

BROOKDALE COMMUNITY COLLEGE

CHEM-136
INTRODUCTION TO INORGANIC, ORGANIC, AND
BIOLOGICAL CHEMISTRY

4 CREDITS

COURSE SYLLABUS

BROOKDALE COMMUNITY COLLEGE
INTRODUCTION TO INORGANIC, ORGANIC, AND
BIOLOGICAL CHEMISTRY

CHEM 136
(4 CREDITS)

COURSE OBJECTIVE:

The student will consider concepts from inorganic, organic, and biological chemistry that will be applied to allied health and biological fields of study. Reinforcement of chemical concepts will be made as hands-on skills are developed in the laboratory program. This course is designed for students who have had no previous chemistry courses.

REQUIRED MATERIALS:

1. **TEXTBOOK:** Chemistry: An Introduction to General, Organic, & Biological Chemistry, 10th edition, by K. Timberlake; Pearson Prentice Hall Education, Inc.: Upper Saddle River, NJ, 2009.
2. **LABORATORY MANUAL:** The Essentials-Chemistry: An Introduction to General, Organic, & Biological Chemistry, by K. Timberlake; Pearson Prentice Hall Education, Inc.: Upper Saddle River, NJ, 2005.
3. **SAFETY GOGGLES:** New Jersey State Law requires that all students wear appropriate splash and impact-proof safety goggles while performing laboratory experiments or during demonstration of experiments. Safety goggles are available at the College Store.

DISABILITY SERVICES:

If you have a documented disability and would like to request accommodations and/or academic adjustments, contact the Disability Services Office at 732-224-2730 or TTY at 732-842-4211.

UNITS OF THE COURSE:

1. Measurements, Energy, Elements, and Radiation
2. Compounds, Chemical Quantities, and Gases
3. Solutions and Acid-Base Chemistry
4. Organic Chemistry
5. Biochemistry

CORE COMPETENCIES:

The following objectives of the **Scientific Perspective**, the **Mathematical Skills** Competency, and the **Critical Thinking, Problem Solving** Competency are taught in this course:

Students will be able to::

- identify a problem and analyze it
- recognize and construct logical forms of argumentation
- analyze, discuss, and use quantitative information
- apply algebraic and/or geometric techniques to analyze and solve mathematical problems
- use appropriate problem solving technologies
- develop appropriate skills in observation and experimentation to solve problems
- analyze and interpret scientific data
- evaluate and apply appropriate technology

The course examinations, laboratories, and other assignments are used to assess student attainment of these competency objectives within the context of the course curriculum.

In addition, this course reinforces objective 1.1 of the **Communication Skills** Competency that states: the student will “communicate information and ideas clearly and effectively in written form”. Students are required to write, using correct English, Mathematical and Chemical symbols, responses to laboratory and exam questions requiring explanations, comparisons, and/or interpretation of results.

CHEMISTRY DEPARTMENTAL GRADING STANDARD:

A	90 – 100
B+	87 – 89.99
B	80 – 86.99
C+	77 – 79.99
C	70 – 76.99
D	60 – 69.99
F	below 60

Additional note: As of May 2005, if a student fails either the lecture or the laboratory portion of the course and chooses to retake the course, that student must retake the entire course (**BOTH the laboratory AND the lecture**) in another semester. Laboratory grades cannot be carried over to a new semester.

UNIT 1A

- Chapters:** 1 (omit 1.2-1.4) and 2 (omit 2.6)
- Name of Unit:** Measurements and Energy and Matter
- Unit Objective:** Apply some of the basic concepts of the metric system, density, specific gravity, and energy. Also distinguish between solids, liquids, and gases.
- Lab Experiments:** Experiments 1, 2 – Measurement, and Experiment 3 – Density and Specific Gravity, Constructing a Graph

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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Chapter 1

- | | |
|--|---|
| 1. Perform conversions within the metric system and between the metric and U.S. standard systems | READ: 1.1, 1.5, 1.6, 1.7
QUESTIONS & PROBLEMS: 1.1, 1.3 on page 18; odd numbers on pages 30, 35, 39; and numbers 71, 75, 77, 79 on pages 48,49 |
| 2. Solve problems involving density and specific gravity | READ: 1.8
QUESTIONS & PROBLEMS: odd numbers on page 44; and numbers 81, 85, 87 on page 48 |

Chapter 2

- | | |
|--|--|
| 3. Solve energy problems involving:
a.) potential and kinetic energy
b.) calories - specific heat
c.) calories in carbohydrates, lipids, and proteins | READ: 2.1, 2.2, 2.4
HEALTH NOTE: page 58
QUESTIONS & PROBLEMS: odd numbers on pages 56, 58; numbers 17, 19 on page 65, and numbers 43, 44 on page 76 |
| 4. Perform conversions between the temperature scales ($^{\circ}\text{F}$, $^{\circ}\text{C}$, and K) | READ: 2.3
HEALTH NOTE: page 62
QUESTIONS & PROBLEMS: odd numbers on page 63 |
| 5. Identify the physical state of a substance from a list of characteristics | READ: 2.5
QUESTIONS & PROBLEMS: number 25 on page 67 |

UNIT 1B

Chapter:	3
Name of Unit:	Atoms and Elements
Unit Objective:	Determine the fundamental structure of an atom
Lab Experiments:	Experiment 4 – Atomic Structure, Experiment 5 – Electronic Arrangement and Periodic Properties

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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Chapter 3

1. Be able to classify matter according to its' components: elements, compounds, mixtures	READ: 3.1 QUESTIONS & PROBLEMS: number 1 on page 86
2. Give the names and symbols for elements in Table 3.3, page 87; also include Be.	READ: 3.2 QUESTIONS & PROBLEMS: odd numbers on page 89
3. Identify an element as a metal, non-metal, or noble gas	READ: 3.3 QUESTIONS & PROBLEMS: odd numbers on pages 93, 94; and number 87 on page 115
4. Solve problems involving subatomic particles, atomic number, and mass number	READ: 3.4, 3.5 QUESTIONS & PROBLEMS: odd numbers on pages 98, 100; and numbers 93, 95 on pages 115, 116
5. Solve problems involving isotopes	READ: 3.6 QUESTIONS & PROBLEMS: odd numbers on page 103; number 99 on page 116; and number 103 on page 116
6. Give the electron level arrangement for the first 18 elements	READ: 3.7 (omit Orbitals); 3.8 (Group Numbers and Valence Electrons only) QUESTIONS & PROBLEMS: odd numbers on page 106; and number 105 on page 116

UNIT 1C

- Chapter:** 9 (omit 9.6)
- Name of Unit:** Nuclear Radiation
- Unit Objective:** Explain why some atoms decay radioactively, identify some of the particles emitted, and recognize some of the harmful and beneficial uses of radiation
- Lab Experiment:** Experiment 6 – Nuclear Radiation

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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Chapter 9

- | | |
|--|---|
| 1. For radioactivity describe:
a.) radioactive particles
b.) cell sensitivity
c.) protective methods
d.) half-life | READ: 9.1, 9.3, 9.4
HEALTH NOTE: page 352
QUESTIONS & PROBLEMS: odd numbers on pages 322, 336; numbers 25, 26 on page 333; and numbers 49, 51, 63, 65, 67, 69 on pages 345, 346 |
| 2. Be able to write equations for alpha and beta decay | READ: 9.2
HEALTH NOTE: page 326
QUESTIONS & PROBLEMS: numbers 13, 15, 17a, 17c on page 328; and numbers 53a, 53c, 55a,b,c,d, 57a,b on page 346 |
| 3. Recognize units of radiation (no calculations)
a.) curie
b.) rad
c.) rem
d.) LD ₅₀ | READ: 9.3
HEALTH NOTE: page 331
QUESTIONS & PROBLEMS: numbers 21, 22 on page 333 |
| 4. Describe some uses of radioisotopes as tracers | READ: 9.5
HEALTH NOTES: page 339
QUESTIONS & PROBLEMS: number 33 on page 340 |

UNIT 2A

- Chapters:** 4 and 3 (3.8 only)
- Name of Unit:** Compounds and their Bonds
- Unit Objective:** Describe the types of chemical bonds by showing their formation using valences and Lewis electron dot structures
- Lab Experiment:** Experiment 7 – Compounds and their Formulas

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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Chapter 3

1. For atoms:
- a.) determine the valence shell and number of valence electrons by using the Periodic Table
 - b.) draw Lewis electron (dot) structures
- READ: 3.8 (omit Atomic Size and Ionization Energy)
QUESTIONS & PROBLEMS: numbers 55, 59, 61 on page 111

Chapter 4

2. For atoms:
- a.) define and be able to recognize ions (cations and anions)
 - b.) memorize the possible ions of the metals with variable charge in Table 4.5 on page 131
 - c.) memorize the name, formula and charge of the polyatomic ions in Table 4.7 on page 134
 - d.) explain the inertness of Group 8A elements
- READ: 4.1, 4.3, 4.4
QUESTIONS & PROBLEMS: odd numbers on pages 126, 127; and number 29 on page 138
3. List some important ions in the body and state their function
- HEALTH NOTE: pages 126, 135
4. For compounds:
- a.) apply the octet rule to determine how elements combine to form ionic and covalent compounds
- READ: 4.2, 4.3, 4.4, 4.5
QUESTIONS & PROBLEMS: odd numbers on pages 129, 133; and numbers 31, 33, 35 on page 138

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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b.) name ionic and covalent compounds

5. Explain the effect of bond type (ionic, polar covalent, non-polar covalent) on...
- a.) boiling point
 - b.) solubility (“like dissolves like”)
 - c.) state (solid, liquid, gas)

LECTURE & READ: 4.6, 4.8
QUESTIONS & PROBLEMS: odd numbers on page 147; and number 69 on page 153

UNIT 2B

- Chapters:** 5 (5.1 and 5.2 only)
- Name of Unit:** Chemical Quantities
- Unit Objective:** Understand how we count atoms and molecules, and be able to solve problems using molar mass

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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Chapter 5

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|---|--|
| 1. Calculate moles for atoms
Calculate molar mass | READ: 5.1, 5.2
QUESTIONS & PROBLEMS: odd numbers on page 166; and number 87 on page 202 |
| 2. Convert between moles and grams for atoms and compounds. | READ: 5.2
QUESTIONS & PROBLEMS: odd numbers on page 171; and numbers 89, 91 on page 202 |

UNIT 2C

Chapter: 6 (omit, 6.6, 6.7)
(omit all math in Boyle's, Charles', and Gay-Lussac's Laws, but do the math of Dalton's Law)

Name of Unit: Gases

Unit Objective: Explain the gas laws and apply them

Lab Experiment: Experiment 14 – Partial Pressures

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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Chapter 6

1. Understand the 4 properties that describe a gas. Convert between mmHg, Torr, and atmospheres.

READ: 6.1, 6.2
HEALTH NOTE: page 215
QUESTIONS & PROBLEMS: odd numbers on pages 213, 216

2. State and recognize applications of Boyle's, Charles', Gay-Lussac's, and Dalton's laws.

READ: 6.3 – 6.5 (omit math), 6.8
HEALTH NOTE: page 218, 233
QUESTIONS & PROBLEMS: numbers 9, 10, 11a, 12, 13, 21, 22 on pages 219, 220; number 23 on page 221; number 29 on page 224; and numbers 49, 51 on page 234; and numbers 59, 69, 73 on pages 237, 238

UNIT 3A

Chapter:	7 (7.1, 7.3, 7.4, 7.5)
Name of Unit:	Solutions
Unit Objective:	Describe solutions and express solution concentrations as a ratio in mass/volume percent and in molarity
Lab Experiment:	Experiment 15A – Solutions

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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Chapter 7

1. Describe liquid mixtures and their components as well as:

- a.) "Like Dissolves Like"
- b.) hydrogen bonds
- c.) surface tension
- d.) saturated and unsaturated

READ: 7.1, 7.3

QUESTIONS & PROBLEMS: odd numbers on pages 246, 254, 255

2. Perform solution concentration calculations for mass & volume ratios, mass/volume %, and molarity.

READ: 7.4, 7.5

QUESTIONS & PROBLEMS: numbers 31, 33, 35 on pages 258, 259; numbers 43, 45, 47 on page 264

3. List ways in which the body gains and loses water to maintain fluid balance

HEALTH NOTE: page 245

UNIT 3B

- Chapter:** 7 (7.2, 7.7 only)
- Name of Unit:** Properties of Liquid Mixtures
- Unit Objective:** Describe electrolytes, non-electrolytes, colloids, and suspensions. Explain processes of osmosis and dialysis, and understand the purpose of the “mEq/L” concentration system
- Lab Experiments:** Experiment 18 – Solutions, Colloids, and Suspensions, Experiment 17 – Electrolytes and Insoluble Salts

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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Chapter 7

- | | |
|--|---|
| 1. Regarding dissociation:
a.) write dissociation equations
b.) explain what strong, weak, and non-electrolytes are in terms of dissociation | READ: 7.2
QUESTIONS & PROBLEMS: odd numbers from 9 –13 on pages 249, 250 |
| 2. State the purpose of the “mEq/L” concentration system and its application | READ: 7.2
QUESTIONS & PROBLEMS: numbers 15, 17, 19 on page 250 |
| 3. State the principle cations and anions in blood plasma | HEALTH NOTE: page 250 |
| 4. Differentiate among various liquid mixtures with respect to particle size and their important properties | READ: 7.7
QUESTIONS & PROBLEMS: numbers 61, 62 on page 273 |

LEARNING OBJECTIVES**OBTAINING THE OBJECTIVES**

5. For osmosis and dialysis:

- a.) describe the processes in terms of diffusion & membranes
- b.) recognize solutions as iso-, hypo-, or hypertonic, and determine which way water will flow across an osmotic membrane
- c.) define osmotic pressure
- d.) determine relative osmotic pressures

READ: 7.7

QUESTIONS & PROBLEMS: odd numbers on pages 273, 274; and numbers 99, 100 on page 277

6. For fluid motion explain:

- a.) renal (kidney) function
- b.) hemodialysis

READ: 7.7

HEALTH NOTE: page 273

QUESTIONS & PROBLEMS: numbers 96, 98 on page 277

UNIT 3C

- Chapter:** 8
- Name of Unit:** Acids and Bases
- Unit Objective:** Recognize acids, bases, and salts, and determine the pH range for a substance in aqueous solution. Describe systems in the body which guard against drastic pH change.
- Lab Experiment:** Experiment 19 – Acids, Bases, pH, and Buffers

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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Chapter 8

1. Describe characteristics of acids and bases, and write dissociation and neutralization reactions.

READ: 8.1 (omit conjugate acid-base pairs), 8.2., 8.5 (omit acid-base titration)
QUESTIONS & PROBLEMS: odd numbers 1 - 9 on pages 285, 286; all on page 289; odd numbers 37 – 41 on page 304

2. Predict whether a solution of a given salt will be acidic, basic, or neutral

READ: 8.3, 8.4 (in 8.4 omit math)
QUESTIONS & PROBLEMS: odd numbers page 292, numbers 29, 31, 32 on page 297

3. Describe hemoglobin, carbonate, and phosphate buffers including:

- a.) pH maintenance
- b.) acidosis and alkalosis
- c.) carbon dioxide-oxygen transport

READ: 8.6
HEALTH NOTE: page 306
QUESTIONS & PROBLEMS: odd numbers on page 307; and numbers 57, 58 on page 309

UNIT 4A

- Chapter:** 10 and 11
- Name of Unit:** Introduction to Organic Chemistry
- Unit Objective:** Compare some specific physical properties of inorganic and organic compounds. Name, draw, and predict reaction products for cyclic and acyclic hydrocarbons and haloalkanes.
- Lab Experiments:** Experiment 21 – Properties of Organic Compounds, Experiment 22 – Structures of Alkanes, Experiment 23 – Reactions of Hydrocarbons (omit part D)

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
1. Compare inorganic and organic compounds with respect to bonding and physical properties.	READ: 10.1, 10.4 QUESTIONS & PROBLEMS: all on page 354; number 27 on page 367; and numbers 39-42 on page 377
2. Name and draw any cyclic or acyclic alkane, haloalkane, alkene, alkyne, or aromatic compound. This includes drawing and differentiating between expanded, condensed, and molecular formulae.	READ: 10.2, 10.3, 11.1, 11.5 QUESTIONS & PROBLEMS: odd numbers on page 358; odd numbers 15-25 on pages 363, 364; odd numbers on page 386, 387, 398; numbers 47, 49, 51 on page 377; and numbers 29, 31, 43, 44 on page 401, 402.
3. Define with examples: a.) isomers b.) functional group c.) saturated and unsaturated hydrocarbons	READ: 10.3, 10.4, 10.5, 11.1, 11.2 QUESTIONS & PROBLEMS: number 13 on page 363; odd numbers on page 372; number 57 on page 378; and number 35 on page 402
4. Write equations for: a.) combustion of alkanes b.) hydrogenation of alkenes (addition) c.) hydrogenation of alkynes (addition) d.) hydration of alkenes (addition)	READ: 10.4, 11.3 QUESTIONS & PROBLEMS: number 29 on page 367; number 53 on page 378; number 13 on page 393; number 39 on page 402.

UNIT 4B

- Chapter:** 12 (omit 12.6)
- Name of Unit:** Alcohols, Phenols, Thiols, Ethers, Aldehydes, and Ketones
- Unit Objective:** Name, draw, and predict reaction products for alcohols, phenols, thiols, ethers, aldehydes, and ketones
- Lab Experiments:** Experiment 26 – Alcohols and Phenols, Experiment 27 – Aldehydes and Ketones

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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Chapter 12

- | | |
|---|---|
| 1. Name and draw alcohols, phenols, thiols, ethers, aldehydes, and ketones. | READ: 12.1, 12.2, 12.4
QUESTIONS & PROBLEMS: odd numbers on pages 411, 412, 424; number 51 on page 438; numbers 61, 65, 67 on page 439 |
| 2. For alcohols:
a.) classify as 1°, 2°, or 3°
b.) explain their water solubility and high boiling point based upon hydrogen bonding
c.) explain why 1° and 2° alcohols oxidize and 3° alcohols do not | READ: 12.1, 12.2, 12.3
QUESTIONS & PROBLEMS: odd numbers on page 414; number 7 on page 412; numbers 49, 55, 57, 69, 71 on pages 438, 439 |
| 3. Write equations for:
a.) dehydration of alcohols to form alkenes
b.) oxidation of 1° alcohols, 2° alcohols, thiols, and aldehydes | READ: 12.3, 12.5
QUESTIONS & PROBLEMS: odd numbers on page 418, 419; number 33 on page 427; number 59 on page 438; and number 77 on page 440 |

UNIT 4C

Chapter:	13
Name of Unit:	Carboxylic Acids, Esters, Amines, and Amides
Unit Objective:	Name, draw, and predict reaction products carboxylic acids, esters, amines, and amides
Lab Experiment:	Experiment 30 – Carboxylic Acids and Esters

LEARNING OBJECTIVES

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Chapter 13

1. Name and draw carboxylic acids, esters, amines, and amides.

READ: 13.1, 13.3, 13.4, 13.5
QUESTIONS & PROBLEMS: odd numbers on page 451; number 17 on page 459; number 23 on page 460; numbers 35 on page 468; numbers 45, 47 on page 472, 473; numbers 56, 57, 68 on page 478

2. Explain the water solubility and high boiling point of carboxylic acids, amines due to hydrogen bonding.

READ: 13.2, 13.4
QUESTIONS & PROBLEMS: numbers 9, 11 on page 454; numbers 39, 41 on page 468, 469; numbers 59, 67 on page 478

3. For amines:

- classify as 1°, 2°, or 3°
- define alkaloid

READ: 13.4
HEALTH NOTE: page 467
QUESTIONS & PROBLEMS: number 33 on page 468

4. Write equations for:

Carboxylic acids:

- ionization
- neutralization
- esterification, basic ester hydrolysis, and saponification
- amidation and acidic amide hydrolysis

READ: 13.2, 13.3, 13.4, 13.5
HEALTH NOTE: pages 456, 461
QUESTIONS & PROBLEMS: numbers 13, 15 on page 454; numbers 19, 21 on pages 458, 459; number 31 on page 460; number 43 on page 469; and numbers 61, 64, 69 on page 478

Amines:

- neutralization

UNIT 5A

- Chapter:** 14 (in 14.2- omit Fischer projections), 18.2
- Name of Unit:** Carbohydrates
- Unit Objective:** Classify carbohydrates according to their structures and predict whether a given carbohydrate will give a positive reducing sugar, fermentation, or iodine test. Describe the digestion (hydrolysis), absorption, and storage of carbohydrates.
- Lab Experiment:** Experiment 29 – Test for Carbohydrates

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
1. For carbohydrates: a.) write the photosynthesis equation b.) write the metabolism equation c.) identify them given a formula d.) be familiar with medical conditions associated with them e.) classify them as aldoses or ketoses and as hexoses and pentoses, etc.	READ: 14.1, 14.2 HEALTH NOTE: page 490, 501, 502 QUESTIONS & PROBLEMS: odd numbers on pages 486, 487; and numbers 21, 22 on page 491; and number 60(b,c,d) on page 510
2. Classify carbohydrates as mono-, di- or polysaccharides; indicate components and hydrolysis (digestion) products	READ: 14.1, 14.5, 14.6, 18.2 HEALTH NOTE: page 635 QUESTIONS & PROBLEMS: numbers 37, 38 on page 503; numbers 7, 9 on page 632; numbers 91, 92, 94 on page 672
3. Identify open and ring forms for monosaccharides	READ 14.1 – 14.3 QUESTIONS & PROBLEMS: number 19 on page 491; numbers 23, 24 on page 494
4. Predict whether a given carbohydrate will give a positive Benedict's, fermentation, or iodine test	READ: 14.4, 14.5, 14.6 HEALTH NOTE: page 496 QUESTIONS & PROBLEMS: numbers 31, 32 on page 497; numbers 39, 41 on page 506

UNIT 5B

Chapter:	15, 18.2
Name of Unit:	Lipids
Unit Objective:	Identify the structure and classes of lipids and describe the digestion of triglycerides.

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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|--|---|
| 1. For lipids: <ul style="list-style-type: none">a.) List/identify the different classes (e.g. waxes, triglycerides, steroids, etc.)b.) Give components for each classc.) Give examples of compounds from each classd.) Define saturated, mono-unsaturated, and polyunsaturated fatty acids and understand how this affects melting pointe.) Describe the function of the lipid bilayer in plasma membrane | READ: 15.1-15.3, 15.5-15.7
QUESTIONS & PROBLEMS: all on page 515; numbers 5, 6, 11, 13, 15, 17 on page 521; numbers 37, 41 on page 533; numbers 43, 45, 49, 50 on page 540; numbers 55-57 on page 542; number 77, 78 on page 546 |
| 2. For triglycerides: <ul style="list-style-type: none">a.) Differentiate between fats & oilsb.) Write the structure given fatty acid componentsc.) Explain what is meant by the terms “partially” and “fully hydrogenated” oilsd.) Write hydrogenation equations | READ: 15.1-15.4, 18.2
HEALTH NOTE: Page 502, 527
QUESTIONS & PROBLEMS: numbers 21, 26, 27 on pages 525; numbers 9, 12 on page 521; numbers 29, 30, 35 on page 530; numbers 11, 12, 14 on page 632 |
| 3. Describe how soaps and detergents <ul style="list-style-type: none">a.) are made from triglycerides (write equation for saponification)b.) work | READ: 15.4
ENVIRONMENTAL NOTE: Page 461
QUESTIONS & PROBLEMS: numbers 31, 32 on page 530 |

UNIT 5C

- Chapter:** 16 (16.1 – 16.5)
- Name of Unit:** Amino Acids and Proteins
- Unit Objective:** Understand how proteins are synthesized and hydrolyzed (digested) and state structural features of amino acids and proteins.
- Lab Experiments:** Experiment 37 – Peptides and Proteins; Experiment 41 – Analysis of Urine

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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|--|---|
| 1. For amino acids:
a.) Recognize the general formula
b.) Write an equation joining two amino acids (you won't need to memorize amino acid structures) | READ: 16.2, 16.4
QUESTIONS & PROBLEMS: numbers 3, 5, 7, 9 on page 557, and 19 on page 560 |
| 2. Define and illustrate for amino acids and proteins:
a.) Zwitterion
b.) Amphoteric nature (capable of reacting as both an acid and base)
c.) Essential Amino Acids- complete vs. incomplete | READ: 16.2, 16.3
HEALTH NOTE: page 566
QUESTIONS & PROBLEMS: odd numbers on page 558 |
| 3. For Proteins:
a.) Their functions in the body
b.) Denaturation
c.) 1 ^o , 2 ^o , 3 ^o & 4 ^o structures and linkages holding them together | READ: 16.1, 16.2, 16.5
HEALTH NOTE: page 550
QUESTIONS & PROBLEMS: numbers 1, 2 on page 554; odd numbers on page 570, 571 |

UNIT 5D

- Chapter:** 16 (16.6 – 16.9) and 18.2
- Name of Unit:** Enzymes and Digestion
- Unit Objective:** Describe how the body digests, absorbs, and distributes carbohydrates, triglycerides, and proteins.

LEARNING OBJECTIVES	OBTAINING THE OBJECTIVES
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1. For enzymes:

- a.) Name them
- b.) Describe effect on activity of:
 - 1. Substrate concentration
 - 2. Enzyme concentration
 - 3. Temperature
 - 4. pH
- c.) Understand cofactors

READ: 16.6-16.9

QUESTIONS & PROBLEMS: odd numbers on page 580; all on page 583

2. For digestion of carbohydrates, triglycerides, and proteins state:

- a.) Enzyme involved
- b.) What hydrolysis occurs mouth, stomach, and small intestine
- c.) What end products are formed, absorbed, and stored (if at all)

READ: 16.6, 16.7, 18.2

HEALTH NOTE: pages 575-576

QUESTIONS & PROBLEMS: odd numbers on pages 572; numbers 43, 45, 47 on page 576; numbers 8, 10, 13 on page 632; numbers 88, 91, 92, 94 on page 672