

Genetics 466 Course Outline - Spring 2015
11:00-11:50 MWF 204 Ed Sci

Date	Lecture Topic	Suggested Reading (Chapter:pages)	Suggested Book Problems (Chapter:problem)
Part 1. The Central Dogma of Biology (Hittinger)			
Jan 21	1. The Genetics Revolution	1:1-28 (suggested p/review)	1:4,6,10,12,14,15
Jan 23	2. DNA: The Secret of Life	7:259-270	
Jan 26	3. DNA Replication	7:270-287	7:3-5,11,14,17,19-21,25-27,30-33
Jan 28	4. Central Dogma: Transcription	8:291-309	8:1,3,6,11,17,19,21,22,32
Jan 30	5. Central Dogma: The Genetic Code	9:319-329,339-344	
Feb 2	6. Central Dogma: Translation	9:329-339	9:1,3,7-10,12-14,16-19,23,28,30-32,34,38-40,43-45,47-49
Feb 4	7. Mutations, DNA Repair	16:581-605	
Feb 6	8. DNA Repair, Recombination	16:605-609,4:155-157	16:1-3,6,7,9-13,16-20,22,23,25,28-32,36,37
Feb 9	9. Polymerase Chain Reaction (PCR)	10:356-358	
Feb 11	10. DNA Cloning, Bioengineering	10:351-356,358-373,382-383,387-391 5:173-177,191-193,196-198 (review)	
Feb 13	11. DNA Sequencing	10:374-382	10:2,3,5-7,9,12,14-16,20,22,23,25,26,28-30,32,33
Part 2. Genes, Chromosomes and Linkage (Laughon)			
Feb 16	12. Meiosis and Mendel	31-46,87-93,101-108,Appendix 2-1,2-2	2:15,17,21,22,26,27,29,30,33,35,39,40,43,47-49,68; 3:18,54
Feb 17	Exam I Tuesday Evening 7:15 until 9:15 – 125 Ag Hall (covers lectures 1 to 11)		
Feb 18	13. Probability for Genetic Events I	93-95, Handout	2:41,43,44,46,71 3:12-14,22,25abc,28-31,47
Feb 20	14. Probability for Genetic Events II	Handout	3:45b; Daily sheet problems
Feb 23	15. Testing Genetic Hypotheses	96-98, Handout	3:24,36,37
Feb 25	16. Extensions to Mendelism	48-54, 215-241	2:37 3:29 6:13,14,16-25,32,35,44,50,62-64,67
Feb 27	17. Chromosomes & Sex	54-70, 103-104	2:42,50,51,53-56,61,63,65,77 3:20,30,50 6:27
Mar 2	18. Chromosome Number	617-634	17:22,24,30,54,55,57,59,72
Mar 4	19. Chromosome Rearrangements	634-651	17:35,39,43,44,48
Mar 6	20. Linkage and Mapping I	127-144, 150-152, Handout	4:12-15,18,20,21,23,24,30,37,47,54-58,63
Mar 9	21. Linkage and Mapping II	148-150, 152-153, Handout	4:35-36,38a,43,44,48
Mar 11	22. Linkage and Mapping III	637-639, Handout	Daily sheet problems
Part 3. Evolutionary Genetics (Pool)			
Mar 13	23. Sequencing Human Genomes	510-519, 524-526	14:12-15,22
Mar 16	24. Genetic Variation	665-677, 684-687	18:2ab,9-13,17,18,23-25,28,29,31
Mar 17	Exam II Tuesday Evening 7:15 until 9:15 – 125 Ag Hall (covers lectures 12 to 22)		
Mar 18	25. Mutation and Genetic Drift	687-694, 702-703	18:2c,19-22,35,37
Mar 20	26. Genes, Geography, and History	677-684, 694-696	18:4,6,26,30,32,38
Mar 23	27. Natural Selection	696-702, 703-704, 761-771	18:7,8,14-16,27,34,36,39-42; 20:9,10
Mar 25	28. Genetic Variation and Human Health	507-510, 532-534, 705-707, 749-754	14:8,16,17,31; 19:5,6,16,28,29
Mar 27	29. Genes, Environment, & Phenotypes	715-739	19:7,9-12,19-23
Apr 6	30. Predicting Phenotypes & Mapping QTL	739-748	19:15,17,18,24-27

Apr 8	31. Domestication & Conservation Genetics	Box 18-6, 704-705	
Apr 10	32. Molecular Evolution & the Tree of Life	526-532, 534-536, 771-790	14:7,9,25-27; 20:2,5,11,15,17-20,22,23,25-27
Apr 13	33. Computational Genomics	519-524	14:5,6,11,20,23,32,34

Part 4. Genes in Action (Hittinger)

Apr 15	34. Transposable Elements	15:TBA	
Apr 16	Exam III Thursday Evening 7:15 until 9:15 – 125 Ag Hall (covers lectures 23 to 33)		
Apr 17	35. Bacterial Genetics	5:TBA	
Apr 20	36. Molecular Complementation	5:TBA	
Apr 22	37. Bacterial Gene Expression	11:TBA	
Apr 24	38. Bacterial Gene Expression II	11:TBA	
Apr 27	39. Eukaryotic Gene Expression	12:TBA	
Apr 29	40. Eukaryotic Gene Expression II	12:TBA	
May 1	41. Eukaryotic Gene Expression III	8:310-315	
May 4	42. Development	13:TBA	
May 6	43. Cancer	13:502-503,16:609-612	
May 8	44. Genetics for the 21 st Century		
May 14	Exam IV Tuesday Evening 7:25 until 9:25 – Room TBA (covers lectures 34 to 44)		

Course Information and Policies Spring 2015

Instructors: Dr. C. T. Hittinger, Dr. A. Laughon, Dr. J. Pool

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TA Office Hours will be posted on the Learn@UW site. They will be in Genetics/Biotech 1421, which is in the first floor of the new wing.

DISCUSSION SECTIONS

Although attending a discussion section is not mandatory, you are **strongly advised and encouraged to attend** in order to review lecture material, work problems, and ask questions. You may attend whichever discussion section you wish, regardless of the one you for which you are registered. You may even attend multiple discussion sessions! Discussion sections will begin meeting the second week of classes.

TEXTBOOK

The required text is *Introduction to Genetic Analysis* (11th Edition), by Griffiths, Wessler, Carroll, and Doebley. The publisher offers electronic and binder-ready, loose leaf versions of the textbook at a discount from the hardbound version. Copies of the textbook are also on reserve in Steenbock Library.

CLASS NOTES/HANDOUTS/LECTURES

Notes containing figures corresponding to the Powerpoint slides shown for each lecture will be posted at the course website. You can print these out and bring them with you to class to help follow the lecture. These are not intended to be a complete set of lecture notes! Taking your own notes during lecture is a very important skill that helps you learn the material. It is expected that you will take your own notes during lecture. You are responsible for any material discussed in lecture, whether or not it is visible on the printed slide. Lectures will be audiotaped and posted on the course Learn@UW website. Occasionally, supplementary problem sets and other material will also be posted on the course Learn@UW website. You are responsible for any of the material posted there. Lectures will contain additional information that is not covered in the textbook. Lectures provide the best indication of what material each instructor believes is most important and, hence, most likely to appear on the exams.

EXAMS

Grades will be based entirely on four exams. Each exam will cover about one quarter of the course material, and all exams will be weighted equally. Exams will be based primarily on solving problems; they will emphasize the material and concepts covered in the lectures and homework assignments. All exams except the last exam will be held from 7:15PM-9:15PM. The first three exams are **tentatively** scheduled for Feb. 17th (Tuesday), March 17th (Tuesday), and April 16th (Tuesday). The last exam is scheduled for Thursday, May 14 at 7:25PM. (This exam date and time is assigned by the university and not by the course instructors). **Place these dates and times on your calendars now!** If you have an unavoidable conflict with the scheduled exam time, such as another exam or course at the same time, contact Martha Reck mreck2@wisc.edu at least 3 days before the exam. If your conflict is indeed unavoidable, you will be permitted to take an early exam on the same day. **There will be no make-up exams after a scheduled exam is given.**

GRADING

Each exam will count for 25% of the final grade. No scores are dropped. Grades are based on performance on exams relative to the rest of the class. Typically, students whose point total on all four exams places them in the upper 10-15% of the class receive an A; students with scores approximately equal to the class average, receive a BC.

HOMEWORK

The only way to gain a real understanding of the concepts of genetics is by working problems. Assigned problems have been selected for you to work because they emphasize essential concepts and test your understanding of material that we think is important. The problem assignments will not be collected for grading. However, it is assumed that you will work the assigned problems and seek help if you have difficulty. Since the exams will be problem oriented, you will have a much easier time on the exams if you have worked and understood the homework problems. Conversely, you will have a very difficult time on the exams if you have not done any of the homework assignments. **At least one-third of the points on exams will be based directly on homework problems.** Therefore, it will be to your distinct advantage to work and understand the homework problems. Expect to spend at least two hours outside of class reading and working problems for each hour of lecture time.

OFFICE HOURS

Instructors and TAs are available for office hours. Do not use office hours as an alternative to attending discussion sections! Instead, office hours provide an opportunity for you to get extra individual help in those areas where you are having trouble. You should come prepared to ask specific questions about homework problems or lecture material that you are still finding difficult. If you are unable to make any of the scheduled office hours, schedule an individual appointment with a TA or instru