

GANPAT UNIVERSITY

Faculty of Science

Teaching and Examination scheme

&

Syllabus of

B.Sc. Chemistry

Semester II

Effective from July 2018

GANPAT UNIVERSITY**FACULTY OF SCIENCE****REVISION OF TECHING & EXAMINATION SCHEME AND SYLLABUS**

Programme	Bachelor of science	Branch/Spec.	Chemistry			
Semester	II	Academic Council Approved Syllabus (in which the revision is carried out)			Notification No	
					Date	
Effective from Academic Year		2018-19	Effective for the batch Admitted in		July 2018	
Subject code	Subject Name	Revision in Full Syllabus (Yes/No)	Revision in Teaching Scheme(Yes/No)	Revision in Exam Scheme(Yes/No)	Revision in Content (Yes/No)	Percentage of changes if content revision
BCHE2CHE	Chemistry-II					
BPHY2PHY	Physics: II					
BMAT2MAT	Mathematics: II (for A group students)					
BBIT2PAP	Plant Anatomy and Physiology(for B group students)					
BOPE2CSK	Communication Skill: II					
BELE2ESC	Environmental Science					
BELE2CFA	Computer Fundamentals and Applications					

NEED OF REVISION:

New Syllabus implemented as per UGC guidelines.

FACULTY OF SCIENCE																				
TEACHING AND EXAMINATION SCHEME																				
Programme		Bachelor of Science				Branch/Spec.		Chemistry												
Semester		II																		
Effective from Academic Year				2018-19		Effective for the batch Admitted in								July 2018						
Sr. No.	Subject Code	Subject Name	Teaching scheme											Examination scheme (Marks)						
			Credit						Hours (per week)					Theory			Practical			
			Lecture (DT)			Practical (Lab.)			Lecture (DT)			Practical (Lab.)		CE	SEE	Total	CE	SEE	Total	
			L	TU	Total	P	TW	Total	L	TU	Total	P	TW	Total						
1	BCHE2CHE	Chemistry:II	4	--	4	2	2	2	4	--	4	3	1	4	40	60	100	40	60	100
2	BPHY2PHY	Physics: II	4	--	4	2	2	2	4	--	4	3	1	4	40	60	100	40	60	100
3	BMAT2MAT	Mathematics: II (for A group students)	4	--	4	2	2	2	4	--	4	3	1	4	40	60	100	40	60	100
	BBIT2PAP	Plant Anatomy and Physiology(for B group students)	4	--	4	2	2	2	4	--	4	3	1	4	40	60	100	40	60	100
4	BOPE2CSK	Communication Skill: II	2	1	3	--	--	--	2	1	3	--	--	--	40	60	100	--	--	--
5	BELE2ESC	Environmental Science	2	1	3	--	--	--	2	1	3	--	--	--	40	60	100	--	--	--
	BELE2CFA	Computer Fundamentals and Applications	2	1	3	--	--	--	2	1	3	--	--	--	40	60	100	--	--	--
Total			16	03	18	06	06	06	16	03	18	09	03	12	200	300	500	120	180	300

GANPAT UNIVERSITY									
FACULTY OF SCIENCE									
PROGRAMME		B.Sc.			Branch/Spec.				
SEMESTER		II			Version		2.0.0.0		
Effective From Academic Year				2018		Effective for the batch Admitted in			July-2018
Subject Code		BCHE2CHE		Subject Name		Chemistry-II			
Teaching Scheme					Examination Scheme (Marks)				
Per Week	Lecture		Practical		Total		CE	SEE	Total
	L	Tu	P	Tw					
Credit	04	-	02		06	Theory	40	60	100
Hours	04	-	03	01	08	Practical	40	60	100
Pre-requisites									
Before studying Chemistry, all students have basic knowledge of chemistry up to 10+2 level, Inorganic, Organic, Physical and Analytical chemistry concepts									
Learning Outcome									
After the successful completion of the course, students will be able to understand									
<ul style="list-style-type: none"> ✓ Basics of Inorganic, Organic, Physical and Analytical chemistry concepts ✓ Ionic solids, organic functional groups, IUPAC, structure of compound. ✓ Chemical kinetics, EMF, order reaction, electrode ✓ Qualitative Analysis, water analysis, TDS, hardness of water 									
Theory Syllabus									
Unit	Content								Hours
01	Inorganic Chemistry: Ionic Solids Introduction, Characteristics of ionic solids, Born-Haber Cycle, Max Born Equation Limiting radius ratio, Relation between radius ratio, coordination number and crystal structure, Derivation of r^+/r^- ratio in trigonal, square planar, body centered and tetrahedral crystal lattice, Crystal structure of ionic solids: HCP, BCP and FCC Crystal structure of ionic solids, AB type - CsCl and ZnS (zinc blende), AB ₂ type - CaF ₂ and TiO ₂ , Defects in Ionic Crystal Lattice (stoichiometric and non-stoichiometric) Semi-conductors Molecular Orbital Theory Basic Concepts of Molecular Orbital Theory, Characteristics of molecular orbitals with necessary diagram (i.e. bonding, anti-bonding, gerade and ungerade orbitals) Energy level diagram of diatomic molecules of First and Second row elements of periodic table and NO & CO molecules, Electronic configuration of the above mentioned molecules and calculation of bond order and magnetic moment Comparison of MO and VB Theories								15

2	<p>Organic Chemistry Alcohols, Phenols and Ethers IUPAC Nomenclature of alcohols (mono, di and trihydric alcohols), phenols and ethers, Physical properties of alcohols, Chemical properties of alcohols [Reactions of O-H bond cleavage and C-O bond cleavage - only reactions]. Industrial production of phenol, Dow Process, Cumene Process, Physical properties of phenol, Chemical properties of phenol, Reactions of O-H group. Reactions of aromatic ring [Electrophilic substitution reactions, Reimer Tiemann Reaction, Kolbe Schmitt Reaction, Fries Rearrangement – with reaction mechanism], Relative acidity of alcohols and phenols, Preparation of ethers – Williamson Synthesis, Physical properties of ethers, Chemical properties of ethers, Substitution reaction [Reaction with Cl₂ in dark & Reaction of Cl₂ in light], Reactions involving C-O bond cleavage [hydrolysis, reaction with H₂SO₄, cold HI and hot HI]\</p> <p>Amines Classification and Nomenclature, Basicity of amines, Physical properties of amines Preparation of primary amines [Reduction of nitro compounds, reaction of organic halides with ammonia, Hoffmann degradation of amides], Chemical properties of primary amines [Reaction with acid chlorides, aryl sulphonyl chlorides, reaction with alkyl halides]. Chemical properties of Aniline [Reactions of Aniline with acid chlorides, aryl sulphonyl chlorides, Reaction with bromine (formation of 2,4,6 –tri bromo aniline and p- bromo aniline), Diazotization of Aniline and reactions of Diazonium salt Hinesburg Reaction to distinguish between primary, secondary and tertiary amines</p>	15
03	<p>Physical Chemistry: Chemical Kinetics. Introduction of following terms. Rate of reaction, Order of reaction, Molecularity, Rate equation for First, second order reaction. (a=b) & (a b). Characteristics of first second order reaction. Rate equation for third order reaction. Characteristics of third order reaction. Numerical.</p> <p>Electromotive Force Introduction, Types of Cell, Half-cell, Reversible and irreversible cell, Convention sign, Types of Electrodes, Standard Electrode Potential, Electrolytic Cell, Galvanic Cell, EMF series, Representation of Cell, Relation between <i>G</i>, <i>H</i> and <i>K</i>, Nernst Equation and its applications.</p>	15
04	<p>Analytical Chemistry: Basic Principles of Qualitative Analysis Introduction, Factors affecting qualitative analysis: common ion effect, solubility product (<i>K_{sp}</i>), Use of NH₄Cl and NH₄OH in Qualitative analysis, Use of HCl and H₂S in Qualitative analysis, Numerical on common ion effect. Explanation with chemical equations in, Charcoal test, Cobalt nitrate test, Borax bead test, Flame test</p> <p>Acids and Bases Strong acid-weak base, Strong base- weak acid, Weak acid-weak base Buffers solution- buffer capacity, Mechanism of acidic and basic buffer solution</p> <p>Water Analysis Analysis of hardness of water in terms of Total solid and volatile solid, Non-filterable solid and non-filterable volatile solid, Filterable solid, Total solid, Total Suspended Solid, Acidity, Basicity or Alkalinity, Turbidity, Various methods for determination of hardness of water.</p>	15

Reference Books

1. 'Organic Chemistry', Morrison and Boyd.
2. 'Organic Chemistry', T.W. Graham Solomons and Craig B. Fryhle.
3. 'Organic Chemistry', Francis A. Carey.
4. 'Organic Chemistry', Clayden.
5. 'Fundamentals of Organic Chemistry', Solomon, *John Wiley*.
6. 'Textbook of Organic Chemistry', P.L. Soni and H.M. Chawla.
7. 'Atomic Structure and Chemical Bonding', Manas Chanda.
8. 'Inorganic Chemistry', Suretker Thate.
9. 'Inorganic Chemistry', James E. Huheey (3rd Edition), Harper International SI Edition.
10. 'Coordination Chemistry', Gurdeep Chatwal and M.S. Yadav, *Himalaya Publishing House*.
11. 'Principles of Inorganic Chemistry', B.R. Puri, L.R. Sharma & K.C. Kalia, *Vallabh Publications, Delhi*.
12. 'A text book of Physical Chemistry', B.K. Sharma.
13. 'Emf', B.K. Sharma.
14. 'Principles of Physical Chemistry', S.H. Maron and C.F. Prutton.
15. 'Elements of Physical Chemistry', B.R. Puri, L.R. Sharma, M.S. Pathania.
16. 'Advanced Physical Chemistry', J.N. Gurtu.
17. 'Physical Chemistry', N. Kundu and S.K. Jain.
18. 'Physical Chemistry', K. L. Kapoor.
19. 'Thermodynamics', Gurudeep Raj.
20. 'Book for Water Analysis', R. K. Trivedi, V. P. Kudesia.
21. 'Analytical Chemistry', Dick.
22. 'Inorganic Qualitative Analysis', Vogel and Gehani Parekh.
23. 'Electrometric Methods of Analysis', Browning.
24. 'Principle of Instrumental Analysis', Skoog.

GANPAT UNIVERSITY

FACULTY OF SCIENCE

Pre-requisites

Before studying Chemistry, all students have basic knowledge of chemistry up to 10+2 level, Inorganic, elements, titration, indicator.

Learning Outcome

After the successful completion of the course, students will be able to understand

- ✓ Basics of organic functional group and acid bases
- ✓ Basics of glassware's and instruments used in chemistry laboratory
- ✓ Titration and standardization process

Practical Syllabus

Sr. No.	Content
01	<p>Demonstrative practical's:</p> <ul style="list-style-type: none"> ✓ Melting point and Boiling point of an organic compound. ✓ Cleaning of glassware's Calibration of Glassware (Measuring Cylinder & flasks). ✓ Crystallization of Organic compounds. <p>Preparation of standard solutions (Primary & Secondary).</p>
02	<p>Organic Chemistry</p> <ol style="list-style-type: none"> 1. Identification of an organic compound through the functional group analysis, 2. Determination of melting point and boiling point, preparation of suitable derivative. 3. Candidate should perform the analysis of at least 10 compounds. <p>List of Compounds</p> <p>Acids: Benzoic acid, Phthalic acid, Succinic acid</p> <p>Phenols: α-Naphthol, β-Naphthol</p> <p>Bases: p-Toludine, Aniline, N-methylaniline</p> <p>Neutrals: Naphthalene, Anthracene, Acetamide, Benzamide, Acetanilide, m-Dinitrobenzene, Urea, Thiourea, Toluene, Acetone, Benzaldehyde, Methy acetate, Ethyl acetate, Ethanol, 1-Propanol, Glycerol, Chloroform, Carbon tetrachloride, Chlorobenzene, Nitrobenzene.</p>
03	<p>Volumetric Titrations</p> <ol style="list-style-type: none"> 1. To determine the strength of NaOH and Na₂CO₃ present in the solution mixture of NaOH & Na₂CO₃ and to find out their percentage composition. 2. To determine the strength of NaHCO₃ and Na₂CO₃ present in the solution mixture of NaHCO₃ & Na₂CO₃ and to find out their percentage composition. 3. To determine the Normality, gram/liter and molarities of H₂C₂O₄, 2H₂O and H₂SO₄ present in the solution mixture of H₂C₂O₄, 2H₂O & H₂SO₄ by using X N NaOH and Y N KMnO₄ solutions. 4. To determine the Normality, gram/liter and molarity of H₂C₂O₄, 2H₂O and K₂C₂O₄ 5. Present in the solution mixture of H₂C₂O₄, 2H₂O & K₂C₂O₄ by using X N NaOH and Y N KMnO₄ solutions. 6. To determine the amount of Ca⁺² and Mg⁺² ion by EDTA solution from the mixture solution of CaCl₂ and MgCl₂. <p>Water analysis:</p> <p>Water hardness, temporary hardness, permanent hardness, TDS, TSS.</p>
Reference Books	
<ol style="list-style-type: none"> 1. Textbook of quantitative analysis, A. I. Vogel. 2. Textbook of qualitative analysis, A. I. Vogel. 3. Experimental physical chemistry by R. C. Das & B. Bahera 'Practical in inorganic chemistry & analytical chemistry', H.G. Raval, Nirav & RupalPrakashan. 4. A. I. Vogel, A Text Book of Practical Organic Chemistry. 5. A. Ault, Techniques and Experiments for Organic Chemistry. 6. N. K. Vishnoi, Advanced Practical Organic Chemistry. 7. B. B. Dey and M.V. Sitaraman, Laboratory Manual of Organic Chemistry. 8. Raj K. Bansal, Laboratory Manual in Organic Chemistry. 9. W. J. Popiel, Laboratory Manual of Physical Chemistry, ELBS, London 1970 10. Findlay's Practical Physical Chemistry, B. P. Levitt, Longman, London, 1985 11. D. P. Shoemaker, C. W. Garland, Experiments in Physical Chemistry, McGraw-Hill, New York,. 12. A.K. De, Environmental Chemistry, New Age publishers, New Delhi, 3, 4 & 5th Edn., 2003. 13. B.K. Sharma and H.Kaur, Environmental Chemistry, Goel Publishing House, Meerut, 3rd Edn, 1996 	

GANPAT UNIVERSITY									
FACULTY OF SCIENCE									
Programme	Bachelor of Science				Branch/Spec.	Chemistry			
Semester	II				Version	2.0.0.0			
Effective from Academic Year	2018-19			Effective for the batch Admitted in	July 2018				
Subject code	BPHY2PHY	Subject Name			Physics: II				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	--	2		6	Theory	40	60	100
Hours	4	--	3	1	8	Practical	40	60	100
Pre-requisites:									
Basic concepts of Secondary and Higher Secondary science									
Learning Outcome:									
Students gain a fundamental knowledge about Solid State Physics, Optics, Electrostatics and Wave Mechanics									
Theory syllabus									
Unit	Content								Hrs
1	Solid State Physics: Crystalline and Amorphous Solids (1.1), Crystal Lattice and Crystal Structure (1.2), Translational Symmetry, Space, Unit Cell and Primitive Cell (1.3), Symmetry Elements in Crystals (1.4 [1.4.1 to 1.4.6]), Symmetry operations, The Seven crystal Systems (1.5), Coordination Number (1.5.1), Some importance crystal structure (1.6), Simple Cubic Structure (1.6.1), Body centred Cubic Structure (1.6.2), Face centred Cubic Structure, (1.6.3), Hexagonal closed packed Structure, Atomic Packing factor, Wigner-Seitz Cells (1.7), Miller Indices (1.8), The spacing of a set of crystal planes (1.11), Point Groups (1.12).								15
2	(a) Refraction through Lenses: Principal Foci (2.3), Least possible distance between an object & its real image in a convex lens (2.4), Derivation produced by a thin lens (2.5), Equivalent Focal Length of Two Thin Lenses Separated by a Finite Distance (2.6), Cardinal Points of an Optical system (2.8), Principal Foci and Focal Planes (2.9), Principal Points and Principal Planes (2.10), Nodal Points (2.11) Aberrations (3.1), Spherical aberration in a Lens (3.5), Chromatic aberration (3.12). (b) Interference: Interference in thin films (8.15), Interference due to reflected light (8.16), Interference due to transmitted light (8.17), Newton's Rings (8.23), Determination of the wavelength of sodium light using Newton's Rings (8.24), Refractive Index of a Liquid using Newton's Rings (8.25)								09 06
3	(a) Electrostatics: Gauss's Law (4.21), Gauss's Law in Differential Form (4.22), Gauss's Law and Coulomb's Law (4.23), Force on The surface of a charged Conductor (4.25), Electrostatic Energy in the medium surrounding the charged conductor (4.26), Millikan's Oil drop Method for Determination of Electronic charge (4.29) (b) Steady Current: Current and current density (8.6), Conservation of Charge i.e., Continuity Equation (8.8), Ohm's Law at a Point (8.11), Wiedemann and Franz Law (8.13), The Relaxation Time (8.14).								09 06
4	(a) Waves: Theory of Resonator (6.16), Dependence of the Frequency of Resonator on the size and the Shape of the Mouth (6.17), Velocity of Transverse Waves along a Stretched String (7.1), Laws of Transverse Vibration of Strings (7.3), Melde's Experiment (7.5), Kundt's Tube (7.13) (b) Ultrasonic waves: Properties of Ultrasonics (11.23), Production of Ultrasonic Waves (11.24), Piezo-Electric Oscillator (11.24.3), Magnetostriction Oscillator, Detection of Ultrasonic Waves (11.25),								09 06

	Applications of Ultrasonic waves (11.27), Determination of Velocity of Ultrasound in Liquids by Ultrasonic Interferometer.	
Text Books		
1	Solid State Physics By Ajay Kumar Saxena (Macmillan India Limited)	
2	A Textbook of OPTICS By N.Subrahmanyam & BrijLal (S.Chand& Company Ltd.)	
3	Electricity and Magnetism By K. K. Tewari (S. Chand & Company Ltd.)	
4	Waves and Oscillations By N. Subrahmanyam and BrijLal (Vikas Publishing House Pvt. Ltd., New Delhi) – Second Revised Edition.	
Reference Books		
1	Introduction to Solid State Physics By C. Kittel (John Willey)	
2	Fundamental of Solid State Physics By Saxena, Gupta, Saxena (PragatiPrakashan)	
3	Elements of Solid State Physics by J.P. Srivastava(PHI).	
4	Optics and Atomic Physics By D.P. Khandelval (Himalaya publishing house)	
5	Principles of Optics By B.K. Mathur (S.Chand& Company Ltd.)	
6	Optics By AjoyGhatak (TMH Edition)	
7	Electricity and Magnetism by Mahajan and Rangwala.	
8	Electricity and Magnetism - Berkley Physics Course Vol-II	
9	University Physics By Sears, Zeemansky and Young (Narosa Publishing House)	
10	A Text Book on Oscillations, Waves and Acoustics By M. Ghosh& D. Bhattacharya (S.Chand)	
11	Vibration, Waves & Heat By Sears and Zeemansky	

Sr. No.	List of Practical
01	Bar Pendulum : Determination of 'K' and 'g'
02	Damping coefficient, Relaxation and quality factor in the damped motion of a simple Pendulum
03	M.I. of a Fly wheel
04	Newton's rings: Determination of R and λ using sodium light.
05	Melde's Experiment.
06	Find out Refractive index of prism using spectrometer.
07	Study of line spectra.
08	To determine the ratio of magnetic moments of two magnets by using vibrational magnetometer.
09	Measurement of the distance using ultrasonic sensors.
10	Study of Resonator.
11	Determination of the velocity of ultrasonic waves in a non-electrolytic liquid by ultrasonic interferometer.
12	Arrangement of Spectrometer for parallel rays using Schuster method and calibration of spectrometer.
13	Refractive index of liquid using convex lens.

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FACULTY OF SCIENCE									
Programme	Bachelor of Science				Branch/Spec.	Chemistry			
Semester	II				Version	2.0.0.0			
Effective from Academic Year	2018-19			Effective for the batch Admitted in	July 2018				
Subject code	BMAT2MAT		Subject Name	Mathematics: II					
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	4	--	2		6	Theory	40	60	100
Hours	4	--	3	1	8	Practical	40	60	100
Pre-requisites:									
Basic concepts of coordinate geometry, Complex numbers.									
Learning Outcome:									
After successful completion of the course, students will be able to identify convergence of infinite series; to apply De Moivre's theorem; to understand analytical solid geometry.									
Theory syllabus									
Unit	Content								Hrs
1	Complex numbers, Argand diagram, Geometric representation of algebra of complex numbers, Polar and exponential form of complex number, De' Moivre's theorem (Proof for rational index) and its application, Roots of a complex number								15
2	Definition of limit of a sequence, Convergence and divergence of an infinite series, Alternating Series (Without proof). Comparison test, Ratio test and Root test.								15
3	Definition of a sphere in R^3 , Cartesian equation of a sphere, General equation of a sphere, Equation of a sphere with diametrically opposite end points, Intersection of a sphere with Line/plane/sphere(No theory but only problems), Equation of a tangent plane to a sphere. The tangency of a plane and normality of a line to a sphere, Orthogonal spheres.								15
4	Polar coordinates and its relationships with Cartesian coordinates, polar equation of line-/circle /conic, different types of cone and cylinder, Equations of enveloping cone/cylinder, Right circular cone/cylinder (without proof). Problems on cone and cylinder.								15
Practical content									
1) Tracing of Cartesian curves. 2) Tracing of parametric curves. 3) Tracing of polar curves. 4) Find the length of arc and curves in Cartesian & parametric forms using definite integral. 5) Find the volume of a solid generated by the continuous curve using definite integral. 6) Find the surface area of a surface generated by rotating the arc of a continuous curve using definite integral 7) Evaluate the integration of $\sin^n x$, $\cos^n x$, $\tan^n x$ (for $n \in \mathbb{N}$) using reduction formulae. 8) Evaluate the integration of $\sin^m x \cos^n x$ (for $m, n \in \mathbb{N}$) using reduction formulae. 9) Algebra of complex numbers. 10) Application of De' Moivre's theorem 11) Discuss Convergence of the infinite series and sequence. 12) Transformation of equations from one system to another system (polar and Cartesian co-ordinate system in R^2). 13) Transformation of equations from one system to another system (Cartesian, cylindrical and spherical co-ordinate system in R^3). 14) Problems based on Sphere, Cone, Cylind									
Reference Books									
1	Real Analysis, N.P.Bali, Firewall Media Publisher.								
2	Functions of One Complex Variable, J. B. Conway, Narosa Publ. House, New Delhi.								
3	Foundations of Complex Analysis, S. Ponnusamy, Narosa Publ. House, New Delhi.								
4	Analytical Solid Geometry by Shanti Narayan and P.K.Mittal, S.Chand & Co.								
5	Solid Geometry(three dimension) – H. K. Das ,S. C. Saxena and Raisinghania , S. Chand								

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FACULTY OF SCIENCE									
Programme	Bachelor of Science				Branch/Spec.	Chemistry			
Semester	II				Version	2.0.0.0			
Effective from Academic Year	2018-2019				Effective for the batch Admitted in	July-2018			
Subject code	BBIT2PAP		Subject Name		Plant Anatomy and Physiology				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	04	--	1	1	06	Theory	40	60	100
Hours	04	--	3	1	08	Practical	40	60	100
Pre-requisites:									
Students should have basic knowledge of Plant Sciences of 10 +2 level.									
Learning Outcome:									
The course will help the student to understand basic fundamentals and History of Cell biology, basic aspects related to organization of prokaryotic and eukaryotic cell. It also provide base for studying microorganisms by using various techniques of microscopy.									
Theory syllabus									
Unit	Content								Hrs
1	<ul style="list-style-type: none"> - Introduction to plant anatomy, Meristem and Permanent tissue, Meristem tissue: apical, lateral, intercalary and simple & complex permanent tissues. - The shoot and root apical meristem and its histological organization, primary structure of shoot & root, secondary growth, growth rings, leaf anatomy (dorsi-ventral and isobilateral leaf) 								15
2	<ul style="list-style-type: none"> - Plant water relations: Importance of water to plant life, diffusion, osmosis, plasmolysis, imbibition, guttation, transpiration, stomata & their mechanism of opening & closing. - Micro & macro nutrients: criteria for identification of essentiality of nutrients, roles and deficiency systems of nutrients, mechanism of uptake of nutrients, mechanism of food transport 								15
3	<ul style="list-style-type: none"> - Photosynthesis- Photosynthesis pigments, concept of two photo systems, photphosphorylation, calvin cycle, CAM plants,Kranz anatomy - Respiration in plant :Anaerobic respiration :Glycolysis,Krebs cycle &Oxidative phosphorylation and photorespiration, 								15
4	<ul style="list-style-type: none"> - Nitrogen metabolism- inorganic & molecular nitrogen fixation, nitrate reduction and ammonium assimilation in plants. - Growth and development: Definitions, phases of growth, growth curve, Plant hormones (auxins, gibberlins, cytokinins, abscisic acid, ethylene) 								15
Reference Books									
1	P.S. Verma and V.K.Agrawal, 2016. 'Cell biology, Genetics, Molecular Biology, Evolution and Ecology' S.Chand.								
2	Nelson, D.L., Cox, M.M. 2004 Lehninger Principles of Biochemistry, 4 th edition, W.H. Freeman and Company, New York, USA.								
3	H.S.Chawla,Introduction to plant Biotechnology,CRC publishers,3 rd edition (2009).								
4	Farn,Plant anatomy								
5	Earu,Plant anatomy								
6	Pandey,Plant anatomy								
7	R. C. Dubey, Text Book of Biotechnology, S.Chand Publisher,3 rd edition (2001).								
8	Satyanarayana U., Biotechnology,Books and allied P.Limited publisher,1st edition (2013)								
List of Practicals									
1	Introduction of laboratory environment and Safety measure in Biotechnology Laboratory								
2	Introduction to Instrumentsused in Biotechnology laboratory								
3	Types and Methods of cleaning of glassware, Sterilization and Plugging, Use of chemicals and Precautions, Disposal of Laboratory waste and cultures.								
4	Preparation of Standard solutions								
5	Preparation of stained mounts of anatomy of monocot and dicot's root, stem & leaf.								
6	Separation of photosynthetic pigments by paper chromatography.								

7	Mounting and staining of root nodules from a leguminous plant.
8	Effect of Light intensity on rate of photosynthesis
9	Effect of different types of light on rate of photosynthesis

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FACULTY OF SCIENCE									
Programme	Bachelor of Science				Branch/Spec.	All			
Semester	II				Version	2.0.0.0			
Effective from Academic Year	2018-19				Effective for the batch Admitted in	July 2018			
Subject code	BOPE2CSK		Subject Name		COMMUNICATION SKILLS - II				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	02	01	0	0	03	Theory	40	60	100
Hours	02	01	0	0	03	Practical	0	0	0
Pre-requisites:									
Familiarity with basics of English language, strong determination and will-power for skill-set enhancement.									
Learning Outcomes:									
At the end of the course, the students shall acquire satisfactory competency in the fundamental communication skills so as to be able to:									
<ul style="list-style-type: none"> • listen, understand and respond effectively • read, comprehend and apply the acquired knowledge/information in various practical situations • speak efficiently under various conditions • write various drafts in clear and concise manner • gain greater proficiency in language without wading through dull and insipid. 									
Theory syllabus									
Unit	Content								Hrs
1	Remedial English Grammar, Usage and Vocabulary:								
	Modals, Conditionals, Concord, Commonly Confused Pairs of words, One Word Substitutes, Synonyms and Antonyms, Word Formation: Prefixes, Roots and Suffixes (Derivational & Inflectional), Error Analysis (Correction of Errors in a given sentence - errors in the use of words - errors of Indianisms - use of slang - errors in punctuation)								07
2	Oral Communication in Context								
	Asking for and giving information, offering and responding to offers, requesting and responding to requests, congratulating people on their success, expressing sympathy, expressing condolences, apologizing and forgiving, giving instructions, seeking and giving permission, expressing opinions (likes and dislikes), agreeing and disagreeing.								06
3	Skills for Career Building – I								
	<p>Presentation Skills: Definition of presentation, Components of presentation, planning to prepare effective presentation, Steps for preparing effective presentation, Boredom Factors in presentation, Attention grabbers in presentation</p> <p>Group Discussion: Definition and nature of group discussion, Pre-requisites for group discussion, Objectives of group discussion, Characteristics of group discussion, how to prepare for group discussion, Dos and don'ts in group discussion</p>								07
4	Skills for Career Building – II								
	Official Correspondence - Letters to higher authorities, Significance & types of advertisements, drafting advertisements - Classified and Display, Notice, Agenda & Minutes of Meeting, Memo writing, E-Mails, Press release								10

Text Books	
1	Technical Communication - Principles and Practice by Meenaksi Raman & Sangeeta Sharma (Oxford University Press)
Reference Books	
1	Effective Technical Communication by M Ashraf Rizvi (TMH Publication)
2	Cambridge IELTS 1-10, Cambridge University Press
3	A Communicative Grammar of English by Geoffery Leech and Fan Svartvik (Pearson Longman)
4	Online resources: You Tube - Daily Video Vocabulary, Vocab 24, TED Lectures, Inspirational speeches/addresses of success people, parliamentary speeches, interviews, various internet channels devoted to learning and improving communication in English

GANPAT UNIVERSITY										
FACULTY OF SCIENCES										
PROGRAMME	B.Sc.				Branch/Spec.			All		
SEMESTER	I /II				Version			2.0.0.0		
Effective From Academic Year				2018-19		Effective for the batch Admitted in				July 2018
Subject Code	BELE1ESC/ BELE2ESC			Subject Name		Environmental Science				
Teaching Scheme					Examination Scheme (Marks)					
Per Week	Lecture		Practical		Total		CE	SEE	Total	
	L	Tu	P	Tw						
Credit	2	1	-	-	3	Theory	40	60	100	
Hours	2	1	-	-	3	Practical	40	60	100	
Pre-requisites										
Basic understanding of concepts related to environment and awareness about the harmful effects of pollution are required to understand the concept better										
Learning Outcome										
The course provides knowledge regarding conservation of environment which is very crucial in the present day scenario.										
Theory Syllabus										
Unit	Content								Hours	
01	Introduction to environmental studies Multidisciplinary nature of environmental studies; Scope and importance; Concept Of sustainability and sustainable development. Ecosystems What is an ecosystem? Structure and function of ecosystem; Energy flow in An ecosystem: Food chains, food webs and ecological succession. Case studies of the following ecosystems: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)								13	
02	Environmental Pollution Environmental pollution : types, causes, effects and controls; Air, water, <ul style="list-style-type: none"> • Soil and noise pollution • Nuclear hazards and human health risks • Solid waste management: Control measures of urban and industrial Waste. • Pollution case studies. 								10	
03	Conservation of Environment: The concepts of conservation and sustainable development, why to conserve, aims and objectives of conservation, policies of conservation; conservation of life support systems-soil, water, air, wildlife, forests.								12	
04	Biodiversity: What is biodiversity, levels and types of biodiversity, importance of biodiversity, causes of its loss, how to check its loss; Hotspot zones of the world and India, Biodiversity Act, 2002.								10	
Tutorial Content										
Field work <ul style="list-style-type: none"> • Visit to an area to document environmental assets: river/ forest/flora/fauna, etc. • Visit to a local polluted site---Urban/Rural/Industrial/Agricultural. • Study of common plants, insects, birds and basic principles of identification. • Study of Simple ecosystems---pond, river, Delhi Ridge, etc. 										

Reference Books

1. 'Introduction to Environmental Engineering and Science', G. M. Masters, Prentice Hall of India Pvt. Ltd.
2. 'Environmental Science', B. J. Nebel, Prentice Hall of India Pvt. Ltd.
3. 'Ecology: The Link between the natural and social sciences', E. P. Odum, IBH Publishing Com., Delhi.
4. 'Environmental Studies', Snehal Popli, Mahajan Publication.
5. 'Environmental Studies', R. Rajagopalan, Oxford University Press.
6. 'Environmental Pollution: Causes, Effects and Control', K.C. Agrawal, Nidhi Publishers, New Delhi.

GANPAT UNIVERSITY									
FACULTY OF SCIENCE									
Programme	Bachelor of SCIENCE				Branch/Spec.	All			
Semester	I/II				Version	2.0.0.0			
Effective from Academic Year		2018-19			Effective for the batch Admitted in			July 2018	
Subject code	BELE1CFA/ BELE2CFA		Subject Name		COMPUTER FUNDAMENTALS AND APPLICATIONS				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	2	1	-	-	3	Theory	40	60	100
Hours	2	1	-	-	3	Practical	40	60	100
Pre-requisites:									
<ul style="list-style-type: none"> Eagerness to be familiar with the generation wise technological advancement. Awareness regarding Computer utility among various sectors. Basic historical information regarding Computer technology. 									
Learning Outcome:									
<ul style="list-style-type: none"> Knowledge pertains to Computer fundamentals and its applications. Knowhow of various Computer peripheral devices. Better understanding of Graphical User Interface and icons. Understand the concepts of digital document and presentation. Knowledge pertains to Hypher Text Markup Language. 									
Theory syllabus									
Unit	Content								Hrs
1	Computer Fundamentals: What is Computer, Basic Applications of Computer; Components of Computer System, Central Processing Unit (CPU), input/output Devices, Computer Memory								4
2	Microsoft Office: MS Word : Concepts of word, Applications of word processing, Features of Word, Inserting, Deleting, Formatting, Opening, Saving, Protecting, Managing and Printing Document, Footnote and Endnotes, Mail Merge, Hyperlink, Macros, Insert Table, chart, shapes, Table Operations MS Excel: Introduction to Worksheet and Work Book, Application of Excel, features of excel, Cell, Addressing modes, Formatting a Worksheet, Charts, Naming Ranges, Conditional Formatting, Sort and Filter, Freeze Panes, What-If Analysis , Pivot table and chart, Functions: Statistical, Mathematical, Financial and Database functions MS Power Point: Introduction to Power Point, Creating a Presentation, features of power point, Power Point views, Slideshow set up, Printing a Presentation, Formatting slides, Slide transition & Custom animation, Inserting pictures, chart & tables								12
3	Internet: An Introduction to Internet, Internet Address, Uniform Resource Locator, Internet Service Provider, Intranet, Extranet, Working of Internet ,Hypertext Transfer Protocol, , World Wide Web , Search Engines								4
4	Basic HTML Concepts: What is HTML?, HTML document Structure, HTML Basic Tags – underline, bold, italic, small, super script, sub script, working with list, image, table ,link, block and inline elements, HTML form								10

Tutorial content	
List of problems specified by the subject teacher based on above mention topics.	
Text Books	
1	PC Software for windows made simple by R.K. Taxali -Tata McGraw-Hill Publishing Co. LTD.
2	The complete reference Web Design by Thomas A. Powell
Reference Books	
1	Working with Personal Computer by RP Soni, Harshal Arolkar and Sonal Jain–Books India Publication
2	The Complete Reference Office 2000 by Stephen L. Nelson. Tata McGraw-Hill Publishing Co.LTD.
3	Learning Web Design (A beginner’s guide to HTML, CSS ,JavaScript and Web Graphics) by Jeniifer Niederst Robbins