

## SYLLABUS: BIOC 701

**Course:** 121-NDSU-1127.  
**Title:** Comprehensive Biochemistry I  
**Credits:** 4.  
**Semester:** Fall, 2011.

**Instructor:** Dr. Sangita Sinha, Assistant professor, Chemistry and Biochemistry.  
E-mail: [sangita.sinha@ndsu.edu](mailto:sangita.sinha@ndsu.edu); Office: IACC 364; Tel: 231-5658.

**Office Hours:** No set time, but please call or E-mail to check my availability.

**Method of Instruction:** Four lecture hours per week. Classes will be in Civil and Industrial Engineering, Rm 207, on Mon. & Fri at 11:00 AM -12:15 PM; and in Dunbar 152 on Wed at 3:00 – 4:15 PM. First and last day of class are Aug. 24th and Dec. 17th, respectively.

**Instructional material:** Text book: *Biochemistry* by Donald Voet and Judith G. Voet, 3rd Edition, John Wiley & Sons, New York.

**Prerequisite:** Chem. 342 or equivalent.

**Course objectives:** This is a graduate level course designed to educate students about the chemical basis of life; i.e. how the chemical and three-dimensional structures of different biological molecules and their assemblies dictates their properties; and how this relates to their function in living things. A key emphasis of this course is protein structure and function, especially allostery, enzyme kinetics and the mechanisms of enzyme catalysis. Students will also be introduced to basic biochemical experimental techniques and be trained to critically interpret, analyze and evaluate biochemistry research literature.

**Class materials:** Class information/changes, if any, will be announced via in-class announcements or E-mail or Blackboard. It is your responsibility to ensure you check these media to stay current with the class. Class slides will be posted on blackboard by the end of same day as the class.

### **Academic responsibility:**

The academic community is operated on the basis of honesty, integrity, and fair play. [NDSU Policy 335: Code of Academic Responsibility and Conduct](#) applies to cases where cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Consequences of academic dishonesty include, but are not limited to being awarded a score of zero on the exam in question, or even a grade of F for the course. Serious violations can lead to severe penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the [Office of Registration and Records](#). Informational resources about academic honesty for students and instructional staff members can be found at [www.ndsu.edu/academichonesty](http://www.ndsu.edu/academichonesty).

**Special needs:** Students who need special accommodations for learning or who have special needs in this course are invited to share these concerns or requests with the instructor and contact the [Disability Services Office](#) as soon as possible.

**Attendance:** You are expected to attend each class. Information provided in class may not be repeated in any other media.

**Performance Evaluation:** Performance will be evaluated as below:

<b>Task</b>	<b>Format</b>	<b>Score</b>
Exam 1	Essay type and short answer formats.	50
Exam 2	Essay type and short answer formats.	50
Exam 3	Essay type and short answer formats.	50
Quizzes	Multiple choice or short answers (1-2 sentences) 10 min. time limits	20
Homework		15
Modeling	Building molecular models.	20
Assignment	Introduction to public databases / data mining tools	10
Group Research Projects	Literature-based, in-depth research of an assigned enzyme family. Points awarded for: literature survey, understanding of the literature; in-group participation (mutual scoring) and presentation.	30
Class questions	Informal questions asked by instructor (0.5 pt/question)	5 pts + Upto 5 pt. bonus
Total		250

**Course Grades:**

Guaranteed grade cut-offs are as below:

<b>Grade</b>	<b>Score</b>
A	225
B	200
C	175
D	150
F	100

Final grades will be assigned on the basis of the distribution of the class scores on a curve, which may lower the cutoffs listed above.

## Tentative Schedule of classes (subject to change)

Class	Day, Date	Topic	Chapter	Evaluation
	Mon., Aug. 22	No class	1 (part)	
1	Wed., Aug. 24	Introduction	1 (part)	Quiz 1
2	Fri., Aug. 26	Aqueous solutions; Thermodynamic Principles	2: S1-2	
3	Mon., Aug. 29	Thermodynamic Principles	3: S1-2	HW 1 due
4	Wed., Aug. 31	Thermodynamic Principles	3: S3-4; 4:S1	
5	Fri., Sep. 2	Amino Acids	4: S1-3	Learn aa
	Mon. Sep. 5	LABOUR DAY HOLIDAY		
6	Wed., Sep. 7	AA modeling;	4;	HW 2 due
7	Fri., Sep. 9	Nucleic Acids, gene expression	5: S1	
8	Mon., Sep. 12	Nucleic Acids, gene expression	5: S2-4	Models due
9	Wed., Sep. 14	Nucleic Acids, gene expression	5: S4-5	
10	Fri., Sep. 16	Techniques for Nucleic acid & protein purification	6: S1, 2, 4	Quiz 2
11	Mon., Sep. 19	Techniques for Nucleic acid & protein purification	6: S3	
12	Wed., Sep. 21	Techniques for Nucleic acid & protein purification	6: S5-6	Quiz 3
13	Fri., Sep. 23	<b>Exam 1 review</b>	<b>Evening Exam</b>	
14	Mon., Sep. 26	Covalent structures of Nucleic acids & Proteins	7: S1	
15	Wed., Sep. 28	Covalent structures of Nucleic acids & Proteins	7: S2-3	
16	Fri., Sep. 30	Covalent structures of Nucleic acids & Proteins	7: S4-6	Assignment
17	Mon., Oct. 3	Three dimensional structures of proteins	8: S1	Quiz 4
18	Wed., Oct. 5	Three dimensional structures of proteins	8: S2	Model bldg
19	Fri., Oct. 7	Three dimensional structures of proteins	8: S3	
20	Mon., Oct. 10	Three dimensional structures of proteins	8: S4-5	
21	Wed., Oct. 12	Protein Folding and structural evolution 9 (part)	8: S5; 9: S6	Quiz 5
22	Fri., Oct.14	Hemoglobin – structure and function	10: S1-2	
23	Mon., Oct. 17	Hemoglobin – structure and function	10: S2	
24	Wed., Oct. 19	Hemoglobin – structure and function	10: S4,3	
25	Fri., Oct. 21	<b>Exam 2 review</b>	<b>Evening Exam</b>	
26	Mon., Oct. 24	Introduction to Enzymes	13	
27	Wed., Oct. 26	Projects; Rates of enzymatic reactions	14: S1	
28	Fri., Oct. 28	Rates of Enzymatic Reactions	14: S2	
29	Mon., Oct. 31	Rates of Enzymatic Reactions;	14: S2-4	
30	Wed., Nov. 2	Enzyme Catalysis	15: S1 -2	Quiz 6; HW3
31	Fri., Nov. 4	Enzyme Catalysis	15: S1 -2	
32	Mon., Nov. 7	Enzyme Catalysis	15: S3	
33	Wed., Nov. 9	Enzyme Catalysis	15: S4	
	Fri., Nov. 11	VETERANS DAY HOLIDAY		
34	Mon. Nov. 14	Sugars and Polysaccharides	11: S2	Quiz 7
35	Wed. Nov. 16	Sugars and Polysaccharides	11: S2	
36	Fri. Nov. 18	Sugars and Polysaccharides	11: S3	
37	Mon. Nov. 21	No class: Practise projects		Quiz 8

38	Wed. Nov. 23	No class: Practise projects		
39	Fri. Nov. 25	THANKSGIVING HOLIDAY	-	-
40	Mon., Nov. 28	Lipids and Membranes	12: S1-2,3c	
41	Wed., Nov. 30	Projects		Project
42	Fri., Dec. 2	Lipids and Membranes	12, S4,5	
43	Mon., Dec. 5	Exam Review		Quiz 9 & 10
44	Wed., Dec. 7	No class		
45	Fri., Dec. 9	No class		
	Dec. 12-16:	<b>EXAM 3:</b>	<b>EXAM 3</b>	<b>EXAM 3</b>