

**BIOL 4668/7668 – EUKARYOTIC MOLECULAR GENETICS**  
**Spring, 2012 Whitaker bld. Room # 1103 12 – 1:30 PM**

**Professors:**

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(Prior appointment by E-mail is strongly recommended for a meeting during office hours and required for any meeting outside of the office hours)

**Required textbook:** - J.D.Watson, T.A. Baker, S.P. Bell, A. Gann, M. Levine, R. Losick (2008) Molecular Biology of the Gene (6<sup>th</sup> edition). Pearson / Benjamin Cummings / CSHL Press.

**Additional sources:** - Molecular Biology: Genes to Proteins, 4th edition” by Burton Tropp, 2012. ISBN: 978-1-4496-0091-4.

- B. Lewin (2007) Genes IX. Jones and Bartlett Publishers, Inc. Scientific reviews and research papers (to be posted on Web).

**TENTATIVE SYLLABUS**

Week 1: 01/10, 12	Introduction/Techniques in molecular genetics I (FS)	Ch. 1, 6, 21
Week 2: 01/17	Techniques in molecular genetics II (FS)	Ch. 21
01/19	Model genetic systems (FS)	Ch. 22 and outside sources
Week 3: 01/24,26	Transcription and RNA processing I, II (FS)	Ch. 12, 13
Week 4: 01/31	Regulation of transcription (FS)	Ch. 17, 19, 20
02/02	Protein biosynthesis I (FS)	Ch. 14
Week 5: 02/07,09	Regulatory RNAs I, II (FS)	Ch. 6, 18 and outside sources
Week 6: 02/14	RNA editing (FS)	Ch. 6, 18 and outside sources
02/16	<b>EXAM I</b>	
Week 7: 02/21	DSB Repair I: Homologous recombination (FS)	Ch. 10 and outside sources
02/23	DSB Repair II: NHEJ (FS)	Ch. 9 and outside sources
Week 8: 02/28	Site-specific recombination (FS)	Ch. 11 and outside sources
03/01	Telomeres and telomerases (KL)	Ch. 8 and outside sources
Week 9: 03/06	Chromosome duplication and condensation (KL)	Ch. 7 and outside sources
03/08	Mutagenesis and MMR I (KL)	Ch. 9 and outside sources
Week 10: 03/13	Mutagenesis and MMR II (KL)	Ch. 9 and outside sources
03/15	<b>EXAM II</b>	
Week 11: 03/20,22	<b>SPRING BREAK</b>	
Week 12: 03/27	Direct reversal and BER (KL)	Ch. 9 and outside sources
03/29	NER (KL)	Ch. 9 and outside sources
Week 13: 04/03	DNA and chromatin structure (KL)	Ch. 6, 7
04/05	DNA replication I (KL)	Ch. 8 and outside sources
Week 14: 04/10	DNA replication II (KL)	Ch. 8 and outside sources
04/12	Cell cycle and checkpoint control (KL)	outside sources
Week 15: 04/17	Transposable elements (KL)	Ch. 11 and outside sources
04/19	Genetic instability and cancer I (KL)	outside source
Week 16: 04/24	Genetic instability and cancer II (KL)	outside sources
04/26	Trinucleotide repeats and neurological diseases (KL)	outside sources
Finals week: 05/01	<b>FINAL EXAM</b>	

NOTE:

- 1) Only eukaryotic material is covered in each chapter, except for the cases when prokaryotic materials are used for the comparison.
- 2) Most lectures use outside sources (provided via Web) in addition to the textbook.
- 3) If you have previously taken BIOL 4469 (Mol. Biology) or BIOL 7668 (Euk. Mol. Genetics - graduate), you cannot get additional credit for BIOL 4668.
- 4) Exam will be given only during class hours on the dates specified in the syllabus.
- 5) There will be no early finals.
- 6) **Students registered for BIOL 7668 are required to co-register for BIOL 7964.**
- 7) Watson et al. textbook package for BIOL 7668 includes a special supplement – Scientific American (Current Issues in Cell, Molecular Biology and Genetics).

#### **Exam rules:**

Students are allowed to use notes (no more than 1 page per person, could be double-sided, handwritten or printed, stapled or clipped together; you can use only your own notes and cannot ask another person for his/her notes).

Textbooks, folders, binders, notebooks, paper printouts, cell phones or laptops are not allowed.

#### **Grading:**

BIOL 4668:

Each Exam – 30%

Quizzes / in class activity – 10%





















BIOL 7668:






















Each Exam – 25%





Quizzes / in class activity – 10%

Homework (based on materials covered in BIOL 7964 seminars) – 15%

# Official School Calendar - Spring Semester 2012

January	3	Undergraduate Curriculum Committee - Petitions (Full Committee)	
	4 - 13	Phase II Registration For Spring Semester 2012	
		<ul style="list-style-type: none"> <li>• All Students</li> <li>• Registration ends at 4:00pm ET</li> </ul>	
	9	Classes Begin - Spring Semester 2012.	
	9	Fee payment deadline - 4:00pm ET for Spring Semester 2012. Visit <a href="http://www.bursar.gatech.edu/calendar.php">www.bursar.gatech.edu/calendar.php</a> .	
	13	Last day to register, make schedule changes, and/or drop courses without a "W" grade for Spring Semester 2012 by 4:00pm ET.	
	16	Official School Holiday.	
	17	<b>NEW</b> Last day for reactivation of degree petitions to be received by the Registrar's Office for Spring commencement.	
	17	Fee payment deadline - 4:00pm ET for Spring Semester 2012 to avoid class cancellation. Visit <a href="http://www.bursar.gatech.edu/calendar.php">www.bursar.gatech.edu/calendar.php</a> .	
	17	Undergraduate Curriculum Committee - Academic Matters and Appeals (Full Committee)	
	19	Graduate Curriculum Committee - Academic Matters (Full Committee)	
	24	Undergraduate Curriculum Committee - Petitions (Subcommittee)	
February	1	Deadline for readmission applications for Summer Term 2012 for students with an academic standing of drop or review. All other readmissions see April 1.	
	9	Graduate Curriculum Committee - Academic Matters (Full Committee)	
	14	Undergraduate Curriculum Committee - Academic Matters and Appeals (Full Committee)	
	17	Progress Report Deadline - All 1000 & 2000 level course grades must be entered on-line by Noon ET.	
	28	Undergraduate Curriculum Committee - Petitions (Subcommittee)	
March	2	Deadline to change grade mode from letter grade to pass/fail (and vice versa). No changes to audit mode permitted after the last day of registration. <a href="http://www.catalog.gatech.edu/rules/10a/php">www.catalog.gatech.edu/rules/10a/php</a> .	
	2	Last day to apply for grade substitution.	
	2	Last day to drop individual courses with a grade of "W" by 4:00 pm ET.	
	8	Graduate Curriculum Committee - Academic Matters (Full Committee)	

	13	Undergraduate Curriculum Committee - Academic Matters and Appeals (Full Committee)	
	14	Last day to withdraw from school with "W" grades in all courses for Spring Semester 2012 by 4:00pm ET.	
	14	Schedule of classes for Summer and Fall Semesters 2012 available on-line.	
	19 - 23	Spring Break.	
	20	Undergraduate Curriculum Committee - Petitions (Full Committee)	
April	1	Deadline for readmission applications for Summer Term 2012. The deadline for readmission applicants with an academic standing of drop or review was February 1, 2012.	
	2	<a href="#">Graduate Thesis Deadline</a> at Noon ET.	
	2 - 27	Phase I Registration For Fall Semester 2012	
		<ul style="list-style-type: none"> <li>• Current Students</li> <li>• Registration ends at 4:00pm ET</li> </ul>	
	2 - 27	Phase I Registration For Full, Early, and Late Summer Sessions 2011	
		<ul style="list-style-type: none"> <li>• Current Students</li> <li>• Registration ends at 4:00pm ET</li> </ul>	
	3	Undergraduate Curriculum Committee - Petitions (Subcommittee)	
	12	Graduate Curriculum Committee - Academic Matters (Full Committee)	
	17	Undergraduate Curriculum Committee - Academic Matters and Appeals (Full Committee)	
	22	Last day to apply for cross registration for Summer Semester 2012.	
	24	Undergraduate Curriculum Committee - Petitions (Subcommittee)	
	27	Last day of classes.	
	4/30 - 5/4	Final Exams.	
May	4	<a href="#">Commencement</a> - PhD and Master's Ceremony 7:00pm.	
	5	END OF TERM.	
	5	<a href="#">Commencement</a> - Bachelor's Ceremony 9:00am.	
	7	Deadline - All grades must be entered on-line by Noon ET.	
	8	Grades available online for students after 6:00pm ET.	

- 10 - Phase II Registration For Full, Early, and Late Summer Semesters 2012 - New and  
18 Current Students (Incoming Summer Freshmen see Late Summer Session Calendar  
June 24-29). Registration ends at 4:00 pm ET. 
- 14 Fee payment deadline - 4:00pm ET for Summer Terms 2012. Visit   
[www.bursar.gatech.edu/calendar.php](http://www.bursar.gatech.edu/calendar.php).
- 14 Classes Begin - Summer Term 2012. 
- 21 Fee payment deadline - 4:00pm ET for Summer Terms 2012 to avoid class  
cancellation. Visit   
[www.bursar.gatech.edu/calendar.php](http://www.bursar.gatech.edu/calendar.php).