



SYLLABUS

Course Title	CHEMISTRY-VIII	
Course Code	BSC601	
Course Credit	Lecture	: 04
	Tutorial	: 00
	Practical	: 02
	Total	: 06
Detailed Syllabus:		
Sr. No	Name of chapter & Details	Session Allotted
SECTION-I		
	Inorganic Chemistry	
1	Multi Electron System <ol style="list-style-type: none"> 1. Concept of spectral terms and term symbols. 2. s-s coupling, l-l coupling, l-s coupling, j-j coupling and L-S coupling with vector diagram. 3. Derivation of spectral term symbol for P1, P2, P3, & d1 to d9. 4. Micro states: definition, calculation and derivation of microstates for p1,p2, d1&d2 (pigeon hole diagram). 5. Hund's rules for the determination of ground state spectral term. 	10
2	Crystal Field Theory - II <ol style="list-style-type: none"> 1. Jahn-Teller effect: Statement and explanation. 2. Tetragonal distortion with example. 3. Splitting of d-orbital in square planar complexes with examples. 4. Hole formalism. 5. Splitting of D and F ground terms (using hole formalism). 6. Orgel Diagram of D and F states. 7. Selection rules for d-d transition. 8. Types of electronic transition in metal complexes. 9. Absorption spectrum of Ti³⁺, Cu²⁺ & Ni²⁺. 	10
3	Magneto Chemistry <ol style="list-style-type: none"> 1. Introduction (Magnetic field, Magnetic pole, Intensity of 2. Magnetization). 3. Magnetic induction. 4. Permeability, intensity of magnetism, magnetic susceptibility, molar magnetic susceptibility. 5. Magnetic behavior: Diamagnetism, Paramagnetism, Ferro magnetism and Antiferro magnetism. 6. Effect of temperature on magnetic behavior of substances. 7. Derivation of equation for total angular magnetic momentum and 	08

	diamagnetic momentum. 8. Determination of magnetic susceptibility by Gouy method.	
SECTION-II		
	Industrial Chemistry	
4	Glass <ol style="list-style-type: none"> 1. Introduction 2. Physical and chemical properties of glass 3. Raw materials for manufacture 4. Chemical reactions involved 5. Method of manufacturing 6. Formation of batch material <ul style="list-style-type: none"> ○ Melting ○ Shaping ○ Annealing ○ Finishing 7. Special types of glasses 8. Fused silica glass, High silica glass, optical glass, borosilicate glass, lead glass, colored glass, opal glass, safety glass, fiber glass, glass wool, pyrex glass, photochromic glass, insulating glass, rare earth glass, vitreosil, photosensitive glass. 	07
5	Oil and Fats <ol style="list-style-type: none"> 1. Introduction 2. Distinction between oils and fats 3. Properties of fats and oils 4. Classification of fats and oils 5. Manufacturing of cotton seed oil 6. Expression method 7. Solvent extraction method 8. Refining of crude vegetable oil 9. Hydrogenation of oils 10. Optimum conditions for the process 11. Dry process 12. Wet process 13. Analysis of oils and fats 14. Saponification value 15. Acid value 16. Iodine value 17. Reichert – Meissl (RM) value 	07
6	Soaps and Detergents <ol style="list-style-type: none"> 1. Introduction to soap 2. Raw materials for manufacture 3. Methods for manufacture of soap 4. Batch process 5. Continuous process 6. Types of soap 7. Toilet soap, transparent soap, shaving soap, Neem soap, Liquid soap 8. Recovery of glycerin from spent lye. 9. Introduction to detergents 10. Principal group of synthetic detergents 	06

	<ol style="list-style-type: none"> 11. Bio degradability of surfactants 12. Classification of surface active agents 13. Anionic detergents 14. Manufacture of anionic detergents 15. Oxo Process 16. Alfol Process 17. Welsh Process 18. Cationic detergents 19. Manufacture 20. Non – Ionic detergents 21. Manufacture by batch process 22. Amphoteric detergents 23. Manufacture of shampoo 	
7	<p>Environmental Chemistry</p> <ol style="list-style-type: none"> 1. Environment – definition and introduction 2. Segments of environment 3. atmosphere 4. Hydrosphere 5. Lithosphere 6. Biosphere • Air Pollution 7. Introduction 8. Green house effect 9. Major sources of air pollution 10. Photochemical smog and acid rain 11. CFC and ozone depletion 12. Sources and effects of NOX and SOX 13. Control of Air pollution • Water pollution 14. Introduction 15. Classification of water pollution 16. Physical pollution 17. Chemical pollution 18. Biological pollution 19. Physiological pollution 20. Sources of water pollution 21. Sewage and domestic waste 22. Industrial effluents 23. Agricultural discharges 24. Fertilizers 25. Toxic metals 26. Siltation 27. Thermal pollutions 28. Radioactive materials 29. Water Pollution Control 30. Dissolved Oxygen (D.O.) determination 31. Chemical Oxygen Demand (C.O.D.) determination 32. Biological Oxygen Demand (B.O.D.) determination 	08

List of Practicals (6 hours / week)
<p>Aim: To perform inorganic qualitative analysis of given mixture. (10 practical) (Each mixture contains 3 positive radicals & 3 negative radicals)</p> <p>Salts: NaCl, Na₂CO₃, KCl, KNO₃, KBr, KCrO₄, K₂Cr₂O₇, NH₄Cl, (NH₄)₂CO₃, NH₄OH, CuSO₄·5H₂O, CuCl₂·2H₂O, Cu(NO₃)₂, NiSO₄·6H₂O, NiCl₂·6H₂O, FeSO₄·7H₂O, FeCl₃·6H₂O, MnSO₄·H₂O, MgCl₂·4H₂O, MgSO₄, CoCl₂·6H₂O, ZnSO₄·7H₂O, AlCl₃·6H₂O, BaCl₂·2H₂O, CaCl₂·2H₂O</p>
Instructional Method and Pedagogy:
<ol style="list-style-type: none"> 1. Lectures will be conducted with the aid of multi-media projector, black board, OHP etc. 2. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. 3. Surprise tests/Quizzes/Tutorials will be conducted. 4. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. 5. Minimum ten experiments shall be there in the laboratory related to course contents.
Students Learning Outcomes:
<p>After Successful completion of the above course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand Multi electron system. 2. Understand description of Crystal field theory. 3. Different types of magnetism. 4. Types of glass and their mechanism 5. Distinction between oils and fats
Text Books:
<ol style="list-style-type: none"> 1. Text book of Inorganic chemistry by G.S. Sodhi 2. Inorganic chemistry by sharpe 3. Text book of Inorganic chemistry by Gopalan R. 4. B.Sc. Inorganic chemistry by Ekta prakashan
Reference Books:
<p>List of Reference Books Inorganic Chemistry</p> <ol style="list-style-type: none"> 1. Quantum Chemistry– R.K. Prasad, New Age International Publishers 2. Inorganic Chemistry- James E Huheey (3rd Edition) Harper 3. International SI Edition 4. Coordination chemistry – Gurdeep Chatwal and MS Yadav, 5. Himalaya publishing House 6. Principles of Inorganic Chemistry – B.R.Puri, L.R. Sharma & K.C. 7. Kalia; Vallabh Publications, Delhi 8. Modern aspects of Inorganic Chemistry- H.J. Emeleus and A.G. 9. Sharpe; Routledge & Kegan Paul Ltd., 39 Store street, London 10. WCIE7DD 11. Advance Inorganic Chemistry (3rd Edition)- F.A. Cotton and G. 12. Wilkinson; Wiley Eastern Pvt. Ltd. <p>List of Reference Books for Industrial Chemistry</p> <ol style="list-style-type: none"> 1. Environment Pollution Control Engineering by Rao C.S.

2. Industrial Chemistry by B.K. Sharma
3. Environmental Chemistry by A.K. De
4. Environmental Solution of Analysis by S.M. Khopkar
5. Engineering Chemistry by Jain & Jain
6. Regiel's Handbook of Industrial Chemistry by James A. Kent
7. Environmental Chemistry by Sharma & Kaur
8. Outlines of Chemical Technology by Charles Dryden

Additional Resources:

1. https://en.wikipedia.org/wiki/Crystal_field_theory
2. <http://fred.csir.co.za/www/wdm/envirochem/def.html>
3. <http://www.chem.iitb.ac.in/~rmv/ch102/magnet2.pdf>
4. <https://www.thoughtco.com/glass-composition-and-properties-608351>



SYLLABUS

Course Title		CHEMISTRY-IX	
Course Code		BSC602	
Course Credit	Lecture	: 04	
	Tutorial	: 00	
	Practical	: 02	
	Total	: 06	
Detailed Syllabus:			
Sr. No	Name of chapter & Details		Session Allotted
SECTION-I			
1	<p>1. Terpenoids</p> <ul style="list-style-type: none"> ▪ Introduction ▪ Occurrence, Isolation, General characteristics of Terpenoids, Isoprene Rule ▪ Constitution and Synthesis of : <ul style="list-style-type: none"> a. Citral b. Terpeneol <p>2. Amino acids, Peptides and Proteins [8 hours]</p> <ul style="list-style-type: none"> ▪ Introduction ▪ Classification of amino acids name and formula ▪ Synthesis of amino acids by: <ul style="list-style-type: none"> a. Amination of -halogen acids b. Gabriel phthalimide synthesis c. Hofmann Degradation d. Erlen-meyer azlactone synthesis e. Hydantoin method ▪ Physical properties of amino acids, Chemical properties of amino acids, Isoelectric point ▪ Introduction to Polypeptides ▪ Synthesis of Polypeptides by: <ul style="list-style-type: none"> a. Bergmann Method b. Sneeihan's Method (use of Phthaloyl group) c. Fischer's Method (use of p-toluenesulphonylchloride) 		11

	<ul style="list-style-type: none"> ▪ Introduction and classification of proteins ▪ Constitution of Thyroxine, Synthesis of Thyroxine 	
2	<p>1. Synthetic Explosive, Perfumes and Insecticides</p> <ul style="list-style-type: none"> ▪ Synthesis and uses of : ▪ Explosives: <ul style="list-style-type: none"> a. RDX (Research Development Explosive) b. TNT (Trinitrotoluene) c. PETN (Pentaerythritol tetranitrate) ▪ Perfumes: <ul style="list-style-type: none"> a. Musk Xylene b. Musk Ketone c. Musk Ambrette ▪ Insecticides: <ul style="list-style-type: none"> a. Baygon b. Carbendazin c. Parathion 	07
3	<p>1. Polynuclear Aromatic Hydrocarbons</p> <ul style="list-style-type: none"> ▪ Introduction, Synthesis and chemical properties: <ul style="list-style-type: none"> a. Biphenyl b. Diphenyl methane c. Naphthalene d. Anthracene <p>2. Conformational Isomerism</p> <ul style="list-style-type: none"> ▪ Conformation of acyclic system. ▪ Conformational analysis of ethane. ▪ Conformational analysis of n – butane. ▪ Conformation of cyclic system: Cyclohexane and cyclopentane. ▪ Conformational analysis of cyclohexane: Boat form and Chair form. ▪ Conformation of monosubstituted cyclohexane. 	10
SECTION-II		
4	<p>1. NMR Spectroscopy</p> <ul style="list-style-type: none"> ▪ Introduction, principle ▪ Nuclear quantum number ▪ Equivalent and nonequivalent protons with illustrations ; enantiomeric and diastereomeric protons, shielding and de shielding of protons; ▪ Chemical shift ▪ Paramagnetic anisotropic effect ▪ Relative intensity of signals ▪ Spin- spin coupling and coupling constant 	14

	<ul style="list-style-type: none"> ▪ Deuterium labeling ▪ Application of NMR ▪ Problems for determination of structure of organic molecules 	
5	<p>1. Mass Spectroscopy</p> <ul style="list-style-type: none"> ▪ Introduction ▪ Classification of spectroscopy origin and basic principles ▪ Instrumentation ▪ General fragmentation modes ▪ Important future for the mass spectra of alkanes <p>2. Problems based on application of U.V. IR, NMR spectroscopy with empirical and molecular formula.</p>	14
List of Practical (6 hours / week)		
<ol style="list-style-type: none"> 1. Acetylation: <ol style="list-style-type: none"> a. Synthesis of Acetanilide from aniline. b. Synthesis of acetyl salicylic acid from salicylic acid. 2. Nitration: <ol style="list-style-type: none"> a. Synthesis of p- nitro acetanilide from acetanilide. 3. Halogenation: <ol style="list-style-type: none"> a. Synthesis of p- bromo acetanilide from acetanilide. b. Synthesis of of Iododform from acetone. 4. Oxidation: <ol style="list-style-type: none"> a. Synthesis of benzoic acid from benzaldehyde. 5. Reduction: <ol style="list-style-type: none"> a. Synthesis of m – nitro aniline from m – dinitro benzene. 6. Condensation: <ol style="list-style-type: none"> a. Synthesis of benzoyl glycine (Hippuric acid) from glycine. 		
Instructional Method and Pedagogy:		
<ol style="list-style-type: none"> 1. Lectures will be conducted with the aid of multi-media projector, black board, OHP etc. 2. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. 3. Surprise tests/Quizzes/Tutorials will be conducted. 4. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. Minimum ten experiments shall be there in the laboratory related to course contents. 		
Students Learning Outcomes:		
<p>At the end of the course the students will be able to:</p> <ol style="list-style-type: none"> 1. Understand different types of natural product. 2. Different types poly nuclear aromatic compounds. . 3. Understand conformational isomerism. 		

4. Understand NMR spectroscopy.
5. Understand Mass spectroscopy.

Text book:

1. Chemistry of Alkaloids -University Granth Nirman Board Ahmedabad.
2. Reactions and Rearrangements by Gurdeep Chatwal.
3. Name Reactions in Organic Synthesis by Dr. A.R.Parikh et. al.
4. Organic Chemistry of Natural Products by Gurudeep Chatwal Vol L
5. Spectrometric identification of organic compounds
6. By Silverstrin Bassler (16th Edition).
7. Elementary organic spectroscopy by Y. R. Sharma.
8. Spectroscopy of organic compounds by John R. Dyer.
9. Spectroscopy of organic compounds by P. S. Kalsi.

Reference Books:

1. Chemical Application of Group theory by F Albert Cotton
2. Symmetry in chemistry by H. M. Jahe.
3. Molecular spectroscopy by B. K. Sharma.
4. Organic Spectroscopy by B. K. Sharma.
5. Synthetic Organic Natural Products (Vol. I&II) by O.P Agrawal.
6. A Text Book of Organic Chemistry (II Edition) by Raj K. Bansal
7. Medicinal Chemistry by Ashutoshkar.
8. Pharmaceutical Chemistry by Axel Kleemann & Jugen Engel (IV Edition. Thieme Stuttgart New York).
9. Organic Name reactions by Gautam Brahmachari.

Additional Resources:

1. https://en.wikipedia.org/wiki/Nuclear_magnetic_resonance_spectroscopy.
2. <https://www.slideshare.net/solairajanant/nmr-spectroscopy-13887430>.
3. <http://www.cyberlipid.org/simple/simp0004.htm>.
4. <http://www.chem.ucalgary.ca/courses/350/Carey5th/Ch07/ch7-0.html>.
5. <http://chem.ch.huji.ac.il/nmr/whatisnmr/whatisnmr.html>.
6. <https://www.accessscience.com/content/polynuclear-hydrocarbon/535800>.
7. https://en.wikipedia.org/wiki/Explosive_material.
8. <http://www.businessdictionary.com/definition/explosive.html>.



SYLLABUS

Course Title	CHEMISTRY-X	
Course Code	BSC603	
Course Credit	Lecture	: 04
	Tutorial	: 00
	Practical	: 02
	Total	: 06
Detailed Syllabus:		
Sr. No	Name of chapter & Details	Session Allotted
SECTION-I Physical Chemistry		
1	Third Law of Thermodynamics Nernst heat theorem, Third law of thermodynamics, Determination of absolute entropies of solids, liquids and gas, Applications of third law of thermodynamics (ΔS_0 , ΔG_0 and equilibrium constant of chemical reaction, Tests of third law of thermodynamics, Residual entropy)	07
2	Partial Molar Properties Concept of chemical potential, Gibbs-Duhem equation, Variation of chemical potential with temperature and pressure, Determination of partial molar properties by method of intercept, Applications of chemical potential (Henry's law, Raoult's law and Nernst's distribution law)	05
3	Photochemistry <ul style="list-style-type: none"> • Introduction • Difference between thermal and photochemical reactions • Laws of photochemistry: <ul style="list-style-type: none"> Lambert-Beer law Grotthus-Draper law Stark-Einstein law • Factors affecting the quantum efficiency • Classification of photochemical reaction primary photochemical reactions secondary photochemical reactions <ul style="list-style-type: none"> • Mechanism of some photochemical reaction decomposition of HI Reaction of hydrogen and bromine	08

	<p>polymerisation of anthracene</p> <ul style="list-style-type: none"> • Reasons for low and high quantum yield • photosensitization with two examples • luminescence <p>fluorescence phosphorescence chemiluminescence</p>	
4	<p>Electrochemistry Concentration cells: Definition, Electrode concentration cells, Electrolyte concentration cells, Concentration cells without transference, Concentration cells with transference, Liquid junction potential, Elimination of liquid junction potential, Applications of emf measurements: Determination of solubility of sparingly soluble salts, Valency of metal ion, Dissociation constant of weak acid, Transport number of ion, Ionic product of water, Degree of hydrolysis, pH by different electrodes Examples : Mean Activity a_{\pm} , its relation with a_+ and a_-</p>	08
SECTION-II : Analytical Chemistry		
5	<p>Electrochemistry (Conductometry) Electric transport, Conductance in metals and in electrolyte solution, Specific conductance, equivalent conductance, Importance of conductivity electrodes and platinization of electrodes, Variation of specific conductance with dilution as well as area of cross section of dip type electrode and distance between two plates of electrodes etc., Kohlrausch law and its importance, Cell constant and its importance. Conductometric Titration : Strong acid - strong base, Strong acid - Weak base, Weak acid – Strong base, Weak acid – Weak base, Mixture of strong acid + Weak acid - strong base Precipitation Titration : $\text{AgNO}_3 - \text{NaCl}$, $\text{BaCl}_2 - \text{K}_2\text{SO}_4$, $\text{Ba}(\text{OH})_2 - \text{MgSO}_4$ Replacement Titration : Salt of weak acid – strong acid and Salt of weak base – strong base, Degree of hydrolysis and Hydrolysis constant, Determination of solubility and solubility product of sparingly soluble salt, for the measurement of conductivity, Importance of conductivity water and temperature for the measurement of conduction.</p>	10
6	<p>Chromatography Introduction, Classification of chromatography - types of chromatography, Detail study of Adsorption (Column) chromatography, Partition chromatography – paper and TLC, Gas chromatography- GLC & GSC, Ion exchange chromatography, Application such as main physical characteristic of chromatography: Solubility, adsorption value, volatility, R_f value, R_t & R_x value, nature of adsorption etc. (I) Column chromatography: Principles, Method of separation of green leaf</p>	09

	<p>pigment, mixture of inorganic, vitamins, colors of flowers etc. separation of α β γ carotene from carrot.</p> <p>(II) Partition chromatography: Paper chromatography, TLC</p> <ol style="list-style-type: none"> Paper chromatography: Principle of paper chromatography, Experimental methods like :Ascending and Descending method containing one dimensional and two dimensional method, circular method and it's R_f value, R_x value, circulation method, separation of amino acid, sugar, phenyl amine glycine and Fe^{+2} , Co^{+2} , Ni^{+2} mixture using spray reagent ninhydrine and aniline phthalate TLC: Introduction of principles, Method of preparation of chromatoplate, Experimental techniques, superiority of TLC over other chromatographic Techniques, Application of TLC. <p>(III) Gas chromatography: Introduction, Principle of GLC and GSC</p> <ol style="list-style-type: none"> GLC: Instrumentation, Evaluation selection and characteristic of Carrier gas, Effect of temperature & pressure of gas, application. GSC: Methods and its application. <p>(IV) Ion Exchange chromatography: Introduction, Principle, Type of resins, Properties of ion exchange resins, Basic requirement of useful resins, Method of separation with illustration curve, Application of ion exchange resins</p>	
7	<p>Introduction of Complexometry Titration Method of preparation of standard E.D.T.A. Solution, Velcher's law explanation, Graph with stability constant value.</p> <p>Types of EDTA Titration: Direct Titration, Back Titration, Substitution Titration, Alkalimetry titration mixture with the help of masking and damasking agent, Principle of metal ion indicator, Use of EBT, Calcon, Muroxide with structure and characteristic.</p>	04
8	<p>Potentiometric and pH metry Introduction and interpretation of pH metry and potantiomtry, Importance of indicator and reference electrode in the measurement of EMF and pH.</p> <p>E.M.F. method: Study of acid – base Titration, Redox Titration, Argentometric Titration include mixture of Cl^- , Br^- , I^- with graph and proper explanation.</p> <p>pH metry : Definition, Interpretation of various methods of determining pH value like pH paper method (Demonstration only), potentiometric method using only hydrogen electrode as indicator electrode and calomel electrode as reference electrode to determine pH value, Weak acid strong base Titration with curve and determination of dissociation constant (K_a) of weak acid.</p>	05
List of Practical (6 hours / week)		
Potentiometry		
1. To determine normality and dissociation constant of benzoic acid using 0.1N NaOH.		

- To determine normality of given acid xN HCl using NaOH solution.
- To determine concentration of xN FAS using $K_2Cr_2O_7$.
- To determine normality of each halide in the mixture using 0.1N $AgNO_3$ solution.
- To determine normality and dissociation constant of benzoic acid using 0.1N NaOH.

Polarimeter

- To determine specific rotation of three different concentration (10%, 5%, 2.5%) of dextrose solution. From graph find out the unknown concentration by plotting concentration v/s rotation angle.
- Study the inversion rate of sugar in presence of 1N HCl and determine the rate of reaction.

Surface tension:

- Find the surface tension of the liquids A, B, and C by using Dropweight method. Find the value of Parachor of liquids and CH_2 group.

Thermodynamics:

- Calculate entropy of vaporization (ΔS_v) of a given liquid by plotting a graph of $\log(1/\text{time})$ vs. $(1/\text{temperature})$.

Chromatography:

- To determine R_f value of individual and mixture of amino acid by ascending paper chromatography.
- To determine R_f value of individual and mixture of amino acid by circular paper chromatography.
- To determine R_f value of individual and mixture of amino acid by thin layer chromatography (TLC).
- To determine R_f value of individual and mixture of metal ions by ascending paper chromatography.
- To determine R_f value of individual and mixture of metal ions by circular paper chromatography.

Instructional Method and Pedagogy:

- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval.
- Surprise tests/Quizzes/Tutorials will be conducted.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Minimum ten experiments shall be there in the laboratory related to course contents.

Students Learning Outcomes:

At the end of the course the students will be able to:

- Understand physical chemistry
- Understand description of analytical chemistry
- Different types of chromatography

Text Books:

- Textbook of Physical Chemistry by P.L.Soni, S.Chand & Company Ltd. New Delhi, 22nd edition 2005.
- Essentials of Physical Chemistry by Bahl B. S. and Tuli G. D., S.Chand & Company Ltd. New Delhi.

3. Elements of Physical Chemistry by Atkins Peter and Paula Julio, Oxford University press New Delhi, 6th edition.

Reference Books:

1. Fundamental of analytical chemistry by skoog & west
2. Instrumental method of chemical analysis By B. K. Sharma 22 wilhim
3. Water analysis and water pollution by V. P. Kudesia
4. Instrumental method of chemical analysis By Chatwal Amreli
5. Thin layer chematography by Egal stall
6. Book for water analysis: By R.K. Trivali, V. P. Kulesiya.
7. Analytical Chemistry by click
8. Inorganic inflictive analysis by Vogel and Gehani Parekh
9. Electronic methods of analysis by brewing
10. Principle of instrumental analysis by S korg.

Additional Resources:

1. <https://en.wikipedia.org/wiki/Chromatography>
2. <https://www.khanacademy.org/test-prep/mcat/chemical-processes/separations-purifications/a/principles-of-chromatography>
3. <https://www.britannica.com/science/chromatography>
4. <https://web.njit.edu/~kebbekus/analysis/4CHROMAT.htm>
5. <https://www.chemicool.com/definition/potentiometry.html>
6. http://tera.chem.ut.ee/~koit/arstpr/pot_en.pdf.



SYLLABUS

Course Title	CORE SCIENCE PROJECT	
Course Code	BSC615	
Course Credit	Lecture	: 00
	Tutorial	: 00
	Practical	: 03
	Total	: 03
Detailed Syllabus:		
Sr. No	Name of chapter & Details	Session Allotted
PROJECT WORK		
Total Marks: 100 (Only selected students will be enrolled in subject)		
Project Report must be submitted in 35 to 60 pages.		
Presentation PowerPoint for 5 to 10 minutes.		
Instructional Method and Pedagogy:		
<ol style="list-style-type: none">1. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in their previous study.2. At least ten molecules should be synthesized on the basis of current research scenario.		
Students Learning Outcomes:		
At the end of the course the students will be able to:		
<ol style="list-style-type: none">1. Find out difficulties arise during work in laboratory.2. Realize the structural aspects of basic science by their practical performance.3. Aware about various types of reagents and catalyst can use in different reaction conditions..4. Know the process of manufacturing and identification criteria in industrial aspects.		
Text book:		
<ol style="list-style-type: none">1. Dr Deepak Pant, Inorganic Chemistry Practical.2. http://pubs.acs.org/doi/abs/10.1021/cr010334m.		
Reference Books:		
<ol style="list-style-type: none">1. Vogel's: Textbook for organic chemistry.2. Advanced Practical Organic Chemistry, Third Edition.		
Additional Resources:		
<ol style="list-style-type: none">1. https://en.wikipedia.org/wiki/Organic_reaction.		

2. <https://www.sciencedirect.com/>
3. <https://www.sciencedirect.com/science/journal/00404020>.
4. <http://onlinelibrary.wiley.com/>.
5. <http://www.springer.com/in/>.



SYLLABUS

Course Title		CREATING AND MANAGING NEW VENTURES	
Course Code		BBC308	
Course Credit		Lecture	: 03
		Tutorial	: 00
		Practical	: 00
		Total	: 03
Detailed Syllabus:			
Sr. No	Name of chapter & Details		Session Allotted
SECTION-I			
1	<ul style="list-style-type: none"> ○ What is Entrepreneurship? ○ Who is an entrepreneur? ○ Concepts of entrepreneurship and innovation, ○ Myths and approaches to entrepreneurship, ○ The Entrepreneurial perspective, ○ Entrepreneurship in India and prospects, ○ Evolution of entrepreneurship, ○ Case studies of entrepreneurial successes, ○ Startup India and other government policies and programs , ○ Financial support for entrepreneurship and innovation 		22
2	<ul style="list-style-type: none"> ○ Importance of innovation, ○ the innovation process, ○ cases of innovation, ○ how to engineer an innovative product. 		
3	<ul style="list-style-type: none"> ○ Human Resource Management for startups, ○ Entrepreneurial Leadership, ○ legal aspects of entrepreneurship, ○ entrepreneurship marketing, 		
SECTION-II			
4	<ul style="list-style-type: none"> ○ finance in entrepreneurship, ○ Operations and Production management, ○ case study submissions 		23
5	<ul style="list-style-type: none"> ○ Initial idea conceptualization ○ Creativity & Business Ideas: ○ Creativity: Concept & Features of creative people ○ Sources and Techniques of New Ideas 		
6	<ul style="list-style-type: none"> ○ Sample Business plan knowhow, ○ Live development of B-Plan as a group activity ○ presentation skills 		

Students Learning Outcomes:

At the end of this course, students will be able to:

1. Relate and apply various entrepreneurial concepts and business theories in practical context
2. Understand the process of creating a business idea and its implementation
3. Be aware about the basic principles and requirements of being an entrepreneur and how to be one
4. Get inspired for taking up entrepreneurship as a career option

Text book:

1. Entrepreneurship –Theory, Process and Practice –Donald Kuratko & Hodgetts

Reference Books:

1. Entrepreneurship creating and leading an entrepreneurial organization By Arya Kumar, Pearson Education
2. Entrepreneurship-Hisrich Robert D. & Peters Michael P., Tata McGraw-Hill
3. The Dynamics of Entrepreneurial Development and Management -Vasant Desai

Additional Resources:

Books:

1. "The Effective Executive" by Peter Drucker
2. "The startup Playbook " by David S Kidder

Websites:

1. www.entrepreneur.com
2. <http://www.ted.com/>
3. <http://www.allbusiness.com/>
4. <http://www.noobpreneur.com/>
5. <http://yourstory.com/>



SYLLABUS

Course Title		BASICS OF COMPUTER APPLICATIONS	
Course Code		CE451	
Course Credit	Lecture	: 03	
	Tutorial	: 00	
	Practical	: 00	
	Total	: 03	
Detailed Syllabus:			
Sr. No	Name of chapter & Details		Session Allotted
SECTION-I			
1	Computer Fundamentals: Introduction to Computers, Applications, History, Computer Organization, Input and Output Devices, Storage Devices, Classification of Computers, Hardware & Software		22
2	Introduction to Operating System, Windows & its Utilities Introduction to Operating System- Functions of Operating Systems and their characteristics DOS Introduction, Basic DOS commands Windows Introduction to Windows, Features of Windows, Types & Versions Overview of File System, Basic operations with File System Working with Control Panel Creation of Users, Installation/Un-Installation of Applications, Drivers		
3	Working with Office Document Writer Creating, Editing & Navigating, Formatting, Working with Table, Mail Merge, Macros. Spreadsheet Working with Sheets, Formatting Sheets, Data Filters, Formulas, Graphs & Charts, Analyzing Data, Macros. Presentation Creating Presentation, Designing, Editing, Animation, Inserting Sounds, Movies and Charts, Usage of Hyperlinks.		
4	Networking and Internet Computer Network, Networking Devices & Technologies, Introduction to Internet, Web Surfing, Overview of Browsers,		

	Email Providers, Creating & Working with Emails, Email Groups, Video Conferences	
SECTION-II		
5	Google Apps – I Moving from Office to Google Drive Google docs: Creating Document, Upload, Edit Document, Sharing, Limitation of Google Docs. Google sheets: Creating Sheets, Upload, Edit Sheets, Sharing, Limitation of Google Sheets. Google slide: Creating Slide, Upload, Edit Slide, Sharing, Limitation of Google Slide.	23
6	Google Apps - II Google Calendar: Creating and Viewing Events, Inviting others, Notifications Google Forms: Usage of Various Components, Designing & Sharing Google Sites: Introduction to Templates, Creating/Editing Pages, Publishing Sites	
7	Google Apps - III Google Classrooms: Capturing your Classroom's, Communicating with students Google Maps, Exploration of Google Earth Usage of Google Groups to Promote Online Discussion	
8	Applications & Online Tools Working with pdf, Conversion from pdf into various formats Basics of Origin - Graphing, Exploration of Data, Analysis of Data E-Books, Online Videos, Edmodo, Canvas	
Instructional Method and Pedagogy:		
<ol style="list-style-type: none"> Lectures will be conducted on the basis of Classroom Response Systems with the use of multimedia projector and black board. Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval. Experiments will be based on the practical curriculum and will be evaluated at regular interval 		
Students Learning Outcomes:		
On the completion of the course, students will be able to : <ul style="list-style-type: none"> Explore the fundamental of computer, hardware, software. Demonstrate proficiency in the use of email. Compose various documentation skills of open office and Google collaboration tools in daily routine work. Adapt data management and manipulation skills in daily routine work. 		
Text book:		
<ol style="list-style-type: none"> Title : Microsoft Office 2007 Bible, Wiley India New Delhi Author(s): Walkenbach John Tyson Herb Wempen Faithe Prague Cary, N. Groh Michael, R. Aitken Peter, G. Bucki Lisa. 		

2. Title : The Internet, Prentice Hall of India Publication Author(s) : Douglas E. Comer.

Reference Books:

1. Title : Learn Microsoft Office 97, BPB Publications New Delhi Author(s): Russell Stuart.

2. Title : Google Drive & Docs in 30 Minutes (2nd Edition): The unofficial guide to the new Google Drive, Docs, Sheets & Slides by IAN Lamont

Additional Resources:

1. www.originlab.com

2. www.officetutorials.com

3. <https://gsuite.google.com/learning-center>

4. <http://www.basicknowledge101.com/subjects/internet.html>