

Syllabus: 341 Chem.

Heterocyclic Organic Chemistry

Cr. H. (2+0)

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Chap. 1: Heterocycles and Aromaticity

- Definition of H.C. compounds, natural sources and importance.
- Criteria for aromaticity; aromatic and non aromatic heterocycles.
- Chemical behavior of aromatic compounds.

Chap. 2: Nomenclature of Heterocyclic compounds

- Different methods of naming heterocyclic compounds: common nomenclature, modified replacement nomenclature and Hantzsch-Widman nomenclature (IUPAC)
- Nomenclature of fused heterocyclic compounds (benzofused heterocycles and two or more fused heterocycles)

Chap. 3: 5-Membered heterocyclic compounds

Synthesis and reactions of pyrrole furan, thiophene, indole, and diazoles (imidazole and pyrazole)

Chap. 4: 6-Membered heterocyclic compounds

Synthesis, reactions and basicity of pyridine, and quinoline

Chap. 5: Biologically important heterocycles

Uraciles (pyrimidines) and purines: structure, synthesis, DNA and RNA nucleotides (structure and nomenclature)

Chap. 6: Carbohydrates

Definition, nomenclature, classification of carbohydrates

- Monosaccharides: absolute configuration, cyclic structures, oxidation, reduction, osazones, ascorbic acids and amino sugars
- Oligo and polysaccharides: structure and cellulose technology

Chap 7 : Amino acids and proteins

Naturally occurring amino acids: properties, synthesis and reactions.

- Synthesis of peptides
- Protein classification

Chap 8: Lipids and fatty acids

- Structure and main characteristics of fatty acids
- Classification of lipids: waxes, oils and fats (triglycerides).
- Synthesis and properties of triglycerids and glycolipides.

Text books:

1. المركبات الحلقية غير المتجانسة ، أ.د. حسن الحازمي، ناصر العندس، سهام العيسى، دار الخريجي للنشر و التوزيع، الطبعة الأولى ، ١٤٢٢ .
2. تسمية المركبات العضوية ، أ.د. حمد الخثلان ، أ.د. حسن الحازمي، دار الخريجي للنشر و التوزيع، ١٤١٥ .
3. Heterocyclic chemistry, J.A. Joule and K. Mills, 4th ed., Blackwell Publishing 2000
4. <http://www.acdlabs.com/iupac/nomenclature/>
5. http://chemistry.boisestate.edu/people/richardbanks/organic/mc/additional%20questions%20vol%202/additional_multiple_choice_quest_vol2.htm
7. http://chemistry.boisestate.edu/people/richardbanks/organic/mc/additional_questions/additional_multiple_choice_quest.htm
8. <http://www.cem.msu.edu/~reusch/VirtualText/Questions/problems/exam2.htm>
9. <http://www.cem.msu.edu/~reusch/VirtualText/Questions/problems/exam3.htm>
10. <http://www.cem.msu.edu/~reusch/VirtualText/Questions/problems/exam5.htm>
11. <http://www.cem.msu.edu/~reusch/VirtualText/Questions/problems/exam7.htm>
12. <http://www.cem.msu.edu/~reusch/VirtualText/Questions/problems/exam8.htm>
13. <http://www.cem.msu.edu/~reusch/VirtualText/Questions/problems/exam9.htm>
Publishing 2000
14. <http://www.acdlabs.com/iupac/nomenclature/>

Grading System

1 st Mid-Term Exam20
2 nd Mid- Term Exam 20
Homework & Project10
Quizzes10
<u>Final Exam.</u>	<u>..... 40</u>
Total	100

Good luck