

**B. Tech. First Year, Semester- I**  
(All Branches except Agriculture Engineering and Biotechnology)

<b>3- WEEKS STUDENT INDUCTION PROGRAMME</b>														
<b>in the beginning of the session</b>														
SN	Subject Code	Subject Name	Type	Category	Period			Evaluation Scheme						Credit
								Sessional Component		Sessional (SW) (TS/PS)	End Semester Examination (ESE)	Total	Cr	
					L	T	P	CT	TA					
1.	BAS102	Engineering Chemistry	T	BS	3	1	0	20	10	30	70	100	4	
2.	BAS103	Engineering Mathematics-I	T	BS	3	1	0	20	10	30	70	100	4	
3.	BEC101	Fundamentals of Electronics Engineering	T	ES	2	1	0	20	10	30	70	100	3	
4.	BME101	Fundamentals of Mechanical Engineering	T	ES	2	1	0	20	10	30	70	100	3	
5.	BAS105	Soft Skills	T	BS/ HS	3	0	0	20	10	30	70	100	3	
6.	BAS152	Engineering Chemistry Lab	P	BS	0	0	3	-	50	50	50	100	1	
7.	BEE151/ BEC151	Basic Electronics Engineering Lab	P	ES	0	0	3	-	50	50	50	100	1	
8.	BAS155	English Language Lab	P	ES/ HS	0	0	3	-	50	50	50	100	1	
9.	BWS151	Workshop Practice Lab	P	ES	0	1	3	-	50	50	50	100	2	
					<b>13</b>	<b>5</b>	<b>12</b>			<b>350</b>	<b>550</b>	<b>900</b>	<b>22</b>	

**Abbreviation Used:**

- BS:** Basic Science Course
- ES:** Engineering Science Course
- HS:** Humanities and Social Science Course
- VA:** Value Added Course

**B. Tech. First Year, Semester- II**  
(All Branches except Agriculture Engineering and Biotechnology)

SN	Subject Code	Subject Name	Type	Category	Period			Evaluation Scheme						Credit
					L	T	P	Sessional Component		Sessional (SW) (TS/PS)	End Semester Examination (ESE)	Total	Cr	
								CT	TA					
1.	BAS202/ BAS201	Engineering Chemistry / Engineering Physics	T	BS	3	1	0	20	10	30	70	100	4	
2.	BAS203	Engineering Mathematics-II	T	BS	3	1	0	20	10	30	70	100	4	
3.	BEC201/ BEE201	Fundamentals of Electronics Engineering / Fundamentals of Electrical Engineering	T	ES	2	1	0	20	10	30	70	100	3	
4.	BME201/ BCS201	Fundamentals of Mechanical Engineering/ Programming for Problem Solving	T	ES	2	1	0	20	10	30	70	100	3	
5.	BAS205/ BAS204	Soft Skills / Environment and Ecology	T	HS/ BS	3	0	0	20	10	30	70	100	3	
6.	BAS252/ BAS251	Engineering Chemistry Lab / Engineering Physics Lab	P	BS	0	0	3	-	50	50	50	100	1	
7.	BEC251/ BEE251	Basic Electronics Engineering Lab/ Basic Electrical Engineering Lab	P	ES	0	0	3	-	50	50	50	100	1	
8.	BAS255/ BCS251	English Language Lab / Programming for Problem Solving Lab	P	HS/ ES	0	0	3	-	50	50	50	100	1	
9.	BWS251/ BCE251	Workshop Practice Lab / Engineering Graphics & Design Lab	P	ES	0	1	3	-	50	50	50	100	2	
10.	BVA251/ BVA252	Sports and Yoga / NSS	P	VA	0	0	3		100	*100		*100	0	
					<b>13</b>	<b>5</b>	<b>12+</b> <b>3*</b>			<b>350+</b> <b>*100</b>	<b>550</b>	<b>900+</b> <b>*100</b>	<b>22</b>	

\*Compulsory Qualifying Audit Course

**Abbreviation Used:**

- BS:** Basic Science Course
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*Summer Internship (4-week) / NPTEL Course (4-week) during summer break after Semester-II and same will be assessed/evaluated in the Semester-III*

# BAS102 / BAS202: ENGINEERING CHEMISTRY

## Course Objectives:

1. To enable the students to understand about the Chemistry of Atomic and Molecular structure, Chemistry of advanced Materials like Liquid crystals, Nanomaterials, Graphite & fullerenes and Green Chemistry.
2. To enable the students to understand and apply the detailed concepts of spectroscopic techniques and stereochemistry to identify the compounds, element etc.
3. To enable the students to understand and apply the concepts related to Electrochemistry, Batteries, Corrosion and Chemistry of Engineering Materials like cement.
4. To enable the students to understand and apply detailed concepts of water source, water impurities, hardness of water and boiler troubles used in industry as well as analysis of coal & determination of calorific values.
5. To enable the students to understand detailed concepts related to polymers, Polymerization, Polymer Blends and Polymer Composites.

Content	Contact Hours
<b>Unit-1:</b>	<b>8</b>
<b>Atomic and Molecular Structure:</b> Molecular orbital's of diatomic molecules, Bond Order, Magnetic characters and numerical problems. <b>Chemistry of Advanced Materials:</b> <b>Liquid Crystals;</b> Introduction, Types and Applications of liquid crystals, Industrially important materials used as liquid crystals. <b>Graphite and Fullerene;</b> Introduction, Structure and applications. <b>Nanomaterials;</b> Introduction, Preparation, characteristics of nanomaterials and applications of nanomaterials, Carbon Nano Tubes (CNT), <b>Green Chemistry:</b> Introduction, 12 principles and importance of green Synthesis, Green Chemicals, Synthesis of typical organic compounds by conventional and Green route (Adipic acid and Paracetamol), Environmental impact of Green chemistry on society.	
<b>Unit-2:</b>	<b>8</b>
<b>Spectroscopic Techniques and Applications:</b> Elementary idea and simple applications of UV, IR and NMR, Numerical problems. <b>Stereochemistry:</b> Optical isomerism in compounds without chiral carbon, Geometrical isomerism, Chiral Drugs.	
<b>Unit-3:</b>	<b>8</b>
<b>Electrochemistry and Batteries:</b> Basic concepts of electrochemistry. <b>Batteries;</b> Classification and applications of Primary Cells (Dry Cell) and Secondary Cells (Lead Acid battery). <b>Corrosion:</b> Introduction to corrosion, Types of corrosion, Cause of corrosion, Corrosion prevention and control, Corrosion issues in specific industries (Power generation, Chemical processing industry, Oil & gas industry and Pulp & paper industries). <b>Chemistry of Engineering Materials:</b> <b>Cement;</b> Constituents, manufacturing, hardening and setting, deterioration of cement, Plaster of Paris (POP).	

<b>Unit-4:</b>	<b>8</b>
<p><b>Water Technology:</b> Sources and impurities of water, Hardness of water, Boiler troubles, Techniques for water softening (Lime-Soda, Zeolite, Ion Exchange and Reverse Osmosis process), Determination of Hardness and alkalinity, Numerical problems.</p> <p><b>Fuels and Combustion:</b> Definition, Classification, Characteristics of a good fuel, Calorific Values, Gross &amp; Net calorific value, Determination of calorific value by Bomb Calorimeter, Theoretical calculation of calorific value by Dulong's method, Ranking of Coal, Analysis of coal by Proximate and Ultimate analysis method, Numerical problems, Chemistry of Biogas production from organic waste materials and their environmental impact on society.</p>	
<b>Unit-5:</b>	<b>8</b>
<p><b>Materials Chemistry:</b></p> <p><b>Polymers;</b> Classification, Polymerization processes, Thermosetting and Thermoplastic Polymers, Polymer Blends and Composites, Conducting and Biodegradable polymers, Preparation, properties, industrial applications of Teflon, Lucite, Bakelite, Kelvar, Dacron, Thiokol, Nylon, Buna-N and Buna-S and their environmental impact on society, Speciality polymers.</p> <p><b>Organometallic Compounds:</b> General methods of preparation and applications of Organometallic compounds (RMgX and LiAlH<sub>4</sub>).</p>	

### Course Outcomes:

Upon completion of the course the student should be able to:

Units	Course Outcomes	Bloom's Level
CO-1	Get an understanding of the theoretical principles of chemistry of molecular structure, bonding and properties, Chemistry of advanced materials (liquid crystals, Nanomaterials, Graphite & Fullerene) as well as the Principles of Green Chemistry.	K3
CO-2	Apply the fundamental concepts of determination of structure with various spectral techniques and stereochemistry.	K4
CO-3	Utilize the theory of construction of electrodes, batteries and fuel cells in redesigning new engineering products and categorize the reasons for corrosion and study methods to control corrosion and develop understanding of Chemistry of Engineering materials (Cement).	K3
CO-4	Develop understanding of the sources, impurities and hardness of water, apply the concepts of determination of calorific values and analyze the coal.	K3
CO-5	Develop the understanding of Chemical structure of polymers and its effect on their various properties when used as engineering materials. Understanding the applications of specific polymers and Chemistry applicable in industrial process.	K3

### Reference Books:

1. Engineering Chemistry by Rath & Singh, 2<sup>nd</sup> Edition, Cengage Learning India Pvt Ltd Delhi.
2. Engineering Chemistry by SS Dara, S Chand & Co Ltd
3. Engineering Chemistry by Jain & Jain, S.Chand & Comp, New Delhi
4. Engineering Chemistry by K. Sesha Maheswaramma, Pearson
5. Engineering Chemistry by OG Palanna, Mc Graw Hill Education, New Delhi
6. Engineering Chemistry by Shashi Chawala, Dhanpat Rai Publishing Comp, New Delhi
7. University Chemistry by BH Mahan
8. University Chemistry by CNR Rao

## BAS103 : ENGINEERING MATHEMATICS-I

### Course Objectives:

The objective of this course is to familiarize the graduate engineers with techniques in matrix, calculus, multivariate analysis and vector calculus. It aims to equip the students with standard concepts and tools from intermediate to advanced level that will enable them to tackle more advanced level of mathematics and applications that they would find useful in their disciplines.

The students will learn:

- The essential tools of matrices, Eigen values and its application in a Comprehensive manner.
- To apply the knowledge of differential calculus in the field of engineering.
- To deal with functions of several variables that is essential in optimizing the results of real life problems.
- To apply integral calculus in various field of engineering and have a basic understanding of Beta and Gamma functions and application of Dirichlet's integral.
- To deal with vector calculus that is required in different branches of Engineering to graduate engineer.

Content	Contact Hours
<b>Unit-1: Matrices</b>	8
Elementary transformations, Inverse of a matrix, Rank of matrix, Solution of system of linear equations, Characteristic equation, Cayley-Hamilton Theorem and its application, Linear Dependence and Independence of vectors, Eigen values and Eigen vectors, Complex Matrices, Hermitian, Skew-Hermitian and Unitary Matrices, Applications to Engineering problems.	
<b>Unit-2: Differential Calculus- I</b>	8
Successive Differentiation (nth order derivatives), Leibnitz theorem, Curve tracing, Partial derivatives, Euler's Theorem for homogeneous functions, Total derivative.	
<b>Unit-3: Differential Calculus-II</b>	8
Expansion of functions by Taylor's and Maclaurin's theorems for functions of one and two variables, Maxima and Minima of functions of several variables, Lagrange's method of multipliers, Jacobians, Approximation of errors.	
<b>Unit-4: Multiple integration</b>	8
Double integral, Triple integral, Change of order of integration, Change of variables, Beta and Gamma function and their properties, Dirichlet's integral and its applications to area and volume, Liouville's extensions of Dirichlet's integral.	
<b>Unit-5: Vector Calculus</b>	8
<b>Vector differentiation:</b> Gradient, Curl and Divergence and their Physical interpretation, Directional derivatives.	
<b>Vector Integration:</b> Line integral, Surface integral, Volume integral, Gauss's Divergence theorem, Green's theorem and Stoke's theorem (without proof) and their applications.	

## **BAS203 : ENGINEERING MATHEMATICS-II**

<b>Content</b>	<b>Contact Hours</b>
<b>Unit -1: Ordinary Differential Equation of Higher Order</b>	8
Linear differential equation of nth order with constant coefficients, Simultaneous linear differential equations, Second order linear differential equations with variable coefficients, Solution by changing independent variable, Method of variation of parameters, Cauchy-Euler equation, Application of differential equations in solving engineering problems.	
<b>Unit-2: Laplace Transform</b>	10
Laplace transform, Existence theorem, Properties of Laplace Transform, Laplace transform of derivatives and integrals, Unit step function, Laplace transform of periodic function, Inverse Laplace transform, Convolution theorem. Application of Laplace Transform to solve ordinary differential equations and simultaneous differential equations.	
<b>Unit-3: Sequence and Series</b>	8
Definition of Sequence and series with examples, Convergence of series, Tests for convergence of series, Ratio test, D' Alembert's test, Raabe's test, Comparison test. Fourier series, Half range Fourier sine and cosine series.	
<b>Unit-4: Complex Variable–Differentiation</b>	8
Functions of complex variable, Limit, Continuity and differentiability, Analytic functions, Cauchy- Riemann equations (Cartesian and Polar form), Harmonic function, Method to find Analytic functions, Milne's Thompson Method, Conformal mapping, Mobius transformation and their properties.	
<b>Unit-5: Complex Variable –Integration</b>	8
Complex integration, Cauchy- Integral theorem, Cauchy integral formula, Taylor's and Laurent's series, singularities and its classification, zeros of analytic functions, Residues, Cauchy's Residue theorem and its application.	

## BEE101 / BEE201: FUNDAMENTALS OF ELECTRICAL ENGINEERING

Content	Contact Hours
<b>Unit -1: DC Circuits</b>	6
Electrical circuit elements (R, L and C), Concept of active and passive elements, voltage and current sources, concept of linearity, unilateral and bilateral elements. Kirchhoff's laws, Mesh and nodal methods of analysis.	
<b>Unit-2: : Steady State Analysis of Single Phase AC Circuits</b>	6
Representation of Sinusoidal waveforms – Average and effective values, Form and peak factors. Analysis of single phase AC Circuits consisting R-L-C combination (Series and Parallel) Apparent, active & reactive power, Power factor. Concept of Resonance in series & parallel circuits, bandwidth and quality factor. Three phase balanced circuits, voltage and current relations in star and delta connections.	
<b>Unit-3: Transformers</b>	6
Magnetic circuits, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency.	
<b>Unit-4: Electrical machines</b>	8
DC machines: Principle & Construction, Types, EMF equation of generator and torque equation of motor, applications of DC motors (simple numerical problems) Three Phase Induction Motor: Principle & Construction, Types, Slip-torque characteristics, Applications (Numerical problems related to slip only) Single Phase Induction motor: Principle of operation and introduction to methods of starting, applications. Three Phase Synchronous Machines: Principle of operation of alternator and synchronous motor and their applications.	
<b>Unit-5: Electrical Installations</b>	4
Introduction of Switch Fuse Unit (SFU), MCB, ELCB, MCCB, ACB. Types of Wires, Cables and Bus-bars. Fundamentals of earthing and lightning protection. Types of Batteries	

## BME101 / BME201: FUNDAMENTALS OF MECHANICAL ENGINEERING

Content	Contact Hours
<b>Unit -1: Introduction to Mechanics</b>	8
<p>Force moment and couple, principle of transmissibility, Varignon's theorem. Resultant of force system- concurrent and non-concurrent coplanar forces, Types of supports (Hinge, Roller) and loads (Point, UDL, UVL), free body diagram, equilibrium equations and Support Reactions.</p> <p>Normal and shear Stress, strain, Hookes' law, Poisson's ratio, elastic constants and their relationship, stress-strain diagram for ductile and brittle materials, factor of safety.</p>	
<b>Unit-2: Introduction to IC Engines and Electric Vehicles</b>	8
<p><b>IC Engine:</b> Basic definition of engine and Components, Construction and Working of Two stroke and four stroke SI &amp; CI engine, merits and demerits, scavenging process; difference between two-stroke and four stroke IC engines and SI and CI Engines.</p> <p><b>Electric vehicles and hybrid vehicles:</b> Components of an EV, EV batteries, chargers, drives, transmission and power devices. Advantages and disadvantages of EVs. Hybrid electric vehicles, HEV drive train components, advantages of HV.</p>	
<b>Unit-3: Introduction to Refrigeration and Air-Conditioning</b>	8
<p><b>Refrigeration:</b> Refrigerating effect, Ton of Refrigeration; Coefficient of performance, methods of refrigeration, construction and working of domestic refrigerator, concept of heat pump.</p> <p><b>Air-Conditioning:</b> Its meaning and application, humidity, dry bulb, wet bulb, and dew point temperatures, comfort conditions, construction and working of window air conditioner.</p>	
<b>Unit-4: Introduction to Fluid Mechanics and Applications</b>	8
<p>Introduction: Fluids properties, pressure, density, dynamic and kinematic viscosity, specific gravity, Newtonian and Non-Newtonian fluid, Pascal's Law and Continuity Equation.</p> <p>Working principles of hydraulic turbines (Pelton Wheel and Francis)&amp; pumps (Centrifugal and Reciprocating) and their classifications and hydraulic lift.</p>	
<b>Unit-5: Introduction to Measurement and Mechatronics</b>	12
<p><b>Introduction to Measurement:</b> Concept of Measurement, Error in measurements, Calibration, measurements of pressure(Bourdon Tube Pressure and U-Tube Manometer), temperature(Thermocouple and Optical Pyrometer), mass flow rate(Venturi Meter and Orifice Meter), strain(Bonded and Unbonded Strain Gauge), force (Proving Ring) and torques(Prony Brake Dynamometer); Concepts of accuracy, precision and resolution.</p> <p><b>Introduction to Mechatronic Systems:</b> Evolution, Scope, Advantages and disadvantages of Mechatronics, Industrial applications of Mechatronics, Introduction to autotronics, bionics, and avionics and their applications. Sensors and Transducers: Types of sensors, types of transducers and their characteristics.</p>	



<p><b>Overview of Mechanical Actuation System</b> – Kinematic Chains, Cam, Ratchet Mechanism, Gears and its type, Belt, Bearing.</p> <p><b>Hydraulic and Pneumatic Actuation Systems:</b> Overview: Pressure Control Valves, Direction Control Valves, Rotary Actuators, Accumulators and Pneumatic Sequencing Problems.</p>	
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**Course Outcomes:**

The students will be able to		Blooms Level
CO1	Apply the concept of force resolution and stress and strain to solve basic problems	K3
CO2	Understand the construction details and working of internal combustion engines, electric vehicle and hybrid vehicles.	K2
CO3	Explain the construction detail and working of refrigerator, heat pump and air-conditioner.	K2
CO4	Understand fluid properties, conservation laws and hydraulic machinery used in real life.	K2
CO5	Understand the working principle of different measuring instrument and mechatronics with their advantages, scope and Industrial application.	K2

**Reference Books:**

1. Basic Mechanical Engineering, G Shanmugam, S Ravindran, McGraw Hill
2. Basic Mechanical Engineering, M P Poonia and S C Sharma, Khanna Publishers
3. Mechatronics : Principles, Concepts and Applications, Nitaigour Mahalik, McGraw Hill
4. Mechatronics, As per AICTE: Integrated Mechanical Electronic Systems, K.P. Ramachandran, G.K. Vijayaraghavan, M.S.Balasundaram, Wiley India
5. Mechanical Measurements & Control, Dr. D. S. Kumar. Metropolitan Book Company
6. Fluid Mechanics and Hydraulic Machines, Mahesh Kumar, Pearson India

## BAS105 / BAS205: SOFT SKILLS

### Course Objectives:

1. Students will be enabled to **understand** the correct usage of grammar.
2. Students will be able to **converse** well with effective speaking and listening skills in English.
3. Students will be able to **create** substantial base by the formation of strong professional vocabulary for its application at different platforms and through numerous modes as Comprehension, reading and writing
4. Student will be able to **equip** with basics of communication skills and will **apply** it for practical and oral purposes by being honed up in presentation skills and voice-dynamics.
5. Students will be able **build up** personal traits that will make the transition from institution to workplace smoother and help them to excel in their jobs.

Content	Contact Hours
<b>Unit-1 Applied Grammar and Usage:</b>	<b>8</b>
Transformation of Sentences: Simple, Compound and Complex, Subject-verb agreement, Prefix and Suffix, Advanced Vocabulary: Antonyms, Synonyms, Homophones, , Homophones, New word Formation, Select word power	
<b>Unit-2: Listening and Speaking Skills</b>	<b>8</b>
Active Listening :Meaning and Art of Listening, Traits of a Good Listener, Listening modes, listening and Note taking, Types of Listening, Listening Techniques using Ted Talk Audio listening with script reading, Pronunciation; Speaking style ; content and sequencing.	
<b>Unit-3: Reading and Writing Skills:</b>	<b>8</b>
Reading style: Skimming; Scanning; Churning & Assimilation, Effective writing tools and methods: Inductive Deductive; Exposition; Linear; Interrupted; Spatial & and Chronological etc, Official and Business Letter writing, Agenda, Notices, Minutes of meeting,	
<b>Unit-4: Presentation and Interaction Skills</b>	<b>8</b>
Introduction to oral communication, Nuances and Modes of Speech Delivery, Public speaking: confidence, clarity, and fluency, Individual Speaking: Elements; Non verbal Communication: Kinesics, Paralinguistic features of Voice-Dynamics, Proxemics, Chronemics, and Presentation Strategies: planning, preparation, organization, delivery	
<b>Unit-5: Work- place skills:</b>	<b>8</b>
Leadership qualities; Impact, Communication skills for Leaders: Listening and Responding; Mental health at work place: Managing Stress; Techniques: Application of 4 A's; Avoid; Alter; Access; Adapt	

## BAS152 / BAS252 : ENGINEERING CHEMISTRY LAB

### Course Objectives:

1. To enable the students to understand about the fundamental concepts of analytical instruments
2. To enable the students to understand about the analysis of chloride content, hardness, alkalinity of water.
3. To enable the students to understand about the measure of pH, surface tension and viscosity of a liquid.
4. To enable the students to understand about the preparation of different resins.
5. To enable the students to understand about the synthesis of organic compounds such as adipic acid and paracetamol by conventional and green route.

### LIST OF EXPERIMENTS

1. Calibration of Analytical Equipment and apparatus.
2. Determination of Hardness of water sample by EDTA method.
3. Determination of Alkalinity of water sample.
4. Determination of pH by titrimetric method.
5. Determination of surface tension of given liquid.
6. Determination of Viscosity of a given liquid by viscometer.
7. Determination of the strength of Ferrous ammonium sulfate using external indicator.
8. Determination of the strength of Potassium dichromate using internal indicator.
9. Determination of available chlorine in bleaching powder.
10. Determination of chloride content in water sample.
11. Preparation of Phenol formaldehyde (PF) resin.
12. Preparation of Urea formaldehyde (UF) resin.
13. Preparation of Adipic acid / Paracetamol.
14. Determination of Cell Conductance of a solution.
15. Determination of Rate constant of hydrolysis of esters.
16. Element detection and identification of functional groups in organic compounds.

**NOTE:** Instructor may choose any 10 experiments from above and may also change any two of the above..

### Course Outcomes:

Upon completion of the course the student should be able to:

	Course Outcomes	Bloom's Level
CO-1	Get an understanding of the use of different analytical instruments.	K3
CO-2	Measure the molecular / system properties such as surface tension, viscosity, conductance of solution, chloride and iron content in the water.	K3
CO-3	Measure the hardness and alkalinity of the water.	K3
CO-4	Know the fundamental concepts of the preparation of phenol formaldehyde & urea formaldehyde resin, adipic acid and Paracetamol.	K3
CO-5	Estimate the rate constant of reaction.	K3

# **BAS155 / BAS255 : ENGLISH LANGUAGE LAB**

## **Course Objectives:**

1. To facilitate software based learning to provide the required English Language proficiency to students.
2. To acquaint students with specific dimensions of communication skills i.e. Reading, Writing, Listening, Thinking and Speaking.
3. To train students to use the correct and error-free writing by being well versed in rules of English grammar.
4. To cultivate relevant technical style of communication and presentation at their work place and also for academic uses.
5. To enable students to apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics.

## **Professional Communication Lab shall have two parts:**

### **1-Interactive Communication Skills:**

Students should practice the language with variety of activities and exercises based on employability skills. Interactive and Communicative Practical with emphasis on Oral Presentation/Spoken Communication, based on International Phonetic Alphabets (I.P.A.)

#### **LIST OF PRACTICALS**

1. Group Discussion: Practical based on Accurate and Current Grammatical Patterns.
2. Conversational Skills for Interviews under suitable Professional Communication Lab conditions with emphasis on Kinesics.
3. Communication Skills for Seminars/Conferences/Workshops with emphasis on Paralinguistic/Kinesics.
4. Presentation Skills for Technical Paper/Project Reports/ proposals based on proper Stress and Intonation Mechanics
5. Official/Public Speaking practice sessions based on suitable Rhythmic Patterns.
6. Theme Presentation/ Keynote Presentation based on correct methodologies of argumentation
7. Individual Speech Delivery/Conferencing with skills to defend Interjections/Quizzes.
8. Argumentative Skills/Role Play Presentation with Stress and Intonation.
9. Comprehension Skills based on Reading and Listening Practical's on a model Audio
10. Startup presentations, Video portfolio, Extempore, Role play, Just a Minute (JAM) etc.

### **2-Computer assisted software based Language Learning:**

Software based self-guided learning to provide the required English language proficiency to students from an employability and career readiness standpoint. The software should align to Common European Framework of Reference for Languages (CEFR) and deliver a CEFR level – B2 upon completion.

## Course Outcome:

1. Students will be enabled to understand the basic objective of the course by being acquainted with specific dimensions of communication skills i.e. Reading, Writing, Listening, Thinking and Speaking.
2. Students would be able to create substantial base by the formation of strong professional vocabulary for its application at different platforms and through numerous modes as Comprehension, reading, writing and speaking etc.
3. Students will apply it at their work place for writing purposes such as Presentation/official drafting/administrative communication and use it for document/project/report/research paper writing.
4. Students will be made to evaluate the correct and error-free writing by being well-versed in rules of English grammar and cultivate relevant technical style of communication & presentation at their work place and also for academic uses.
5. Students will apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics. They will apply techniques for developing interpersonal communication skills and positive attitude leading to their professional competence.

## Suggested Softwares:

- *Oxford Achiever* by Oxford University Press.
- *Cambridge English Empower* by Cambridge University Press.
- *MePro*. by Pearson India Education Services Pvt. Ltd.
- *New Interactions* by McGraw-Hill India.

## Reference Books:

1. Word Power Made Easy by Norman Lewis, W.R.Goyal Pub. & Distributors, 2009, Delhi.
2. Manual of Practical Communication by L.U.B. Pandey; A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2013, Delhi
3. Practical Communication Process & Practice, LU.B. Pandey: A.I.T.B.S. Pub. India Ltd Krishna Nagar, Delhi, 2013.
4. English Grammar and Usage by R.P. Sinha, Oxford University Press, 2005, New Delhi.
5. English Grammar, Composition and Usage by N.K.Agrawal & F.T.Wood, Macmillan India Ltd., New Delhi.
6. Effective Communication Skill, Kulbhusan Kumar, RS Salaria, Khanna Publishing House
7. English Grammar & Composition by Wren & Martin, S.Chand & Co. Ltd., New Delhi.
8. Communication Skills for Engineers and Scientists, Sangeeta Sharma et.al. PHI Learning Pvt.Ltd, 2011, New Delhi.
9. Personality Development, Harold R. Wallace & L. Ann Masters, Cengage Learning, New Delhi
10. Personality Development & Soft Skills, Barun K.Mitra, Oxford University Press, 2012 New Delhi.
11. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., 2001, New Delhi.
12. Developing Communication Skills by Krishna Mohan, Meera Bannerji- Macmillan India Ltd. 1990, Delhi.
13. Spoken English- A manual of Speech and Phonetics by R.K.Bansal & J.B.Harrison, Orient Blackswan, 2013, New Delhi.
14. Business English by Ken Taylor, Orient Blackswan, 2011, New Delhi

## BWS151/ BWS251: WORKSHOP PRACTICE LAB

S. No.	Mechanical Workshop	Duration
<b>1</b>	<b>Introduction to Mechanical workshop material, tools and machines</b>	3 Hrs
	To study layout, safety measures and different engineering materials (mild steel, medium carbon steel, high carbon steel, high speed steel and cast iron etc) used in workshop.	
	To study and use of different types of tools, equipment, devices & machines used in fitting, sheet metal and welding section.	
	To determine the least count of Vernier calliper, vernier height gauge, micrometer (Screw gauge) and take different reading over given metallic pieces using these instruments.	
<b>2</b>	<b>Machine shop</b>	3 Hrs
	Demonstration of working, construction and accessories for Lathe machine	
	Perform operations on Lathe - Facing, Plane Turning, step turning, taper turning, threading, knurling and parting.	
<b>3</b>	<b>Fitting shop</b>	3 Hrs
	1. Practice marking operations. 2. Preparation of U or V -Shape Male Female Work piece which contains: Filing, Sawing, Drilling, Grinding.	
<b>4</b>	<b>Carpentry Shop</b>	3 Hrs
	Study of Carpentry Tools, Equipment and different joints.	
	Making of Cross Half lap joint, Half lap Dovetail joint and Mortise Tenon Joint	
<b>5</b>	<b>Welding Shop</b>	6 Hrs
	Introduction to BI standards and reading of welding drawings.	
	Practice of Making following operations Butt Joint Lap Joint TIG Welding MIG Welding	
<b>6</b>	<b>Moulding and Casting Shop</b>	6 Hrs

	Introduction to Patterns, pattern allowances, ingredients of moulding sand and melting furnaces. Foundry tools and their purposes Demo of mould preparation and Aluminum casting Practice – Study and Preparation of mould for Plastic	
<b>7</b>	<b>CNC Shop</b>	<b>6 Hrs</b>
	Study of main features and working parts of CNC machine and accessories that can be used. Perform different operations on metal components using any CNC machines	
<b>8</b>	<b>To prepare a product using 3D printing</b>	<b>3 Hrs</b>
	<b>Total</b>	<b>33 Hrs</b>

### Course Outcome:

The students will be able to		Blooms Level
CO1	Use various engineering materials, tools, machines and measuring equipments.	<b>K3</b>
CO2	Perform machine operations in lathe and CNC machine.	<b>K3</b>
CO3	Perform manufacturing operations on components in fitting and carpentry shop.	<b>K3</b>
CO4	Perform operations in welding, moulding, casting and gas cutting.	<b>K3</b>
CO5	Fabricate a job by 3D printing manufacturing technique	<b>K3</b>

### Reference Books:

1. Workshop Practice, H S Bawa, McGraw Hill
2. Mechanical Workshop Practice, K C John, PHI
3. Workshop Practice Vol 1, and Vol 2, by HazraChoudhary , Media promoters and Publications
4. CNC Fundamentals and Programming, By P. M. Agrawal, V. J. Patel, Charotar Publication.