**340 chem (Organic Chemistry)**

**Introduction and Course Goals**

Welcome to **Organic Chemistry**. **Chem. 340 2(2+0),** course offered to meet the needs of students interested in cheemistry sciences, and provide them with the basic concepts of organic chemistry relevant to their further studies and life. All will be discussed and explored in detail. When you finish this course, you should be able to:

√        Classification of organic compounds

√        Nomenclature of common classes of organic compounds

√        Relationship between structure, physical and chemical properties

√        Formation and reactions of common functional groups

√        Application of organic compounds in life.

**LECTURE SCHEDULE**

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| **No.** | **Topic** |
| **1** | **Introduction and course requirements****Organic- Halides**  Nomenclature, physical properties.  Synthesis [halogenations of alkanes, addition of HX to alkenes and alkynes, from alcohol ( SOCl2 , PX3, PX5)].  (SN1, SN2, E1, E2)  Reactions (nucleophilic substitution elimination, Grignard’s reagent, reduction by metal and acids) |
| **2** | **Alcohols**  Nomenclature, physical properties.  Addition of water to alkenes; oxidiation of alkenes  Substitution of halogen in halide alkyl  Grignard reagent with Aldehdydes , ketones and esters, reduction of Aldehdydes, ketones , acids and esters). |
| **3** | **Alcohols**  Reaction of alcohols (salt formation, oxidation, ester formation.  Reactions with hydrogen halide, SOCl2, PX3,  Elimination of H2O |
| **4** | **Thiols**  Nomenclature, physical properties.  Preparation  Reactions |
| **5** | **Phenols**  Nomenclature, physical properties  Synthesis of phenols (hydrolysis of diazonium salt, alkali fusion, of sodium benzene sulfonates).  Reaction of phenol (salt formation, oxidation, ester formation). |
| **6** | **Sulfides**  Nomenclature, physical properties.  Preparation  Reactions |
|  | **First  MID TERM EXAM** |
| **7** | **Ethers and epoxides**  Nomenclature, physical properties  Synthesis of ether (dehydration of alcohols, William synthesis of epoxide, synthesis from alkenes and alcohol. |
| **8** | **Ethers and epoxides**  Reaction of ethers (with HI, reaction of epoxide(three member ring ) with H2O, ROH,  HX, LiAlH4, phenol, Grignard reagent.  |
| **9** | **Aldehyde and Ketones**  Nomenclature, physical properties.  Synthesis [ oxidation of alcohols, ozonolysis of alkenes, hydration of alkynes, hydrolysis of alkyl dihalides]. |
| **10** | **Aldehyde and Ketones**  Reaction of aldehyde and ketones [ reaction of carbonyl compounds, addition of Grignard reagent, addition of alkynide ions, addition of HCN. |
| **11** | **Aldehyde and Ketones**  Addition of alcohol,(hemiacetal, cital, hemiketal, and ketal formation, no mechanism) Addition of ammonia and its derivatives, synthesis of amino acids , acidity of aldehaydes and ketones, aldol condensation |
|  | **SECOND MID TERM EXAM** |
| **12** | **Carboxylic acid and their derivatives**  Nomenclature, physical properties.  Synthesis [oxidation of aldehyde], carbonation of Grignard reagent, hydrolysis of nitrile, and carbonation of acetylene. |
| 13 | **Carboxylic acid and their derivatives**  Reaction of carboxylic acid( salt formation, formation of acid derivatives: acid chloride, acid anhydride, amide, ester. |
| **14** | **Carboxylic acid and their derivatives**  Reaction of acid derivatives [elimination reaction, hydrolysis of acid chloride, ester, reaction with acid chloride, acetylation, reduction. |
| **15** | **Amines**  Nomenclature, physical properties.  Synthesis, of amines[ reduction of nitro, nitrile, oxime, amide, alkylation of ammonia]. |
| **16** | **Amines**Reaction [salt formation, alkylation, reaction with nitrous acid, amide formation. |
|  | **Final EXAM** |

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| First Mid Term Exam | 20  |
| Second Mid Term Exam | 20  |
|   Quizzes | 10  |
| Homeworks | 10 |
| Final Exam | 40 |
| Total | 100  |

**RESOURCES**

**Textbooks**

**Organic chemistry: A short course, Harold hart *et al  1995***

**Electronic Resources**

Organic Chemistry - tenth edition - By T. W. Graham Solomons & Caraig B. Fryhle

موقع التنزيل المتاح هو

<https://drive.google.com/file/d/0B3yBUlQNJt0lT2NCSlBjZ0FRUnc/edit?pref=2&pli=1>