**Course Schedule**

Please see Course Schedule for due dates and times of exams and assignments.

**Disclaimer**

This syllabus is subject to change.
NUTR 43700
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