		<b>SYLLABUS</b>
<b>Course Title</b>		<b>CHEMISTRY-III</b>
<b>Course Code</b>		BSC301
<b>Course Credit</b>	Lecture	: 04
	Practical	:03
	Tutorial	: 00
	Total	: 07
<b>Detailed Syllabus:</b>		
<b>Sr. No</b>	<b>Name of chapter &amp; Details</b>	<b>Session Allotted</b>
<b>SECTION-I</b>		
<b>1</b>	<b>Wave Mechanics.</b> Introduction of wave Mechanics, Postulates of wave Mechanics, Interpretation of $\psi$ , $\psi^2$ , $\psi\psi^*$ , Derivation of Schrodinger's equation in three dimensions (Cartesian Coordination), Eigen function & Eigen value, Orthogonal & Normalised wave function and problems on it.	<b>28</b>
<b>2</b>	<b>Chemistry of Lanthanide Elements.</b> Introduction, Occurrence & Important ores, Isolation of Lanthanide Elements from ore, Individual Isolation by ( I ) Ion Exchange Method ( II ) Solvent Extraction Method, Electronics Configuration with necessary Explanation, □ Oxidation State & their Stability, Magnetic properties, Colour ( spectral ) properties, Lanthanide Contraction, Misch Metal, Uses of Lanthanides & their Compounds.	
<b>3</b>	<b>Carbonyl Compounds (Aldehydes and Ketones)</b> Introduction and Nomenclature, Preparation of Carbonyl Compounds, Synthesis of Aldehydes, Synthesis of Ketones, Structure and Physical Properties, Reactivity and applications of carbonyl compounds, Understanding of reaction mechanism, Study of important name reactions involving carbonyl compounds, Active methylene compounds: Keto-enol tautomerism, Identification Tests for aldehydes and ketones	
<b>4</b>	<b>Carboxylic Acid Compounds</b> Introduction and Nomenclature, Nomenclature of mono and dicarboxylic acids, Preparation of monocarboxylic acid compounds, Physical Properties of mono carboxylic acid compounds, Acidity of Carboxylic acids, Effect of other functional groups on Acidity, activity and applications of carboxylic acids, Esterification of Carboxylic Acids, Mechanism of Esterification, Trans-Esterification, Introduction of Amino acids	

<b>SECTION-II</b>	
5	<p><b>Basic of some physical properties</b> Introduction ,Surface tension and parachor ( Drop method ) &amp; its method for determination ,Viscosity and its method for determination ,Refractive index and its method for determination ,Theory of Optical activity , Dipole moment and its method for determination ,Application and numerical, Examples</p>
6	<p><b>Phase Rule and related theory of solutions</b> Statement and meaning of the term – Phase, Components, Degree of freedom , Explanation of phase equilibrium of one component system – Water &amp; Sulphur system ,Phase equilibria of two component system : Solid-liquid mixture – desilverization of lead (Pb-Ag) , Solid solution – compound formation with congruent melting point (Mg-Zn) , System of <math>\text{CuSO}_4 \cdot 5\text{H}_2\text{O}</math> ,Theory of liquid-liquid mixture ,Ideal liquid mixture ,Azeotropes , Lower and upper consolute temperature , Steam distillation,Short explanation of Raoult's law, Henry's law &amp; Nernst's distribution law ,Examples</p>
7	<p><b>Fuels</b> Introduction ,Calorific value ,Determination of calorific value- bomb calorimeter ,Characteristic of an idea fuel ,Classification of fuels ,Natural solid fuels-wood, peat, lignite and coal ,Types of coal ,Artificial solid Fuels Charcoal, cock, and briquettes ,High and low Carbonization of Coal ,natural gaseous fuels – natural gas and biogas ,Artificial gaseous fuels – coal gas, water gas, oil gas, Produces gas ,Advantages and dis advantages of solid liquid and gaseous fuels</p>
8	<p><b>Synthetic drugs and dyes</b> <b>Drugs</b> - Introduction ,Classification ,Synthesis and uses of sulpha trizole ( cibazole) , phenacetin, paludrine, chloramphenicol, veronal <b>Dyes</b> – Introduction ,Classification ,Synthesis and uses of methylorange, Diamomblack -f malachite green, Indigotin ,Congored, Crystal violet, Anthraquinone</p>
<b>List of Practicals (6 Hours/Week)</b>	
<p><b>1 Organic Qualitative Analysis [10 marks]</b> <b>[Minimum six bifunctional Organic Compounds should be given]</b> Identification of an organic compound through the functional group analysis and determination of melting point or boiling point (Bifunctional organic compounds)</p> <p><b>2 Organic Volumetric Estimation: [10 marks] [Standard solution to be given]</b></p> <ol style="list-style-type: none"> <li>To determine the amount of <math>-\text{CONH}_2</math> in the given Acetamide solution</li> <li>To determine the amount of Phenol / m-cresol in the given solution</li> <li>To determine the amount of Aniline / p-toludine in the given solution</li> <li>To determine the amount of Ester in the given solution</li> <li>To determine the amount of Glucose in the given solution</li> <li>To determine the amount of <math>-\text{COOH}</math> in the given carboxylic acid</li> </ol> <p><b>3 Gravimetric Estimation (Any Three) [15 marks]</b></p> <ol style="list-style-type: none"> <li>Estimation of <math>\text{Ba}^{+2}</math> as <math>\text{BaSO}_4</math></li> <li>Estimation of <math>\text{Fe}^{+2}</math> as <math>\text{Fe}_2\text{O}_3</math></li> <li>Estimation of <math>\text{Ni}^{+2}</math> as <math>\text{Ni}(\text{DMG})_2</math></li> <li>Estimation of <math>\text{Al}^{+2}</math> as <math>\text{Al}_2\text{O}_3</math></li> </ol>	
<b>Instructional Method and Pedagogy:</b>	

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:


On the successful completion of the course, students will be able to:

- Understand the concepts and applications of periodic properties, bonding & shapes of molecules, first transition series elements, reaction of alkyl halides and cycloalkanes, Thermodynamics, and adsorption phenomena.
- Apply the concepts of acid, base, pH, and modes of concentration in various tests of simple chemicals.]
- Perform various chemical tests for simple organic & inorganic chemicals.

### Reference Books:

1. Concise Inorganic Chemistry by J.D.Lee, wiley india, 5th edition 2013
2. Textbook of Inorganic Chemistry by Soni P.L., Sultan Chand & Sons. 20th edition 2013
3. Advanced Inorganic Chemistry (3rd Edition) - FA.Cotton and G. Wikinson, Wiley Eastern Pvt.Ltd 6th edition, 2009
4. Advanced Inorganic Chemistry (Volume II) by Prakash Satya, S.Chand & Company Ltd. New Delhi, 2006
5. Organic reaction mechanisms by V.K. Ahluwalia, Narosa publishing house 4th edition. 2011
6. Advanced Organic Chemistry by Arun Bahl and B.S.Bahl, S.Chand & Company Ltd. New Delhi, 18th edition 2010.
7. Organic Chemistry by Morrison and Boyd, Pearson Education Delhi 7th edition 2011
8. Solomons & Fryhle's Organic Chemistry by Solomon Graham T.W. and Fryhle Craig B., Wiley India (P) Ltd. New Delhi. 10th edition.
9. A Textbook of Physical Chemistry by P.L.Soni, S.Chand & Company Ltd. New Delhi, 22nd edition 2005.
10. Essentials of Physical Chemistry by Bahl B. S. and Tuli G. D., S.Chand & Company Ltd. New Delhi.
11. Elements of Physical Chemistry by Atkins Peter and Paula Julio, Oxford University Press New Delhi, 6th edition.
12. Analytical Chemistry, Chatwal G. R. and Arora M. Himalaya Publishing House Pvt. Ltd. Mumbai 1st
13. Analytical Chemistry: Theory and Practice. By Verma R. M., CBS Publishers & Distributors New Delhi 3rd edition.

14. Vogel's Textbook of Quantitative Chemical Analysis by Mendham J. and Denney R. C. Pearson Education Ltd. New Delhi 6th edition.
15. Wastewater Treatment Concepts and Design Approach by Karia G.L. and Christian R.A. 2nd edition

		<b>SYLLABUS</b>	
<b>Course Title</b>		<b>MATHEMETICS-III</b>	
<b>Course Code</b>		BMT301	
<b>Course Credit</b>		Lecture	: 4
		Practical	: 3
		Tutorial	: 0
		Total	: 7
<b>Detailed Syllabus:</b>			
<b>Sr. No</b>	<b>Name of chapter &amp; Details</b>		<b>Session Allotted</b>
<b>SECTION-I</b>			
<b>1</b>	<b>Graph Theory:</b> Basic concept of graph theory: Definition of Graph, vertex set, edge set, order of a graph, size of a graph, types of graph, multiple edges, simple and multiple graphs, degree of vertex, pendent vertex, isolated vertex, regular graph, complete graph, directed edge, directed graph, undirected graph, mixed graph, walk, trail, path, simple path, cycle, connected-disconnected graph, unicycle graph, sub graph, components of graph, Adjacency matrix, path matrix, incidence matrix, tree, directed tree, forest.		<b>28</b>
<b>2</b>	<b>Set Theory:</b> Relation: reflexive, symmetric, anti-symmetric, transitive, equivalence, POSET(partial ordered set). Hasse diagram, maximal-minimal elements, greatest-least elements, lower-upper bound, greatest lower bound, least upper bound.		
<b>3</b>	<b>Boolean Algebra and Lattices:</b> Lattices, Lattices as Poset, Direct product, Homomorphism, Complete Lattices, Bounds of Lattices, Distributive Lattices, Boolean Algebra, Sub Boolean Algebra, Direct product		
<b>SECTION-II</b>			
<b>4</b>	<b>Solution of System of Non Linear Algebraic Equation :</b> Roots of Non Linear Equations Bisection, False Position, Secant Method, Newton Raphson, Successive Approximation, Birge Vieta Method.		<b>28</b>
<b>5</b>	<b>Interpolation:</b> Introduction, Newton's Forward, Newton's Backward, Gauss's Forward, Gauss's Backward, Stirling's Formula, Bessel's Formula, Laplace-Everett Formula, Newton's Divides Differences and Lagrange's Formula.		
<b>6</b>	<b>Numerical integration:</b>		

	Composite rules, Trapezoidal rule, error estimation in trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule, Error estimation in Simpson's 1/3 rule, Error estimation in Simpson's 3/8 rule, Gaussian integration.	
<b>List of Practicals: (6 Hours/Week)</b>		
<ol style="list-style-type: none"> <li>1. Solve seven bridge problem by graph theory.</li> <li>2. Solve matrix representation by graph theory.</li> <li>3. Draw Hasse diagram &amp; discuss all element evaluation.</li> <li>4. To solve examples of Posset &amp; Lattices.</li> <li>5. Write types of Lattices.</li> <li>6. To solve non-linear equations by using bisection, false position and secant method.</li> <li>7. To solve non-linear equations by using N-R method, successive approximation method and birge vieta method. .</li> <li>8. To solve interpolating values by interpolation methods for basic problems.</li> <li>9. To solve interpolating values by interpolation methods for real life problems.</li> <li>10. To solve numerical integral methods for basic problems.</li> <li>11. To solve numerical integral methods for real life problems.</li> </ol>		
<b>Instructional Method and Pedagogy:</b>		
<ol style="list-style-type: none"> <li>1. Lectures will be conducted with the aid of multi-media projector, black board, Audio/Video clips etc. relevant to the content.</li> <li>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.</li> <li>3. Surprise tests/Quizzes/Tutorials will be conducted.</li> <li>4. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.</li> <li>5. Minimum ten practical's shall be there in the tutorial related to course contents.</li> </ol>		
<b>Students Learning Outcomes:</b>		
<p>At the end of the course the students will be able to:</p> <ul style="list-style-type: none"> <li>• <b>Understand</b> different concept of graph theory and able to relate them with real life problems.</li> <li>• <b>Solve</b> chemical &amp; real life problems numerically.</li> <li>• <b>Choose</b> proper numerical method for particular &amp; specific problem.</li> <li>• <b>Realize</b> the importance of approximate solution of those problems which has not analytical solution.</li> </ul>		
<b>Reference Books:</b>		
<ol style="list-style-type: none"> <li>1. Numerical Methods by V. Rajaraman,, Prentice-Hall Pvt. Ltd., 3<sup>rd</sup> Edition.</li> <li>2. Applied Numerical Analysis by C. F. Gerald and P. O. Wheatley, Pearson Education Asia, New Delhi, 7<sup>th</sup> Edition.</li> </ol>		

3. Numerical Methods for Engineering by Steven C. Chapra and Raymond P. Canale, The McGraw-Hill, 7<sup>th</sup> Edition.
4. Elementary Numerical Analysis by Atkinson and Han, Wiley India, 2<sup>nd</sup> Edition.
5. Graph Theory with Applications to Engineering and Computer Science by Narsingh Deo.



# SYLLABUS

<b>Course Title</b>	<b>PHYSICS-III</b>
<b>Course Code</b>	BPH 301
<b>Course Credit</b>	Lecture : 4
	Practical : 3
	Total : 7

## Detailed Syllabus:

Sr. No	Name of chapter & Details	Session Allotted
<b>SECTION-I</b>		
1	<b>Properties of Matter:</b> Bending of Beam, Bending Moment of a Beam, Cantilever loaded at the free end, Cantilever supported at its ends, loaded in the middle, Viscosity and coefficient of viscosity, Streamline and Turbulent flow, Reynold's number, Poiseulle's Equation for the flow of liquid through a tube, Volume of liquid flowing out, Stoke's law.	<b>28</b>
2	<b>Thermodynamics:</b> Work done of a gas at constant pressure, Change in internal energy, Work done by isothermal expansion, First law of Thermodynamics, Second law of Thermodynamics, Thermodynamic Process (only definition), Heat Engine, Thermal efficiency of Heat Engine, Carnot Theorem, Concept of entropy, General Expression for the change of Entropy of a Perfect gas, Isothermal and Adiabatic process, Change of entropy in Reversible and Irreversible process, Entropy and Disorder - Third law of Thermodynamics.	
3	<b>Radiation Heat:</b> Properties of radiant heat, Emission and absorption of Radiation, Absorbing power, Reflecting power, Transmitting power, Radiating, Black Body, Stefan's Law, Wien's Law, Energy distribution in a Black Body, Rayleigh-Jeans Law, Planck's Law.	
4	<b>Electric Field and Potential:</b> Electric field intensity, Electric Flux, Electric Flux density, Gauss Law, Proof of Gauss Law, Field around a charged straight conductor, Electric field around a sphere, Electric Potential, Potential gradient and Electric Intensity, Potential of a charged sphere, Potential and Electric field due to Electric dipole, Potential energy of a Capacitor, Capacity of a condenser (Capacitor), Capacity of a Parallel Plate Condenser.	
<b>SECTION-II</b>		
5	<b>Magnetism:</b> Magnetic field and Magnetic Induction, Hall Effect, Hall Voltage and Hall coefficient, Hall Mobility, Magnetic flux, Magnetic field around current carrying conductor, Magnetic field due to solenoid, Magnetic susceptibility and	



	permeability, Para, Dia, Ferro-magnetic substances, Hysterisis loop, Energy loss due to Hysterisis, Self Induction, Self Inductance of a solenoid, Mutual Inductance, Mutual Inductance of two solenoids.	
6	<b>Relativity:</b> Galilean Transformation, Ether Hypothesis, Michelson-Morley Experiment, Special theory of Relativity, Lorentz Transformation, Length contraction, Time dilation, Relativity of simultaneity, Addition of velocities, Variation of mass with velocity, Mass-Energy relation.	28
7	<b>Transistor Biasing:</b> Transistor biasing, Inherent variations of Transistor Parameters, Stabilization, Stability Factor, Methods of Transistor Biasing, Base Resistor method, Biasing with feedback resistor, Voltage divider bias method, Design of transistor biasing circuits.	
8	<b>Single stage Transistor Amplifier:</b> Single stage Transistor amplifier, How a transistor amplifier works, Practical Circuit of Transistor amplifier, Phase reversal, Load line analysis, Voltage gain, Classification of Amplifier, Frequency response & Bandwidth.	
<b>List of Practicals: (6 Hours/Week)</b>		
<ol style="list-style-type: none"> <li>Determine the Young's modulus by Cantilever.</li> <li>Determine the Young's modulus by bending of beam.</li> <li>Study of one dimensional elastic collision using two spheres.</li> <li>Determine the viscosity of liquid by Searl's co-axial cylinder.</li> <li>Determine the thermal conductivity of cardboard by Lee's Method.</li> <li>Temperature of filament and Heat radiation &amp; verification of Stefan's Law.</li> <li>Find the co-efficient of viscosity of water by its flow through capillary tube of uniform bore.</li> <li>Determine the Moment of Inertia of a Fly wheel.</li> <li>Determine the figure of merit &amp; volt sensitivity of ballistic galvanometer.</li> <li>Measurement of High resistances by leakage.</li> <li>Comparison of Capacitance by De Sauty's method</li> <li>Measurement of specific resistance of electrolyte by Kohlrauch's Method</li> <li>Study of magnetic field of Solenoid.</li> <li>Determine the self induction by Maxwell Bridge.</li> <li>Frequency response &amp; Bandwidth of R.C.Coupled Amplifier.</li> <li>Experimental checkups by Multimeter, (Power Supply, Resistor, Transistor, Diode, Capacitor).</li> </ol>		
<b>Instructional Method and Pedagogy:</b>		
<ul style="list-style-type: none"> <li>Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.</li> <li>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.</li> <li>Surprise tests/Quizzes/Tutorials will be conducted.</li> <li>The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.</li> <li>Approximately ten experiments shall be there in the laboratory related to course contents.</li> </ul>		
<b>Students Learning Outcomes:</b>		
<p>At the end of the course the students will be able to:</p> <ul style="list-style-type: none"> <li>Understand basic concepts of bending moment, cantilever, viscosity, flow of liquid, radiation, electric field, magnetism, relativity and transistors</li> <li>Apply the concept of thermodynamics, electric field, transistor biasing and magnetism.</li> </ul>		

- Perform the practical of cantilever, heat transfer, electric field and magnetic hysteresis.  
Conclude the effect of electric field and magnetic field

**Reference Books:**

- Engineering Physics by R.K.Gaur, S.L.Gupta, Dhanpat Rai Publications.
- Principles of Electronics by V.K.Mehta & Rohit Mehta., S.Chand Company.
- Modern Physics by R.Murugesan & Kiruthiga Sivaprasath, S.Chand Comp.
- Waves and Oscillations by Brij Lal and Subrahmaniam. S.Chand comp.



# SYLLABUS

<b>Course Title</b>		<b>ENGLISH AS A SECOND LANGUAGE - LEVEL-II</b>		
<b>Course Code</b>		ESL201		
<b>Course Credit</b>		Lecture	: 03	
		Tutorial	: 00	
		Practical	: 00	
		Total	: 03	
<b>Detailed Syllabus:</b>				
<b>Sr. No</b>	<b>Name of chapter &amp; Details</b>			
<b>Unit No.</b>	<b>Context</b>	<b>Topics</b>	<b>Learning objectives</b>	<b>Session Allotted</b>
<b>SECTION-I</b>				
<b>1</b>	Social	FEEL THE FORMS....	Students will be able to study and fill up several types of forms they come across in their daily life.	<b>22</b>
<b>2</b>	Social	VOCAB HOUSIE	Students will be able to enhance their language by learning various vocabulary related to family & relations, seasons, food & culture, restaurants and its type, shopping, festivals and occasions.	
<b>3</b>	Social	LISTEN & LEARN	Students will listen audios of recorded tapes, telephonic conversation, descriptive audios etc. to pick up foreign accent by identifying the phonemes of certain letters like 't', 'k', 'p' etc.	
<b>4</b>	Academic	POLISH YOUR PUNCTUATION	Students will be able to understand the importance of punctuation and use it appropriately in the text	

5	Academic	READ TO DESCRIBE	Students will be able to read and understand a variety of descriptive text on person, place, situation and instance.	
<b>SECTION-II</b>				
6	Academic	TELL ME ABOUT	Students will learn to write description of a place (native, city, college). Also they will learn to describe their friend's personality, any instance or situation	<b>23</b>
7	Professional	WATCH YOUR WORDS & MIND YOUR MANNERS	Students will be able listen telephonic conversations and identify the phrases used to express apology, permission, request, agreeing, disagreeing, offering etc.	
8	Professional	BAY OF SURVEY	Students will learn to draft the appropriate questions for a questionnaire keeping the purpose, audience and the topic of the survey and compile the data and finally present it through data representation charts.	
9	Professional	LET'S LEARN TO DOCUMENT	Students will be able to write a report based on the data compiled using appropriate format and tone. Also, they will be able to write various types of letters like complain letters, letters on agreeing/disagreeing or offering help etc.	

**Students Learning Outcomes:**

At end of the course, students will:

- Understand variety of academic, social and professional conversations.
- Speak on a variety of topics in academic, social and professional contexts.
- Read and understand language in academic, social and professional contexts.
- Write and express ideas in routine academic, social and professional contexts.