

PALOMAR COLLEGE
COURSE OUTLINE OF RECORD FOR
DEGREE CREDIT COURSE

X Transfer course X A.A. degree applicable course
(check all that apply)

COURSE NUMBER AND TITLE: CHEM 205 Introductory Biochemistry

UNIT VALUE: 3

MINIMUM NUMBER OF SEMESTER HOURS: 48

BASIC SKILLS REQUIREMENTS: Appropriate language and computational skills.

ENTRANCE REQUIREMENTS

PREREQUISITE: CHEM 105

COREQUISITE: None

RECOMMENDED PREPARATION: None

SCOPE OF COURSE:

Fundamental principles of the chemistry of living systems, including structure and function of proteins, nucleic acids, carbohydrates, and lipids. Emphasis on metabolisms, energy storage and utilization.

SPECIFIC COURSE OBJECTIVES:

The successful student will be able to:

1. Demonstrate basic biochemical principles.
2. Identify and elaborate on biochemical reaction pathways.
3. Be prepared to study related fields in medical and health related professions.

CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:

General topics of course are based on:

1. Conformation
 - a. Introduction to protein structure and function
 - b. Oxygen transporters: Myoglobin and Hemoglobin
 - c. Hemoglobin: An allosteric protein
 - d. Molecular Disease: Sickle-Cell Anemia
 - e. Introduction to Enzymes
 - f. Mechanisms of Enzyme Action: Lysozyme and Carboxypeptidase
 - g. Zymogen Activation: Digestive Enzymes and Clotting Factors
 - h. Connective-Tissue Proteins: Collagen and Elastin
 - i. Introduction to Biological Membranes
2. Generation and Storage of Metabolic Energy
 - a. Metabolism: Basic Concepts and Design
 - b. Glycolysis
 - c. Citric Acid Cycle
 - d. Oxidative Phosphorylation
 - e. Pentose Phosphate Pathway and Gluconeogenesis

- f. Glycogen and Disaccharide Metabolism
 - g. Fatty Acid Metabolism
 - h. Amino Acid Degradation and the Urea Cycle
 - i. Photosynthesis
3. Biosynthesis of Macromolecular Precursors
 - a. Biosynthesis of Membrane Lipids and Steroid Hormones
 - b. Biosynthesis of Amino Acids and Heme
 - c. Biosyntheses of Nucleotides
 4. Molecular Information:
 - a. DNA: Genetic Role, Structure and Replication
 - b. Messenger RNA and Transcription
 - c. The Genetic Code and Gene-Protein Relationships
 - d. Protein Synthesis
 - e. Control of Gene Expression
 - f. Eucaryotic Chromosomes
 - g. Viruses
 5. Molecular Physiology:
 - a. Immunoglobulins
 - b. Bacterial Cell Walls
 - c. Membrane Transport
 - d. Excitable Membranes
 - e. Hormone Action
 - f. Muscle Contraction and Cell Motility

REQUIRED READING:

Stryer, Lubert. Biochemistry. 4th edition. New York: W.H. Freeman & Co., 1995.

SUGGESTED READING:

Gumport, Richard I., et al. Student's Companion to Stryer's Biochemistry. 4th edition. New York: W.H. Freeman & Co., 1995.

REQUIRED WRITING:

One or two paragraphs on essay exam questions illustrating student's ability to conceptualize biochemical ideas with the help of schematic illustrations for biochemical pathways. See also grading policy and standards. A minimum of 10 pages will be completed. A small investigative term paper of 2-3 hand written or typed pages concerning actual problems in biochemistry along with a take-home test of ten short-answer and/or essay questions will also be required.

OUTSIDE ASSIGNMENTS:

Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.

1. Answering homework assignments: 5 hours per week
2. Reading the assigned textbook material: 4 hours per week

INSTRUCTIONAL METHODOLOGY:

Check all that apply:

- lecture
- laboratory
- lecture-laboratory combination
- directed study

This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.

Yes _____ No X

If yes, check all that apply.

- Television Course (Video one-way, e.g. ITV, video cassette, etc.)
- Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
- Two-Way Video Conferencing (Two-way interactive video and audio)
- One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
- Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

GRADING POLICY AND STANDARDS (include methods of determining whether the stated objectives have been met by students):

One two-hour mid-term examination consisting of a set of 20 multiple choice and 10 essay questions.

One two-hour comprehensive final exam with 40 multiple choice questions will be given during the course.

The make-up of the course grade is as follows:

Midterm Take-home Exam, Term Paper = 30%

Weekly quizzes = 30%

Final Exam = 40%

IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?

Yes _____ No X Number of times course may be taken for credit: 1.

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable:

CONTACT PERSON: Bettina Heinz

SIGNATURES ON FILE
