BIOLOGY 302
MOLECULAR AND GENERAL GENETICS
SYLLABUS, SUMMER, 2012

Instructor: Dr. Steven M. Caruso, BS471, (410) 455-2246, scaruso@umbc.edu

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Prerequisite: "C" or better in BIOL 141 (or BIOL 100), and CHEM 101 (or CHEM 123); sophomore standing.

Text: Genetics: A Conceptual Approach 4th edition, Benjamin A. Pierce.

Class Meeting Time: Mon (11:00 – 12:00); Tue, Wed, Thu (9:15 – 12:00), BS120; **May 29 – July 9**
Thursday, May 31st – We will meet in MP103 for lecture and discussion

Lecture Schedule: Tue, Wed, Thu (9:15 – 12:00), BS120

Exam Schedule: An exam will be given each Monday (11:00 – 12:00) in BS120 starting June 4. The material covered on each exam and the exam format will be announced in class. The use of cell phones in any manner during exams is prohibited and will result in zero on the exam and report to the UMBC Academic Conduct Committee.

Each exam counts equally towards your grade and is mandatory. The lowest exam grade will be dropped, so your exam grade will be determined by your five highest scoring exams. The exams will be worth 90% of your grade, so each exam will be worth 18%.

If you are unable to take a scheduled exam due to a permissible reason, e.g., illness, official university sanctioned activities, nuclear war, etc., you must notify either me or the Biology Department Office (410-455-2261) prior to the exam. Depending on the circumstances, a make-up exam may be scheduled, but only for those with an appropriate reason for missing the exam. **Illnesses will require a physician's note.** The format of the make-up exam will either be an essay exam or a term paper, at the discretion of the instructor. **Vacation is not considered an acceptable reason, plan on being present until July 9th.**

Homework: Homework problems have been assigned on Blackboard. These are open book. Six homework sets will be offered, with each due by the following Sunday at midnight. Homework will be worth 10% of your grade.

Laptops: Laptops are a convenience to many of us. However, their use in lecture has been shown to actually decrease performance over pen and paper note-taking. This is true even when the student actually uses the laptop to take notes rather than to IM/Facebook/Tweet/Email/Game, which happens all too often. I discourage their use during lecture, but won't forbid it unless I find abuse and/or other students complain.

Discussion Periods: An optional (but strongly recommended) and informal discussion section will be available to students immediately following the Thursday lecture in BS120.

Policy on Academic Misconduct: Any confirmed case of cheating on an exam will be dealt with through UMBC's Academic Conduct Committee as described in the Policy for Academic Misconduct in Undergraduate Courses. Any and all instances of academic misconduct will be reported to the committee. Penalties include, but are not limited to, a grade of "F" in the class.

LECTURE TOPICS, SUGGESTED READINGS & PROBLEM SETS

Topics	Pierce: Genetics 4th ed.	Particularly Useful Problems
Introduction	Ch. 1, Ch. 5: sec. 5.5, Ch. 6 through pg.137	Ch. 1: 1, 3, 5, 11, 13, 15, 16, 24, 30 1 – 2
The Genetic Material		
Structure	Ch. 10	1 – 11, 13 – 16, 18 – 21, 25 – 28
Replication	Ch. 12: pp. 321 – 324	1, 2, 19
Chromosome Structure	Ch. 2: through sec. 2.1 Ch. 9: through sec. 9.1 Ch. 11: through sec. 11.3	1, 5, 6 1 – 3, 7 – 11, 24, 31
Cell Division	Ch. 2	8, 13 – 18, 23 – 25, 32, 33, 37
Monohybrid Crosses:		
Mendel's Experiments	Ch. 3: through sec. 3.2	1 – 4, 14, 19, 20
Deviations from Mendel	Ch. 5: through sec. 5.1, 5.3 Ch. 6: through sec. 6.2	Ch. 5: 1, 2, 13 – 15, 19, 24, 35 Ch. 6: 3 – 5, 21, 25, 27
Sex Linkage	Ch. 4: sec. 4.2	9, 11, 22, 23, 25
Sex Determination and Dosage Compensation	Ch. 4: through sec. 4.1 Ch. 4: sec. 4.3	3 – 5, 7, 8, 15, 16 12, 13
Probability and Chi-square	Ch. 3: sec. 3.4	6, 11, 23 – 24
Dihybrid Crosses:		
Unlinked Genes	Ch. 3: sec. 3.3	9, 10, 29, 30
Gene Interactions	Ch. 5: sec. 5.2	3 – 5, 25
Linked Genes and Mapping	Ch. 7 (*Note Coupling definition error!)	1-4, 5*, 6 – 10, 13 – 19, 21, 22, 24, 26, 29 – 31, 34, 36
Gene Action (overview)	Ch. 15: through sec. 15.1	1, 16, 17
Replication	Ch. 12	1 – 5, 7, 9, 10, 13, 14, 16, 19, 23, 24
Transcription	Ch. 13	1, 2, 4, 6 – 12, 14, 16, 17, 19, 20, 24, 25, 28, 33
Processing	Ch. 14	2, 4 – 9, 11, 12, 16, 17, 19, 21, 22, 24, 28
Translation	Ch. 15	4 – 12, 14, 15, 20 – 24, 26 – 29
Mutation & repair	Ch. 18	1, 3 – 6, 14 – 16, 22, 23, 32, 37
Transposable Elements	Ch. 11: sec 11.4 on	12 – 16, 18, 20 – 22, 38, 40
Bacterial Genetics	Ch. 8	1-6, 8-10, 12, 13, 17-18, 20, 24, 34
Gene Regulation		
Prokaryotic	Ch. 16	1 – 8, 11 – 18, 20, 21, 24, 25, 27
Eukaryotic	Ch. 17 & Ch. 23: pg. 644 – 645	Ch. 17: 1 – 3, 5 – 9, 12 – 15, 23, 25
Genetics and Cancer	Ch. 23	1, 3, 5, 7 – 15, 17 – 21, 23 – 27, 29
Recombinant DNA Technology	Ch. 19	2 – 10, 12 – 13, 17 – 18, 21 – 22, 25, 29 – 32, 37 – 38
Applications of Recombinant DNA Technology	Ch. 6 sec. 6.3 on Ch. 20	11 – 13, 15, 17 – 18 1, 6 – 7, 16 – 21, 27, 29, 32 – 34, 38
Euploidy & Aneuploidy	Ch. 9	2, 4, 13 – 15, 28, 32, 35

These are only suggested minimum reading assignments. Other readings may be useful as well, as may be a variety of online resources. Topics occasionally jump around in the book, it is perfectly ok to read the chapters start to finish, instead of inside out – the section numbers are there only to assist you. These problems will not be collected, but *will* help you learn the material and succeed on the exam. PowerPoint slides are NOT a study guide, only a lecture tool, all covered and included material is important.