**Syllabus: (145 Chem. Health Science, 2 Cr (2+0))**

**Chap 1: Hydrocarbons compounds** **(2 Lectures)**

Chemical Bonds (ionic, Covalent), Atomic and Molecular orbital, Hybridization, Polarity and Inductive effect.

**Chap 2: Alkanes and Cycloalkanes (3 lectures)**

Alkyl groups, IUPAC nomenclature, Isomerism (structural and geometrical), physical properties, sources, synthesis, reactions (Combustion, Halogenations and ring opening).

**Chap 3: Alkenes and Alkynes (4 lectures)**

IUPAC nomenclature, physical properties , Isomerism geometrical, synthesis (dehydrohalogenation of alkyl halides, dehydration of alcohols], Reaction [Reduction, halogenations, hydrogenation, addition of HCN, HX Markonikov rule, Carbonium ions and their stability, Hydration, halohydrin formation, oxidation, epoxidation, ozonololysis].

**1st Midterm Exam**

**Chap 4: Aromatic compounds (3 lectures):**

Aromatic character, Huckel rule, Nomenclature, Electrophilic aromatic substitution reactions (Alkylation, halogenations, alcylations, nitration, sulphonation) and side chain (halogenations of alkyl side chain, oxidation), Orientation in monosubstituted benzenes derivatives.

**Chap 5: Alkyl halides (2 lectures):**

IUPAC nomenclature, Classification, physical properties, synthesis **(**alcohol with SOCl2, PX3, PX5, halogenations of alkanes, addition of HX to alkenes and alkynes) Reactions (Grignard reagent, Nucleophilic substitution (CN-, OH-, NH3....))

**Chap 6: Alcohol and Phenol (3 lectures)**

Classification, IUPAC nomenclature, physical properties, Hydrogen bondings, Acidity, synthesis of alcohols (Grignard reagent with aldehyde and ketone, reduction of aldehyde, ketones , acids and esters). Synthesis of phenols (hydrolysis of diazonium salt, alkalin fusion, of sodium benzene sulfonates), reaction of alcohols (salt formation, oxidation, ester formation), reaction of phenol (salt formation, oxidation, ester formation).

**Chap 7: Ethers and Epoxides (2 lectures)**

Classification, IUPAC nomenclature, physical properties, Synthesis of ether ( dehydration of alcohols , William synthesis of epoxide, synthesis from alkenes and halohydrin) reaction of ethers (with HI, reaction of epoxide with H2O, ROH, HX, LiAlH4, phenol, Grignard reagent).

**2nd Midterm Exam**

**Chap 8 : Aldehyde and ketones (2 lectures)**

Nomenclature (IUPAC), physical properties, synthesis (oxidation of alcohols, Rosenmod`s reductions), reaction (addition of Grignard reagent alkynide ions, and HCN, addition of alcohol (hemiacetal, acetal, hemiketal, and ketal formation, Hydrazones and oximes.

**Chap 9: Carboxylic acids and it's derivatives (4 lectures)**

Nomenclature (IUPAC), physical properties, synthesis (Alkyl and aryl Nitrile hydrolysis, reaction with CO2), reactions (Acidity, salt formation, formation of acid derivatives: acid chloride, acid anhydride, amide, ester. Haloform reduction, Hydrolysis of acid derivatives).

**Chap 10: Amines**

Classification, IUPAC nomenclature, physical properties, Synthesis (Reduction of amide and nitro compounds), Reactions (Basicity formation of diazonium salts)

Text book: Elements of organic chemistry by Isaak Zimmerman and Henry Zimmerman, 2nd edition.

Distribution of marks

Med Exam I … ……....30

Med Exam II …….. 30

Final Exam. ………………….. 40

Total 100