

**IBS 605  
EXPERIMENTAL GENETICS  
FALL 2005 SYLLABUS**

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<b>Course Faculty</b>				
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**A. COURSE DESCRIPTION**

IBS605 is a 3 credit hour course designed to provide first year graduate students with the foundation of knowledge in classical and molecular genetics necessary for advanced graduate courses and research in any of the basic science departments of the UK College of Medicine. The course will be focused primarily on basic genetic principals, prokaryotic genetics, eukaryotic genetics, and genomics. The course will also cover contemporary topics including human genetics and bioinformatics. In addition, experimental approaches in genetic research will be reviewed. Course material will be presented in several formats, primarily of didactic lecture by expert faculty, but will also be reinforced by discussions of selected readings and bioinformatics small-group sessions.

**Lectures will be given Monday, Wednesday, and Friday from 10:00 - 10:50 AM in Nursing 115. Special room assignments will be posted on the Blackboard course site (see below, section H).**

**B. COURSE OBJECTIVES**

The primary objective of this course will be to provide graduate students with a working knowledge of basic principles and the latest advances in areas of contemporary genetic research.

**C. TEXT**

***Genetics - from genes to genomes, 2<sup>nd</sup> Edition, Hartwell, et al., McGraw- Hill, NY, 2004.***

Additional readings from the scientific literature will also be provided, or will be readily accessible from on-line scientific journals and the course website.

#### ***D. PREREQUISITES***

General College Chemistry I and II, Organic Chemistry I and II, Principles of Biology I and II or equivalents. Students who have questions whether they can enroll in IBS605 should talk with the course director.

#### ***E. GRADING***

Students will be evaluated based on: 1) performance on four written examinations, 2) performance in homework assignments and bioinformatics group session.

Each **exam** will last approximately two hours and each will account for **22.5% of the final grade** (Total = **90%**). Locations for exams are listed below, and will also be announced in class and posted on the Blackboard course website (see below).

Another component of the final grade will be performance on study questions/exercises provided with 2 paper discussions and the bioinformatics session. The average of these assignments will comprise **10% of the final grade**. Room assignments for the discussion/problem solving sessions (i.e. small group formats) will be announced in class and posted on the Blackboard course website (see below). Unexcused absence from the session or failure to complete the assignment will result in a grade of zero.

The grading standards to be employed for the course are as follows:

- A: 90-100%
- B: 80- 89.9%
- C: 70- 79.9%
- D: 60- 69.9%
- E: below 60 %

Students who perform in these ranges will be guaranteed to receive the indicated grades, at a minimum. However, some adjustments (curving) of this scale are possible, depending on the performance of the class as a whole. Grades will NOT be rounded up.

Challenges to a grade can be submitted for a reevaluation if it is deemed that a mistake has been made in the original grading. Challenges must be accompanied by a written explanation of the perceived mistake. Upon submission of a challenge, the entire examination will be subject to reevaluation and all questions therein will be regraded. Examinations for regrading must be submitted within one week (7 days) and to the course director only.

Graduate students will not receive a grade of "D" but instead will receive a failing mark for an average under 70%. All examinations must be taken at the scheduled time except when legitimate medical or personal circumstances make it impossible to do so. The course director must be notified of the circumstances of your absence prior to the examination. In these cases, either an oral or written make-up examination will be given. An "I" grade will not be assigned to students who simply miss an examination.

## ***F. UNDERGRADUATE ENROLLMENT***

Undergraduate students may enroll in the course with the permission of the course director and the Graduate School.

## ***G. OFFICE HOURS***

Course directors and instructors will be available for consultation. Students are encouraged to consult with participating faculty as needed. It is suggested to call or email faculty to set up an appointment as specific office hours are not established.

## ***H. BLACKBOARD AND COURSE INFORMATION (IMPORTANT!)***

**Blackboard**, a software program designed for facilitating course administration, will be used this semester in IBS605. You must be able to access the Blackboard course site in order to view such items of importance as *posted lecture notes, assignments* (exercises, study questions, room assignments for discussion sessions and exams) and *other announcements*. You can reach and register with Blackboard from the IBS site (<http://www.mc.uky.edu/ibs/coursework.asp>). **Steve Evans** will be assisting the course director in maintenance and control of the Blackboard site for IBS605. Any questions about use of Blackboard should be directed to Steve (phone: 323-2454; e-mail: [steven.evans@uky.edu](mailto:steven.evans@uky.edu)) .

## ***I. DISCUSSION/BIOINFORMATICS SESSIONS***

Attendance at these sessions is required and all students will be expected to participate actively in discussions. You will be expected to read assigned papers prior to class, and participate in the group exercise; details will be provided at a later date.

*Important: Do not use the library for printing course materials!!!*

J. SCHEDULE

#	Date	Topic	Lecturer
1	W <b>Aug</b> 24	Introduction: Course Overview	Spear (MI)
2	F 26	Mendelian Genetics	McCann (BCH)
3	M 29	Transmission of DNA	McCann (BCH)
4	W 31	Chromosomes and Cancer	McCann (BCH)
5	F <b>Sept</b> 2	Pedigree Construction/Analysis	H. Pierce (MCC)
	M 5	<b>No Class - Labor Day</b>	
6	W 7	Meiosis	A. Pierce (MI)
7	F 9	Recombination	A. Pierce (MI)
8	M 12	Linkage Analysis	Spear (MI)
	T 13	<b>Exam #1 (Sessions 1 - 8): 6-8 PM, Nursing 115</b>	
9	W 14	Introduction to Prokaryotic Genetics	Pickett (MI)
10	F 16	Bacterial Conjugation	Pickett (MI)
11	M 19	Complementation Analysis	Pickett (MI)
12	W 21	Bacterial Transformation	Pickett (MI)
13	F 23	Uses of Transformation, Conjugation and Complementation	Pickett (MI)
14	M 26	Cloning/Molecular Techniques #1	Spear (MI)
15	W 28	Cloning/Molecular Techniques #2	Spear (MI)
16	F 30	Cloning/Molecular Techniques #3	Spear (MI)
17	M <b>Oct</b> 3	Transposable Elements I	Perry (MI)
18	W 5	Transposable Elements II	Perry (MI)
	F 7	<b>No Class - Fall Break</b>	
19	M 10	Transposable Elements III	Perry (MI)
	T 11	<b>Exam #2 (Sessions 9 - 19): 6-8 PM, Nursing 115</b>	
20	W 12	Yeast Genetics I	Craven (PHA)
21	F 14	Yeast Genetics II	Craven (PHA)
22	M 17	Yeast Genetic III	Craven (PHA)
23	W 19	Somatic Cell Genetics I	Davidson (MI)
24	F 21	Somatic Cell Genetics II	Davidson (MI)
25	M 24	Transcriptional Regulation	Spear (MI)
26	W 26	Developmental Genetics I	Spear (MI)
27	F 28	Developmental Genetics II	Spear (MI)
28	M 31	Mouse Genetics	Spear (MI)
29	W <b>Nov</b> 2	Genetically Modified Mice I	Spear (MI)
30	F 4	Genetically Modified Mice II	Spear (MI)
31	M 7	Paper - Gene Therapy	Spear (MI)
	T 8	<b>Exam #3 (Sessions 20 - 31): 6-8 PM, Nursing 115</b>	
32	W 9	Genomics I	Spear (MI)
33	F 11	Genomics II	Spear (MI)
34	M 14	Genomic Imprinting	Spear (MI)
35	W 16	Evolutionary Genetics I	Davidson (MI)
36	F 18	Evolutionary Genetics II	Davidson (MI)
37	M 21	Complex Traits I	Van Zant (PGY)
38	W 23	Complex Traits II	Van Zant (PGY)
	F 26	<b>No Class - Thanksgiving</b>	
39	M 28	Hardy-Weinberg Analysis	TBA
40	W 30	Gene Chip/Microarray Analysis	McClintock (PGY)
41	F <b>Dec</b> 2	Gene Families/Odorant Receptors	McClintock (PGY)
42	M 5	Bioinformatics I	Spear (MI)
43	W 7	Bioinformatics II	Spear (MI)
44	F 9	Bioinformatics III	Spear (MI)
	W 14	<b>Final Exam (sessions 32-44): 10:30 AM, Nursing115</b>	