

**BIOL 4668/7668 – EUKARYOTIC MOLECULAR GENETICS**  
**Spring, 2015 Molecular Sciences & Engr 1222 12:05 – 1:25 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:	01/6, 08	Introduction/Techniques in molecular genetics I (FS)	Ch. 1, 6, 21
Week 2:	01/13	Techniques in molecular genetics II (FS)	Ch. 21
	01/15	Model genetic systems (FS)	Ch. 22 and outside sources
Week 3:	01/20, 22	Transcription and RNA processing I, II (FS)	Ch. 12, 13
Week 4:	01/27	Protein biosynthesis I (FS)	Ch. 14
	01/29	Regulation of transcription (FS)	Ch. 17, 19, 20
Week 5:	02/03, 05	Regulatory RNAs I, II (FS)	Ch. 6, 18 and outside sources
Week 6:	02/10	RNA editing (FS)	Ch. 6, 18 and outside sources
	02/12	<b>EXAM I</b>	
Week 7:	02/17	DNA (KL)	Ch. 6
	02/19	Chromatin (KL)	Ch. 7
Week 8:	02/24	Chromosome segregation and condensation (KL)	Ch. 7 and outside
	02/26	DNA replication I (KL)	Ch. 8 and outside sources
Week 9:	03/03	DNA replication II (KL)	Ch. 8 and outside sources
	03/05	Telomeres and telomerases (KL)	Ch. 8 and outside source
Week 10:	03/10	DNA repair introduction and MMR	Ch. 9 and outside sources
	03/12	<b>EXAM II</b>	
Week 11:	03/17, 19	<b>SPRING BREAK</b>	
Week 12:	03/24	DSB Repair I: Homologous recombination (FS)	Ch. 10 and outside sources
	03/26	DSB Repair II: NHEJ (FS)	Ch. 9 and outside sources
Week 13	03/31	Site-specific recombination (FS)	Ch. 11 and outside sources
	04/02	Damage prevention, direct reversal and BER (KL)	Ch. 9 and outside
		sources	
Week 14:	04/07	NER and translesion polymerases	Ch. 9 and outside sources
	04/09	Cell cycle and checkpoint control (KL)	outside sources
Week 15:	04/14	Transposable elements (KL)	Ch. 11 and outside sources
	04/16	Trinucleotide repeats and neurological diseases (KL)	outside sources
Week 16:	04/21	Genetic instability and cancer I (KL)	outside source
	04/23	Genetic instability and cancer II (KL)	outside sources

Finals week: 04/30 (11:30am - 2:20pm) **FINAL EXAM**

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:

There are 3 exams

Each Exam – 33.33%

Quizzes / in class activity / attendance – are counted as bonus points for the exams

BIOL 7668:

There are 3 exams

Each Exam – 28.33%

Quizzes / in class activity / attendance – are counted as bonus points for the exams

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