Course specification

University/Academy: Damanhour

Faculty/Institute: Faculty of Science

Department: Chemistry

1. Course Data:		
Course code: **Chem. 352**	**Course title:** **Analytical, Organic and Physical Chemistry**	**Academic year/level:** **2009-2010**
Specialization: **Third year (botany) /2nd term**	**No. of instructional units:** **lecture** 3+2 **practical** -----	

2. course Aim	• **Understand the basic concepts of Separation techniques, Electroanalytical methods and Spectrophotometric techniques.** • **Realize the principles of Definition, nomenclature,and Classification of Carbohydrates.** • **Understand the chemistry of Amino acids, Piptides, Lipids and nucleic acids.** • **Recognize the chemistry of Kinetics (Rate of reaction, and Methods of determination of reaction order.** **Understand the basic concepts of Transition-state theory, the collision theory, the catalysis, and Colloidal state of Matter.**
3. Intended learning outcome	
a) Knowledge and understanding	**A1: Understand solvent extraction, chromatographic techniques, ion exchange resins, electrophoresis potentiometry, polarography, Spectrophotometric techniques (UV., Vis. and IR), Atomic absorption, Fluorescence and emission spectra.** **A2: Recognize the principles of definition, classification, conformation and reactions of Carbohydrates, Amino acids, Lipids and nucleic acids.** **A3: Know of the Application of Chemistry Kinetics and Colloidal state of Matter.**

b) Intellectual skills	**B1: Estimate the basic concepts of Separation techniques, Electroanalytical methods and Spectrophotometric techniques.** **B2: Decide the principles of Carbohydrates, Amino acids, Lipids and nucleic acids.** **B3: Discuss the Application of Chemistry Kinetics and Colloidal state of Matter.**
c) Professional skills	**C1: Write the chemistry of Carbohydrates, Amino acids, Lipids and nucleic acids.** **C2: Explain the Application of Chemistry Kinetics and Colloidal state of Matter and spectroscopic techniques (IR, and UV spectra) in the identification of organic compounds.**
d) General skills	**D1: Use IT and web search engines for collecting information.** **D2: Work effectively in a team, and independently on solving organic chemistry problems.** **D3: Exchange ideas, principles and information by oral, written and visual means.** **D4: Communicate effectively with his lecturer and colleagues.**
4. course content	**ANALYTICAL CHEMISTRY** **Separation techniques (solvent extraction, chromatographic techniques, ion exchange resins, electrophoresis).** **Electroanalytical methods (potentiometry, polarography).** **Spectrophotometric techniques (UV., Vis. and IR).** **Atomic absorption. Fluorescence and emission spectra** **ORGANIC CHEMISTRY** **Chemistry of Carbohydrates: Definition. Classification. Monosaccharides (D- and L-family, ring structure, anomers, conformation, effect of acids and alkalies, oxidation, reduction Oligosaccharides. Polysaccharides.** **Chemistry of Amino Acids and Peptides: Amino acids. Peptides. Physiologically active proteins.** **Chemistry of lipids: Classification. Fatty acids. Triglycerides. Phospholipids. Prostaglandins.**

	Steroids. **Chemistry of nucleic acids: Sugar components. Organic bases. Nucleosides. Nucleotides. Primary structure. Secondary structure.** **Chemistry of heredity. Replication of DNA** **PHYSICAL CHEMISTRY** **Chemical Kinetics: Rate of reaction. Zero, 1st, 2nd and 3rd order reactions. Pseudo unimolecular reactions.** **Methods of determination of reaction order. Complex reactions. Effect of temperature on reaction rates.** **Transition-state theory. The collision theory. Chain reactions. Reactions in solution. General acid-base catalysis. Catalysis by enzymes.** **Colloidal State of Matter: The colloidal state. Classification, preparation and purification of colloidal systems.** **Colligative, optical, kinetic and electrical properties of colloidal systems.** **Electrokinetic phenomena. Stability and instability of the colloidal systems**
5. Teaching and learning methods	**4.1. Lectures and seminars using data show and board.** **4.2. Problem classes and group tutorial.** **4.3. Reports and discussion groups**
6. teaching and learning methods for students with special needs	----------
7. Student Assessment	**5.1. Mid term exam.** **5.2. Problems.** **5.3. Assignments.** **5.4 Written exam.**
a) Procedures used:	**Assessment Schedule** **Week: 16**
b) Schedule:	**Assessment 1: Mid term** **Assessment 2: Final written**

c) Weighing of Assessment:	**Mid-Term Examination: 0** **Final-Term Examination: 150** **Semester Work: 0** **Other types of assessment 0** **Total 150**
8. List of Textbooks and References:	**6.1. Course Notes** • **Chemistry Rob Lewis and Wynne Evans, Palgrave Macmillan Houndmills, Basingstoke, Hampshire RG21 6XS and 175 Fifth Avenue, New York, N.Y. 10010, 3rd edition, 2006** • **Physical chemistry, Peter Atkins, Julio de Paula, Oxford University Press, New York, Oxford, 2006.** • **Herper's illustrated Biochemistry,27 th Edition by Murray,Granner and Rodwell,2006.** • **Periodical and website**
a) Course Notes	**Essential Books (Text Books)** **Chemistry "The Central Science", Theodore L. Brown, H. Eugene LeMay, Jr and Bruce E. Bursten (Editors), Pearson Education International, Prentice Hall, 10th Edition, 2006.**
b) Required Books (Textbooks)	• **Fundamentals of Organic chemistry, 5 th Edition by Solomon, 1991.**
c) Recommended Books	• **Organic Chemistry, 4 th Eddition by Robert Wlorrison and Robert Boyd, Allyn and Bacon, Ir.c., Boston, London, Sydney, Toronto, 1983.** **Organic Chemistry, 6 th Eddition by I. L. Finar, Longmann Group Limited, volume I and I11975.**
d) Periodicals, web sites,…,etc	----------

Course Instructor
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