SAULT COLLEGE
of Applied Arts and Technology
Sault Ste. Marie

COURSE OUTLINE

CHM-210-2

BIOCHEMISTRY (THEORY)

revised June, 1981 by D. Heggart

BIOCHEMISTRY

CHM 210-4

TEXT:

Modern Topics in Biochemistry - Bennett & Frieden - MacMillan (1967)

Introduction to Biochemistry - Routh - Saunders (1971)

Experimental Methods in Modern Biochemistry - Redina - Saunders (1971)

Vitamin C and the Common Cold - Linus Pauling

15 weeks x 5 hrs./wk. = 75 hours

Theory - 30 hours

Lab - 45 hours

Topic Number	Periods	Topic Description	Reference
1		Biochemical Cystology - structure and function of subcellular organelles	
2		Carbohydrate Chemistry - structure, function and reactions of sugars, starch and cellulose - optical activity	
3		Lipids & Fat Soluble Vitamins - classification, structure, reaction and metabolism of fats. - structure, function and source of Vitamin A, D, E, K	
4		Amino Acids, Peptides and Proteins - structure, function, metabolism, biosynthesis - mechanism of protein synthesis	
5		Nucleic Acids - structure, function, biosynthesis - involvement in protein synthesis	
6		Vitamins - water soluble vitamins -- function, structure, source	
7		Hormones - structure, function, examples	
8		Enzymes - structure, function - mechanism of action - examples	
9		Metabolism - enzyme control - oxidative pathways - Embden - Meyerhaf - Kreb - P.P.P.	
10		Seminars (2) - on selected subjects	
11		Laboratory-selected experiments and projects (Redina)	

BIOCHEMISTRY THEORY

A Student Guide for CHM 210-2

Topic 1 - The Cell - Biochemical Cystology

The student should be able:

1. to describe the biochemical composition structure and function of the subcellular organelles.

2. view and complete"Wards Solo Learn - Introduction to the animal cell".

3. complete assignment #1 Routh p. 75

4. as a review, view filmstrip - The New Concept of the Cell - 1519

Topic 2 - Carbohydrate Chemistry

The student would:

1. view film strip - carbohydrates 70W33006 and complete the work sheet.

2. be able to describe the structure and function of simple sugars, starches, cellulose, and explain type of linkage.

3. understand optical activity and be able to define terminology:

   a) optical activity

   b) polarized light

   c) polarimeter

   d) dextrorotatory

   e) levorotatory

   f) specific solution

   g) asymmetric carbon

   h) enantiomers

   i) racemic mixtures

4. understand terms used to classify carbohydrates

   a) aldose
   b) betose
   c) monosaccharide
   d) diose
   e) triose
   f) tetrose etc
   g) disacchaude
   h) polysacchaude

5. describe chemical reactions of carbohydrates

   a) dehydration
   b) glycoside formation
   c) oxidation
   d) femmentation
   e) esterformation

6. Complete assignment #2 Routh p19.

3 - Lipids and Fat Soluble Vitamins

The student should:

1. know the classification of lipids with examples.
2. know and describe the general structure of fats, reactions and metabalism.
3. be able to describe and illustrate phosphatides and give function.
4. be able to describe and illustrate sphengalipids and give function.
5. be able to describe and illustrate glycolipids and give function.
6. be able to describe and illustrate steroids and give function.
7. be able to describe and illustrate waxes and give function.
8. be able to classify the vitamines as to fat or non-fat soluble and give structure, function and source of a) Vit. A
   b) Vit. D
   c) Vit. E
   d) Vit. K
9. complete assignment #3 Routh p35.

4 - Amino Acids, Peptides, Proteins

The student should:

1. view "wards solo learn - introduction to amino acids" and complete work sheet.
2. view film strip "proteins" - 70W3300C and complete work sheet also film strip "protein synthesis" 70W3900 #5.
3. complete lecture note guideline - proteins - introduction to structure and reactivity.
4. complete assignment #4 Routh p55.

5 - Nucleic acids

The student should:

1. view "wards solo learn - introduction to DNA" and complete work sheet.
2. view film strip - DNA structure and replication - 70W3300 and complete work sheet, also film strip - reproduction - 70W3900 #6.
3. view film strip - protein synthesis - 70W3300E and complete work sheet.
4. view film strip - evident - 70W3300F and complete work sheet.
5. complete assignment #5 Routh p64.
6. as a review view film strip - macromolecules in Biology - 1558

6 - Porphyrins

The student will deliver a seminar on some aspect of this topic. Titles might be:

a) general structure of porphyrins and specific structure of chorophyl.

b) structure and function of haemoglobin.

c) biosynthesis of porphyrins.

d) synthesis of B_{12}.

e) photosynthesis.

f) sickle cell anemia

7 - Vitamins

The student will read - Vitamin C and the common cold - by Linus Pauling and complete questions found in appendix.

The student should also be able to give structure, function and source of the water soluble vitamins.

8 - Hormones

The student should:

1. view film strip - hormones - 1551 and complete work sheet.

9 - Enzmology

The student should:

1. view filmstrip - the during cell- control - 70W3900 #4
2. view filmstrip "Enzymes - The Spark Plugs of Life" - 575 and complete work sheet.
3. complete assignment #6 Routh p89.

10 - Metabolism

The student will:

1. view the following filmstrips a) ATP- A pocket of energy - 1520

b) sugar metabolism - 1548

c) photosynthesis - 70W3900 #1
digestion - 70W3900 #2
Respiration 70W3900 #3

2. to be able to illustrate the various oxidative pathways

a) embden - meyerhof

b) kreb

c) P.P.P.

3. complete assignment #7 Routh p105.

4. complete assignment #8 Routh p114.

11. Optional topics - filmstrips are available for independent study in the following areas.

a) nutrition - energy, growth and repair #613.

b) antibiotics - disease fighting champions #566.

c) introduction to histology #1557.

d) the work of your blood #551.

Additional Filmstrips:

Certain filmstrips which will help to review and/or expand class discussions are available.

1) the chemical lab in your body #578

2) radioisotopes - A Biological Tool #1501