

BCH 6415
Advanced Molecular and Cell Biology
3 Credits
Spring Semester 2018

This course is designed for advanced graduate students and highly advanced undergraduates who already have taken a one semester graduate level survey course in molecular biology (such as BCH 5413, or the COM BMS core course) and desire a course on current state-of-the-art aspects of molecular biology. Lectures and discussions will be based entirely upon the current scientific literature on nuclear structure and organization, transcription, RNA processing, protein synthesis, post-translational regulation, DNA replication, DNA repair, and DNA recombination, and emphasize experimental approaches to understanding these cellular processes. Students should have a good working knowledge of molecular biology and be able to comprehend articles on these topics in journals such as *Cell*, *Science*, *Nature*, *Genes and Development*, etc. No general molecular biology textbook covers topics in this course in sufficient detail and depth, though introductory background information may be available in textbooks such as:

Lodish et al., *Molecular Cell Biology* Alberts et al., *Molecular Biology of the Cell*
Cox et al., *Molecular Biology: Principles & Practice* Weaver, *Molecular Biology*

Ample use will be made of handouts and reading lists of relevant scientific articles throughout the course; much of the material in handouts will be taken from articles in the current scientific literature. Each instructor lectures in areas of his/her research expertise. Whenever possible, instructors will provide handouts of their lectures, but students are responsible for obtaining their own copies of the assigned (and optional) reading from scientific journals. The slides from each lecture will be available on the UF e-Learning Canvas website under "BCH6415".

Formal lectures and discussions will be held 5th period in Room R3-265 in the Academic Research Building on Monday, Wednesday, and Friday, 11:45 am to 12:35 p.m.

COURSE INSTRUCTORS:

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EXAMS:

Three examinations periods are scheduled during the semester for **Thurs February 15** and **Mon March 26** at **6:00 – 8:00 pm** in Room R3-265 of the Academic Research Building, plus the **Final Exam** on **Mon April 30**. The final exam is NOT cumulative. Please arrange your schedules to enable you to attend these sessions. There will be NO make-up exams. Review sessions for Exams 1 and 2 are scheduled for **Mon Feb 12**, and **Thurs March 22** from 5-6 pm in Rm. R3-265.

GRADES:

Grades will be based on the three exams which will be worth 100 points each. The final exam is **NOT** cumulative and will cover only the material from the final third of the course.

BCH 6415 – Spring 2018

Lecture Schedule

<u>DATE</u>	<u>DAY</u>	<u>TOPIC</u>	<u>INSTRUCTOR</u>
Jan 8	Mon	Technology/Methodology	Dr. Yang
Jan 10	Wed	Nucleosomes & Chromatin I	Dr. Yang
Jan 12	Fri	Nucleosomes & Chromatin II	Dr. Yang
Jan 15	Mon	NO CLASSES – MARTIN LUTHER KING DAY	
Jan 17	Wed	Basal Transcription	Dr. Huang
Jan 19	Fri	Chromatin Remodeling I	Dr. Yang
Jan 22	Mon	Chromatin Remodeling II	Dr. Yang
Jan 24	Wed	Chromatin Remodeling III	Dr. Yang
Jan 26	Fri	Histone Modification I	Dr. Huang
Jan 29	Mon	Histone Modification II	Dr. Huang
Jan 31	Wed	Co-Activators/Co-Repressors	Dr. Huang
Feb 2	Fri	Activation of Transcription	Dr. Huang
Feb 5	Mon	Nuclear Organization, Transcription Factories	Dr. Huang
Feb 7	Wed	MAR's, Insulators, Transvection	Dr. Huang
Feb 9	Fri	Locus Control Regions	Dr. Huang
Feb 12	Mon	Gene Regulation by Long Non-Coding RNA's	Dr. Huang
Feb 12	Mon	Review Session for Exam 1; 5-6 pm, R3-265	
Feb 14	Wed	Pol I and III Transcription	Dr. Huang
Feb 15	Thurs	EXAM 1 – 6:00-8:00 p.m.; Lectures through 2/9	
Feb 16	Fri	Transcription Elongation I	Dr. Yang
Feb 19	Mon	Transcription Elongation II	Dr. Yang
Feb 21	Wed	RNA Processing I – Capping, Polyadenylation	Dr. Berglund
Feb 23	Fri	RNA Processing II – RNA stability, turnover	Dr. Berglund
Feb 26	Mon	Protein Synthesis I	Dr. Gumz
Feb 28	Wed	Protein Synthesis II	Dr. Gumz
March 2	Fri	Post-Translational Regulation	Dr. Gumz
MARCH 5 – 9		SPRING BREAK	
March 12	Mon	RNA Splicing I	Dr. Berglund
March 14	Wed	RNA Splicing II	Dr. Berglund
March 16	Fri	RNAi & Micro RNA's	Dr. Xie
March 19	Mon	DNA Methylation & Epigenetic Regulation	Dr. Yang
March 21	Wed	DNA Topology	Dr. Bloom
March 22	Thurs	Review Session for Exam 2; 5-6 pm, R3-265	
March 23	Fri	DNA Replication: Initiation & Origins	Dr. Bloom
March 26	Mon	DNA Replication – Mechanisms I	Dr. Bloom
March 26	Mon	EXAM 2 – 6:00-8:00 p.m.; Lectures through 3/21	
March 28	Wed	DNA Replication – Mechanisms II	Dr. Bloom
March 30	Fri	DNA Replication: Fidelity	Dr. Bloom
April 2	Mon	Completing Replication & Telomeres	Dr. Bloom
April 4	Wed	DNA Damage & Excision Repair	Dr. Bloom
April 6	Fri	Mismatch Repair	Dr. Brown
April 9	Mon	Mechanisms of DNA DSB Repair	Dr. Brown
April 11	Wed	Damage Response I	Dr. Brown
April 13	Fri	Damage Response II	Dr. Brown
April 16	Mon	Homologous Recombination	Dr. Bloom
April 18	Wed	Lesion Bypass	Dr. Bloom
April 20	Fri	Viral Replication I	Dr. Flanagan
April 23	Mon	Viral Replication II	Dr. Flanagan
April 25	Wed	Review Session for Exam 3; 11:45 am-12:35 pm, R3-265	
April 30	Mon	FINAL EXAM (Non-Cumulative)	