Department of

CHEMISTRY

Department Contact:

Chairman’s Office

Tel: 6825945-236 Fax: 6823368

E-mail :
Website:

History:
Chemistry department is considered one of the oldest in the university. It was established in 1421-1422 H. within the faculty of Education. The department awards Bachelor of Science degree (B.Sc.) in Chemistry.

Departmental Requirements:
To earn a B.Sc. Degree in Chemistry, student must complete 136 credit hours distributed as follows:
*12 credit hours of university courses.
*31 credit hours of faculty courses.
*75 credit hours of department courses according to specialization made up of.
*69 credit hours of core department courses.
*6 credit hours of electives, from the department.
*6 credit hours of free courses.
*12 credit hours of free courses from out the department.

Requirements for Department of CHEMISTRY Credit Hours 69

<table>
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<th>No</th>
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Course Descriptions:
CHEM 2110: Inorganic Chemistry (1)
Introduction including electronic configuration and chemical properties depending on the general properties and periodicity of elements of main groups – Ionic and covalent compounds – studying the physical and chemical properties for each group – Studying the position of hydrogen in the periodic table and its physical and chemical properties – studying hydrogen compounds – studying electron deficient compounds and studying boron compounds as an example.

Prerequisites: CEHM 2110

CHEM 2120: Inorganic Chemistry (2)
Importance and occurrence of Transition Elements in Periodic Table – Properties of the first transition elements series – Simple introduction to the crystal field and valence bond theories – Color and Paramagnetic properties – Disproportionation reactions – Study of Lanthanides and Actinides – Study of different oxidation states and chemical reaction.

CHEM 2310: Chemical Thermodynamics
Introduction to thermodynamics – Thermochemistry – First law of thermodynamics – Chemical, Mechanical and Thermal equilibria – Second and third law of thermodynamics – Free energies

CHEM 2320: Electrochemistry

Prerequisites: CHEM 3210

CHEM 2420: Organic Chemistry (2)
Classification, nomenclature, physical properties, synthesis and reactions of the following organic classes: Alcohols, Phenols, Ethers, Aldehydes, Ketones, Carboxylic acids and Amines – Mechanisms of different chemical reactions.

Prerequisites: CHEM 2410

CHEM 2210: Qualitative Analysis
Introduction to qualitative analysis – Importance of studying qualitative analytical chemistry – Principles of qualitative analysis – Study the chemical equilibria – Application on acid base reactions – Solubility and solubility products – Precipitation reactions – Theoretical principles of separation of mixtures.

CHEM 2220: Quantitative Analysis
Introduction to quantitative analysis – Volumetric analysis: Neutralization titration, Precipitation titration, Oxidation-Reduction titration, compleximetry – Gravimetric analysis: methods of gravimetric analysis, Precipitated and weighed form – Organic and Inorganic Precipitant

Prerequisites: CEHM 2210 CHEM 3130: Coordination Chemistry
Theories of chemical bonds in coordination compounds: Verner Theory, Valence Bond Theory, Crystal Ligand Field Theory, Molecular Orbital Theory – Electronic Spectra of Transition Metal Complexes: Different electronic transitions, Energy levels of transition metal ions, Russel and Sandor theory, Ligand field theory, Orgel diagrams, Absorption spectra of transition metal complexes

Prerequisites: CHEM 2120

CHEM 2410: Organic Chemistry (1)
Structures of Organic compounds – Aliphatic Hydrocarbons: Structures, nomenclature – Stereocchemistry of cycloalkanes and alkenes, Synthesis and reactions – Aromatic Hydrocarbons: Benzene aromaticity, nomenclature, synthesis and reactions

CHEM 3140: Chemistry of Organometallic Compounds
Definition and stability of organometallic compounds – Derivatives of metals of group 1A to 5A – Transition metal complexes – Classification of ligands – 18 electron rule – Theoretical background of the rule – Carbonyl complexes bonding structure and synthesis – π-complexes bonding and reactions – Oxidation addition reactions – Insertion reactions – Homogeneous catalysis examples – Infrared and nuclear magnetic resonance in organometallic studies

Prerequisites: CHEM 2110 + CHEM 2410

CHEM 2370: Chemistry of Petroleum
Introduction and studies of physical properties of matters – Ionization mechanism – Debye Huckel law and molar conductance of ions – Transport number – Conductance and ionic speeds – Applications of conductance measurements – Theory of conductance and factors affecting conductance – Hydration of ions and ionic colligation

Prerequisites: CHEM 2310

CHEM 2510: Chemistry of Petroleum

Prerequisites: CHEM 2410

CHEM 3170: Group Theory

Prerequisites: CHEM 3130

CHEM 3180 Advanced Inorganic Chemistry:

Prerequisites: CHEM 3130

CHEM 3240: Chromatographic separation theory
Introduction to thermodynamics – Thermochemistry – Fi

CHEM 3330: Kinetic Chemistry
Introduction of kinetic chemistry – Reaction rate and factors affecting the rate – Simple reaction – Kinetics of complex reaction – Basic experimental methods of measuring reaction rate – First and second order reactions – Collision reaction – Arrhenius equation – Activation energy.

Prerequisites: CHEM 2310

CHEM 3430: Heterocyclic Chemistry
Nomenclature of aromatic and non aromatic heterocyclic compounds – Synthesis and chemical reactions of heterocyclic five member ring containing one and two hetero atoms – Methods of preparation and physical properties of Indol and its compounds – Study of preparation and chemical reactions of six membered ring containing one and two hetero atoms – preparation and chemical reactions of Quinoline and isoquinoline.

Prerequisites: CHEM 2420

CHEM 3440: Polymer chemistry
Introduction of polymer chemistry – Definition, Properties, General synthesis – Types of polymerization system – Copolymerization and their stereochemistry – Methods of petrochemical production – Chemistry of industrial fibers – used technology in manufacturing polyethylenes – Polystyrenes – PVC and natural rubber

Prerequisites: Chem 2420

Chem 3450: Physical Organic Chemistry
Structure and reactivity of hydrocarbon radical cations – Orbital interactions and long range electron transfer – Charge distribution and charge separation in radical rearrangement reactions – Solvent effects reaction coordinates and reorganization energies on Nucleophilic substitution reactions in aqueous solution.

Prerequisites: CHEM 2410

Chem 4150: Spectroscopy of Inorganic Compounds

Prerequisites: CHEM 2120

CHEM 4160: Nuclear and Irradiation Chemistry

Prerequisites: CHEM 2120

CHEM 4250: Electrochemical Analysis

Prerequisites: CHEM 2220

CHEM 4260: Environmental and Pollution Chemistry

Prerequisites: CHEM 2220 + CHEM 3240

CHEM 4340: Quantum Chemistry

Prerequisites: CHEM 2110 + Cals 1080

CHEM 4360: Chemistry of Corrosion

Prerequisites: Chem 3320

Chem 4350: Chemistry of Surface and Catalysis

Prerequisites: Chem 3330

Chem 4460: Chemistry of Natural Products
Introduction and definition of natural products resulting from secondary metabolites – Isolation and separation – Terpenes study; Classification, Chemistry of Terpenes, biosynthesis – Steroids study; classification, examples on some Steroid compounds, biological importance, biosynthesis – Alkaloids: isolation from plants, classification, examples on some alkaloidal compounds of various classes – Plant phenolics: examples ( flavonoids and coumarins), biosynthesis

Prerequisites: CHEM 2420

CHEM 4470: Organic Reaction Mechanism
Introduction of organic reaction mechanism – Determination of reaction mechanism by physical and chemical properties – Nucleophilic substitution – Elimination reactions – Electrophilic addition to carboncarbon double bond–Nucleophilic addition to carbonyl group– Rearrangement reactions.

Prerequisites: CHEM 2420

CHEM 4480: Organic Spectroscopy

Prerequisites: Chem 3130

Chem 3240: Chromatographic separation theory

Prerequisites: CHEM 3430.

**CHEM 4490: Principles of NanoChemistry**


**Prerequisites:** CHEM 2420

**CHEM 4980: Chemical Search Project**

Identification and classification of Periodicals – Abbreviations for Journals and writing references for Journals and Books in a proper way – Definition and importance of reviews, Patents, Encyclopedias and other major Reference Books – The use of Chemical abstract service including all index , writing and Presentation of a Seminar – Writing and Discussion of a small report in any of Chemical fields.

**CHEM 4390: Solid State Chemistry**


**Prerequisites:** CHEM 2310

**CHEM 4530: Advanced Organic Chemistry**


**Prerequisites:** CHEM 2420

**CHEM 4380: Molecular stimulation**

Introduction and basic definitions of surface chemistry– study of surface tension phenomenon –Classical dynamics –Force field – Periodic and stochastic boundaries – Carlo and molecular dynamics simulation – Free energy.

**Prerequisites:** CHEM 4350

**CHEM 4280: Statistics Analytical Chemistry**


**Prerequisites:** CHEM 3230 + Calcs. 1080

**CHEM 4270: Application of Computer in Chemistry**


**Prerequisites:** CHEM 3230

**CHEM 3550: Industrial Chemistry**


**Prerequisites:** CHEM 3230

**CHEM 4230: Instrumental Analysis**


**Prerequisites:** CHEM 2220

**CHEM 3520: Carbohydrate Chemistry**


**Prerequisites:** CHEM 2420

**CHEM 3190: Transition Metal Applications**

Homogeneous Transition Metal Catalysis (Carbonylation of alkenes and alkenes catalyzed by metal–Preparation of organotransition metal complexes) –Basic Chemistry of transition metal complexes and their reaction patterns (Formation of transition metal complexes – Fundamental reactions of transition metal complexes – Comparisons of transition metal catalyzed reactions with Grignard reactions)–Synthetic reactions via transition metal carbine complexes (Chemistry of transition metal carbin complexes – Catalytic metatheses of Alkenes and Alkynes and their synthetic applications)

**Prerequisites:** CHEM 2120
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<td><strong>Professors</strong></td>
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| Nadia Ragab Mohamed  
    Organic  
    2007, National Research Center, Cairo.  
    nadia_ragab_m@hotmail.com |
| **Associate Professors**  |
| Amal Fathy Waly  
    Biochemistry  
    2006, Aggrecalueer Research Center, Cairo |
| **Assistant Professors**  |
| Sarah Salem Ayedh Al-qahtani  
    Chemistry  
    2010, King saudi University  
    shams056@hotmail.com |
| Wissal Ahmed Hassani  
    Physical Chemistry  
    2005, Alkhartoum University  
    wisalomdur@yahoo.com |
| Abeer Zein Elabdeen Ragab  
    Inorganic Chemistry  
    2006, Menufia University  
    pinkroseabeer@yahoo.com |
| Mai Mostafa Ahmed Hassan  
    Inorganic Chemistry  
    2004, Mansoura University  
    freeyosof2005@yahoo.com |
| **Lecture**  |
| Rawan Meaigeb Alkabery  
    Chemistry  
    2001AlKrj. University  
    r-r-r-r-r-r-r@hotmail.com |
| **Adminstrator**  |
| Rawan Meaigeb Alkabery  
    Chemistry  
    2001AlKrj. University  
    r-r-r-r-r-r-r@hotmail.com |