I. LOCATOR INFORMATION:

Instructor: Subir K. Nagdas, Ph.D.
Course Number and Name: BICH 411-01 and BIOCHEMISTRY I
Office Location: LSA 336
Semester Credit Hours: 3.0
Office Hours: Monday- 2pm-5pm
Wednesday- 2pm-5pm
Day and Time Class Meets: Lecture: TR11:00am-12:15pm STB338
Telephone: 672-2073
Total Contact Hours for Class: 47 hours
Email: snagdas@uncfsu.edu

Semester Credit Hours: 3.0

Prerequisites: Undergraduate level BIOL150 Minimum Grade of C and Undergraduate level CHEM 220 Minimum Grade of C or Undergraduate level CHEM 221 Minimum Grade of C

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account that is easily accessible via the Internet. The university has established email as the primary mode of communicating with enrolled students about impending deadlines, upcoming events, and other information important to student progression at the university. Students are responsible for reading their email on a regular basis to remain aware of important information disseminated by the university. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Students making inquiries via email to FSU faculty and staff about academic records, grades, bills, financial aid, and other matters of a confidential nature are required to use their FSU email account. Rules and regulations governing the use of FSU email may be found at: http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf

II. COURSE DESCRIPTION

An introductory course provides the theoretical basis for the major principles in biochemistry. This course includes an historical perspective of biochemistry, and a study of the four major biological macromolecules: proteins, lipids,
carbohydrates, and nucleic acids. Three major areas of biochemistry will be emphasized: (1) acid/base equilibrium; (2) structure and function of biomolecules; and (3) biological information flow. In addition to lectures and discussions, problems will be assigned to solve that will help the students to understand the basic biochemical concepts and to promote the critical thinking and to instill the problem solving skills.

III. **Disabled Student Services:** In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. **TEXTBOOK:**
Prerequisites: Biol 200 and Chem 220 or Chem 221.

V. **Student Learning Outcomes:**
Upon completion of this course, students should be able to demonstrate the following Department of Public Instruction (DPI) and National Science Teachers Association (NSTA) competencies:

1. Explain the major concepts and principles of biochemistry (DPI,1.0; NSTA, 5.1). Students should be able to demonstrate competence and understanding in their ability to investigate:
   a. the biochemical processes of life including protein synthesis and methods for studying biochemical processes (DPI, 1.3)
   b. the relationship of biochemistry to human health (DPI, 1.10)
   c. biochemical reactions, including types of reactions (DPI, 1.2)
   d. solutions, such as acids, bases, buffers (DPI, 1.3)
This outcome will be assessed by the exams and the quizzes.

2. Apply appropriate mathematics to investigations in biochemistry and the analysis of data (DPI,3.0; NSTA, 5.3).
This will be evaluated by exams and the quizzes.

3. Interpret findings, communicate results and make conclusions based on evidence (DPI,5.0; NSTA, 5.5).
It will be evaluated by research report and by presentation of the report.
VI. Course Requirements and Evaluation Criteria:

Total- 300 points

1st Exam (Take Home)-50 points (Chapters 1 and 2)

2nd Exam- 70 points (Chapters 3 and 4)

3rd Exam- 60 points (Chapters 5 and 7)

4th Exam- 80 points (Chapter 6)

Final Exam—40 points (Chapters 8 and 10)

Grading Scale:A: 90-100% B: 80-89.9% C: 70-79.9% D: 60-69.9%
F: below 60%

Attendance Requirements: Students are expected to attend all lecture sessions, except in cases of illness and other unforeseen emergencies. It is the student’s responsibility to contact the instructor about the steps that must be taken for making up any and all missed assignments. The university policy concerning absences from class will be strictly enforced. The instructor will request administrative withdrawal for students who either incur TWO CONSECUTIVE ABSENCES, or whose absences exceed 10% of the total course hours of the semester.

Graded Assignments: Tests, papers, quizzes, reports, experiments will be used to determine student’s final grade. Submit homework on time. Late submission will not be accepted.

General Grading Policies: Take examinations on the scheduled dates. Dates of the examinations will be announced in due time. No student will be allowed to take an exam before or after the scheduled exam time. The only exceptions will apply to those students who have the learning disabilities. The learning disability should be approved by the appropriate authority of the university. Make-up tests are never given because they are annoying and not fair to other students. Tests missed will result in a grade of zero. Every student should take the final exam. At the discretion of the instructor, if a valid excuse is presented, arrangements can be made to take the make-up tests or final at a different time. Please be advised that common cold and similar illnesses may not constitute emergency. Note that makeup exams may be longer, more difficult, and have a different format than the exam given to the class. Students are allowed to see their graded tests in the class; they are not allowed to take the graded tests outside of the classroom.
Academic Integrity: Any student engaging in an act of academic dishonesty, including but not limited to: cheating on exams, copying problem sets, using notes during the exam, asking another student for help or answers during an exam, having another person to take an exam for you will receive a grade of zero for the work on which the offence was committed and will be reported for appropriate action.

Drop Deadline: No student will be allowed to drop the class after the university deadline that is listed in the Academic Calendar.

Students Behavior Expectations: Students are expected to refrain from disruptive behavior during the class. Such behavior is rude and may cause you or those around you to miss an important point or announcement made in class. Examples of disruptive behavior that have been noted by myself and other faculty include, but are not limited to, habitually walking into class late, chatting with other students while the instructor or another student is talking to the class, packing up and leaving class early (unless students informed the instructor at the beginning of the class), sleeping, and talking on cell phones. Cell phones and pagers should be turned off before class begins.

VII. Academic Support Resources – Students are encouraged to review each current issue and read appropriate articles in the following journals, also available in the C. W. Chestnutt Library: Annual Review of Biochemistry, Biochemistry, Bioessays, Cell, Journal of Cell Biology, Journal of Molecular Biology, Nature, Science, Scientific American, Trends in Biological Sciences (TIBS), Trends in Genetics (TIGS). Several online journals are also available in the library and free on the web. For free journal article listings, check http://highwire.stanford.edu/lists/freeart.dtl. Students are also encouraged to make full use of the internet resources, including Medline which is available through the Chestnutt Library’s Pubmed system or through the NIH/NML website at www.ncbi.nlm.nih.gov.

VIII. Course Outline and Assignment Schedule:


Chapter-2: Water: Weak interactions in aqueous systems, Ionization of water, Weak acids and weak bases, Buffering against pH changes in biological systems, and Water as a reactant.

Chapter-3: Amino acids, Peptides, and Proteins- Primary Structure and Chemistry

Chapter-4: The three-Dimensional Structure of Proteins
Chapter-5: Protein Function

Chapter-6: Enzymes: Enzyme Kinetics and Regulatory Enzymes

Chapter-7: Carbohydrates and Glycobiology: Classification, Structure, and Functions of Carbohydrates

Chapter-8: Nucleotides and Nucleic acids: Structure, Chemistry, and Functions of Nucleotides

Chapter-10: Lipids: Structure, Chemistry, Lipids in Membrane, and Their Roles in Biological Systems

An overview of Glycolysis, The Citric Acid Cycle, and Oxidative Phosphorylation (If time permits)

Assignment Schedule will be provided after the completion of each chapter.

IX. Teaching Strategies: The lectures will be divided into four parts: (I) introduction and background review; (II) biomolecules (proteins, carbohydrates, and lipids); (III) mechanisms of enzymatic action; and (IV) metabolism (energy generation and consumption). This course will emphasize an in-depth examination of the field of biochemistry in association with each of the major topics mentioned above. In addition to lectures and literature assignments, problem sets will be assigned in order to equip students with a thorough understanding of biochemistry and to promote critical thinking and problem solving skills.

X. BIBLIOGRAPHY:

The textbooks listed below are good supplemental books for this course. Some of these books are available in the C. W. Chestnutt Library. Other selected references at the end of each chapter will be recommended.


Additional Policies:

1. Food, Cell-phone and i-pod are not allowed in the classroom. Turn off your all electronic devices before you enter into the class.

2. Formulas will not be given during the exams. Students should bring their own calculators and the graph papers everyday in the class and in the exam days.

3. Students are not allowed to ask any test related questions during the exams unless there is a typo.

4. Students are required to solve the problems in the step-by-step manner and the units must be written in each step.