Bharati Vidyapeeth

(Deemed to be University)

Pune, India

Faculty of Engineering and Technology

Programme: B.Tech (Computer Science and Business Systems)

COURSE STRUCTURE AND SYLLABUS

(Choice Based Credit System)

B.Tech (Computer Science and Business Systems)

2018 Course

Bharati Vidyapeeth (Deemed to be University) College of Engineering, Pune
B.Tech- Computer Science & Business Systems (Semester- I and II)
Revised New Syllabus

Semester I		Teaching Scheme				Examination Scheme-Marks							Credit		
						End Semester Examination	Continuous Assessment			TW & Practical	TW & Oral	Total	Theory	Term Work	Total
ID	Course	Lecture	Tutorial	Practical	Contact Hours per week		Unit Test	Attendance	Assignments						
1. 1	Mathematics I	3	1	0	4	60	20	10	10	-	-	100	4	0	4
1.2	Statistics I	3	1	0	4	60	20	10	10	-	-	100	4	0	4
1.3	Principles of Electrical Engineering	3	0	2	5	60	20	10	10	-	50	150	3	1	4
1.4	Fundamentals of Computer Science	3	1	2	6	60	20	10	10	50	-	150	4	1	5
1.5	Fundamentals of Physics	3	0	2	5	60	20	10	10	-	50	150	3	1	4
1.6	Business Communication & Value Science - I	2	1	2	5	50	-	-	-	-	50	100	3	1	4
	Total	17	4	8	29	350	100	50	50	50	150	750	21	4	25

Semester II		Teaching Scheme				Examination Scheme-Marks							Credit		
						End Semester Examination	Continuous Assessment			TW & Practical	TW & Oral	Total	Theory	Term Work	Total
ID	Course	Lecture	Tutorial	Practical	Contact Hours per week		Unit Test	Attendance	Assignments						
1. 7	Mathematics II	3	1	0	4	60	20	10	10	-	-	100	4	0	4
1.8	Statistics II	3	1	0	4	60	20	10	10	-	-	100	4	0	4
1. 9	Data Structures & Problem Solving	3	1	2	6	60	20	10	10	50	-	150	4	1	5
1.10	Fundamentals of Economics	3	0	0	3	60	20	10	10	-	-	100	3	0	3
1.11	Principles of Electronics	3	0	2	5	60	20	10	10		50	150	3	1	4
1.12	Business Communication & Value Science - II	2	1	2	5	50	-	-	-	-	50	100	3	1	4
1. 13	Self Learning Module	0	0	2	2	-	-	-	-	-	50	50	0	1	1
	Total	17	4	8	29	350	100	50		50	150	750	21	4	25

Bharati Vidyapeeth (Deemed to be University) College of Engineering, Pune
B.Tech- Computer Science & Business Systems (Semester- III and IV)
Revised New Syllabus

Semester- III		Teaching Scheme				Examination Scheme-Marks							Credit		
						End Semester Examination	Continuous Assessment			TW & Practical	TW & Oral	Total	Theory	Term Work	Total
ID	Course	Lecture	Tutorial	Practical	Contact Hours per week		Unit Test	Attendance	Assignments						
2.1	Formal Language and Automata Theory	4	1	2	6	60	20	10	10	-	50	150	5	1	6
2.2	Computer Organization & Architecture	4	0	2	5	60	20	10	10	-	50	150	4	1	5
2.3	Object Oriented Programming	3	0	2	5	60	20	10	10	50	-	150	3	1	4
2.4	Computational Statistics	3	0	2	5	60	20	10	10	50	-	150	3	1	4
2.5	Software Engineering	4	1	2	6	60	20	10	10	50	-	150	5	1	6
2.6	Indian Constitution (Non Credit)												0	0	0
	Total	**18**	**2**	**10**	**27**	**300**	**100**	**50**	**50**	**150**	**100**	**750**	**20**	**5**	**25**

Semester- IV		Teaching Scheme				Examination Scheme-Marks							Credit		
						End Semester Examination	Continuous Assessment			TW & Practical	TW & Oral	Total	Theory	Term Work	Total
ID	Course	Lecture	Tutorial	Practical	Contact Hours per week		Unit Test	Attendance	Assignments						
2.8	Operating Systems	4	0	2	5	60	20	10	10	50	-	150	4	1	5
2.9	Database Management Systems	4	0	2	5	60	20	10	10	50	-	150	4	1	5
2.10	Software Design with UML	4	0	2	5	60	20	10	10	50	-	150	4	1	5
2.11	Introduction to Innovation, IP Management & Entrepreneurship	4	0	0	3	60	20	10	10	-	-	100	3	0	3
2.12	Business Communication & Value Science – III	2	0	4	6	50	0	0	0	-	50	100	2	2	4
2.13	Operations Research	2	0	2	4	60	20	10	10	-	50	150	2	1	3
2.14	Essence of Indian Traditional Knowledge(Non Credit)									-	-	0			
	Total	**20**	**0**	**12**	**28**	**350**	**100**	**50**	**50**	**150**	**100**	**800**	**19**	**6**	**25**

BHARATI VIDYAPEETH (Deemed to be University)

COLLEGE OF ENGINEERING, PUNE-43

B. Tech. (Computer Science & Business Systems)

Vision of the Department

"To syndicate industry and institute to impart high quality knowledge through scholarity, research and creative endeavor"

Mission of the Department

- To impart contemporary technology conforming to a dynamic curriculum.
- To engage in professional development and scholarly endeavor through knowledge of common business principles.
- To promote the awareness of business discipline and ethical responsibility through industry alliance

Programme Educational Objectives

1. Prevail technical competency to concord the industry engrossment.
2. Assimilate business management skills.
3. Instigate business level innovation with societal consideration.

Programme Outcomes

The students of B.Tech (Computer Science & Business Systems) will be able to

a. Demonstrate logical and programming skills through comprehensive programming foundation.
b. Apply knowledge of mathematics, computer engineering and basic science to comprehend and solve real world problems.
c. Develop software applications and processes for complex problems to provide efficient solutions by assessing its environmental, social and ethical constraints.
d. Investigate and solve complex computing problems with alternate solutions.
e. Use functional skills of modern IT tools and techniques for engineering activities.
f. Understand the social and cultural impact of computing on society.
g. Provide optimized computational solutions that apprehend the societal and environmental aspects.
h. exhibit the professional, ethical and legal responsibilities related to industry.
i. Perform as an individual and efficient team player to accomplish a goal.
j. Present professional concepts through effective communication skills and documentation.
k. Demonstrate management skills for developing time-bound projects within the available budget and resources.
l. Develop the ability of life long learning for new IT practices.

Syllabus of Semester I

Mathematics I

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Lectures: 3Hrs./Week	Semester Examination: 60 marks	Theory: 4 Credits
Tutorials: 1Hr./Week	Continuous Assessment: 40 marks	
Lab: Nil	Term Work: Nil	

Course Pre Requisites:

The students should have basic Knowledge of high school math, including trigonometry, geometry and calculus

Course Objective:

The course introduces fundamental concepts of Calculus and Discrete Mathematics.

Course Outcomes:

1) Evaluate double integral and triple integral to compute area, volume for two dimensional and three-dimensional solid structure.
2) Understand and apply basic concepts of Boolean algebra.
3) To recall the basic concepts of sets, functions and relations.
4) Develop fundamental understanding of Elementary Combinatory.
5) Understand various concepts of algebraic systems.
6) Student will be able to prove mathematical statements using induction method.

Topics to Be Covered:

UNIT – I **[6 Hours]**

Calculus: Differential calculus and integral calculus, double and triple integral.

UNIT – II **[6 Hours]**

Application of double and triple integral.

UNIT – III **[6 Hours]**

Boolean algebra: Introduction of Boolean algebra, truth table.

UNIT – IV **[6 Hours]**

Basic logic gate, basic postulates of Boolean algebra, principle of duality, canonical form, Karnaugh map.

UNIT – V **[6 Hours]**

Abstract algebra: Set, relation, group, ring, field.

UNIT – VI **[6 Hours]**

Combinatorics: Basic counting, balls and bins problems, generating functions, recurrence relations. Proof techniques, principle of mathematical induction, strong form of induction, pigeonhole principle.

Home Assignments:

Assignments & tutorials covering the following: Successive differentiation, multiple integral, truth table, Karnaugh map, principle of mathematical induction, strong form of induction and pigeonhole principle.

Reference Books:

1. I. N. Herstein, "Topics in Algebra", John Wiley and Sons.
2. M. Morris Mano, "Digital Logic & Computer Design", Pearson
3. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publication, Delhi.

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

Statistics I

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Lectures: 3Hrs/Week	Semester Examination: 60 marks	Theory: 4 Credits
Tutorials: 1Hr/Week	Continuous Assessment: 40 marks	
Lab: Nil	Term Work: Nil	

Course Pre-Requisites:

The students should have basic Knowledge of high school math and calculus

Course Objective:

The course introduces fundamental concepts of statistics and probability

Course Outcomes:

Course outcomes of Statistics-I

1) Students will be able to use appropriate statistical terms to describe data.
2) Students will be able to use appropriate statistical methods to collect, organize, display and analyze relevant data
3) Students will be able to identify the types of sampling.
4) Students will be able to understand mathematical expectation and moments generating function.
5) Students will be able to apply concepts of various probability distributions to find probabilities.
6) Students will be able to apply concepts of Normal, Poisson, Binomial, uniform, exponential, t and F-distribution.

Topics to Be Covered:

UNIT – I **[6 Hours]**

Introduction to Statistics: Definition of Statistics. Basic objectives. Applications in various branches of science with examples

Collection of Data: Internal and external data, Primary and secondary Data. Population and sample, Representative sample.

UNIT – II **[6 Hours]**

Descriptive Statistics: Classification and tabulation of univariate data, graphical representation, Frequency curves. Descriptive measures - central tendency and dispersion. Bivariate data. Summarization, marginal and conditional frequency distribution. Scatter diagram. Linear regression and correlation. Least squares method. Rank correlation.

UNIT III **[6 Hours]**

Sampling Techniques: Random sampling. Sampling from finite and infinite populations. Estimates and standard error (sampling with replacement and sampling without replacement), Sampling distribution of sample mean, stratified random sampling

UNIT – IV **[6 Hours]**

Expected values & moments: mathematical expectation & its properties, Moments (including variance) & their properties, interpretation, Moment generating function

UNIT – V **[6 Hours]**

Probability Theory: concept of experiments, sample space, event. Definition of Combinatorial Probability. Conditional Probability, Bayes Theorem

UNIT – VI **[6 Hours]**

Probability distributions: discrete & continuous distributions, Binomial, Poisson & Geometric distributions, Uniform, Exponential, Normal, Chi-square, t, F distributions

Home Assignments:

Problem sets to be shared by faculty covering the following topics:

Graphical representation of data, Histograms, Descriptive measures - central tendency and dispersion Estimating moments, Distribution parameters, Simulation

Text Books:

1. Introduction of Probability Models, S.M. Ross, Academic Press, N.Y.
2. Fundamentals of Statistics (vol. I and vol. II) - A. Goon, M. Gupta and B. Dasgupta.

Reference Books:

1. A first course in Probability, S.M. Ross.
2. Probability and Statistics for Engineers (4th Edition) - I.R. Miller, J.E. Freund and R. Johnson.
3. Statistical Concepts & Methods - G.K. Bhattacharyya and R.A. Johnson.
4. Introduction to the Theory of Statistics - A.M. Mood, F.A. Graybill & D.C. Boes.

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

Principles of Electrical Engineering

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	**Theory: 3 Credits**
Practical: 02 Hours / Week	Continuous Assessment: 40 Marks	
	Term Work and Oral: 50 Marks	**TW and Oral :1 Credit**

Course Pre-requisites:

The Students should have knowledge of Mathematics, physics

Course Objectives:

The course introduces fundamental concepts of DC and AC circuits, Electrostatics electromagnetism, transformer, electrical wiring.

Course Outcomes: After learning this course the students will be able to

1. Apply knowledge of basic concepts of work, power, energy for electrical, mechanical and thermal systems
2. Calculate current in electrical network using Kirchoff's laws and network theorems.
3. Describe construction, principle of operation, specifications and applications of capacitors and batteries
4. Define basic terms of single phase and three phase ac circuits and supply systems.
5. Describe and apply fundamental concepts of magnetic and electromagnetic circuits for operation of single phase transformer.
6. Describe types of wiring and earthing system.

Topics to Be Covered:

UNIT – I [4 Hours]

Basic Concepts: Concept of EMF, Potential Difference, current, resistance, Ohms law, resistance temperature coefficient, SI units of Work, power, energy. Conversion of energy from one form to another in electrical, mechanical and thermal systems

UNIT – II [8 Hours]

Network Theorems: Voltage source and current sources, ideal and practical, Kirchoff's laws and applications to network solutions using mesh analysis, Simplifications of networks using series-parallel, Star/Delta transformation. Superposition theorem, Thevenin's theorem, Max Power Transfer theorem.

UNIT III [4 Hours]

Electrostatics: Electrostatic field, electric field intensity, electric field strength, absolute permittivity, relative permittivity, capacitor composite, dielectric capacitors, capacitors in series& parallel, energy stored in capacitors, charging and discharging of capacitors, Batteries-Types, Construction& working.

UNIT – IV **[6 Hours]**

AC Fundamentals & AC Circuits: AC waveform definitions, form factor, peak factor, study of R-L, R-C, RLC series circuit, R-L-C parallel circuit, phasor representation in polar & rectangular form, concept of impedance, admittance, active, reactive, apparent and complex power, power factor, 3-ph balanced AC Circuits.

UNIT – V **[8 Hours]**

Magnetic Circuits & Transformer: Magnetic effect of electric current, cross and dot convention, right hand thumb rule, concept of flux, flux linkages, Flux Density, Magnetic field, magnetic field strength, magnetic field intensity, absolute permeability, relative permeability, Ampere's law, B-H curve, hysteresis loop, series-parallel magnetic circuit, composite magnetic circuit, Comparison of electrical and magnetic circuit

Faraday's law of electromagnetic induction, statically and dynamically induced emf, self-inductance, mutual inductance, coefficient of coupling,

Single phase transformer construction, principle of operation, EMF equation, voltage ratio, current ratio, kVA rating, losses in transformer, Determination of Efficiency & Regulation by direct load test.

UNIT – VI **[6 Hours]**

Electrical Wiring and Illumination system: Basic layout of distribution system, Types of Wiring System & Wiring Accessories, Necessity of earthing, Types of earthing, Different types of lamps (Incandescent, Fluorescent, Sodium Vapour, Mercury Vapour, Metal Halide, CFL, LED), Introduction to measuring devices/sensors and transducers related to electrical signals, Elementary methods for the measurement of electrical quantities in DC and AC systems and their practical application. :

Term Work: The term work shall consist of record of minimum eight exercises / experiments.

1. Determination of resistance temperature coefficient
2. Verification of Superposition Theorem
3. Verification of Thevenin's Theorem
4. Verification of Kirchoff's Laws
5. Verification of Maximum power transfer Theorem

6. Time response of RC circuit
7. Study of R-L-C series circuits for $X_L > X_C$, $X_L < X_C$ & $X_L = X_C$
8. Verification of current relations in three phase balanced star and delta connected loads.
9. Direct loading test on Single phase transformer
   a) Voltage and current ratios.
   b) Efficiency and regulations.
10. Study of a Residential (L.T.) Bill

Text Books:

1. B.L. Theraja- "A Textbook of Electrical Technology" Volume- I, S.Chand and Company Ltd.,New Delhi
2. V. K. Mehta, - "Basic Electrical Engineering", S. Chand and Company Ltd., New Delhi
3. I. J. Nagrath and Kothari – "Theory and problems of Basic Electrical Engineering", Prentice Hall of India Pvt. Ltd

Reference Books:

1. Edward Hughes – "Electrical Technology"- Seventh Edition, Pearson Education Publication
2. H. Cotton – "Elements of Electrical Technology", C.B.S. Publications
3. John Omalley Shawn – "Basic circuits analysis" Mc Graw Hill Publications
4. Vincent Del Toro – "Principles of Electrical Engineering", PHI Publications

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

Fundamentals of Computer Science

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Lectures: 3Hrs./Week	Semester Examination: 60 marks	Theory: 4 Credits
Tutorials: 1Hr/Week	Continuous Assessment: 40 marks	
Lab: 2Hrs./Week	Term work & Practical: 50 Marks	TW and Practical :1 Credit

Course Pre-Requisites:

Knowledge of Class XII level computers will be helpful, but not mandatory.

Course Objective:

The course introduces fundamental concepts of computer science

Course Outcomes:

1. Understand the basics of computer science & the process of moving from a problem statement to a computational formulation of a method for solving the problem.
2. Apply the basic concepts of control structures.
3. Understand basic concepts of function.
4. Implement concept of arrays and pointers.
5. Develop an application using the concept of file handling.
6. Describe unix system interface and programming method.

Topics to Be Covered:

UNIT – I **[6 Hours]**

General problem Solving concepts and Imperative languages: Algorithm, and Flowchart for problem solving with Sequential Logic Structure, Decisions and Loops.
Imperative languages: Introduction to imperative language; syntax and constructs of a specific language (ANSI C) .**Types Operator and Expressions with discussion of variable naming and Hungarian Notation**: Variable Names, Data Type and Sizes (Little Endian Big Endian), Constants, Declarations, Arithmetic Operators, Relational Operators, Logical Operators, Type Conversion, Increment Decrement Operators, Bitwise Operators, Assignment Operators and Expressions, Precedence and Order of Evaluation, proper variable naming and Hungarian Notation

UNIT – II **[6 Hours]**

Control Flow with discussion on structured and unstructured programming: Statements and Blocks, If-Else-If, Switch, Loops – while, do, for, break and continue, Goto Labels, structured and un- structured programming

UNIT – III **[6 Hours]**

Functions and Program Structure with discussion on standard library: Basics of functions, parameter passing and returning type, C main return as integer, External, Auto, Local, Static, Register Variables, Scope Rules, Block structure, Initialization, Recursion, Preprocessor, Standard Library Functions and return types

UNIT – IV **[6 Hours]**

Pointers and Arrays: Pointers and address, Pointers and Function Arguments, Pointers and Arrays, Address Arithmetic, character Pointers and Functions, Pointer Arrays, Pointer to Pointer, Multi-dimensional array and Row/column major formats, Initialisation of Pointer Arrays, Command line arguments, Pointer to functions, complicated declarations and how they are evaluated.

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UNIT – V **[6 Hours]**

Structures: Basic Structures, Structures and Functions, Array of structures, Pointer of structures, Self-referral Structures, Table look up, Typedef, Unions, Bit-fields
Input and Output: Standard I/O, Formatted Output – printf, Formated Input – scanf, Variable length argument list, file access including FILE structure, fopen, stdin, sdtout and stderr, Error Handling including exit, perror and error.h, Line I/O, related miscellaneous functions

UNIT – VI **[6 Hours]**

Unix system Interface: File Descriptor, Low level I/O – read and write, Open, create, close and unlink, Random access – lseek, Discussions on Listing Directory, Storage allocator
Programming Method: Debugging, Macro, User Defined Header, User Defined Library Function, makefile utility.

Home Assignments:

1. Algorithm and flowcharts of small problems like GCD
2. Structured code writing with:
    i. Small but tricky codes
    ii. Proper parameter passing
    iii. Command line Arguments
    iv. Variable parameter
    v. Pointer to functions

vi. User defined header
vii. Make file utility
viii. Multi file program and user defined libraries
ix. Interesting substring matching / searching programs
x. Parsing related assignments

Text Books:

1. B. W. Kernighan and D. M. Ritchi, "The C Programming Language", Second Edition, PHI.
2. B. Gottfried, "Programming in C", Second Edition, Schaum Outline Series.

Reference Books:

1. Herbert Schildt, "C: The Complete Reference", Fourth Edition, McGraw Hill.
2. Yashavant Kanetkar, "Let Us C", BPB Publications.

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

Fundamentals of Physics

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Lectures: 3Hrs. /Week	Semester Examination: 60 marks	Theory: 3 Credits
Tutorials: Nil	Continuous Assessment: 40 marks	
Lab: 2 Hrs. / Week	Term Work and Oral : 50 marks	TW and Oral :1 Credit

Course Pre-Requisites:

Knowledge of Class XII level Physics and Mathematics

Course Objective:

The course introduces fundamental concepts of physics

Course Outcomes:

1. To understand the Importance of applications of Applied Physics in daily life
2. To provide students with a basic understanding of the Physics that may be required by engineers in the course of their careers
3. To impart knowledge related to the importance of EM waves and magnetic materials
4. To enhance knowledge related to lasers and its different components to make it suitable for various purposes
5. To introduce most important concepts of superconductivity, crystallography and fiber optics to the students
6. To introduce the learners to the basics of Special theory of relativity, X- rays, Quantum Mechanics

Topics to Be Covered:

UNIT – I **[6 Hours]**

Oscillations: Periodic motion-simple harmonic motion-characteristics of simple harmonic motion-vibration of simple springs mass system. Resonance-definition., damped harmonic oscillator – heavy, critical and light damping, energy decay in a damped harmonic oscillator, quality factor, forced mechanical and electrical oscillators

UNIT – II **[6 Hours]**

Classical Optics: Theory of interference fringes-types of interference-Fresnel's prism-Newton's rings, Diffraction-Two kinds of diffraction-Difference between interference and diffraction-Fresnel's half period zone and zone plate-Fraunhofer diffraction at single slit-plane diffraction grating. Temporal and Spatial Coherence, Polarization - Concept of production of polarized beam of light from two SHM acting at right angle; plane, elliptical and circularly polarized light, Brewster's law, double refraction.

UNIT – III **[6 Hours]**

Quantum Physics: Introduction - Planck's quantum theory- Matter waves, de-Broglie wavelength, Heisenberg's Uncertainty principle, time independent and time dependent Schrödinger's wave equation, Physical significance of wave function, Particle in a one dimensional potential box, Heisenberg Picture.

UNIT – IV **[6 Hours]**

X-ray & Crystallography: Crystallography - Basic terms-types of crystal systems, Bravais lattices, miller indices, d spacing, Debye Scherrer powder method, laue method- Atomic packing factor for SC, BCC, FCC and HCP structures. Semiconductor Physics - conductor, semiconductor and Insulator; Basic concept of Band theory

UNIT – V **[6 Hours]**

Modern Optics: Einstein's theory of matter radiation interaction and A and B coefficients; amplification of light by population inversion, different types of lasers: Ruby Laser, CO2 and Neodymium lasers; Properties of laser beams: mono-chromaticity, coherence, directionality and brightness, laser speckles, applications of lasers in engineering. Fiber optics and Applications, Types of optical fibers

UNIT – VI **[6 Hours]**

Thermodynamics: Zeroth law of thermodynamics, first law of thermodynamics, determination of j by Joule's method, Applications of first law, heat engines, Carnot's cycle and Carnot's engine, second law of thermodynamics, entropy, change in entropy in reversible and irreversible processes, third law of thermodynamics.

Home Assignments:

Problems based on Newton rings, Michelson interference, young double slit

Laboratory

1) Magnetic field along the axis of current carrying coil – Stewart and Gee
2) Determination of Hall coefficient of semiconductor
3) Determination of Plank constant
4) Determination of wave length of light by Laser diffraction method
5) Determination of wave length of light by Newton's Ring method
6) Determination of laser and optical fiber parameters
7) Determination of Stefan's Constant.

Text Books:

1. Halliday, Resnic and Walker, Fundamentals of Physics, 9th Ed.,John Wiley, 2011.
2. Beiser A, Concepts of Modern Physics, 5th Ed., McGraw Hill International, 2003.

3. Ajoy Ghatak, Optics, 5th Ed., Tata McGraw Hill, 2012
4. University Physics-Sears & Zemansky (Addison-Wesley)

Reference Books:

1. Basic Engineering Physics-Amal Chakraborty (Chaya Prakashani Pvt. Ltd.)
2. Basic Engineering Physics-I -Sujoy Bhattacharya, Saumen Paul (TMH)

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

Business Communication & Value Science – I

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Lectures: 2Hr./Week	Semester Examination: 50 marks	Theory: 3 Credits
Tutorials: 1 Hr. / Week	Continuous Assessment: No	
Lab: 2 Hrs. / Week	Term Work and Oral: 50 marks	TW and Oral :1 Credit

Course Pre-Requisites:

1. Basic communication in tenses (past, present, future).
2. Awareness of common words (adjectives used in daily verbal communication).
3. Basic idea of sentence formation and thereby paragraph building and writing.
4. Communication according to daily and varied contextual scenarios.
5. Basic communication model/channel (sender, receiver and feedback), Active and passive listening skills.
6. Basic social etiquettes and knowledge of group work and communication that will enhance their professional growth.

Course Objective:

The course aims to augment student's overall communication and interpersonal skills by engaging them in group activities and thus aid in helping them to emerge as professionals. The English language topics for this semester focus on the development of basic fluency in English, usage of words and also introduce them to the concept and importance of interpersonal skills so as to effectively present their personalities.

Course Outcomes:

1. Speak fluently in English without errors in tenses and hence present themselves as effective English communicators. They will be able to learn the 12 tenses and use them appropriately.
2. Differentiate between active and passive vocabulary and be able to use the 60 words discussed in class for their daily conversation and 40 words also given as assignments.
3. The ability to process their ideas and thoughts (verbal communication) into written communication in an effective, coherent and logical manner within a stipulated time and specific word limit of 100-150 words for paragraph writing.
4. Present them in a certain manner by using the 50-55 phrases discussed in class appropriately for group discussions, personal interviews during the campus recruitment process/competitive exams.
5. Enhance their communication skills by acquainting with the 2 important aspects of communication and helping them to overcome the 10 most common barriers of communication. Learn the 7 different types of listening skills; differentiate effective listening skills and understand the importance of it through 5 activities held in class and implement them in professional life.

6. Understand the importance of team work, team motivation and effective team communication for further implementation in the corporate life. They should also be able to identify concretely between team and group dynamics.

Topics to Be Covered:

UNIT – I **[6 Hours]**

Essential Grammar – I: Tenses: Basic forms and use, sentence formation (general & Technical), Common errors, Parts of speech through context, Direct and reported speech structures and voices.

UNIT – II **[6 Hours]**

Vocabulary Enrichment: Exposure to words from General Service List (GSL) by West, Academic word list (AWL) technical specific terms related to the field of technology, phrases, idioms, significant abbreviations formal business vocabulary

Phonetic: Pronunciation, Reduction of MTI in spoken English, Question formation with emphasis on common errors made during conversation

UNIT – III **[6 Hours]**

Written Communication – I: Letter Writing –Formal and Informal letter writing, Application letters, Report writing academic and business report, Job application letter

UNIT – IV **[6 Hours]**

Communication Skills: Importance of effective communication, types of communication- verbal and non - verbal, barriers of communication, effective communication, Listening Skills: Law of nature- Importance of listening skills, Difference between listening and hearing, Types of listening.

UNIT – V **[6 Hours]**

Self - Awareness & Self Development: Self - Assessment, Self - Appraisal, SWOT, Goal setting - Personal & career- Self-Assessment, Self-Awareness, Perceptions and Attitudes, Positive Attitude, Values and Belief Systems, Self-Esteem, Self - appraisal, Personal Goal setting, Career Planning, Personal success factors, Handling failure, Depression and Habit, relating SWOT analysis & goal setting, and prioritization

Socio-Cultural and Cross-Cultural Sensitivities at the Workplace: What is Inclusion? Women's contributions in Industry, work issues faced by women, what is sexual harassment, what is appropriate behavior for everyone at work

UNIT – VI **[6 Hours]**

Interpersonal Skills – I: Team work, Team effectiveness, Group discussion, Decision making - Team Communication. Team, Conflict Resolution, Team Goal Setting, Team Motivation Understanding Team Development, Team Problem Solving, Building the team dynamics. Multicultural team activity

Time Management: The Time management matrix, apply the Pareto Principle (80/20 Rule) to time management issues, to prioritize using decision matrices, to beat the most common time wasters, how to plan, how to handle interruptions, to maximize your personal effectiveness, how to say "no" to Time wasters

Values of a good manager: Understanding Corporate Values and behavior; Personal / Human Values; Pride and grace in Nationalist

Text Books:

1. Business Communication – Dr. Saroj Hire math
2. English vocabulary in use – Alan McCarthy and O'Dell

There will be handouts and reference links shared.

Reference Books

1. Strategic Writing by Charles Marsh
2. The Seven Basic Plots by Christopher Booker

BHARATI VIDYAPEETH (Deemed to be University)

COLLEGE OF ENGINEERING, PUNE-43

B. Tech. (Computer Science & Business Systems)

Syllabus of Semester II

Mathematics II

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Lectures: 3Hrs./Week	Semester Examination: 60 marks	Theory: 4 Credits
Tutorials: 1Hr./Week	Continuous Assessment: 40 marks	
Lab: Nil	Term Work: Nil	

Course Pre-Requisites:

The students should have basic Knowledge of high school math, Boolean algebra and calculus.

Course Objective:

To develop ability to use the mathematical techniques, skills, and tools necessary for computer science.

Course Outcomes:

At the end of the course, a student will be able to:

1) Apply knowledge of basics of Matrices, Determinants.
2) Solve the consistency of any type of systems
3) Describe Vector space, Orthogonality and Projection.
4) Apply methods Gram-Schmidt orthogonalization and QR decomposition.
5) Calculate Eigenvalues and Eigenvectors.
6) Describe Singular value decomposition and Principal component analysis.

Topics to Be Covered:

UNIT – I **[6 Hours]**

Introduction to Matrices and Determinants, Solution of Linear Equations, Cramer's rule, Inverse of a Matrix.

UNIT – II **[6 Hours]**

Vectors and linear combinations, Rank of a matrix, Gaussian elimination, LU Decomposition, Solving Systems of Linear Equations using the tools of Matrices.

UNIT – III **[6 Hours]**

Vector space, Dimension, Basis, Orthogonality, Projection.

UNIT – IV **[6 Hours]**

Gram-Schmidt orthogonalization and QR decomposition.

UNIT – V **[6 Hours]**

Eigenvalues and Eigenvectors, Positive definite matrices, Linear transformations, Hermitian and Unitary matrices.

UNIT – VI **[6 Hours]**

Singular value decomposition and Principal component analysis, Introduction to their applications in Image Processing and Machine Learning.

Home Assignments:

Assignments & tutorials covering the following: Vectors and linear combinations, Matrices, Determinants, Linear transformations, Complete solution to AX=b, Eigenvalues and Eigenvectors.

Text Book:

1. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publication, Delhi.

Reference Books:

1. Advanced Engineering Mathematics, 7e, by Peter V. O'Neil.
2. Advanced Engineering Mathematics, 2e, by M. D. Greenberg, Pearson Education.
3. Introduction to linear algebra, 5^{th} Edition, Gilbert Strang.
4. Applied Mathematics (Volumes I and II) by P. N. Wartikar & J. N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
5. Digital Image Processing,R C Gonzalez and R E Woods.
6. https://machinelearningmastery.com/introduction-matrices-machine-learning/

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

Statistics II

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Lectures: 3 Hrs/Week	Semester Examination: 60 marks	Theory: 4 Credits
Tutorials: 1Hr/Week	Continuous Assessment: 40 marks	
Lab: Nil	Term Work: Nil	

Course Pre-requisites:

Basic of statistics and probability, Basic programming experience (in any language)

Course Objective:

The course introduces fundamental concepts of linear statistical models, estimation methods, hypothesis testing and fundamental concepts of programming in R

Course Outcomes:

The students completing this course will be able to

1. Understand the basic concepts of Statistical Inference,
2. Understand the basic concepts of Estimation methods,
3. Understand the basic concepts of Hypothesis Testing
4. Understand the basic concepts of linear statistical models.
5. Understand Introductory R language fundamentals, basic syntax and how to use R; what R is and how it's used to perform data analysis;
6. Understand major R data structures and create visualizations using R.

UNIT – I **[6 Hours]**

Linear Statistical Models: Simple linear regression & correlation, multiple regression & multiple correlation, Analysis of variance (one way, two way with as well as without interaction)

UNIT – II **[6 Hours]**

Estimation: Point estimation, criteria for good estimates (unbiasedness, consistency), Methods of estimation including maximum likelihood estimation.

UNIT – III **[6 Hours]**

Sufficient Statistic: concept & examples, complete sufficiency, their application in estimation

UNIT – IV **[6 Hours]**

Test of hypothesis: concept & formulation, type I and type II errors, Neyman Pearson lemma, Procedures of testing

UNIT – V **[6 Hours]**

Non-parametric Inference: Comparison with parametric inference, Use of order statistics. Sign test, Wilcoxon signed rank test, Mann-Whitney test, Run test, Kolmogorov-Smirnov test. Spearman's and Kendall's test. Tolerance region

Basics of Time Series Analysis & Forecasting: Stationary, ARIMA Models: Identification, Estimation and Forecasting.

UNIT – VI **[6 Hours]**

R statistical programming language: Introduction to R, Functions, Control flow and Loops, Working with Vectors and Matrices, Reading in Data, Writing Data, Working with Data, Manipulating Data, Simulation, Linear model, Graphics in R

Home Assignments:

Problem sets to be shared by faculty covering the following topics:

Estimation Methods: Parametric & Non – Parametric, Hypothesis Testing

Text Books:

1. Probability and Statistics for Engineers (4th Edition) - I.R. Miller, J.E. Freund and R. Johnson.
2. Fundamentals of Statistics (vol. I and vol. II) - A. Goon, M. Gupta and B. Dasgupta.
3. Hands-on Programming with R - Garrett Grolemund
4. R for Everyone: Advanced Analytics and Graphics - Jared P. Lander

Reference Books:

1. Statistical Theory with Engineering Application - A. Hald.
2. Statistical Methods - G.W. Snedicor and W.G. Cochran.
3. Statistical Concepts & Methods - G.K. Bhattacharyya and R.A. Johnson.
4. Introduction to Linear Regression Analysis - D.C. Montgomery & E.Peck
5. Introduction to the Theory of Statistics - A.M. Mood, F.A. Graybill & D.C. Boes.
6. Practical Non-Parametric Statistics - W.J. Conover
7. Applied Regression Analysis - N. Draper & H. Smith

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

Data Structures & Problem Solving

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Lectures: 3 Hrs. / Week	Semester Examination: 60 marks	Theory: 4 Credits
Tutorials: 1 Hr. / Week	Continuous Assessment: 40 marks	
Lab: 2 Hrs./ Week	Term Work and Practical: 50 Marks	TW and Practical :1 Credit

Course Pre Requisites:

Students should have knowledge of Fundamentals of data types and programming concepts

Course Objective:

The course is aimed to provide an understanding of key concepts underlying the choice and implementation of data structures, algorithms and step by step approach in solving problems with the help of these fundamental data structures.

Course Outcomes:

Students will be able to:

1) Understand the fundamentals and analysis of algorithms
2) Understand and implement Linear data structures
3) Understand and implement Non Linear data structure of Trees.
4) Understand and implement Non Linear data structure of Graphs.
5) Understand and implement the .
6) Understand the concepts of distributed system security.

Topics to Be Covered:

UNIT – I **[6 Hours]**

Basic Terminologies & Introduction to Algorithm and Data Organization: Algorithm specification, Recursion, Performance analysis, Asymptotic Notation - The Big-O, Omega and Theta notation, Programming Style, Refinement of Coding - Time-Space Trade Off, Testing, Data Abstraction

UNIT – II **[6 Hours]**

Linear Data Structure: Array, Stack, Queue, Linked-list and its types, Various Representations, Operations & Applications of Linear Data Structures

UNIT – III **[6 Hours]**

Non-linear Data Structure Trees Binary Tree, Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVL Tree, Splay Tree), Various Representations, Operations : search and traversal algorithms and complexity analysis
Applications of Trees.

UNIT – IV **[6 Hours]**

Non-linear Data Structure Graphs: Graphs : Directed and Undirected, Various Representations
Operations: Search and traversal algorithms and complexity analysis
Applications of Graphs.

UNIT – V **[6 Hours]**

Searching and Sorting: Sequential Search, Binary Search, Breadth First Search, Depth First Search, Insertion Sort, Selection Sort, Shell Sort, Divide and Conquer Sort, Merge Sort, Quick Sort, Heap Sort, Introduction to Hashing

UNIT – VI **[6 Hours]**

File: Organisation (Sequential, Direct, Indexed Sequential, Hashed) and various types of accessing schemes

Home Assignments:

1. Towers of Hanoi using user defined stacks.
2. Reading, writing, and addition of polynomials.
3. Line editors with line count, word count showing on the screen.
4. Trees with all operations.
5. All graph algorithms.
6. Saving / retrieving non-linear data structure in/from a file

Text Books:

1. Fundamentals of Data Structures, E. Horowitz and S. Sahni, 1977
2. Data Structures and Algorithms, Alfred V. Aho, John E. Hopperoft, Jeffrey D. Ullman

Reference Books:

1. The Art of Computer Programming: Volume 1: Fundamental Algorithms, Donald E. Knuth
2. Introduction to Algorithms, Thomas, H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein.
3. Open Data Structures: An Introduction (Open Paths to Enriched Learning)), 31st ed. Edition , Pat Morin

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

Fundamentals of Economics

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Lectures: 3 Hrs/Week	Semester Examination: 60 marks	Theory: 3 Credits
Tutorials: Nil	Continuous Assessment: 40 marks	
Lab: Nil	Term Work: Nil	

Course Pre-requisites:

Knowledge of Class XII level Mathematics

Course Objective:

1. To impart knowledge, with respect to concepts, principles of Economics, which govern the functioning of a firm/organization
2. To explain the students about concept of production, cost, national income, an aggregate supply and aggregate demand consumption

Course Outcomes:

After completing this course, students should be able to:

1. Demonstrate an understanding of the methods and principles of microeconomic and macroeconomic theory, including tradeoffs, opportunity costs, and marginal decision making.
2. Explain how markets work and how market prices are determined using principles of supply and demand.
3. Assess the impact of market failure such as externalities, and public goods and evaluate possible public policy remedies.
4. Analyze financial markets and investments, including the stock market, and their relation to the economy.
5. Evaluate key economic indicators (including GDP, unemployment, inflation) and their use in evaluating macroeconomic conditions.
6. Understand major macroeconomic tools, including fiscal and monetary policies, and their use in managing the economy. Also apply ethical principles in a variety of economic contexts.

Topics to Be Covered:

UNIT – I **[6 Hours]**

Microeconomics

Principles of Demand and Supply – Supply Curves of Firms – Elasticity of Supply

Demand Curves of Households – Elasticity of Demand Equilibrium and Comparative Statics (Shift of a Curve and Movement along the Curve) Welfare Analysis – Consumers' and Producers' Surplus – Price Ceilings and Price Floors

UNIT – II **[6 Hours]**

Consumer Behaviour – Axioms of Choice – Budget Constraints and Indifference Curves Consumer's Equilibrium – Effects of a Price Change, Income and Substitution Effects – Derivation of a Demand Curve
Applications – Tax and Subsidies – Intertemporal Consumption – Suppliers' Income Effect

UNIT – III **[6 Hours]**

Theory of Production – Production Function and Iso-quants – Cost Minimization
Cost Curves – Total, Average and Marginal Costs – Long Run and Short Run Costs
Equilibrium of a Firm Under Perfect Competition Monopoly and Monopolistic Competition

UNIT – IV **[6 Hours]**

Macroeconomics
National Income and its Components – GNP, NNP, GDP, NDP
Consumption Function
Investment
Simple Keynesian Model of Income Determination and the Keynesian Multiplier
Government Sector – Taxes and Subsidies
External Sector – Exports and Imports

UNIT – V **[6 Hours]**

Money – Definitions
Demand for Money – Transitionary and Speculative Demand
Supply of Money – Bank's Credit Creation Multiplier
Integrating Money and Commodity Markets – IS, LM Model
Business Cycles and Stabilization – Monetary and Fiscal Policy – Central Bank and the Government

UNIT – VI **[6 Hours]**

The Classical Paradigm – Price and Wage Rigidities – Voluntary and Involuntary Unemployment.

Home Assignments:

In the discussion topics mentioned above, students should be asked to prepare in advance in groups and present in class

Text Books:

1. Microeconomics- Pindyck, Robert S., and Daniel L. Rubinfeld Microeconomics
2. Macroeconomics- Dornbusch, Fischer and Startz

Reference Books:

Other articles could be sent through email as and when a relevant topic is discussed.

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

Principles of Electronics

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Lectures: 3Hrs/Week	**Semester Examination: 60 marks**	**Theory: 3 Credits**
Tutorials: Nil	**Continuous Assessment: 40 marks**	
Lab: 2 Hrs/ Week	**Term Work and Oral: 50 marks**	**TW and Oral :1 Credit**

Course Pre Requisites:

The students should have knowledge of Class XII level Electronics, Physics & Mathematics

Course Objective:

The course introduces fundamental concepts of electronics

Course Outcomes:

Students will be able to,

1. Identify semiconductor materials, draw band-diagrams, distinguish between intrinsic and extrinsic semiconductors.
2. Explain the phenomenon of rectification, draw the I-V characteristics and calculate ripple factor.
3. Explain the I-V characteristics of BJTs – both input and output; learn to bias transistors as an amplifier.
4. Describe FET and MOSFET and differentiate between BJT, FET and MOSFET.
5. Explain the fundamentals of feedback amplifiers and Operational Amplifier .
6. Demonstrate the knowledge of Boolean algebra including simplification techniques and operation of basic types of flip-flops.

Topics to Be Covered:

UNIT – I **[6 Hours]**

Semiconductors: Crystalline material: Mechanical properties, Energy band theory, Fermi levels; Conductors, Semiconductors & Insulators: electrical properties, band diagrams. Semiconductors: intrinsic & extrinsic, energy band diagram, P&N-type semiconductors, drift & diffusion carriers.

UNIT – II **[6 Hours]**

Diodes and Diode Circuits: Formation of P-N junction, energy band diagram, built-in-potential, forward and reverse biased P-N junction, formation of depletion zone, V-I characteristics, Zener breakdown, Avalanche breakdown and its reverse characteristics; Junction capacitance. Linear piecewise model; Rectifier circuits: half wave, full wave, PIV, DC voltage and current, ripple factor, efficiency, idea of regulation.

UNIT – III **[6 Hours]**

Bipolar Junction Transistors: Formation of PNP / NPN junctions; transistor mechanism and principle of transistors, CE, CB, CC configuration, transistor characteristics: cut-off active and saturation mode, transistor action, injection efficiency, base transport factor and current amplification factors for CB and CE modes. Biasing and Bias stability: calculation of stability factor

UNIT – IV **[6 Hours]**

Field Effect Transistors: Concept of Field Effect Transistors (channel width modulation), Gate isolation types, JFET Structure and characteristics, MOSFET Structure and characteristics, depletion and enhancement type; CS, CG, CD configurations; CMOS: Basic Principles

UNIT – V **[6 Hours]**

Feed Back Amplifier, and Operational Amplifiers: Concept (Block diagram), properties, positive and negative feedback, loop gain, open loop gain, feedback factors; topologies of feedback amplifier; effect of feedback on gain, output impedance, input impedance, sensitivities (qualitative), bandwidth stability. Introduction to integrated circuits, operational amplified and its terminal properties; Application of operational amplifier; inverting and non-inverting mode of operation, Adders, Subtractors, Constant-gain multiplier, Voltage follower, Comparator, Integrator, Differentiator

UNIT – VI **[6 Hours]**

Digital Electronics Fundamentals: Difference between analog and digital signals, Boolean algebra, Basic and Universal Gates, Symbols, Truth tables, logic expressions, Logic simplification using K- map, Logic ICs, half and full adder/subtractor, multiplexers, demultiplexers, flip-flops, shift registers, counters.

List of Experiments:

1. To plot V-I characteristics of PN junction diode.
2. To plot regulation characteristics of half wave rectifier
3. To plot regulation characteristics of Full wave rectifier
4. To plot input-output characteristics of CE configuration of BJT.
5. To study Biasing techniques of BJT- to find stability factor of self bias, collector to base bias, fixed bias circuits.
6. To plot frequency response of single stage FET amplifier (CS/CD configuration) and find its bandwidth.
7. To study Colpitts Oscillator.
8. Study of OP-AMP circuits: Inverting and Non-inverting Amplifier.
9. Study of basic logic gates and De-Morgan's Theorem.
10. Study of half adder and full adder.

List of Assignments: -

1. Describe applications of diodes as Clippers and Clampers.
2. Describe application of Zener diode as Voltage regulator.
3. Study of characteristic curves for CB configuration of BJT using Virtual Lab.
4. Simulation of BJT amplifier using Virtual Lab.
5. Design and Implementation of Various Arithmetic Circuits using Virtual Lab.
6. To design, built and test any electronic circuit (Group activity)

Text Books:

1. Sedra & Smith: Microelectronics Engineering
2. Millman &Halkias: Integrated Electronics

Reference Books:

1. Electronic Devices and Circuit Theory by Robert Boylestad
2. Solid State Electronic Devices by Streetman, Banerjee
3. Malvino: Electronic Principle

4. Schilling & Belove: Electronics Circuits
5. Millman & Grabal: Microelectronics
6. Salivahanan: Electronics Devices & Circuits
7. Boylestad & Nashelsky: Electronic Devices & Circuit Theory

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

Business Communication & Value Science - II

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Lectures: 2 Hrs/Week	**Semester Examination: 50 marks**	**Theory: 3 Credits**
Tutorials: 1 Hr/ Week	**Continuous Assessment: Nil**	
Lab: 2 Hrs/ Week	**Term Work and Oral: 50 marks**	**TW and Oral :1 Credit**

Course Pre-requisites:

1. Basic knowledge of the parts of speech in English.
2. Vocabulary covered in the previous semester along with basic knowledge of verbs & adverbs.
3. Basic awareness of the need of speaking skills within social circle.
4. The elements of team dynamics done during the previous semester with proper application.
5. Basic awareness of the concepts of feedback, criticism.
6. The various common conflicts that may arise at varied situations.

Course Objective:

The course aims to augment students overall communication and interpersonal skills by engaging them in group activities and thus aid in helping them to emerge as professionals. The soft skills topics for this semester are intended to develop student's expertise on public speaking skills and to deal positively with criticism and so as to effectively present their personalities

Course Outcomes:

By the end of the course, students should be able to

1. Speak fluently in English without errors in the sentence construction and hence present themselves as effective English communicators. They will be able to learn 20-25 common errors made in parts of speech and also use 10 modal verbs efficiently during professional communication.
2. Differentiate between vocabulary used as adjectives, verbs and adverbs and be able to use the 60-70 words for their daily conversation.

3. Overcome the fear of speaking and will be aware of the 3 types of public speaking necessary according to the contemporary requirements. They would be able to deliver a public speech according to the need of the audience and also be aware of positive body language to be manifested during a speech.
4. Deal with the deeper parameters of working in teams like team motivation, multicultural team activity and team conflict resolution.
5. Analyze them relating to their hobbies and strengths and hence set realistic goals in terms of personal and professional growth. They will be able to identify at least 5-7 strengths and a couple of goals to be achieved that will enable their lives to be directed appropriately.
6. Apply 5-6 positive strategies to diversity and inclusion during team work.

Topics to Be Covered:

UNIT – I **[6 Hours]**

Essential Grammar – II: Application of tenses, Auxiliaries- correct usage and importance in formal communication, Business Vocabulary - Vocabulary exercises through web-based applications

UNIT – II **[6 Hours]**

Written Communication II: Email writing- Formal and Informal email writing structure, Inquiry letters, Instruction letters, complaint letters, Routine business letters, Sales Letters etc. Technical writing, Essay writing, Paragraph writing.

UNIT – III **[6 Hours]**

Vocabulary- II: Vocabulary exercises through web-based applications, Usage and application through mock meetings

Situational Conversation: Application of grammar and correct spoken English according to context/ situation and application in business scenario.

UNIT – IV **[6 Hours]**

Fundamentals of Effective Communication: Public Speaking: fundamentals of effective public speaking, types- Extempore speech, manuscript speech, and ways to enhance public speaking skills, storytelling, oral review

Presentation Skills: PowerPoint presentations, Effective ways to structure the presentation, importance of body language

Leadership Skills, Leader's Role, Responsibilities And Skill Required: Understanding good Leadership behaviors, Learning the difference between Leadership and Management, Gaining insight into your Patterns, Beliefs and Rules, Defining Qualities and Strengths of leadership, Determining how well you perceive what's going on around you, interpersonal Skills and Communication Skills, Learning about Commitment and How to Move Things Forward, Making Key Decisions, Handling Your and Other People's Stress, Empowering, Motivating and Inspiring Others, Leading by example, effective feedback.

Problem Solving Skill: Problem solving skill, Confidence building

UNIT – V **[6 Hours]**

Corporate / Business Etiquettes: Corporate grooming & dressing, etiquettes in social & office Setting-Understand the importance of professional behavior at the work place, Understand and Implement etiquettes in workplace, presenting oneself with finesse and making others comfortable in a business setting. Importance of first impression, Grooming, Wardrobe, Introduction to Ethics in engineering and ethical reasoning, rights and responsibilities

UNIT – VI **[6 Hours]**

Diversity and Inclusion Part II: Socio-Cultural and Cross-Cultural Sensitivities at the Workplace: PwD and LGBT at the workplace, Learning disabilities at the workplace; Caste, class, regionalism, religion and poverty: the different identities of Indian employees and employers and how to include everyone; Global diversity identities of race, religion, nationhood; Appropriate Social Media Use

Values Sciences Part II: Values of a good manager: Ethics in Business; Embodying organizational pride with grace

Text Books:

1. Business Communication Today by Bovee, Thill, Raina
2. APAART: Speak Well 1 (English Language and Communication)
3. APAART: Speak Well 2 (Soft Skills)

Reference Books:

1. Strategic Communication by Charles Marsh
2. English vocabulary in use – Alan Mc'carthy and O'dell
3. Business Communication – Dr. Saroj Hiremath

Self Learning Module

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Lectures: 0 Hrs/Week	**Semester Examination: Nil**	
Tutorials: 0 Hr. / Week	**Continuous Assessment: Nil**	
Lab: 2 Hrs/ Week	**Term Work and Oral: 50 marks**	**TW and Oral :1 Credit**

Students will be undertaking self-learning courses in consultation with the faculty member as per their choices.