

**Guide to Operation
Introductory Human Physiology
(MCB/Physiology 240)
Fall Semester, 2009**

Office & Staff Information

<http://www.life.illinois.edu/Physiology/240/MCB/240Index.htm>

Course Title:	<i>Physiology (Human Systems Physiology)</i>
Course Number:	<i>MCB 240 (Lecture, 3 Hr)</i>
Course Office:	<i>414, Natural History Bldg. (NHB) Phone 244-6175</i>
Professor:	<i>Essie Meisami, 414 NHB Phone 244-6175 E-mail: <meisami@illinois.edu></i>
Dr. Meisami's Office Hour	<i>Wednesdays 2-4 p.m. (414 NHB)</i>
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Grader TA:	<i>Lavanya Anandan E-mail: <lanandan@illinois.edu></i>

Required Textbooks

- 1) *Vander's Human Physiology, Widmaier, Raff, Strang, McGraw-Hill, 11th edition, 2008.*
- 2) *Physiology Coloring Book, Kapit, Macey, Meisami, Benjamin/Cummings, 2nd edition, 2000.*
- 3) *Lecture Outline and Study Guide for Systems Physiology: MCB 240, Meisami, Stipes Publishing Co., Champaign, Illinois, Fall 2009 Edition*

What Is Physiology & Why We Need to Study It!

“Physiology is Destiny!”

Physiology is the science of the **functional mechanisms** of living organisms and their parts (cells, tissues, organs and systems). MCB 240 is a course on *Systems Physiology* and is devoted to the study of the *functional systems of the human body and explanation of the functions of these systems based on cellular, biochemical and biophysical mechanisms in addition to systemic physiological principles*. In this course you will learn about the mechanisms of the workings of *your own body*. MCB 240 is planned to be one of the required core course for MCB (Molecular and Cellular Biology) and possibly IB (Integrative Biology) majors. In addition, those of you planning to enter medical, dental or pharmacy schools, will find this course very useful for preparing for admission tests for these schools. Regardless of the academic or practical reasons, *we are convinced that you will find the study of physiology fun and intellectually rewarding*.

The facts and principles that you will discover about your body, your health and your own biology in this course, will no doubt help you advance toward a more healthful and wellness oriented way of life. In addition, a knowledge of human physiology will help you develop enlightened views and habits about the issues that are commonly encountered in the modern life, such as brain and mind, drugs and medications, foods and nutrition, exercise, sex and reproduction, smoking, alcohol, wellness, health care and diseases. On the assumption that MCB and IB majors have a stronger preparation and background in chemistry and physics, we plan to introduce more quantitative approaches and formulas in this class, than we do in MCB/Physiology 103, which is a more introductory course and tuned for students in allied health sciences and general education.

Physiology Is One of the Foundations of Biomedical Sciences

In addition to its intrinsic value, physiology is one of the oldest and most important of the **biomedical sciences**. Many of **human diseases** are caused by disorders in the body's physiological mechanisms and the underlying molecular and cellular events.

Examples are diabetes, infertility, blood disorders, heart disease and brain diseases such as Alzheimer's disease, epilepsy and Parkinson's disease. In this course, by learning about the

pathophysiological mechanisms underlying these disorders you will develop a better appreciation of the normal mechanisms of the body and what needs to be done to remedy these disorders. Indeed many of modern therapeutic approaches are based on application of physiological principals and knowledge such as hormonal replacement therapy in management of endocrine disorders such as diabetes and infertility or development of the heart's pacemaker for patients with disorders of heart beat and the kidney dialysis machine for patients with kidney disorder or failure.

Scope and Plan of the Course

This course is a survey of the basic knowledge in *human systems physiology* in health and disease. You will learn this knowledge by attending the lectures and following the study units in this Study Guide that are written for each and all the lectures (**about 30 of them this semester**)

Your learning resources are:

- A *Study Guide* that is geared to your textbook (*Vander's Human Physiology*) and to the *Physiology Coloring Book* and which is written specially for the MCB 240 students. You will find numerous references in the Study Guide to the pages and figures in the textbook and coloring book.
- **The *Physiology Coloring Book***, a highly popular book, which provides for you an extra learning tool. For many students who experience less time and quick pace of information, the first quick learning resource will be the *Physiology Coloring Book*. Students in the previous semesters have recommended this book as a main, quick and useful tool for learning the basic and important facts of human physiology, while using the Vander's textbook for more in-depth learning together with tables and diagrams (see below).
- **A major and popular textbook of human physiology** (*Vander's Human Physiology: Mechanisms of Body Functions, 11th edition*). This scholarly textbook will help you find more detailed explanations for concepts and facts of physiology. Also it offers to you many nice colored diagrams and illustrations as well as Tables to help you digest the basic concepts of the science of physiology.

General Organization of MCB/Physiology 240

- In this course, you will have regular lectures twice a week [**Tu, Thurs, 12:30-2:00 p.m., in Room 100, Material Science Laboratory (on Green Street across from Natural History Bldg.)**]. The lectures will mainly be given by Dr. Meisami, although other guest lecturers or Teaching Assistants may also participate.
- Most of the lectures mentioned above correspond roughly to 1-2 chapters, or a part of a chapter, in your Vander textbook, as well as to certain plates of your *Physiology Coloring Book*. A **Schedule of Lectures and the Corresponding reading (Syllabus)** can be found at the beginning of this *Guide to the Operation of the MCB 240 Course*. This Schedule helps you organize your study program. *Please note that although we have provided reading list in the Syllabus document in front of this guide, these readings are more general. We advise you to consult the detailed reading lists that may be found within each Study Unit, just below the Section Headings. There are 2 or more Sections and their respective Headings in each Study Units.*
- There will be three midterm exams during the semester, each covering the material in the preceding 10 lectures (the course has about 30 x 1.5 hr long lectures in total per semester). Exams will be administered on Tuesday evenings following the 10th, 20th and 30th lecture (or the last one of the semester). **The first two midterm-like exams will be administered on Tuesday evenings during the semester and the last one during the final exam period (see Box 2).** The weight of each of these midterm-like exams will be 300 points.
- There will also be a **comprehensive final exam** over the materials of exams 1 and 2 (first 2/3 of the course) to be administered on Monday evening Dec. 7, 2009, at 7-8 p.m. It will be a multiple-choice exam only and its weight will be 1/3 of the regular midterm-like exams (100 points); those who score at or better than the mean in this exam as well, will earn a special bonus points (10 points out of 1000). *By Dec. 1, 2009, we will post a special set of review questions for the comprehensive final exam, which will focus on the most important subjects and topics that the students should have learned for exams 1 and 2.*

- Each of the midterm-like exams will be preceded with a review session, which will normally take place on Monday late afternoon, the day before the Tuesday exam date) from 5-6 pm. The review session for the third “midterm” exam will be on the late afternoon of **the last day of classes (Wed Dec. 9)**. Attendance in the review sessions is optional but highly recommended. The last exam, given during the final exam week, will be 2 hours long and will consist of the 3rd midterm exam.
- We will also give an **Optional Mini-Exam** with each midterm exam. These mini exams will consist of 15 multiple-choice questions over the subjects that we may not have had time to cover in the lectures but are important to know and for which we assign readings from the textbooks. Students passing these mini-exams with **a minimum score of 10 correct answers out of 15 will receive 10 bonus points for each mini-exam. Comprehensive final exam will also have a mini-exam similar to the first two (see above).**
*These bonus points will be added to the **final total scores out of 1000 of the students at the end of the course and NOT at the end of each exam.** There will be no penalties for NOT taking or not passing a mini-exam.*

Lecture Outline & Study Guide (Study Units)

In order to facilitate your reading and preparation for the exams, you will be using a workbook especially designed for the MCB/Physiology 240 Course: *Lecture Outline & Study Guide for Systems Physiology: MCB/Physiology 240, by Essie Meisami, Stipes Publishing Co., Champaign, Illinois, Spring 2009 edition.* This guide is required of all students taking MCB 240 and can be purchased at the Illini Union and local bookstores

This Guide is divided into about 40 Study Units, each corresponding to one or part of each of the lectures (some lectures may correspond to two Study Units). The Study Units will help you through your reading material and point out important matters covered in the lectures. Exact references will be made in each of the Study Units to specific pages in your *Vander's Human Physiology* textbook and the *Coloring Book of Physiology*, to enable you to locate the answers and explanations for the questions in the textbook and coloring book.

These exact and detailed references to reading materials may be found just below each Section Headings in the Study Units. The exam questions will be similar to the material discussed in the Study Guide (Study Units). In addition to the published Study Guide, we may also post, on the course website, further materials related to quantitative aspects and physical and chemical formulas of the materials that have been discussed in the course, and also occasionally provide some problem sets that you can try to work out to appreciate the marked dependency of physiology on chemistry and physics.

Grading Procedures

Each student may earn up to a maximum possible total points of 1000 in the entire course. This possible total will be mainly the sum of **3 midterm-like exams** that will be given during the semester and in the finals week (300 points per midterm exam X 3 exams = 900 points). Each midterm-like exam will cover about 10 lectures of material. The remaining 100 points will come from the final comprehensive exam that will cover materials mainly from midterm exams 1 and 2.

The final grading system for the whole course will be based on the average performance of the students in the final total scores (out of 1000 points) and curving of the distribution of final total scores (see last sentence in the next paragraph). We will announce, for the midterm exams 1 and 2, a **tentative** scale of grades (*which will not be recorded*), so that you can estimate your rate of performance and progress relative to the whole class and see how you should improve it to achieve a better grade (if necessary). Final letter grades will be assigned at the end of the course (semester) once all scores related to “midterm-like” exams, final comprehensive exam, and the optional mini-exams are obtained.

Assignment of final letter grades will be based on consideration for the average scores, standard deviation from the average and the top scores in the class. In general, based on our past experience, we have found that students who do better than 850 points (85%) in their overall total scores at the end of the course are likely to receive a grade of A (A- to A+) and students in the 75 to 85% range fall in the range of B- to B+ grade, etc. Please note that this is not a straight and fixed scale and may change from semester to semester depending

on the performance of the students in the course. **We usually consider the average (mean) score in the class to roughly correspond to the lowest "B-" grade.**

However, we are likely to reduce this standard if the number of A's will be unusually low. We hope that approximately 20% of the class will earn a final course grade of A (A- to A+). We assign grades in all ranges of A+ to D- and F, as recommended by the University of Illinois Office of Records. *It should be emphasized that Initial assignment of final grades will be done without any reference to the bonus points from mini exams so that students not taking the optional mini-exams will not be discriminated against. Any earned **bonus points** will be added to the **final total score** for each student only after the initial assignments of grades have been determined; this may possibly move the grades of these students up one grade level higher (e.g., C to C+. B to B+ or A- to A).*

Midterms and Final Exams

The "midterm-like" exams will be given **three** times during the semester, each after a set of **10 lectures** or roughly a **4-5-week** period. Two of the three exams will be given during the semester and the **third one** during the "**finals**" week. The *midterm-like* exams 1 and 2 will be 2-hrs long and given on **Tuesday** evenings, from **7 to 9 pm (see Syllabus at the beginning of this Study Guide as well Box 1 and 2 below for details and exact dates).** The third "midterm-like" exam will cover the last set of 10 lectures of the course and will be administered during the **final exam week**. This last exam will also be 2 hour long.

Each midterm-like exam will be worth **300 points** and each will have **70** multiple-choice, True-False and/or matching type questions. In addition you will be given some "**fill-in-the-blank**" and some **short essay** questions. The multiple choice questions part will be worth 210 points (70 questions X 3 points/question = 210 points). The written part (essay and fill-in) will be worth 90 points, to make a total of 300 points (210+90= 300 points). In the multiple-choice part of the exam, you may be given some important and familiar physiological diagrams or drawings (such as those of a nerve action potential or synapse), the components of which you will be asked to identify. In the written part of the exam, you may occasionally be given one or two problems to solve using the given physical and chemical formulas.

Each of the 3 midterm-like exams will cover the material covered in the **preceding 10** lectures (about 4-5 weeks of classes). The third midterm-like exam will be administered during the final exam week and at a day and time to be announced by the University. The format of the third midterm-like exam will be exactly the same as the previous midterm exams (multiple choice and some essay and fill-in questions) and will cover the last part of the course (last 10 lectures, 4-5 week).

The comprehensive final exam is NOT optional and needs to be taken by all students. It will be worth 100 points only (i.e. 1/3 of the regular midterm exams) and will be over the materials covered in **exams 1-2 mainly**; *it will have 50 multiple choice questions only (50 questions x 2 points/quest. =100 points), with no essay or written type of questions and will be administered in the evening of the last Monday of the semester (Monday of the last week of instruction, Dec. 7, at 7-8 p.m., Room TBA).* For those students who may have other obligations during the evening hour, we will have a conflict exam at 4:00 pm. You will have 1 hour to complete the final comprehensive exam. **The purpose of the final comprehensive exam is to two-fold:** *First, to ensure that all students will have adequate review of the knowledge related to first 2/3 of the course; second, to allow those students who did not do well in exams 1 and 2, to have one more chance to better their scores.*

Box 1 (see next page) summarizes the exams and their content and relative weights while **Box 2** summarizes the schedule of midterm-like exams. Dates, time and place of the exams and any updates will be announced in the class and on the course website. (See also tentative schedule below - in Box 2).

Conflict Exam & Make-up Exam

A **conflict exam** will also be administered on the same day as the regular exam (Tuesdays), usually in the late afternoon (4-6 pm). The time and date of the conflict exam for the 3rd midterm-like exam will be arranged during the final exam week (*time and date TBA*). *Only students with legitimate university related conflicts are allowed to take the conflict exam.* **These students will need to write down their names on a sign-up sheet outside Dr. Meisami's office in 414 NHB by 4 pm of the Monday of the exam week.**

Make-up exams are taken if you are sick or have a family emergency, preventing you from taking the regular or conflict exam. In such cases, please make sure to contact Dr. Meisami (meisami@illinois.edu) as soon as you can. You must also contact the Student/Emergency Dean's Office. If your absence is excused by the Dean's office, then we will arrange for you to

take a **make-up exam** on an appropriate later day (usually after the lecture on Thursdays of the exam week- in Mr. Zach Shipp's office, 412A, NHB).

Pass or Not-Pass students/grades. Those students, who take Physiology 240 on the basis of Pass/Not-Pass, **must take all exams the same as other students, and obtain scores of no less than 65% in every exam.**

Extra-Credit Points (mini-exams)

With each of the three midterm-like exams, and also for the final comprehensive exam, if some lecture materials (such as those on some aspects of Reproduction (last lectures) or lectures on blood groups) are not completely finished or covered at all during the regular lecture hours due to lack of time, we will ask the students to study these on their own and give them the option of answering an **optional mini-exams** comprising of 15 multiple-choice questions from the materials that are not covered in the lectures but can be studied in the readings by students themselves.

If you answer **67% (10 out of 15 for mini exams 1 and 2 and 3, and the comprehensive final)** of these optional questions correctly, you will earn **10 additional extra-credit (bonus) points** for each of the midterm exams 1-3, as well as for the final comprehensive exam. *These bonus points (a maximum total of 40 points) will be added to your final total out of 1000 in the course at the very end of the course and not earlier and only after the average score in the class out of possible total of 1000 have been determined. There will be no penalties (or negative points) for NOT taking these mini exams or NOT Passing them.*

Exam Review Question Sets

To help you prepare for exams, we will also provide a set of **exam review questions (aka review sheets)** on the course website, once half-way through the period before each exam and another time on the Monday before the exam week, so that you can be alerted as to what areas and topics you will need to focus on in your studies or need to know for each of the exams. Of course, the exam questions may come from these as well as other subject matters discussed in the lecture or in the reading and Study Guide.

How To Study the "Lecture Notes and Study Guide" Successfully!

How best to study for this course.

The best way to manage your time and studies during this Fall semester would be to work on your **Study Guide, the Physiology Coloring Book plates (especially the facts and text material on the left side of each plate, and appropriate parts of your Vander's textbook)** – as recommended in the Study Guide. Also carefully study the **Review Sheets** that we post online **twice before each exam** (see above for details). Make sure also to attend the **Review Sessions** on the Mondays before each exam. The exam questions will come essentially from the questions asked of you in the Study Guide.

Follow and Focus on the Study Units in the Study Guide

The first time through any study guide and lecture notes, we suggest that you follow the study guide for that lecture. After reading the introduction to each lecture, read the assigned text material according to the procedure for that unit. Try to work toward the goal of achieving the objectives stated. The study questions and key words are to help you in thinking about the material as you read it and also as a guide to how much detail you will be expected to learn.

Look for Bolded Terms and Diagrams in the Textbook and Physiology

Coloring Book. Pay special attention to the words shown in bold or Italics in your **Physiology Coloring Book** or the **Vander's textbook** and also to the diagrams and tables in the Vander's textbook, showing the flow of events; the tables help categorize items for you.

Carefully Study and Try to Color (optional) the Physiology Coloring Book

Plates. Doing the coloring in the *Physiology Coloring Book* will increase and improve your learning. We know this may take a lot of your time but this will really be helpful in focusing your attention to the relationship between the vocabulary of physiology and the concepts and structures involved in understanding the subject of human physiology. We urge you to do your coloring during your spare time- when you are relaxed.

BOX 1

**Number and Type of Questions & Relative Worth of
Midterm and Final Comprehensive Exams
MCB/Physiology 240 Course
Fall Semester 2009**

MIDTERM EXAM 1 (300 points), [70 Multiple-Choice Questions
(210 points) + Essay & Fill-In Questions, 90 points)

MIDTERM EXAM 2 (300 points), [70 Multiple-Choice Questions
(210 points) + Essay & Fill-In Questions, 90 points)

MIDTERM EXAM 3 (300 points), [70 Multiple-Choice Questions
(210 points) + Essay & Fill-In Questions, 90 points)
(THIS EXAM TO BE TAKEN DURING FINAL EXAM WEEK)

FINAL COMPREHENSIVE EXAM (100 POINTS), 50 Multiple Choice Questions
Only; (NO Essay Questions) – to be taken at 7-8 pm on the last Monday of classes.

TOTAL POINTS IN THE COURSE FROM ALL EXAMS = 1000 POINTS

Box 2

**Schedule of EXAMS; MCB/Physiology 240 Course
Fall Semester 2009**

MIDTERM EXAM 1 TUESDAY SEP. 29 (7-9 pm)

MIDTERM EXAM 2 TUESDAY NOV. 3 (7-9 pm)

MIDTERM EXAM 3 (**Finals Week: Dec. 11, 7-10 p.m.**)

COMPREHENSIVE FINAL Exam (MONDAY DEC. 7, 7-8 pm)

Note: Optional Review Sessions for Exams 1 and 2 will be conducted on Monday late afternoon (the day before the exams) at 5-6 pm (Locations TBA). Review session for Exam 3 will be on the evening of the last day of instructions (Wednesday, Dec. 9, 2009 at 5-6 pm, Room TBA).

Complete and latest information on dates, time, location and room number of your exams and their preceding review sessions will be posted on the course website: [<http://www.life.illinois.edu/physiology/240/MCB240Index.htm>]