Organic chemistry studies the structure, properties and reactions of organic compounds, which contain carbon in covalent bonding. The study of structure determines their chemical composition and formula and the study of properties includes physical and chemical properties, and evaluation of chemical reactivity to understand their behavior. The study of organic reactions includes the chemical synthesis of natural products, drugs, and polymers, and study of individual organic molecules in the laboratory and via theoretical (in silico) study.

- Exercises: Organic Chemistry
  - Exercises: Volhard and Schore
  - Exercises: McMurry
  - Exercises: Roberts and Caserio
  - Exercises: Problems in Biomedical Organic Chemistry (Cichewicz)
  - Organic: Acid/Base Practice Problems

- Supplemental Modules (Organic Chemistry)

  Organic Chemistry research involves the synthesis of organic molecules and the study of their reaction paths, interactions, and applications.

  - Acid Halides
  - Alkanes
  - Alkenes
  - Alkynes
  - Alcohols
  - Aldehydes and Ketones
In this resource you will find theory and procedures on the main organic lab techniques (chromatography, crystallization, extraction, distillation) as well as general concepts on how to set up and heat apparatuses (see the Table of Contents tab for a more complete listing of topics). All procedures are accompanied by step-by-step pictures, and graphics are heavily utilized throughout the resource.
How to be a successful organic chemist is meant as an introductory text for undergraduates taking organic chemistry teaching labs. The text is a clear and practical introduction to safety, chemical handling, organic chemistry techniques, and lab reports.
Organic chemistry studies the structure, properties and reactions of organic compounds, which contain carbon in covalent bonding. Study of structure determines their structural formula. Study of properties includes physical and chemical properties, and evaluation of chemical reactivity to understand their behavior. The study of organic reactions includes the chemical synthesis of natural products, drugs, and polymers, and study of individual organic molecules in the laboratory and theoretically.
In this online textbook, a unique approach is taken to the study of organic chemistry. To the greatest extent possible, biological molecules and biochemical reactions are used to explain and illustrate the central concepts of organic chemistry. This approach covers the main organic reaction mechanisms in a biological context. However, earlier chapters on organic structure and spectroscopy also focus as much as possible on examples of interest to students of biology and the health sciences.
11: Nucleophilic Acyl Substitution Reactions
12: Reactions at the α-Carbon, Part I
13: Reactions at the α-Carbon, Part II
INTERCHAPTER: Retrosynthetic analysis and metabolic pathway prediction
14: Electrophilic Reactions
15: Oxidation and Reduction Reactions
16: Radical Reactions
17: The Organic Chemistry of Vitamins
Appendix I: Index of enzymatic reactions by pathway
Appendix II: Review of laboratory synthesis reactions
Back Matter

• Book: Basic Principles of Organic Chemistry (Roberts and Caserio)

This general organic Textmap by John D. Robert and Marjorie C. Caserio emphasizes thermochemistry to aid the undergraduate’s understanding of organic reactions

Front Matter
1: Introduction to Organic Chemistry
2: Structural Organic Chemistry
3: Organic Nomenclature
4: Alkanes
5: Stereoisomerism of Organic Molecules
6: Bonding in Organic Molecules
7: Other Compounds than Hydrocarbons
8: Nucleophilic Substitution and Elimination Reactions
9: Separation, Purification, and Identification of Organic Compounds
10: Alkenes and Alkynes I - Ionic and Radical Addition Reactions
11: Alkenes and Alkynes II - Oxidation and Reduction Reactions. Acidity of Alkynes
12: Cycloalkanes, Cycloalkenes and Cycloalkynes
13: Polyfunctional Compounds, Alkadienes, and Approaches to Organic Synthesis
14: Organohalogen and Organometallic Compounds
   ◦ 15: Alcohols and Ethers
   ◦ 16: Carbonyl Compounds I - Aldehydes and Ketones. Addition Reactions of the Carbonyl Group
   ◦ 17: Carbonyl Compounds II- Enols and Enolate Anions. Unsaturated and Polycarbonyl Compounds
   ◦ 18: Carboxylic Acids and Their Derivatives
   ◦ 19: More on Stereochemistry
   ◦ 20: Carbohydrates
   ◦ 21: Resonance and Molecular Orbital Methods
   ◦ 22: Arenes, Electrophilic Aromatic Substitution
   ◦ 23: Organonitrogen Compounds I - Amines
   ◦ 24: Organonitrogen Compounds II - Amides, Nitriles, and Nitro Compounds
   ◦ 25: Amino Acids, Peptides, and Proteins
   ◦ 26: More on Aromatic Compounds
   ◦ 27: More about Spectroscopy
   ◦ 28: Photochemistry
   ◦ 29: Polymers
   ◦ 30: Natural Products and Biosynthesis
   ◦ 31: Transition Metal Organic Compounds
   ◦ Back Matter

• Book: Virtual Textbook of OChem (Reusch) UNDER CONSTRUCTION

1: Structure and Bonding
   ◦ 2: Intermolecular Forces
   ◦ 3: Chemical Reactivity
   ◦ 4: Aromaticity
   ◦ 5: Nomenclature
   ◦ 6: Stereoisomers Part I
   ◦ 7: Stereoisomers Part II
   ◦ 8: Alkanes
• Book: Organic Chemistry - A "Carbonyl Early" Approach (McMichael)

This is the textbook for a one semester organic chemistry "survey" course. You will be learning and applying the principles which govern the structure of organic compound and relating your understanding of structure to the reactions—the changes in structure—which happen when specific portions of organic compounds interact with other chemical substances. We will spend the first several weeks of the semester looking at a group of organic compounds which share a common structural element—the ca
Organic Chemistry I (Liu)

An open textbook that is suitable for the first semester of Organic Chemistry. Basic concepts of the structures and reactivities of organic molecules are covered in this open textbook. Besides the fundamental discussions of organic acids-bases, stereochemistry, IR and NMR, this book also includes the topics of substitution and elimination reactions, radical substitution of alkanes, preparation and reactions of alkenes and alkynes.

• Map: Organic Chemistry (Bruice)
1: Electronic Structure and Bonding (Acids and Bases)
2: An Introduction to Organic Compounds- Nomenclature, Physical Properties, and Representation of Structure
3: Alkenes- Structure, Nomenclature, and an Introduction to Reactivity • Thermodynamics and Kinetics
4: The Reactions of Alkenes
5: Stereochemistry- The Arrangement of Atoms in Space; The Stereochemistry of Addition Reactions
6: The Reactions of Alkynes- An Introduction to Multistep Synthesis
7: Delocalized Electrons and Their Effect on Stability, Reactivity, and pKa (More About Molecular Orbital Theory)
8: Substitution Reactions of Alkyl Halides
9: Elimination Reactions of Alkyl Halides (Competition between Substitution and Elimination)
10: Reactions of Alcohols, Ethers, Epoxides, Amine, and Sulfur- Containing Compounds
11: Organometallic Compounds
12: Radicals (Reactions of Alkanes)
13: Mass Spectrometry, Infrared Spectroscopy, and Ultraviolet/Visible Spectroscopy
14: NMR Spectroscopy
15: Aromaticity (Reactions of Benzene)
16: Reactions of Substituted Benzenes
17: Carbonyl Compounds I- Reactions of Carboxylic Acids and Carboxylic Derivatives
18: Carbonyl Compounds II- Reactions of Aldehydes and Ketones • More Reactions of Carboxylic Acid Derivatives • Reactions of α, β- Unsaturated Carbonyl Compounds
19: Carbonyl Compounds III- Reactions at the α- Carbon
20: More About Oxidation-Reduction Reactions
21: More About Amines (Heterocyclic Compounds)
22: The Organic Chemistry of Carbohydrates
23: The Organic Chemistry of Amino Acids, Peptides, and Proteins
24: Catalysis
25: Compounds Derived from Vitamins
26: The Organic Chemistry of Metabolic Pathways
27: The Organic Chemistry of Lipids
28: The Chemistry of Nucleic Acids
29: Synthetic Polymers
30: Pericyclic Reactions
31: The Organic Chemistry of Drugs- Discovery and Design
Back Matter
• Map: Essential Organic Chemistry (Bruice)

1: Electronic Structure and Covalent Bonding
2: Acids and Bases
3: An Introduction to Organic Compounds: Nomenclature, Physical Properties, and Representation of Structure
4: Alkenes: Structure, Nomenclature, and an Introduction to Reactivity
5: The Reactions of Alkenes and Alkynes: An Introduction to Multistep Synthesis
6: Isomers and Stereochemistry
7: Delocalized Electrons and Their Effect on Stability, Reactivity, and pKa (Ultraviolet and Visible Spectroscopy)
8: Aromaticity: Reactions of Benzene and Substituted Benzenes
9: Substitution and Elimination Reactions of Alkyl Halides
10: Reactions of Alcohols, Amines, Ethers, and Epoxides
11: Carbonyl Compounds I: Reactions of Carboxylic Acids and Carboxylic Derivatives
12: Carbonyl Compounds II: Reactions of Aldehydes and Ketones • More Reactions of Carboxylic Acid Derivatives
13: Carbonyl Compounds III: Reactions at the α-Carbon
14: Determining the Structure of Organic Compounds
15: The Organic Chemistry of Carbohydrates
16: The Organic Chemistry of Amino Acids, Peptides, and Proteins
17: How Enzymes Catalyze Reactions The Organic Chemistry of Vitamins
18: The Organic Chemistry of Metabolic Pathways
19: The Organic Chemistry of Lipids
20: The Chemistry of Nucleic Acids
21: The Organic Chemistry of Drugs: Discovery and Design
- Map: Organic Chemistry (Vollhardt and Schore)
Welcome to organic chemistry! This text has been written for students. It emphasizes the practical details and skills needed to master this challenging subject. Learning organic chemistry is brain yoga! Our brains become strong and flexible with practice.
A mastery over several such techniques enables the molecular architect (popularly known as organic chemist) to achieve the challenging task of synthesizing the myriad of molecular structures encountered in Natural Products Chemistry, Drug Chemistry and modern Molecular Materials. In this task, organic chemists are further guided by several ‘thumb rules’ that chemists have evolved over the past two centuries.
13: Synthesis of Vitamin B\textsubscript{12}
- 14: Green Chemistry - Protection-Free Organic Synthesis
- Back Matter

• Book: Complex Molecular Synthesis (Salomon)

Design and Logic in the Biosynthesis and Total Synthesis of Natural Products

- Front Matter
- 1: Some Principles of Synthetic Planning
- 2: Sugars - Biosynthetic Starting Materials
- 3: Fatty Acids and Prostaglandins
- 4: Terpenes
- 5: Polyketides
- 6: Amino Acids and Alkaloids
- Back Matter

• Book: Catalytic Asymmetric Synthesis (Punniyamurthy)
Catalytic asymmetric synthesis is the synthesis of a compound that favors the formation of a specific enantiomer or diastereomer via catalysis synthetic methods. Enantioselective synthesis is a key process in modern chemistry and is particularly important in the field of pharmaceuticals, as the different enantiomers or diastereomers of a molecule often have different biological activity.

- Front Matter
- 1: Reactions using Chiral Lewis Acids and Brønsted Acid
- 2: Asymmetric Carbon-Carbon Bond Forming Reactions
- 3: Synthesis via C-H Activation
- 4: Carbon-Heteroatom Bond-Forming Reactions
- 5: Oxidation Reactions
- 6: Hydrogenation Reactions
- 7: Reactions in Nonconventional Conditions
- 8: Asymmetric Hydrosilylation and Related Reactions
- 9: Carbonylation Reactions
- 10: Organocatalysis
- 11: Enzyme-Catalyzed Asymmetric Reactions
- 12: Solutions
- Back Matter

- Book: Radical Reactions of Carbohydrates (Binkley)

Volume I: "Structure and Reactivity of Carbohydrate Radicals", is concerned with the basic structure of carbohydrate radicals and the reactivity that can be expected from these intermediates. "Volume II: Radical Reactions in Carbohydrate Synthesis" contains discussion and analysis of the radical reactions that have been used in carbohydrate synthesis.
Radical Reactions of Carbohydrates I: Structure and Reactivity of Carbohydrate Radicals
Radical Reactions of Carbohydrates II: Radical Reactions of Carbohydrates

Organic Chemistry I (Cortes)

1: Introduction and Course Organization
2: Atomic Structure
3: Covalent Bonding
4: Lewis Formulas, Structural Isomerism, and Resonance Structures
5: Orbital Picture of Bonding- Orbital Combinations, Hybridization Theory, and Molecular Orbitals
6: Electron Delocalization and Resonance
7: Introduction to Organic Chemistry
8: Conformational Analysis of Alkanes
9: Supplementary Notes for Stereochemistry
10: Intro to Theory of Chemical Reactions
11: Bronsted Acid-Base Chemistry
12: Introduction to Lewis Acid-Base Chemistry
13: Study Guide for Chapters 6 and 7
14: Highlights of Nucleophilic Substitution Reactions Involving sp3 Carbon
15: Relationship Between Sn1 and E1 Reactions
16: Electrophilic Additions of Alkenes as the Counterpart of Eliminations
17: Alkene Reactions Part 2
18: Important Concepts in Alkyne Chemistry
19: Oxidation States of Carbon
20: Common Synthetic Sequences
21: Hydride Reactions
22: Study Guide
Problems
Organic chemistry is the chemistry of carbon and carbon-containing compounds. Since the core structural, catalytic, information storage, and retrieval systems of organisms are carbon-based macromolecules, organic chemistry is of direct relevance to the life sciences. Just as importantly, the properties of carbon make possible an amazing range of molecules with unique properties, from small molecules to complex plastics and even more complex biomolecules.

- Front Matter
- 1: Acid–Base Reactions
- 2: Spectroscopy- how we know what we know about the structure of matter
- 3: Conformations and Configurations - the consequences of the three-dimensional nature of carbon compounds
- 4: Nucleophilic Substitution Part II
- 5: Alkenes and Alkynes
- 6: Alcohols and an introduction to thiols, amines, ethers and sulfides
- 7: Nucleophilic attack at the carbonyl carbon-
- 8: Conjugated compounds and aromaticity
- 9: A return to the carbonyl
- Back Matter
This brief book is the outgrowth of some forty lectures in which it was attempted to explain the phenomenon of nuclear magnetic resonance absorption and the uses of high-resolution nuclear magnetic resonance spectroscopy to organic chemists whose background, like that of the author, has often been deficient in nuclear and electromagnetic theory.

- Front Matter
- 1: Introduction - The Nuclear Resonance Phenomenon
- 2: The Chemical Shift
- 3: Spin-Spin Splitting
- 4: Nuclear Magnetic Resonance and Reaction Kinetics
- 5: Nuclear Quadrupole Relaxation Effects and Double Resonance
- Back Matter

- Book: Polymer Chemistry (Schaller)

- Front Matter
1: Monomers and Polymers
   ◦ 2: Synthetic Methods in Polymer Chemistry
   ◦ 3: Kinetics and Thermodynamics of Polymerization
   ◦ 4: Polymer Properties
   ◦ Back Matter