

GENETICS 603
Section 600
Fall 2018

INSTRUCTOR: Clint Magill

Department of Plant Pathology and Microbiology

Office: 202H, L. F. Peterson Phone: 979 845 8250, email: <mailto:c-magill@tamu.edu>

Prerequisite: Gene 301 or equivalent

Course Description: Development of fundamental concepts related to the structure, function, organization, transmission and distribution of genetic material. 4 credits

Course Objectives: Successful completion of this course will prepare you for advanced courses in all areas of genetics and genomics as well as plant and animal breeding.

TEXT: If you already own a recent Genetics text, it should be fine. If not, I recommend either of two that generally follow the same order as class: "Genetics, The Continuity of Life" by Fairbanks and Andersen and "iGenetics, a Molecular Approach" by Russell. The Fairbanks and Anderson text is somewhat dated but has many especially good end-of-chapter problems that are based on actual experimental data. The 9th edition (2019) of Genetics by Hartl and Cochrane appears to be excellent and up to date, but I haven't used it before.

Ancillary: We will take considerable advantage of resources available on the internet, including sites such as the (NCBI) <https://www.ncbi.nlm.nih.gov>. A home page for this course is available at: <http://people.tamu.edu/~c-magill/gene603/> It has outlines of each lecture and copies of all exams I have given since 1999. They make good study guides as far as showing you that the questions are not based on rote memorization, but will require ability to use course information to solve problems. As a distance student, you will have access to Powerpoint versions of each lecture, with audio files attached to help explain the concepts covered. These will be available to you via the eCampus portal <http://ecampus.tamu.edu>.

Grades: Your grade will be determined by your performance on 3 midterm exams, and a comprehensive final, all weighted equally. The exams are scheduled on Friday but can be done on the weekend. They will have a time limit so you will need to contact me when you are ready to begin. Homework assignments will provide opportunities for sufficient **bonus** points to make up at least one unsatisfactory exam. The homework problems and point values will be posted on the class WEB site and announced via e-mail. Each test will be graded on a 120 point basis for 480 possible points. Over 432 points is an A, between 336 and 431 is B, 230 to 335 is C and below 134 is F. In any case, if your final score (exam total plus homework points) is more than 1 standard deviation above the classes total exam average, you are guaranteed an A and if within 1 standard deviation, you cannot make less than B.

Absence Policy/Makeup exams I do expect you to come to class; it helps me to tell whether or not the points I am trying to make are getting across. However, if you must miss a class Powerpoint slides with audio files on e-campus will allow you to catch up. Makeup exams will be offered for any University defined excused absence, or with my approval, if requested ahead of time. As graduate students, I understand that you may have meetings to attend or experiments that are time sensitive. [See excused absences for the events approved by the University.](#)

Academic Integrity Statement and Policy "An Aggie does not lie, cheat or steal, or tolerate those who do." You are an Aggie and I am a member of the Honor Council. For additional information, please visit: <http://aggiehonor.tamu.edu>.

(The schedule below, especially for the dates and value of homework assignments is tentative.)

Week/Dates	Topics	Fairbanks---Russell	
1/Aug 27-31	DNA Structure and Replication; Eu- and Prokaryotes; Transcription, & Processing	Ch 2 Ch 3	Ch 2 & 3 Ch 5
2/Sept 3-7	Translation, Genetic Code; Protein function	Ch 4	Ch 6
Sept 7	HW 1 4 points Due Sept 16	OMIM alleles search	
3/Sept 10 -14	Mutation; Mutagens and Repair Systems	Ch 5	Ch 19
Sept 14	HW 2 5 points Due Sept 23	RNA editing/C-AREs	
4/Sept 17-21	Pathways; Gene Function, Bacterial Genetics	Ch 6	Ch 4
5/Sept 24-28	Pro and Eukaryotic Regulation, RNAi	Ch 7 & 8	Ch 16 & 17

Friday, September 28: EXAM 1; (TBA; allow at least 4 hours, can do on weekend)

6/ Oct 1-5	Recombinant DNA Technology	Ch 9	Ch 7-9
Oct 5	HW 3 12 points, Due Oct 14	BLAST	
7/Oct 8-12	Chromosomes; Meiosis and Mitosis, Mendel	Ch 10-12	Ch 1 & 10
Oct 12	HW 4 5 points Due Oct 21	PCR primer design	
8/Oct 15-19	Interactions, Sex-related, Imprinting, Mapping	Ch 13-15	Ch 11& 12
9/Oct 22-26	Gene Fine Structure, Chromosome # Aberrations	Ch. 16 &17	Ch 13 &14

Friday, October 26: EXAM 2; (TBA; allow at least 4 hours, can do on weekend)

10/ Oct 29-Nov 2	Structural aberrations, Cytoplasmic Inh.	Ch 18	Ch 21 & 15
Nov 2	HW 5 8 points Due Nov 11	Inversion problem	
11/Nov 5-9	Population Genetics & Evolution	Ch19 & 21	Ch 22 & 24
Nov 9	HW 6 8 points Due Nov 18	ABO equilibrium	
12/Nov 12-16	Quantitative Inheritance, Heritability	Ch 20	Ch 23
Nov 16	HW 7 8 points Due Nov 28	QTL mapping or X ²	
13/Nov 19	Transposons	Ch 22 & 23	Ch 20
NOV 21 (Wednesday) Reading Day; Nov 22-25: Thanksgiving break,			
14/Nov 26-30	Developmental Genetics & Immunogenetics	Ch 25	Ch 17
Friday, November 30 EXAM 3; (TBA; allow at least 4 hours, can do on weekend)			
15/Dec 4 & 6	CRISPRS & Hot topics	Ch 26 & 27	NA

The final will emphasize 'take home lessons' from each topic

Monday, DECEMBER 10, (2 hour time limit) Comprehensive FINAL EXAM

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact [Disability Services, at White Creek](#) , ([map](#)) or call 845-1637. For additional information visit <http://disability.tamu.edu>

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Section 700
Fall 2018

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Grades: Your grade will be determined by your performance on 3 midterm exams, and a comprehensive final, all weighted equally. The exams are scheduled on Friday but can be done on the weekend. They will have a time limit so you will need to contact me when you are ready to begin. Homework assignments will provide opportunities for sufficient **bonus** points to make up at least one unsatisfactory exam. The homework problems and point values will be posted on the class WEB site and announced via e-mail. Each test will be graded on a 120 point basis for 480 possible points. Over 432 points is an A, between 336 and 431 is B, 230 to 335 is C and below 134 is F. In any case, if your final score (exam total plus homework points) is more than 1 standard deviation above the classes total exam average, you are guaranteed an A and if within 1 standard deviation, you cannot make less than B.

Absence Policy/Makeup exams Lectures will be posted on e-campus the day before they are delivered in class. It is your responsibility to keep up with the material. Tests are offered over a relatively short period of time. Makeups for tests or assigned homework will be offered only for University defined excused absence, or if requested ahead of time and with my approval, for work, travel or family reasons. [See excused absences for the events approved by the University.](#)

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In the outline of topics below, (#H) indicates hours that I anticipate will be required for reading the text material and for solving the practice problems at the end of each chapter.

Week/Dates	Topics	Fairbanks----Russell
1/Aug 27-31	DNA Structure and Replication; Eu- and Prokaryotes; Transcription, & Processing	Ch 2 Ch 2 & 3 (6H) Ch 3 Ch 5 (6H)
2/Sept 3-7	Translation, Genetic Code; Protein function	Ch 4 Ch 6 (6H)
Sept 7	HW 1 4 points Due Sept 16	OMIM alleles search (3H)
3/Sept 10 -14	Mutation; Mutagens and Repair Systems	Ch 5 Ch 19 (4H)
Sept 14	HW 2 5 points Due Sept 23	RNA editing/C-AREs (3H)
4/Sept 17-21	Pathways; Gene Function, Bacterial Genetics	Ch 6 Ch 4 (5H)
5/Sept 24-28	Pro and Eukaryotic Regulation, RNAi	Ch 7 & 8; Ch 16 & 17 (7H)

Study for EXAM 1 allow at least 10 hours; use old exams as a guide (10)

Friday, September 28: EXAM 1; (TBA; allow at least 4 hours, can do on weekend)

6/ Oct 1-5	Recombinant DNA Technology	Ch 9 Ch 7-9 (5H)
Oct 5	HW 3 12 points, Due Oct 14	BLAST (6H)
7/Oct 8-12	Chromosomes; Meiosis and Mitosis, Mendel	Ch 10-12 Ch 1 & 10 (4H)
Oct 12	HW 4 5 points Due Oct 21	PCR primer design (3H)
8/Oct 15-19	Interactions, Sex-related, Imprinting, Mapping	Ch 13-15 Ch 11& 12 (8H)
9/Oct 22-26	Gene Fine Structure, Chromosome # Aberrations	Ch. 16 & 17 Ch 13 & 14 (8H)

Study for EXAM 2 allow at least 10 hours; use old exams as a guide (10)

Friday, October 26: EXAM 2; (TBA; allow at least 4 hours, can do on weekend)

10/ Oct 29-Nov 2	Structural aberrations, Cytoplasmic Inh.	Ch 18 Ch 21 & 15 (5H)
Nov 2	HW 5 8 points Due Nov 11	Inversion problem (4H)
11/Nov 5-9	Population Genetics & Evolution	Ch 19 & 21 Ch 22 & 24 (7H)
Nov 9	HW 6 8 points Due Nov 18	ABO equilibrium (4H)
12/Nov 12-16	Quantitative Inheritance, Heritability	Ch 20 Ch 23 (6H)
Nov 16	HW 7 8 points Due Nov 28	QTL mapping or X ² (3H)
13/Nov 19	Transposons	Ch 22 & 23 Ch 20 (3H)

NOV 21 (Wednesday) Reading Day; Nov 22-25: Thanksgiving break,

14/Nov 26-30	Developmental Genetics & Immunogenetics	Ch 25 Ch 17 (6H)
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Study for EXAM 3 allow at least 10 hours; use old exams as a guide (10H)

Friday, November 30 EXAM 3; (TBA; allow at least 4 hours, can do on weekend)

15/Dec 4 & 6	CRISPRs & Hot topics	Ch 26 & 27 NA (1H)
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Review for final: Emphasize 'take home lessons' from each topic (6H)

Monday, DECEMBER 10, (2 hour time limit) Comprehensive FINAL EXAM

42 Fifty minute lectures 3 Four hour exams (141 out-of-class hours)

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