

Nucleic Acids Structure and Function (Chem 8370/Bio 8637)

Fall Semester, 2015

Prerequisite: Biochemistry 6610 (or equivalent)

Instructor: Dr. Kathy Grant, 423 NSC, 413-5522, kbgrant@gsu.edu

Lecture: TTh, 5:30 PM - 8:15 PM, Room 409 Classroom South

Office Hour: TBA

Texts: "Nucleic Acids in Chemistry and Biology, Third Edition." Blackburn, Gait, Loakes & Williams (2006); "Introduction to Protein Structure, Second Edition." Branden & Tooze (1999).

Course Objective: A review of nucleic acids structure and function with emphasis on molecular recognition of DNA and RNA by small molecules and proteins.

Tentative Schedule: the course syllabus provides a general plan for the course; deviations may be necessary.

<u>Lecture</u>	<u>Chapter</u>	<u>Topics</u>
Oct 13 (Tu)	1, 2 (Gait)	Introduction, nucleosides and nucleotides. Standard DNA structure.
Oct 15	2 (Gait)	Movie: "Race for the Double Helix." Real DNA structure.
Oct 20 (Tu)	2 (Gait)	Quiz; Dynamics of DNA structure, higher order DNA structure.
Oct 22	7 "	RNA structure and function. RNA splicing. Catalysis by RNA.
Oct 27 (Tu)	7, 8 "	Quiz; Catalysis by RNA. Covalent interactions of DNA with carcinogens and with anti-cancer drugs.
Oct 29	8 "	Covalent interactions of DNA with anti-cancer drugs. Light-activated DNA damage.
Nov 3 (Tu)	8, 9 "	Noncovalent interactions of DNA with small molecules: groove binders and intercalators.
Nov 5	-	DNA in forensic science.
Nov 10 (Tu)	-	Exam; DNA in forensic science.
Nov 12	1, 2 (Tooze)	DNA in forensic science. Basic principles and motifs of protein structure.
Nov 17 (Tu)	8 (Tooze); 10 (Gait)	Non-specific protein/DNA & RNA interactions. DNA recognition by helix-turn-helix motif proteins.
Nov 19	9,10 (Tooze); 10 (Gait)	Quiz; DNA recognition by helix-turn-helix motif proteins. Zinc finger and leucine zipper motifs.
Nov 24 (Tu)	-	No class: Thanksgiving
Nov 26	-	No class: Thanksgiving
Dec 1 (Tu)	9,10 (Tooze); 10 (Gait)	β -Sheet motifs. Restriction enzymes.
Dec 2		Final Exam (Cumulative, 4:15 PM – 6:45 PM)

Miscellaneous: Friday October 30th is the last day to withdraw from a Mini-Mester II class and receive a "W".

Brightspace: Please access D2L Brightspace for on-line course materials. For technical support, contact the IS&T Help Center at: help@gsu.edu, 404-413-HELP (4357), www.gsu.edu/help.

Grades: The grading scheme will be based on 320 points and will consist of three 40 point quizzes, an exam, and a cumulative final.

The projected breakdown of points will be:

Quizzes (3)	120
Exam	100
Final Exam	<u>100</u>
Total:	320 points

Projected grade cut-offs:	A plus	96%
	A	90%
	A minus	88%

	B plus	85%
	B	78%
	B minus	76%

	C plus	72%
	C	65%
	C minus	63%

D	50%	

Notes on Plus/Minus Grading: All instructors have had the option to award grades on a plus/minus scale. The following quality points will be used to calculate GPAs.

A+:	4.30
A:	4.00
A-:	3.70
B+:	3.30
B:	3.00
B-:	2.70
C+:	2.30
C:	2.00
C-:	1.70
D:	1.00
F:	0.00
WF:	0.00

(Unless a Department or College says otherwise, Instructors have the choice as to whether or not to use pluses and minuses. As per Departmental or College policy, Instructors also decide on the criteria for the awarding of plus and minus grades. If a course requires a prerequisite of passing an earlier course with a "C", a grade of "C-" will not meet that prerequisite.)

Evaluations: Student evaluations of the Instructor can be performed using the GoSOLAR online evaluation system. Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State. Upon completion of the course, please take time to fill out the online course evaluation.

Student Accommodations: Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed accommodation plan and are responsible for providing a copy of that plan to Instructors of all classes in which an accommodation is sought.

Academic Honesty: The Department of Chemistry follows Georgia State University's Policy on Academic Honesty (Section 409). **Students are expected to be familiar with and to comply with this policy.** Here is a link to Section 409: <http://www2.gsu.edu/~wwwfhb/sec409.html>. All tests taken must represent your individual, unaided efforts. The following are examples of academic dishonesty: (i) to receive or offer information during an examination; (ii) to use unauthorized supplementary materials during tests; (iii) to commit plagiarism (i.e., the act of presenting an author's written work as one's own, without acknowledgment of the author). Incidents related to academic honesty will be referred to the Chemistry Department Chair for appropriate action.