BIO3070 Genetics Course Syllabus
Winter Semester, 2017

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CLASS MEETING LOCATION

0046 DeRoy

CLASS MEETING TIME

Tuesday and Thursday, 5:30 p.m. to 6:45 p.m.

COURSE DESCRIPTION AND OBJECTIVES

This course provides an introductory overview of major and timely topics in genetics. The objective is to provide students with a broadly-based and fundamental understanding of genetics, and to present selected challenges and issues that currently face the genetics research and communities. This course provides students with an understanding of the principles and concepts of genetics and introduces transmission, nature and action of genetic material in organisms. Specific objectives of this course are:

1. Use the principles of chromosome transmission to predict patterns of inheritance.
2. Evaluate scientific data using the rules of probability.
3. Understand how the structure of DNA enables it to function as genetic material.
4. Explain the relationship between genotype and phenotype.
5. Understand the molecular basis of mutation, and its role in genetic variation.
6. Explain how the genetic code enables protein synthesis to be directed by genetic information.
7. Understand how genomes are replicated, repaired, organized and packaged.
8. Describe the modes of gene regulation in prokaryotes and eukaryotes.
9. Use a computer to search public databases and manage bibliographic information.

COURSE CREDITS

This is a 4 credit course. For Honors students who take the optional Honors Section Laboratory, this is a 5 credit course.

COURSE PREREQUISITES

Students are <u>required</u> to have completed BIO2200 (Microbiology) and BIO2600 (Cell Biology) or the equivalent with a grade of C minus or above. Students who managed to enroll in this course without satisfying these prerequisites will probably not succeed and for this reason will be required to drop it. Students who have questions about these prerequisites should see the Biology Department's Undergraduate Advisor, Ms. Kim Hunter (kwalk@biology.biosci.wayne.edu) during the first week of class.

TEXT BOOK AND LECTURE SLIDES

"*Concepts of Genetics*", 11th edition, (2015), by Klug, Cummings, Spencer and Palladino, published by Pearson Benjamin Cummings, ISBN978-0-321-94891-5, is **REQUIRED**. "*Student's Handbook and Solutions Manual for Concepts of Genetics*" (2015) by Klug, Cummings, Spencer, Palladino and Nickla, published by Pearson Benjamin Cummings, ISBN978-0-13-379680-3, is **RECOMMENDED**. Additional material may also be added. Every effort will be made to provide the lecture slides on Blackboard a day or more before class. However, not all the slides from each lecture will be provided on Blackboard. Some slides will **only be shown** in class. Students are responsible for knowing **ALL** the material that is presented in class, even if that material is not provided on Blackboard and textbook.

OFFICE HOURS

Dr. Fan's office hours are Tuesday and Thursday 1:30 p.m.-3:00 p.m. Office hours will be held only on those days when Wayne State University is open.

A mutually convenient appointment at other times may also be arranged by emailing Dr. Fan. Dropping in unannounced may work on occasion but will not be successful and students may be asked to wait and/or to come back at some appointed time. Dr. Fan will be happy to help students learn the material they are having trouble understanding, however office hours are NOT a substitute for lectures.

In addition, students are welcome to e-mail Dr. Fan for questions or comments. Nevertheless, students are encouraged to first contact their Teaching Assistant (TA) with their questions prior to contacting Dr. Fan. Emails are generally answered within 24 hours.

EXAMS

There will be **three** in-class midterm examinations. There will also be one final exam that will be comprehensive, i.e. it will cover material presented in the entire course. There will be no make-up exams except as noted below.

While facts are important, the emphasis of exams will be on problem solving and understanding genetic concepts. The tests will be designed to assess students' grasp of fundamental principles and their applications. All exams, except for the cumulative final, will have all sections that require written problem solving answers. This may differ from other courses you have taken. Students are strongly advised to prepare themselves for the exams by working **ALL** of the problems within and at the back of each chapter because many of the test questions will be similar. Students should understand that working out the problems within and at the end of each chapter is one of the best ways to learn the material and to prepare for examinations. Students are strongly encouraged to work and study together in groups (get a "Study Buddy"!). Experience has shown that the process of explaining material to other people clarifies the concepts in one's own mind. Students are also strongly encouraged to make the most of the discussion sections with their TAs.

EXAM FORMATS

The three midterms and the final exam will be closed book and held in class. The only thing that students will need to bring to the exams is a few sharp pencils or pens. For all exams calculators will be allowed. Cell phones and all other electronic communication devices must be turned off. Cell phones may not be used as calculators during exams. Anyone who leaves the exam room prior to the end of the test will not be allowed back in. This includes bathroom

breaks; students are advised to plan accordingly. Late-arriving students should know that admittance into the exam room will not be allowed after the first student has left the room.

The three midterm exams will all be written exams and contain 100% problem solving problems. These problems will be conceptually similar to those presented in class and very much like those found within and at the end of the chapters in the textbook (including the *Extra Spicy problems*). The final exam will be multiple-choice (five choices) but most of questions (>95%) will also be problem-solving based. Scantron forms will be supplied. Students should not bring their own Scantron forms to the final exam as they will not be allowed to use them.

The time allowed for each exam includes the time needed to put your name on the pages. For all three midterms, every page will have a place at the top for your name. If your name is not on a page, then that page will not be graded. Each page must have your name on it because the exams are disassembled for grading, then reassembled prior to being returned to students. Pages without names cannot be returned because the graders will not know whose exam is whose.

When the exam time is over, an announcement of "pencils down" will be made. This means there is no more time to write; students will be expected to remain seated and to pass their exam to the end of their row. No talking will be allowed until all the exams have been collected.

Exams will be scanned and archived right after they are graded.

EXAM DATES

There will be three closed-book midterm examinations given in class:

Thursday, February 2, 2017
Thursday, March 9, 2017
Thursday, April 13, 2017

The **final exam** will be held on **Thursday, April 27, 2017 from 5:30 p.m. to 8:30 p.m.**, the same classroom as the class is held (DRY 0046). The final exam is scheduled as designated in the Schedule of Classes for this term (https://wayne.edu/students/final-exam-schedule-winter-2017.pdf). No other time for the final exam will be available and no exceptions will be made for conflicts such as student travel plans.

i>CLICKERS

i>Clickers will be used in this course, and clicker points will contribute to your grades. You must purchase a clicker at the WSU bookstore, and then register your clicker at Blackboard (use the link in the left as "Register Your Clicker here") so that answers from your clicker can be credited to you. Clicker question will generally be of two kinds:

- Questions at the beginning of class or anytime of the class on the home work assignment or on the topic of the previous lectures.
- Concept questions arising in class, this may be happening any time of the class.

You win Clicker points as follows:

Points	Assessment
0	**No answer**
0.5	**Wrong answer**
2	**Right answer**

Twenty-three (23) clicker days will be given through out entire semester starting the second week (the week of January 16th, 2017). In general, two clicker questions per lecture (day) will be given except midterm days and spring break. Clicker questions will be all multiple-choice question with five choices, and only one correct answer will be.

Every person can get three (3) free clicker days as perfect 80 clicker points are derived from 20 clicker days. However, all clicker points may be credited to your final grades if you make over 20 clicker days and earn over 80 clicker points. These free clicker days include all eventualities, including days whey your clicker fails to work, days when you forgot your clicker, days when you have a personal or family emergency, days when you have to be elsewhere or represent your team or club or university, days when you go skiing, or snow day(s).

It is strictly forbidden to operate someone else's clicker for them. If you are discovered doing this, then both you and the person whose clicker you operated will receive **ZERO** for entire clicker points (***THIS IS ZERO-TOLERANCE POLICY***). If you see a classmate operating two or more clickers, please bring it immediately to my attention.

You are required to use **same clicker** through out the entire semester. Registering a different clicker may wipe out all points that you earn previously. Therefore, it is your own responsibility if you lose your clicker points due to a different clicker used.

DISCUSSION/QUIZ SECTIONS

Attendance at the quiz sections is mandatory. Quiz section will start from week 1 (the week of January 9th, 2017). Students may not attend a section for which they are not registered. Students may be assigned homework problems that are recommended to help them learn the material and to prepare for the exams. In addition, the TAs will give 11 quizzes during the semester and one quiz with lowest scored may be dropped. No make-up quizzes will be allowed under any circumstances. However, students will be allowed to drop their lowest quiz score.

One homework will be assigned at the second week of the semester (the week of January 16th, 2017) and due on March 17th, 2017. Up to 20 points of this home assignment will be award to your discussion section points. This homework is **mandatory** and cannot be dropped

Behavior that is not conducive to learning or is distracting to other students, such as (but not limited to) excessive talking at inappropriate times, chronic unexcused tardiness, leaving early, disruptive behavior, cell phone conversations, etc., may result in the deduction of points at the discretion of the TA.

HONORS LABORATORY

The Honors Laboratory will start from week 1 (the week of January 9th, 2017). The Honors Laboratory will be graded on an accumulation of points from quizzes (40 points), proper participation in the laboratory (20 points), and laboratory notebooks (40 points). If students miss a quiz for any reason, there will not be an opportunity to make it up. Laboratory participation that includes laboratory behavior and attendance will be counted up to twenty (20) points. Four (4) points will be taken off for each laboratory absence without legitimate excuse. Additionally, if students are not diligently working or completing the laboratory assignments, the TA may take points off from their participation grade. This is totally at the discretion of the TA. In addition, students' laboratory notebooks will be collected at **FOUR** (**4**) unannounced times. Students may earn up to 10 points per notebook review. Starting the second week of the semester, **FIVE (5)** unannounced laboratory quizzes will be given except midterm weeks and Spring break, and one quiz with lowest scored may be dropped.

Students must have a laboratory notebook with them for each laboratory. The notebook must be bound (e.g., a composition book). In the notebook, students must prepare complete notes of protocols or other information necessary to do the day's experiment before they enter the laboratory. Students are to enter the data from their observations into the laboratory notebook.

Students may not make up laboratories that were missed. Missing any laboratory will cause the loss of points and may affect the final course grade. Students may not miss more than five laboratories in total to complete this course. If a student misses **FIVE or more** laboratories, for whatever reason, they must either withdraw from the course or they will receive a grade of "F" in the course.

GRADING

There will be three midterms and each midterm exam will be worth 200 points. No midterm will be completely dropped. For three midterm exams, the lowest midterm will be counted as 20%, and the second lowest midterm will be counted as 80%. So the total points of midterms will be calculated as:

20% lowest + 80% second lowest + 100% highest

The final exam is worth 300 points and will be comprehensive, i.e. it will cover material presented in the entire course. The final exam is mandatory and will be counted as 100%.

The grades on each exam will be standardized against the second highest grade in the class. All scores will be adjusted by adding the number of points necessary for the second highest score to equal 200 points (midterms) or 300 points (final exam). The highest score that can be achieved is 200 for midterm and 300 for final exam.

The total point distribution is as follows:

	Regular Discussion section	Honors Lab section
Midterm Exams	400	400
Final Exam	300	300
Discussion section/Honors Lab	120	220 (120+100)
Clicker	80	80
Total	900	1,000

There is no extra credit for exams and quizzes under any circumstances. Scores will not be "rounded up" when assigning grades.

The final letter grade will be determined by a straight score as follows:

Total Points		% of available marks	Final Grade
Regular section	Honor section		
819-900	910-1000	91-100	A
792-818	880-909	88-<91	A-
756-791	840-879	84-<88	B+
720-755	800-839	80-<84	B
684-719	760-799	76-<80	B-
648-683	720-759	72-<76	C+
621-647	690-719	69-<72	C
594-620	660-689	66-<69	C-
558-593	620-659	62-<66	D+
522-557	580-619	58-<62	D
495-521	550-579	55-<58	D-
<494	<549	<55	F

Scores will not be "rounded up" when assigning the letter grades.

Students with course scheduling conflicts for any midterm exam must notify Dr. Fan in writing by class time on Friday, January 27th, 2017. No make-up exams will be given unless he is notified in writing by class time on this date. Reasonable exceptions will be granted in cases of illness which will require notification **at least 24 hours** prior to the exam and must be followed up with an original signed note from a physician within five days. No make-up exams will be provided due to court cases or other non-academic scheduling issues, except for religious holidays as described below.

EXAM GRADE DISPUTES / CHALLENGE OPTION

Students will have one (1) week after the return of an exam to challenge the score for any question. Failure to challenge the score within this period indicates a willingness to accept the score as is. The challenge may consist of a typed (not hand-written) description of why the answer is correct, or directly talk with Dr. Fan during office hour and an appointment. It is not an opportunity to complain. The challenge must be turned in to Dr. Fan and accompanied by the exam.

CHEATING

. . or changing an answer on an exam to obtain more points on a re-grade, will receive a zero for that test with no opportunity to drop or replace that score

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A strict zero-tolerance policy for cheating will be enforced. Anyone caught cheating on an exam, quiz, laboratory assignment or any other assigned work in any aspect of this course will receive a score of 0 (zero) for that portion of the grade.

Students are found to be cheating during an exam or quiz (using a "cheat sheet", looking at another's paper, allowing another student to look at your paper, or using any electronic device to communicate with another person), will receive a zero for that test with no opportunity to drop or replace that score. A second episode of cheating will result in a grade of F for the course and may also result in initiation of university disciplinary action.

POSTING OF EXAM GRADES

Exam grades will be posted on Blackboard by Student ID Number as soon as possible after the exam has been administered. The distribution of scores will also be provided in class.

SPECIAL CONSIDERATIONS FOR INDIVIDUALS WITH DISABILITIES

If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. The SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, Dr. Fan will be glad to meet with you privately during his office hours to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to participate fully in their educational experience at Wayne State University.

Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner.

Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.

RELIGIOUS HOLIDAY CONFLICTS

Students who have a conflict with any of the scheduled class or exam times due to religious reasons must notify Dr. Fan in writing by class time on or before Friday, January 27th, 2017. No make-up exams will be given unless he is notified in writing by this date.

ADD/DROP POLICY

Add requests will not be approved after the second week of class, i.e. Monday, January 23rd, 2017. Drop requests must be approved before the fifth week of class (http://reg.wayne.edu/students/information.php#dropping). Beginning the fifth week of class students are no longer allowed to drop but must withdraw from classes. Students who sign up for a class, stop attending, and fail to withdraw will receive an F for the course. Students who withdraw from the course after the fifth week will be assigned one of the following three grades: WP (withdrew but was passing at the time), WF (withdrew but was failing at the time), WN (withdrew and never attended class or no graded work). An "I" grade earned by a student will automatically revert to "F" if the work is not completed within one calendar year. There are no exceptions. Further information on the grading policy can be found at http://sdcl.wayne.edu/RegistrarWeb/Registrar/policies.htm.

SCHEDULE OF TOPICS COVERED

Some topics may require more or less time to cover than indicated on this schedule, so the actual topics that I cover on given days are subject to change depending on the rate of progress. Dates of exams and holidays are **not** flexible.

Date	Day of the week	Book Chapter	Topic
01/10/17	Tuesday	1	Introduction to genetics
01/12/17	Thursday	2	Mitosis and meiosis
01/17/17	Tuesday	3	Mendelian genetics
01/19/17	Thursday	3	Mendelian genetics
01/24/17	Tuesday	4	Extensions of Mendelian genetics
01/26/17	Thursday	4	Extensions of Mendelian genetics
01/31/17	Tuesday	5	Chromosome mapping in eukaryotes
02/02/17	**Thursday**	**Midterm exam #1**	
02/07/17	Tuesday	5	Chromosome mapping in eukaryotes
02/09/17	Thursday	5	Chromosome mapping in eukaryotes
02/16/17	Tuesday	6	Genetic analysis and mapping in bacteria and bacteriophages

02/18/17	Thursday	7	Sex determination and sex chromosomes
02/21/17	Tuesday	8	Chromosome mutations: variation in number and arrangement
02/23/17	Thursday	8	Chromosome mutations: variation in number and arrangement
02/28/17	Tuesday	10	DNA structure and analysis
03/02/17	Thursday	20	Recombinant DNA technology, plus ST3: DNA Forensics
03/07/17	Tuesday	11	DNA replication and recombination
03/09/17	**Thursday**	**Midterm exam #2**	
03/14/17	Tuesday	Spring break	
03/16/17	Thursday	Spring break	
03/21/17	Tuesday	12	DNA organization in chromosomes
03/23/17	Thursday	13	The genetic code and transcription
03/28/17	Tuesday	13	The genetic code and transcription
03/30/17	Thursday	14	Translation and Proteins
04/04/17	Tuesday	15	Gene mutation, DNA repair, and transposition
04/06/17	Thursday	16	Regulation of gene expression in prokaryotes
04/11/17	Tuesday	16	Regulation of gene expression in prokaryotes
04/13/17	**Thursday**	**Midterm exam #3**	
04/18/17	Tuesday	17	Regulation of gene expression in eukaryotes
04/20/17	Thursday	17	Regulation of gene expression in eukaryotes
04/27/17	**Thursday**	**Final Exam (5:30 p.m. to 8:30 p.m.), in the same room as class is held.**	

UNEXPECTED UNIVERSITY CLOSURES.

If the University is officially closed on an exam day, the exam will be held on the next regularly scheduled class day. Closure of the University is announced by the following mechanisms:

1. WSU Homepage (www.wayne.edu) *
2. The University Newsline (313) 577-5345 *
3. WSU Pipeline (www.pipeline.wayne.edu) *
4. WDET-FM (Public Radio 101.9)

5. By other local radio and television stations

* Note: The information on closures and class cancellations is likely to be found at these locations before it is broadcast by local radio and television stations

OTHER

Please turn off cell phones and all other electronic communication devices during class, during laboratory/discussion sections, and during exams.

Any specific issue not covered by this syllabus will be resolved using University policies.

Disputes that cannot be resolved following the guidelines present in this syllabus will be resolved by following the guidelines of the University "Student Due Process".