

Biology 3010: Molecular Genetics Fall 2015

**All lectures will be posted online via ECHO360 and web-links available on Blackboard
There will not be “live” lectures except for Lecture 1 Aug 25th).**

**Problem Solving Sessions 9.30 am to 10.45 am Tuesdays and Thursdays,
in Snyder Memorial Room 2100.**

**Attendance at 50% of the Problem solving sessions is required
(Attendance is taken using clickers)**

Instructor: Dr. John Gray Office Phone: 530 1537 Lab phone 530 1538
email: jgray5@utnet.utoledo.edu Office Hour: 11 to 12 Wednesday (in BO 1099)
(note that problem solving sessions act like an office hour as many students have trouble with the
same material – so be sure to attend and ask questions during the problem solving sessions)

Required Text:

Klug and Cummings, *Essentials of Genetics, Books a la Carte Plus Mastering Genetics with eText -- Access Card Package, 8/E* Publisher Benjamin Cummings. Copyright: 2013.
ISBN-10: 032185716X • ISBN-13: 9780321857163. ~\$116.25 new *Books a la Carte are unbound, three-hole-punch versions of the textbook. This lower cost option is easy to transport and comes with same access code or media that would be packaged with the bound book. All students are required to have clickers to participate in the problem solving sessions and earphones to order to listen to lectures online.*

Important Dates:

M	9/7 (Labor Day)	Last day to add/drop
T	9/15	1st Exam 15% of points (On 6 lectures 8/25 -9/10)
R	10/15	2nd Exam 20% of points (On 7 lectures 9/17 -10/8)
F	10/30	Last day to withdraw (W)
T	11/10	3rd Exam 25% of points (On 7 lectures 10/8-11/5)
Various Deadlines		Mastering Genetics Assignments (10% of points)
W	12/16	Final Exam 8.00 - 10.00 am 30% of Points (20% on 7 lectures 11/12-12/8 and 10% on the first three sections of course)

WHAT IS BIOL 3010 ?

BIOL 3010 is a lecture course and serves as a co-requisite to the companion practical course BIOL 3020 (Molecular Genetics Laboratory). BIOL 3010 is a 3 credit course with the following aims:

- 1:** To teach you the fundamental concepts underlying modern molecular genetics including the properties of nucleic acids, the mechanisms of DNA synthesis, replication and repair, and sources of DNA variation both natural and artificial.
- 2:** To teach you the modern understanding of multiple levels of gene expression including transcription, transcript processing and protein synthesis (translation). The structural and temporal dynamics of gene regulation during development and in response to the environment will be studied.
- 3:** To provide you with an introduction to the practical application of modern molecular genetics including recombinant DNA technology in the study of cellular biology, (e.g. cancer), development, and genetic engineering.
- 4:** To provide you with an introduction to how molecular genetics explains the mechanisms by which living populations evolve over generations. An appreciation of evolution and population genetics greatly assists the efforts to conserve the diversity of endangered species.

Take responsibility for your education! (its never too late)

Take responsibility for your own education. Here's the part where college distinguishes itself from high school. Students are in high school because they have to be. Students are in college because they want to be. You are paying dearly for your college education, so you should go out and get it. Don't wait for someone else to hand it to you; it won't come.

Taking responsibility for your own education means going to the dictionary when you run across a word you don't know. It also means asking your professor to read a draft of your essay, or raising your hand in class to ask for a difficult point to be repeated. But taking responsibility for your education means more than this. It means seeking out challenging courses and difficult professors, for only if you push yourself by taking hard courses will you improve your academic and intellectual skills. It means engaging your friends in the dormitories and coffee shops about what you are learning in the classroom.

It means holding yourself to higher standards than you professors hold you. If you take only easy courses and sit passively through them, you will fail to gain the very education that you are paying so dearly for.

Taken from: College is more than job training (Andrew P Mills The Blade: Toledo, Ohio Saturday Sept 30, 2000)
See also <http://faculty.otterbein.edu/Amills/MillsCollegeEssay.html>

GETTING THE MOST OUT OF BIOL 3010:

In BIOL 3010 you will learn about the amazing advances that have been made in the century just past towards understanding the physical nature of hereditary information and the molecular mechanisms by which hereditary information is transmitted from generation to generation. The current state of our knowledge is very rich although many exciting details remain to be discovered. You will be introduced to much new information and although there may seem to be many details, time limitations will actually allow us to only briefly examine the topics that we will explore.

The information that you will receive will serve as an important foundation for your future studies in biology and also will aid greatly in your understanding of modern life where many new opportunities and dilemmas are presented. In order to appreciate and avail of these opportunities, and to tackle thorny bioethical dilemmas it will be important not only to learn the factual information presented but also to understand the underlying concepts and some of the (current) limitations of our knowledge and abilities.

ONLINE LECTURES AND IN-CLASS PROBLEM SOLVING SESSIONS:

Lecture 1 is live and your presence is required. For the rest of the lectures, I use the "flipped classroom model" so lectures will not be presented live but will be recorded ahead of time and posted online 2 days before the assigned lecture date. You should access the lecture via the web using any internet device you choose or at a University computer lab (use earphones). You can listen at any time to the lecture, start and stop as you wish and replay sections. This should enable students to focus on the sections that they find most difficult.

Instead of live lecturing, the class time will be used for problem solving and attendance is required for at least 50% of these sessions (attendance taken using clickers). Genetics is not only about knowledge of how living things work but how to apply that knowledge to solving problems.

The new online-lecture and in class problem solving sessions are designed to maximize assistance for students who are not strong in the subject.

FORMAT OF IN-CLASS PROBLEM SOLVING SESSIONS

At the end of each lecture I will post a slide of questions at the end of the chapter that will be covered at the next problem solving session (hence the requirement for the solutions manual).

You should work through these problems on your own or in a study group. If you have no problem then you may not want to come to the session – although it could be worthwhile if you learn quicker or easier ways of tackling a problem. We will also go over old exam multiple choice questions that will be posted online (you should bring a clicker to provide your answer but grades are not assigned to these old questions). If you are having trouble with the assigned problems, and the solutions manual is not sufficient help, then you should come to the problem solving session and ask questions. Problem solving sessions will not be recorded.

Ground Rules of Problem Solving Session

- 1: We will cover those posted questions first and handle any other questions if time permits (it is not an office hour). We will not cover questions assigned to a previous session unless I say that we will.
- 2: You must be willing to participate in answering the questions for example by sharing how far you were able to get before stopping (you can expect to be called upon), or coming to the whiteboard to share your answer. In other words we will be using a “team” approach to the problem solving.
- 3: You must have a clicker to participate in answering the multiple choice questions and for attendance taking. This will permit me to identify which wrong answers students are choosing and address issues arising therefrom. No grades are awarded for this activity.
- 4: Only one person speaks at a time, raise your hand and I will point to whom should speak. I will attempt to vary the choice of student participants.
- 5: ***Attendance is required at 50% of the problem solving sessions - attendance will be taken using clickers at two random times during the class. Your presence at both times is required for your attendance to be counted.***

An F grade will be awarded if you do NOT meet the 50% attendance requirement !!

ASKING QUESTIONS IN CLASS:

Most students are reluctant to ask questions in class and the reasons vary from fear of sounding ignorant to not wanting to appear overenthusiastic in front of others. However the dangers in not asking questions are many.

It is very likely that if you don't understand a particular point then there are many others that do not also - by asking the question you assist the teacher in identifying areas that need to be reinforced, reemphasized or in some cases dropped out of the material. If the teacher has to wait until the first exam to find out that he is teaching over the students' heads then it is you the student that is already suffering by having received a tough exam.

Your questions also assist the teacher to determine if the material is being presented too fast or in an unclear fashion - on a rare occasion (hopefully never) you may be able to spot an error in the information being presented and thus you provide a great service in preventing the propagation of inaccurate knowledge.

Finally by not asking questions you will miss the dynamic process of vocal and mental interaction that is an essential part of the scientific process. In the workplace you will learn much of your new knowledge from colleagues by word of mouth and you need to be able to query and verify that new knowledge by asking questions. At scientific meetings there is a danger that people will simply accept information without a rigorous questioning of the methods by which that information was obtained. Communication is an essential skill in science today and the successful scientist uses that skill to attract interest and funding to his/her area of investigation.

So, I urge you to not be hesitant in asking questions in BIOL 3010. If however you are still reluctant to ask questions then be sure to visit me during office hour.

STUDYING AT HOME:

Many studies have shown that long-term memory requires re-exposure to the facts at hand so it is best to review the handouts and your notes regularly and to read the relevant parts of the text book every day. Cramming may allow you to succeed in the short term but will not provide you with the strong foundation of thoroughly assimilated information that will be required for a successful career.

In today's world there is a constant need to keep up to date with new developments and many people end up changing career directions in mid-flight in response to shifting job markets - in this climate there will not be time to re-learn material - it is important to focus now on building a strong foundation of knowledge which will allow you to adapt quickly in the future.

If you study the book and find that it is easy to absorb then try the questions in the book as a test - sometimes this is hard to do but it is the true measure of how well you understand the material. Also I will try and provide references to daily news happenings that relate to the material we cover - this will also be your responsibility - see “News Article” assignment details below.

HOW YOUR PERFORMANCE IN BIOL 3010 WILL BE GRADED:

I do not grade on a curve but on an absolute scale. The breakdown of marks is tabulated below:

T	9/15	1st Exam	15% of points (On 6 lectures 8/25 -9/10)
R	10/15	2nd Exam	20% of points (On 7 lectures 9/17 -10/8)
T	11/10	3rd Exam	25% of points (On 7 lectures 10/8-11/5)
Various Deadlines		Mastering Genetics Assignments (10% of points)	
W	12/16	Final Exam 8.00 - 10.00 am 30% of Points (20% on 7 lectures 11/12-12/8 and 10% on the first three sections of course)	

I strongly suggest that you study regularly and do not leave studying until the night before.

Format of exams: The exams will be entirely multiple choice (except for honors students who will have some longer format questions).

Mastering Genetics Homework Assignments” (This will be worth 10% of your overall grade)

In keeping with the theme of problem solving in this class, there will be homework assignments that will be performed using the online “Mastering Genetics” that accompanies the textbook. You will need access to this website and assignments will be performed and submitted there.

<http://www.masteringenetics.com/site/login.html>

There will be one assignment per chapter in the book and we aim to cover about 18 chapters so each homework will be worth about 0.5% of the overall grade. The main aim here is to ensure that you practice problems as well as remember the basic information and principles.

You may work together in small groups to perform the homework as I have no control over supervising that. If you do work together then make sure that you all understand the answer(s) that are submitted – otherwise you are only fooling yourself. The assignments will be posted shortly after we finish a chapter and will be due a few days later. Late submissions will not get a grade.

In Class Response System (Clickers)

To encourage active learning participation, a personal response system is employed during the problem solving sessions. You are required to purchase a Turning Technology Response Card RF (also known as a “clicker”) for use in class. Your answers will not be tracked and you will not be awarded points but it helps me to interact with the class. Since the same clicker is used university wide, you may already have a clicker and that is sufficient for use in this and other classes. The clicker can be sold back to the bookstore later.

Old multiple choice questions will be asked throughout the problem solving sessions. In some cases new questions will be used and you may be permitted to work in groups before selecting an answer.

Registering your clicker:

In the first week I will hand out a page for you to register your clicker with me. Registration permits me to match your responses to your name. If you don't register, register incorrectly, or use a different

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MasteringGenetics™ EDUCATOR SUPPORT STUDENT SUPPORT

Sign In

Already registered? Sign in with your Pearson account.

Username

Password

 SIGN IN

clicker, your responses will not be credited to you.

Using Your Clicker (Response Card) in BIOL3010-001

Your Response Card is a radio Frequency (RF) transmitter. It sends a signal to the instructor's receiver. The signal contains your answer and the transmitter's ID code. This ID code must be matched to your name for you to receive credit. **Clicker Buttons:** The Response card can be used for either letter or number answers. Press the button that corresponds to your answer. The "GO" button is used for channel setting. The "?" button sends a signal to your instructor that you have a question.

Registering your Clicker : Your name must be associated with the Response Card ID code for you to get a grade. If you use another student's Response Card, you will not get credit. If you have to buy a new Response Card, **you must** tell your instructor so your ID code can be changed.

1. Log into BIOL 3020 on Blackboard
2. Select Clicker Registration from bottom of Menu on the left of screen
3. Your transmitter code is 6 digits (numbers 0-9 and letters A through F).

There is not a letter "O" only a number 0. Enter this number when prompted

4. If anything is incorrect or needs updated, please e-mail me ASAP. jgray5@utnet.utoledo.edu



- 2014:4 Fall, BIOL3010:001 Molecular Genetics
- Course News
- Start Here
- Public Area
- Learner Support
- Instructor Support
- LibGuides
- My Grades
- Clicker Registration

IMPORTANT Register your Clicker by Wednesday August 26th at 5pm !

This is so that your presence at the first problem solving session will be counted.

Channel Setting: Your Clicker must be set to the same channel as your instructor's receiver (41)

1. When your instructor has set up the program, press the "go" button .
2. The light should alternate red and green.
3. Type in the 2 digit channel code for the class. (Channel 1= 01 or channel 41=41)
4. The light should change to a solid green.
5. After the second digit is entered, press and release the "go" button again.
6. Press and release the 1/A button.

Sending a Response : When polling is open on a question, send your answer by pressing the correct response once. The button will stay green for a few seconds to indicate your response has been received. If the light only lights briefly with a red/green light, polling is not open or you are not on the correct channel.

Each student is required to buy a transmitter.

You must bring the transmitter to every problem solving session. No provisions will be made for forgotten, lost or broken transmitters. During lecture, the instructor will ask questions and all students must be willing to participate.

GRADING SCALE:

Grade equivalents will be assigned as follows: This scale is based on the assumption that knowledge of 50% of the material is needed to pass this course. The accompanying lab course has a wider B grade.

% of available marks	Grade	Standard
90-100	A	Achievement of outstanding quality
88-89	A-	Achievement of slightly less than outstanding quality
85-87	B+	Achievement of slightly more than high quality
78-84	B	Achievement of high quality
75-77	B-	Achievement of slightly less than high quality
73-74	C+	Work of slightly more than acceptable quality
64-72	C	Work of acceptable quality
62-63	C-	Work of slightly less than acceptable quality
61-62	D+	Work slightly above the quality expected
52-60	D	Work below the quality expected
50-51	D-	Work slightly below the quality expected

Course Policy on Absences:

Attendance at 50% of problem solving sessions is required and no points are given for attendance. Failure to take the first exam without contacting me, or the absence of an explanation of inability to take the first exam will indicate that you do not intend to complete the course. At UT there is no longer an instructors withdrawal – it is your own responsibility to withdraw or else you will be given a failing grade.

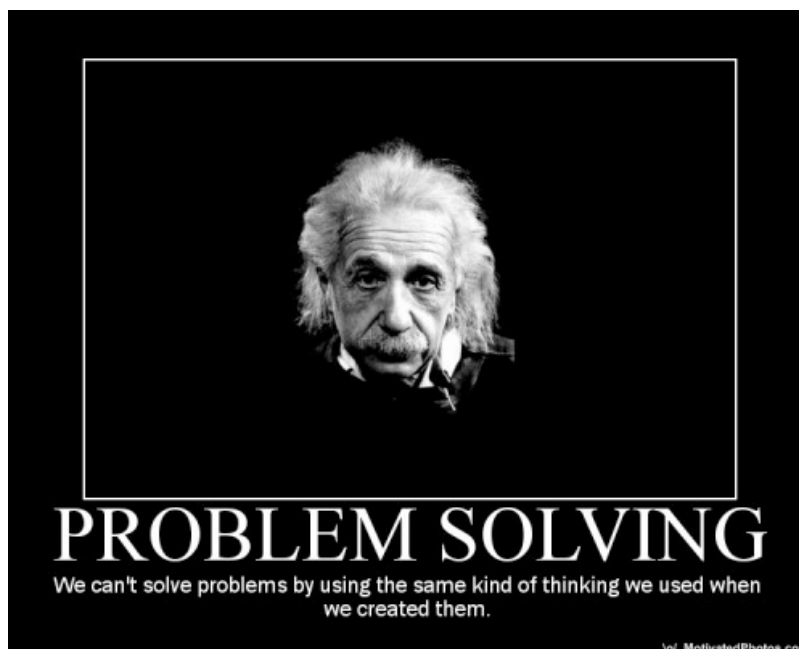
In the event of an unanticipated absence at an exam due to illness or emergency, **evidence of the NECESSITY of the absence must be provided in the form of a doctor's letter or equivalent i.e. a contactable professional or supervisory adult that will substantiate the necessity of your absence.** Any unaccounted for absence will result in no points awarded for that exam and thus greatly threatens your chances of success in the course.

For anyone that has substantiated to me satisfactorily that they had to miss an **exam due to illness or emergency** - I will work with them to create a makeup test which will be in an essay format. **Make ups will only be considered where INDEPENDENT proof of the necessity of the absence is presented.**

Course Policy on Cheating/Plagiarism:

Don't even think about it. Very few students feel the need to cheat. You can get a very respectable grade of which you can be proud if you use the considerable talents and intellect that have propelled you this far in your studies. **Students caught cheating however will be recorded a zero for that quiz or assignment. All available information on the cheating incident will be forwarded to the Dean of Student Affairs for investigation and appropriate action.**

With the advent of the internet some students have copied the work of others directly into their writing assignments. The copying of entire articles and paragraphs or even entire sentences is considered plagiarism and will be treated the same as cheating. The work of others must be paraphrased using your own words/sentences even if you maintain that "it is written better than I could" or "I could not think of another way of saying that" – the usual exception being a direct quote of a speech or announcement. Even when work is paraphrased you must also cite a source/reference of where you found the information so that the reader can locate it for themselves. Web sources must also be cited by providing a complete web address of the referenced material.



Anticipated Online Lecture Topics for Fall 2015

(All lectures are posted online at least 2 days below date given below e.g. midnight Saturday for Tuesday lecture and midnight Monday for Thursday lecture.)

The actual topics that we cover on given days are subject to change depending on the rate of progress.

Lecture	Day	Date	Topic:		
1	T	25-Aug	(Live) Intro Lecture and DNA-The Secret of Life (30 minute movie)	Part 1 Chapters 3,4,9,10,11	
2	R	27-Aug	Revision of Mendelian Genetics (Chap 3)		
3	T	1-Sep	Modification of Mendelian Ratios (Chap 4)		
4	R	3-Sep	DNA Structure and Analysis (Chap 9) NO IN CLASS SESSION		
5	T	8-Sep	DNA Structure (Chap 9) and Chromosome Structure (Chap 11)		
6	R	10-Sep	DNA Replication (Chap 10)		
Exam 1	T	15-Sep	1st Exam 15% of points (On 6 lectures 8/25 -9/10)		
7	R	17-Sep	Gene Mutation and DNA Repair I (Chap 14)	Part 2 Chapters 6,7,8,12,14	
8	T	22-Sep	Gene Mutation and DNA Repair II (Chap 14)		
9	R	24-Sep	Chromosome Mutations (Chap 6)		
10	T	29-Sep	Genetic Analysis in Bacteria and Bacteriophage (Chap 8)		
11	R	1-Oct	Linkage and Gene Mapping in Eukaryotes, (Chap 7)		
	T	6-Oct	No class - Fall Break		
12	R	8-Oct	The Genetic Code and Transcription II (Chap 12)	Part 3 Chapters 13,15,16,17	
13	T	13-Oct	Translation and Proteins I (Chap 13)		
Exam 2	R	15-Oct	2nd Exam 20% of points (On 7 lectures 9/17 -10/8)		
14	T	20-Oct	Translation and Proteins II (Chap 13)		
15	R	22-Oct	Regulation of Gene expression in Prokaryotes (Chap 15)		
16	T	27-Oct	Regulation of Gene expression in Eukaryotes (Chap 15)		
17	R	29-Oct	Recombinant DNA Technology and Gene Cloning I (Chap 17)		
18	T	3-Nov	Recombinant DNA Technology Gene Cloning II (Chap 17)		
19	R	5-Nov	Cancer and Regulation of the Cell Cycle (Chap 16)		
Exam 3	T	10-Nov	3rd Exam 25% of points (On 7 lectures 10/8-11/5)		
20	R	12-Nov	Genomics, Bioinformatics and Proteomics (Chap 18)	Part 4 Chapters 18,19,20,22,23	
21	T	17-Nov	Applications of Biotechnology (Chap 19)		
22	R	19-Nov	Genes and Developmental Genetics (Chap 20)		
	T	24-Nov	No lecture today		
	R	26-Nov	Thanksgiving Day No lecture		
23	T	1-Dec	Genes and Developmental Genetics (Chap 20)		
24	R	3-Dec	Population and Evolutionary Genetics (Chap 22)		
25	T	8-Dec	Conservation Genetics (Chap 23)		
26	R	10-Dec	Finish up all questions and review session for final exam.		
Exam 4	W	16-Dec	Final Exam 8.00 - 10.00 am 30% of Points (20% on 7 lectures 11/12-12/8 and 10% on the first three sections of course)		
