Biology 37 s19 **Endocrinology** **Weekly Schedule 10A**

Lectures/Paper Discussions: Tuesday and Thursday 10:10-12:00
X-hour: Wed 3:30-4:20 (Problem-solving exercises & patient presentations)
Text/Reading:

1. **Text: None required.**
2. **Course Reading:** Collection of 37 manuscripts (each with study guides) that are required course reading. All posted as .pdf files on the course Canvas site. Some papers have supplemental data that is also on the Canvas site.

Faculty: Professor Lee Witters

Date	Topic	Prob Set Posted	Prob Set Due
Tuesday, March 26	Lecture 1: Course Introduction and Overview of the Mammalian Endocrine System		
Wednesday, March 27	**NO X-HOUR**		
Thursday, March 28	Lecture 2: Hormone Receptors; Mechanisms of Hormone Action I		
Tuesday, April 2	Lecture 2 Reading; Lecture 3: Mechanisms of Hormone Action II		
Wednesday, April 3	**X-Hour**: Problem-Solving in Endocrinology- Guide to Success		
Thursday, April 4	Lecture 3 Reading; Lecture 4: Pituitary and Hypothalamus-An Overview		
Tuesday, April 9	Lecture 4 Reading; Lecture 5: Hypothalamic/Pituitary/Gonadal Axis		
Wednesday, April 10	**X-Hour**: Group Problem-Solving: A Mystery Case-The Case of the Irritable Infant		
Thursday, April 11	Lecture 5 Reading; Lecture 6: Sex Steroids; Hormones of Pregnancy & Lactation		
Friday, April 12		**#1**	
Tuesday, April 16	Lecture 6 Reading; Lecture 7: The Adrenal Cortex and Its Hormones		
Wednesday, April 17	**X-Hour**: Group Problem-Solving: Two Mystery Cases-The Cases of the Identical Twins		
Thursday, April 18	Lecture 7 Reading; Lecture 8: Sexual Differentiation and Puberty		**#1**
Tuesday, April 23	Lecture 8 Reading; Lecture 9: Growth Hormone and Related Growth Factors		
Wednesday, April 24	**X-Hour**: Patient Visit and Presentation		
Thursday, April 25	Lecture 9 Reading; Lecture 10: Thyroid Hormones		
Saturday, April 27, 6-8 PM	**Mid-Term Exam Review Session**		
Monday, April 29, 7-9 PM	**Mid-Term Exam**		
Tuesday, April 30	Lecture 10 Reading; Lecture 11: Calcium-Regulating Hormones: PTH and Vitamin D		
Wednesday, May 1	**NO X-HOUR**		
Thursday, May 2	Lecture 11 Reading; Lecture 12: Hormone Production by "Non-Endocrine" Tissue		
Friday, May 4		**#2**	
Tuesday, May 7	Lecture 12 Reading; Lecture 13: Fuel Homeostasis and Pancreatic Hormones		
Wednesday, May 8	**X-Hour**: Group Problem-Solving: Two Mystery Cases-Kids and Kalcium		
Thursday, May 9	Lecture 13 Reading; Lecture 14: Diabetes Mellitus: History & Molecular Pathogenesis		
Friday, May 10			**#2**
Tuesday, May 14	Lecture 14 Reading; Lecture 15: Body Weight: Obesity and Type 2 Diabetes		
Wednesday, May 15	**X-Hour**: Patient Visit and Presentation		
Thursday, May 16	Lecture 15 Reading; Lecture 16: Body Weight: Anorexia Nervosa		
Tuesday, May 21	Lecture 16 Reading; Lecture 17: Neoplasia & Immunoendocrinopathy	**#3**	
Wednesday, May 22	**NO X-HOUR**		
Thursday, May 23	Lecture 17 Reading; Lecture 18: What is a Hormone Anyway?		
Tuesday, May 28	**Optional Final Exam Review Session**		**#3**
Saturday, June 1, 3-6 PM	**Final Exam**		

Biology 37 Course Goals, Format & Expectations

REQUIRED READING ON DAY 1 OF COURSE

I. General Course Goals

- To provide a broad overview of the endocrine signaling system and its function/dysfunction in humans
- To integrate aspects of molecular endocrinology and cellular biochemistry with *in vivo* physiology and pathophysiology
- To illustrate how the study of the molecular genetics, cell biology, biochemistry and pathobiology of an endocrine disorder reveals insights into the molecular/cellular mechanisms and physiology of normal endocrine function
- To introduce students to the biomedical literature and to learn some techniques of clinical/molecular investigation in a hypothesis-based, problem-solving paradigm

II. Course Format

The course will consist of 18 lectures/discussions on Tuesday and Thursday from 10:10-noon (with a break in the middle). **Attendance at all classes is expected of each student**; **attendance at X-hours is optional, but encouraged** (see below).

The discussion/lecture format will generally consist of an instructor-led discussion of manuscripts from the biomedical literature (reading based on the previous class lecture on the same subject) in the 1st hour followed in the 2nd hour by a lecture on an different subject to prepare students for reading for the next class. Powerpoint slides (annotated) for each lecture will be posted on our Canvas site a week in advance of each class. These manuscripts (and their study guides; all already posted) are required reading for the course and should be read in advance of the class. All students will be expected to participate in the discussion of these papers. Students will also be "grouped"; groups will be assigned as "commentators" to specific readings (the same groups will work together during X-hour problem solving). At the end of each class, the papers for the next class will be introduced and students will be referred to a "preview podcast" on our web site to assist in the reading of the papers and study guides. This syllabus material contains lecture outlines and a printout of a Powerpoint set on "What the Major Hormones Do". These latter sheets may be helpful in summarizing in a "Notes' view the information about each of the major hormones to be studied. It also contains some "tips" documents for course success, how to register for Piazza and a map to Professor Witters' office. All of these materials (and future materials) are (or will be) posted on the course web site.

III. Course Schedule

The course schedule is attached, indicating the lecture topic/reading discussions, dates of the examinations & pre-exam review sessions and critical dates regarding the posting & submission of the problem sets. Note that the reading discussion corresponding to a particular lecture subject occurs in the 1st hour of the next class.

IV. Required Readings/Study Guides

One-three manuscripts from the biomedical literature are assigned to correspond to the topics of Lectures 2-17. For each set, a study guide is included. T**he study guide is an important component to draw attention to the key points and to ask questions to guide your reading and study. The style of the questions there may also reflect the style of some exam questions.** These papers have been chosen for their seminal nature and, most importantly, their integration of molecular and physiologic information. All are based on a central aspect of endocrine physiology or pathophysiology in humans and are meant to illustrate important principles of endocrinology and the techniques used to discover them. Student should do the best they can in the initial reading of these papers and utilize other resources, (e.g. reference texts, medical dictionary) as necessary, to address unfamiliar details. We will discuss an overall approach to

reading papers at the end of our 2nd class (**review the following document; also posted on our web site ('Syllabus'>>'Course Help">>'How to Read Papers in Bio 37'**). All will be previewed (in class and with a "preview podcast" on the web site) and then discussed in the following class with Professor Witters. **ALL students should be prepared to participate in those discussions, though specific groups will be assigned as "commentators" on each.**

***Participation, not the "right" answer(s), through comment or questions is the desired goal of this paper discussion*.** The **principles** that these manuscripts illustrate and the general content (not picky details) of each will be heavily represented in the problem sets and on the examinations; the **study guides** are good clues as to the nature of these principles & to potential exam questions. The papers also illustrate a number of **techniques** used in the analysis of the endocrine system and you will need to be familiar with what each technique measures and how and with the interpretation of data obtained from its application**. Simply said, you will have more success in the class & get more out of our course if you actually do the reading & participate in the discussions! Re-reading the papers after the class discussion is an excellent idea!** "Sticky" details of each reading can be reviewed during class, X-hour or office hours.

A list of the readings is attached to the course schedule. All the papers are available as .pdf files on the course web site. **Some papers contain color pictures or "difficult to photocopy" figures which are best viewed by looking at the .pdf file on your laptops. Others have supplemental data which should also be looked at on the web site.**

V. Course Evaluations and Grading

A. Problem Sets: Three (3) problem sets are assigned during the course, as indicated on the course schedule. They will be posted on the course web site ('Assignments') on the date indicated. Completed problem sets are to be submitted in HARD COPY by 10:10 AM on the date due (in class or in my office/dropbox) (122 LSC) AND ALSO digitally as a .doc or .docx file through the course web site. Each problem set will consist of one or more problems, characterized by a description of a subject or family with an endocrine disorder and some preliminary laboratory data. The general assignment in each instance will be to:

- State a hypothesis (or alternative hypotheses) that best explain the abnormal state at a cellular and molecular level
- Describe of an experimental approach as to how you would confirm your hypotheses and the anticipated results of such experiments that would allow such a determination.

A "mock" question/answer and general instructions for completion of problem sets are posted on the course web site ('Assignments'). Students will be free to use any written resources to prepare their answers. **Problem set #1 can be worked on with other members of the class (though each student must submit her/his own answer), while with problem sets #2 & 3 each student must work totally independently.** In both instances, students are expected to adhere strictly to the Dartmouth Honor Principle (see below).

B. Paper Commentaries: After the first week when course enrollment is established, students will be divided into groups of 3-4. Each group will be responsible for creating a commentary on two (2) of the assigned readings during the term. Each group will also work as a team during our X-hour problem solving questions. Details to be announced after class roster set.

C. Examinations: There will be two exams (mid-term and "final"). Each will count equally toward the class grade. The "final" exam is non-cumulative, emphasizing only the material in the second half of the course, though principles & experimental techniques we have covered in the first half of the course are 'fair game'. My policy is to only grant exemptions from scheduled exam time for a direct time conflict with other classes, for illness or for unavoidable absence from campus.

The general format of the exams will consist of narrative-style questions (with some use of matching/fill-in-the-blank/true-false format) that will be designed to assess the application (not just memorization) of course material in unique problem-solving situations. The 2018 exams (along with answer keys) are posted on the course web site ('Syllabus'>>'Course Aids & Help'). Material for the exams will be drawn from class lectures/notes, Powerpoint slides accompanying each lecture/paper discussion AND the assigned manuscripts/study guides. Pre-exam review sessions will be offered prior to both the mid-term and final.

D. Completion of Course Assignments

It is expected that students will complete **all** course assignments on the date and time that they are scheduled. My policy is to give deferral only for illness, unavoidable absence from campus or a direct conflict with a scheduled activity of another class (in the case of the exams). Communication by the student with me about any deviation from this policy is expected of all students before the fact, not afterwards. For late submission of problem sets, there will be a 25% reduction in the grade for each day it is late.

E. Course Grading The course grade will be determined by (1) required completion of **all** course assignments, (2) the number of accumulated course points and (3) by course "engagement" (see below). The policy of the Biology Department is that a minimum of 50% of total possible points must be earned to achieve a passing grade. Anyone with ≥ 90% of possible points will receive "some kind of A". Historically, the median grade in this course has been in the B+ range, but I do not feel held to that, depending on overall class performance (in either direction). **All grading is done by me. Graded problem sets and exams will be returned in class or in my office (122 LSC) and can be picked up during my announced office hours. Note: You will have one week after I announce their availability to pick them up and to request any re-grading then. After that, they will be discarded and grades are then final.**

Breakdown of course points (total 180 possible):

3 problem sets	55 points (15, 20 & 20 points)
2 paper commentaries	5 points
Mid-term examination:	60 points
Final examination:	60 points

While I will not assign a specific point value to it, I do take into account what I term "active engagement and participation" in the course in assigning the final letter grade. Is there evidence that the student is intellectually engaged with the course, is providing interesting insights to peers and is contributing to the general learning atmosphere of the course? Ways students can demonstrate this include:

- active participation in class (through questions or comments, particularly during discussion of our papers)
- good use of office hours and the X-hour for same
- posting of comments or questions on 'Piazza' on the web site
- bringing new or recent insights to the attention of us all (e.g. posting an interesting article, image or URL in 'Piazza'); commentary from others on these postings.

Taken together, this does provide you an opportunity to influence your final letter grade, but I will look for evidence that you have done these things **throughout the course** and not just intermittently or towards the end of the course. **Note:** this also means that course points yielding your "numerical" standing relative to the class DO NOT guarantee a certain letter grade.

You are urged to review the documents entitled 'Tips for Success in Bio 37', 'How to Read Bio37 Papers' & 'Study Strategies for Success' (the latter created by the Teaching Science Fellows) at the end of this syllabus.

Also posted in the 'Syllabus'>>'Course Aids & Help Documents' section of our web site.

VI. Laptop/Phone Policy

I have no objection to your using laptops to take notes and the laptops/phones will be useful during our interactive X-hour sessions (in fact, plan to bring them then). **However, if you are going to use your laptop (or phone) for any purpose other than notes/interactive problems (such as checking e-mail, Facebook, Instagram, Twitter, etc.), I am going to ask you to sit on the periphery of the class at a table by yourself so as not to disrupt others.** Studies tell us that students who are focused on the class are disrupted by someone nearby using their computers/phones for other purposes. Parenthetically, there are also studies that show that taking notes on a computer is inferior to written notes.

VII. Course Text, Readings, Reserve Books, Web Sites, Lecture Capture & Lecture Tools

A. Course Text: I am not recommending or requiring a course text. There are reference texts on Course Reserve in Dana and two of these are also available on-line as eResources (see below; Williams & Jamison texts) that can be linked to from our web page ('Syllabus'>>'Useful Web Links').

B. Required Manuscript Readings are available on the Canvas site as .pdf files. Some papers contain color pictures or "difficult to photocopy" figures and are best viewed by looking at the .pdf file on your monitors. Some have supplemental data also on the course web site.

A list of readings is attached to the course schedule. Each required paper is accompanied by a study guide also on the web site, highlighting some areas to concentrate on and questions to consider during your reading. **These study guides are VERY VALUABLE to use in your integration of course material and may contain material that is "fair game" for course exams.** Use of reference texts, medical dictionaries and other supplementary sources is encouraged; vocabulary may be an issue during reading and these other sources could prove helpful. **Listening to the "preview podcast' before reading the paper is a great way to orient yourself before working with the papers & the study guide.** We will review in class a strategy for reading/studying papers after our 2nd lecture (see document "How to Read Papers in Bio37' in 'Syllabus'>>'Course Aids & Help Documents' section of web site; also attached).

C. Valuable Reference Materials: eBooks

There are several other excellent reference books available as eBooks you can link to it via 'Useful Web Links' of our web site ('Syllabus'). The Williams' Textbook of Endocrinology, 13th edition (Melmed et al, eds.), Saunders Elsevier, 2016 can be linked to directly from this page. Another helpful text (Jameson & DeGroot) is also available as an e-Book (Jameson, JL & DeGroot LJ (eds) Endocrinology: adult and pediatric, 7th edition, Elsevier Saunders, 2016)

D. Valuable Web Sites (links on course web site in 'Useful Web Links' ('Syllabus' page))

There are a number of very useful web sites for this course. Please let me know if you find other sites that you think would be useful for this course.

E. Course Web Site

http://canvas.dartmouth.edu

On Day One of the course, please set up your desired contact information, as I will be using this mode through 'Announcements" to communicate with you during the course. To do this, click on 'Account' in upper left green bar —> 'Settings'. Under 'Notifications' in menu, I recommend choosing

'Notify me right away', so you receive any announcements promptly. To choose this, click the check mark in the 'Announcement' line. **Also register for Piazza, the course Q&A module.** If you have registered for Piazza in another course, you shouldn't have to do it again. If not, you will be asked to create a password (don't use your Net ID or Dartmouth PW). This will be a one-time request and, once registered, you will be able to access from Canvas menu without having to enter the PW again. **To protect your privacy for this registration (which I would strongly encourage), please look at a document accompanying this syllabus packet.**
Check with me if you have a problem accessing.

On Day One also take a tour of the Canvas site to see how it is organized. The site is organized with a 'Syllabus' page (which has several links to general course pages and course aids), a 'Calendar', individual pages devoted to each course lecture topic (each of which, in turn, contains preview podcasts, .pdf files of the readings (and study guides for them), Powerpoint slides), an 'Assignments' section for problem sets , 'Course Aids & Help Documents' with old exams, summary PP slides and tips documents, a 'Piazza' section for asking questions and posting interesting material, a 'Course Media Gallery' and a 'Grades' section. There is also a 'Chat' section that we can use for text chats, as needed/scheduled, during the term and a link to the Echo360 for lecture captures.

I STRONGLY encourage the viewing of the Powerpoint files on your computer (the animation and color can be very helpful). Some also like to print these out. They will be up-loaded prior to each class, typically the weekbefore the lectures for the coming week. **PP sets for reading discussions will be uploaded only on the morning of the discussion**; I want you to have "a crack" at the papers without them.

F. Lecture Capture/Podcasts

We will be using the Echo360 lecture capture recording system this term. These files will be available within a few hours of the lecture in a link on the 'Syllabus' page. The video will capture my computer screen, not the room, me or you! Any laser pointing will not be seen. **While I do NOT regard this as a substitute for class attendance**, it might be helpful for several of you if you have an unavoidable absence from class or would simply like to review aspects of a lecture or discussion (you can start and stop me!). Historically, many students have found these useful as a course study adjunct. However, there are things we do in class that are not easily captured with these technologies (especially classroom discussions, student questions). Each 'Course Topics' page will also contain a "preview podcasts" to orient you to the reading assignment.

Keep in mind that there is NO GUARANTEE that this Echo technology will work to effectively capture every lecture, so DO NOT rely on this system as a substitute for class attendance!

G. Poll Everywhere Audience Response System

This term we will be using a learning element, Poll Everywhere. This platform is an interactive program that allows extended faculty-student engagement in the classroom setting, providing, among other things, platforms for asking/answering questions. You will be able to use it with your laptop, pad or phone. We will have a class demo to show you how this works and how we will use it during our first scheduled X-hour.

VII. Office Hours; Use of X- hour

Office hours, **offered 7 days a week generally**, will be announced at each class session and through our Canvas site each week. Students are asked to sign up for times in class, though you can ALWAYS walk-

in**!** Signing up helps me see demand and in scheduling. **My office is located in the Class of 1978 Life Sciences Center (Room 122; map at end of this syllabus and on web site).** Students are encouraged to drop by to ask questions, review material, discuss papers or just chat about life, career plans, Red Sox vs Yankees, politics, art history, the cosmos, iTunes/Spotify favorites, etc! It is very important to me to "make the class smaller" by encouraging students to come by, even for seemingly minor issues and questions or for going beyond course material. **Every one of you is important to me regardless of your background in biology & your present/future plans. I value very much these interactions and want to get to know you all better!**

Office hours also offer you the opportunity of being PROACTIVE AND CURIOUS in your approach to your education, even if you feel in command of the material we are covering, is important. **If you don't feel in command, don't wait till you "see how you do" on the lst problem set or mid-term!**

The **X-hour** is optional and will be used to ask questions, group problem-solving, review material, etc. We will also have two patient visits. **Students are encouraged to attend for all these purposes**. No new material not otherwise covered in class will be introduced during these sessions. **However, nearly all past students who have taken this course have said they have found the X-hour to be VERY useful to their study.**

VIII. Dartmouth Academic Honor Principle

The Dartmouth College Student Handbook states: "Fundamental to the principle of independent learning are the requirements of honesty and integrity in the performance of academic assignments, both in the classroom and outside. Dartmouth operates on the principle of academic honor, without proctoring of examinations. Any student who submits work which is not his or her own, or who commits other acts of academic dishonesty, violates the purposes of the College and is subject to disciplinary actions, up to and including suspension or separation.

There are a number of situations in which a student in Biology 37 might find him or herself tempted to violate the Academic Honor Principle. Review that Principle at: https://students.dartmouth.edu/judicial-affairs/policy/academic-honor-principle

These situations include (but are not limited to) the following:

a) Examinations must be completed without reference to written materials other than those provided with the exam paper and must be completed without communication with anyone else (the only permissible exception is that students may request clarification of any exam question from me during the exam). The answers that you provide must be entirely your own work. **Cell phones must be turned off and left in the room, if you leave it during the exam.**

b) My policy permits the re-submission of exams for potential re-grading by me. Any alteration of the answers between the time when the graded papers were returned to the student and the time when the paper was submitted for re-grading constitutes a breach of the Academic Honor Principle. To deter this practice, I randomly scan exams after grading them.

c) The assigned problem sets can be completed in an "open book" mode, that is, you may access any source of written or information relevant to the problem. **For problem set #1, you are free to discuss the problem with any others in the class. However, you are expected to "write up" & submit your own answer without collaboration with others. For problem sets #2 & 3, students are expected to work totally independently of each other and cannot seek verbal/e-mail/text explanation from others, including NOT sharing with anyone ANY materials (or their source) relevant to the problem.**

d) Any form of plagiarism on the problem sets, namely the submission or presentation of work, in any form, that is not the student's own without acknowledgement of the source, violates the Academic Honor Principle (https://students.dartmouth.edu/judicial-affairs/policy/academic-honor-principle). Students are responsible for the information concerning plagiarism found in the Sources: Their Use and Acknowledgement, at https://writing-speech.dartmouth.edu/learning/materials/sources-and-citations-dartmouth **Electronic, as**

well as 'hard copy', submission of all work is required and the former may used to compare papers between students or to other sources.

Honesty is the foundation of the academic pursuit of knowledge. In recognition of this, I will not overlook any violations of the Academic Honor Principle. Indeed, the Faculty Handbook of Dartmouth College states explicitly that College Faculty is obligated to report potential violations of the Academic Honor Principle to the Dartmouth College Committee on Standards.

IX. Course Accommodations

Students with disabilities, including chronic diseases, learning disabilities, and psychiatric disabilities are encouraged to discuss with me after class or during my office hours appropriate accommodations that might be helpful. Please do this EARLY in the course and not just before the lst exam. I have worked closely with Student Accessibility Services and the Academic Skills Center in the past and can work with students to find study methods, tutoring needs and exam accommodations for those eligible for same. Consult the web site for SAS for more details: https://students.dartmouth.edu/student-accessibility. Students requiring disability-related academic adjustments and services must consult the Student Accessibility Services office (Carson Hall, Suite 125, 646-9900). Once SAS has authorized services, students must show the originally signed SAS Services and Consent Form and/or a letter on SAS letterhead to their professor. As a first step, if students have questions about whether they qualify to receive academic adjustments and services, they should contact the SAS office. All inquiries and discussions will remain confidential.

X. Religious Observances

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me early to discuss appropriate accommodations.

XI. Your Mental Health

I recognize that the academic environment at Dartmouth is challenging, that our terms are intensive, and that classes are not the only demanding part of your life. There are a number of resources available to you on campus to support your wellness, including: your undergraduate dean (http://www.dartmouth.edu/~upperde/), Counseling and Human Development (http://www.dartmouth.edu/~chd/), and the Student Wellness Center (http://www.dartmouth.edu/~healthed/). I encourage you to use these resources and come speak with me in order to take care of yourself throughout the term.

XII. Title IX Obligations

At Dartmouth, I/we value integrity, responsibility, and respect for the rights and interests of others, all central to our Principles of Community. I/we are dedicated to establishing and maintaining a safe and inclusive campus where all have equal access to the educational and employment opportunities Dartmouth offers. I/we strive to promote an environment of sexual respect, safety, and well-being. In its policies and standards, Dartmouth demonstrates unequivocally that sexual assault, gender-based harassment, domestic violence, dating violence, and stalking are not tolerated in our community.

The Sexual Respect Website (sexual-respect.dartmouth.edu) provides a wealth of information on your rights and obligations with regard to sexual respect and resources that are available to all in our community. **As a faculty member, I am obligated to share disclosures regarding conduct under Title IX with Dartmouth's Title IX Coordinator.** Confidential resources are also available, and include licensed medical or counseling professionals (e.g., a licensed psychologist), staff members of organizations recognized as rape crisis centers under state law (such as WISE), and ordained clergy (see https://sexual-respect.dartmouth.edu/reporting-support/all-resources/confidential-resources).

Should you have any questions, please feel free to contact Dartmouth's Title IX Coordinator (Kristi.Clemens@Dartmouth.edu) (and deputies if appropriate).