

Chapter 19 and 20  
**Organic and Biochemistry**  
Learning Objectives

8.12.2022

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To satisfy the minimum requirements for this course, you should be able to:

- 1. Distinguish the differences between alkanes, alkenes, alkynes and aromatic hydrocarbons.**
  - be able to name the straight-chained alkanes from one to ten carbons
  - compare the strengths of the intermolecular forces in various alkanes and be able to predict relative boiling points for alkanes
- 2. Recognize the importance of functional groups in organic chemistry, and be able to:**
  - identify the following functional groups: carboxylic acids; amines; amides; alcohols; esters.
- 3. Explain what a polymer is and why they are important.** Be able to:
  - define, with examples, the terms polymer, monomer and repeat unit
  - recognize what polymers are formed from monomers via addition and condensation polymerizations
- 4. Explain what a biopolymer is and why they are important.** Be able to:
  - define the terms peptide, protein, backbone and side chain
  - write the condensation reaction that forms a peptide bond given two amino acids
  - list the four levels of protein structure hierarchy and know what forces or bonds stabilize each level
  - explain the importance of hydrogen bonding in determining 3-dimensional structure of proteins
- 5. Discuss the function of proteins.** Be able to:
  - list several functions of proteins
  - explain how enzymes act as biological catalysts and how they interact with specific substrate molecules within their effective temperature range.
- 6. Naval Application: Chemical Warfare (see handout)**
  - recognize selected classes of toxic agents of military importance: blister agents, (mustard, lewisite), nerve agents (sarin, VX), choking agents (chlorine, phosgene), blood agents (HCN), riot control agents
  - explain the mechanism by which sarin inhibits acetylcholinesterase

**Note - Only a portion of the material from Sections 19.1-19.7 will be covered and section 19.8 is not assigned; your instructor will provide guidance about specific material from Chapter 19 that is relevant to the learning objectives above. Likewise, for Chapter 20, only material from Sections 20.1-20.2 will be covered and sections 20.3-20.6 are not assigned.**