

## BIO 8803B SPECIAL TOPICS: MOLECULAR EVOLUTION

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**Lectures:** Tues/Thurs 12:05pm-1:25pm ES&T L1118

**Office Hours:** by appointment

**Prerequisites:** biology (knowledge of general biology, genetics and evolution), some math, or personal permission of the instructor

<b>Grading Scheme:</b>	<b>UG</b>	<b>G</b>
Class Participation	20%	10%
Mid-Term	40%	35%
Presentation (20-25 minutes)	N/A	20%
Final-Term	40%	35%

**Text:**

*Fundamentals of Molecular Evolution* by Dan Graur, Wen-Hsiung Li. Sinauer Associates, ISBN: 0878932666

**This book is on reserve in the library.**

**Online Questions (included in Participation score)**

A series of questions will be posted in WebCT. Students are expected to post their ideas and thoughts to them using the Discussion function in the WebCT.

**Exams:** Open-book. The locations and the exact date of the exam will be announced later.

**Further Readings:**

*Molecular Evolution and Phylogenetics* by Masatoshi Nei, Sudhir Kumar. Oxford University Press. ISBN: 0195135849

*Molecular Evolution* by Wen-Hsiung Li. Sinauer Associates, ISBN: 0878934634

*Population Genetics: A Concise Guide* by John Gillespie. Johns Hopkins University Press. ISBN: 0801857554

**Presentation:** A list of papers for presentation will be provided. Students can choose one paper and present it for 25-minutes during some classes. The presenter is also expected to lead a short (~5 minutes) question-and-answers session.

The presentation will be graded according to: (1) delivery (2) organization of the talk (3) proper usage of visual aids (4) thoroughness of the research.

## DETAILED SYLLABUS

Lecture: Soojin Yi

Jan.9. Introduction. Chapter 1.

Jan.11. Molecular Population Genetics I. Chapter 2.

Jan. 16. Molecular Population Genetics II. Chapter 2.

Jan. 18. Effective Population Size. Chapter 2.

Jan. 23. Models of nucleotide substitution I. Chapter 3.

Jan. 25. Student presentations 1,2

Jan. 30. Models of nucleotide substitution II. Chapter 3.

Feb. 1. Rates and patterns of nucleotide substitution I. Chapter 4.

Feb. 6. Student presentations 3,4

Feb. 8. Rates and patterns of nucleotide substitution II. Chapter 4.

Feb. 13. Student presentations 5,6.

Feb, 15. Test of Neutrality. Supplementary material.

Feb. 20. Student presentations 7,8.

Feb. 22. Review Session.

Feb. 27. Mid-term exam.

Lecture: King Jordan

Mar. 1. Molecular Phylogenetics I. Chapter 5.

Mar. 6. Molecular Phylogenetics II. Chapter 5.

Mar. 8. Students presentations 9,10

Mar. 13. Gene Duplication and Chromosomal Evolution I. Chapter 6.

Mar, 15. Students presentations 11,12.

SPRING BREAK!!

Mar. 27. Gene duplication and Chromosomal Evolution II. Chapter 6.

Mar. 29. Student presentations 13,14.

Apr. 3. C-value paradox & Genome Evolution I, Chapter 8

Apr. 5. C-Value paradox & Genome Evolution II. Evolution by Transposition I. Chapter 7.

Apr. 10. Evolution by Transposition II. Chapter 7.

Apr. 12. Student Presentations 15,16

Apr. 17. Evolution of Biological Networks. Supplementary material.

Lecture: John McDonald

Apr. 19. Regulatory Evolution & Evolution of Development I. Supplementary Material.

Apr. 24. Regulatory Evolution & Evolution of Development II. Supplementary Material.

Apr. 26. Guest Lecture

May 1. Final exam.