A. Course Description

Credits: 3

Prerequisites: CHEM 325 Biochemistry I: Biomolecule Structure and Function
OR
CHEM 301 Biochemistry

Lab Hours/ Weeks: Corequisites: None

Lecture Hours/ Week :

MnTC Goals: None

This course is the second of two-semester biochemistry lecture sequence and part of three lecture-lab biochemistry series. The series broadly cover the study of chemical processes in living organisms. In this course, students learn about the energy producing pathways of glycolysis, Krebs cycle, oxidative phosphorylation, and fatty-acid oxidation. Coverage will also include a discussion of how biosynthetic processes are controlled and integrated with metabolism of the cell as well as gene regulation and biochemical aspects of evolution. This course is intended for students majoring in chemistry and provides more extensive coverage of the subject than a student will get in a comprehensive/introduction to biochemistry course.

B. Course Effective Dates: 01/12/2015 - Present

C. Outline of Major Content Areas:

See Course Description for major content areas.

D. Learning Outcomes (General)

1. Understand the differences between anabolic and catabolic processes in metabolism
2. Known photosynthesis reaction
3. Know the genetic code and the concepts of translation and transcription
4. Know how recombinant DNA works
5. Know the differences between RNA and DNA
6. Understand the mechanism of DNA repair and its relationship to diseases
7. Know the structure of viral particles and their mechanism of infection
8. Understand the concept of gene expression and genomic reorganization
9. Use knowledge from organic chemistry reaction mechanism to follow metabolic pathways
10. Be able to describe how anabolic and catabolic processes are coupled to energetics from ATP hydrolysis
11. Understand redox and electron transfer reactions in biological systems
12. Understand that reaction coordinate diagrams are useful for thermodynamics of coupling anabolic and catabolic processes in metabolism
13. Know and understand the Calvin cycle
14. Flow the fate of precursors and radioactive labels in metabolic reactions
15. Relate glycogen and glycolysis metabolism to diseases and their treatment
16. Identify enzymes involved in metabolic pathways

E. Learning Outcomes (MN Transfer Curriculum)

This contains no goal areas.

G. Special Information
Note: First day attendance required except by instructor permission.