Department of Engineering Sciences and Humanities

## Structure &Syllabi

F.Y.B. Tech (2019 Pattern)

DEPARTMENT OF F.Y.B. TECH ENGINEERING

Vision

To satisfy the aspirations of youth force, who wants to lead nation towards prosperity through techno-economic development.

Mission

To provide, nurture and maintain an environment of high academic excellence, research and entrepreneurship for all aspiring students, which will prepare them to face global challenges maintaining high ethical and moral standards.
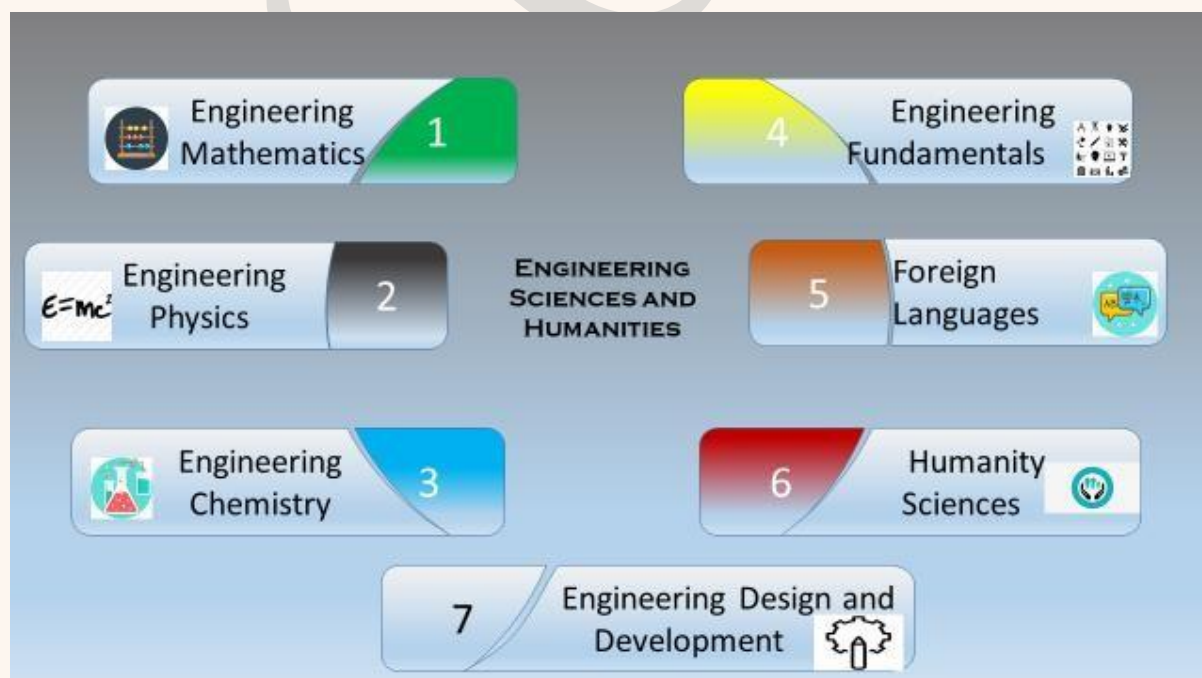
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DEPARTMENT OF F.Y.B.TECH
Program Outcomes (POs)

1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

5. Modern Tool usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and Sustainability: Understand the impact of the professional engineering solutions insocietal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principle sand apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological challenges.

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DEPARTMENT OF F.Y.B.TECH
Highlights of the Syllabus

Curriculum of F. Y. B. Tech Department is designed in consultation with experts like:

Academic Experts

Industry/Corporate Experts

Distinguished Alumni

The curriculum of the F.Y.B. Tech comprises of three groups and designed in association with the Tata Consultancy Services, Pune, IIT Ropar, KPIT (Automotive Electronics), Bentley System and Persistent Systems Pvt. Ltd. Pune.

Group 1: 1. Civil Engineering 2. Electronics and Telecommunication Engineering 3. Electrical Engineering 4. Mechanical Engineering 5. Automation and Robotics Engineering

Group 2: Computer Science and Business Systems

Group 3: Computer Engineering and Information Technology Engineering
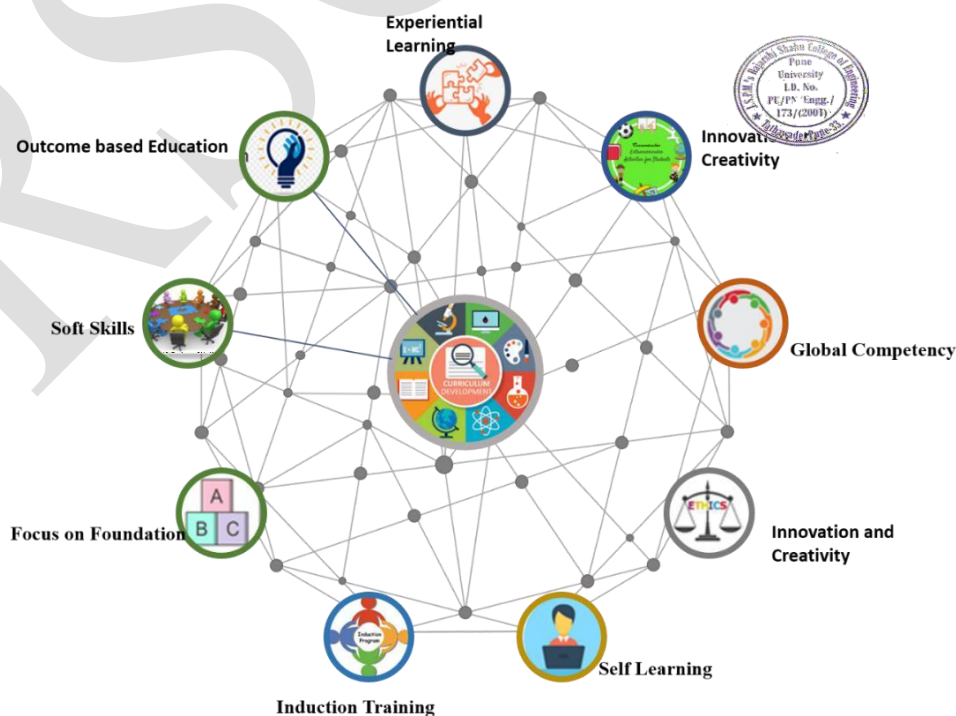
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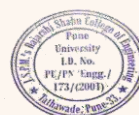
Unique features of the curriculum:

1. **Curriculum centered at Outcome Based Education**: The new curriculum is focused on **student-centered instruction models** that concentrate on evaluating student success by outcomes. The outcomes include topic awareness, industry required skills and attitude.

2. **Foundation Courses:** The **Basic Science** subjects and **Fundamental Engineering** subjects are pivotal for Engineering Education. These courses are structured in the sense of implementing the respective streams with a more realistic approach.

3. **Contemporary Curriculum:** Curriculum focuses on learning using **modern tools and technologies** such as Survey using Unmanned Aerial Vehicle: drone, robotics, biomedical engineering, CAD latest apps, hands-on experience on 3D printing technology and CNC / VMC machine, conceptualization of recent **Education4.0** trends like Machine Learning, AI, Data Science

4. **Induction Training**: It's a well-planned three-week event to **acquaint** new aspirants about the atmosphere in the organization, connect them with the people in it, help themselves to unfold and get settled with an innocuous every day routine. Training will also gain awareness, sensitivity and perception of oneself, individuals around them, society at large, and nature.

5. **Engineering Design and Development**: **Experiential learning** is the main aspect in information gain by experience. This gives students the opportunity to collaborate or develop their own learning skills, such as problem solving, critical thinking and time management, which exploit the advantages of modern techniques to solve real-world problems using **Problem Based Learning pedagogy(PBL).**

6. **Self-Learning:** The curriculum provides students the **flexibility** to take initiatives satisfy their learning needs with the support of online learning platforms such as MOOCs, NPTEL, Swayam, MHRD, etc.

7. **Global Competence**: Curriculum aims to build **cognitive skills** that enable access to opportunities for personal and professional development. Foreign language training like English, German, Japanese and French enables to gain insight into the problems and solutions that arise from **different cultures**.

8. **Blend of Curricular and Extra-Curricular Activities**: The curriculum has a good blend of activities like co-curricular, extra-curricular, sports, culture etc. for the **overall development** of students.

9. **Inculcating Ethics and Values**: The curriculum included attempts to target **ethics and values** in order to improvise student conduct, helping them make the right choices, lead their professional lives and become ethical individuals.

10. **Internship Program:** The program involves internships with the goal of acquiring various **discipline-related skills and technologies** and developing their technical and professional knowledge.

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F. Y. B. Tech.
Structure for Group 3
1. Computer Engineering 2. Information Technology Engineering
Academic Year – 2021-2022(Semester –I)

Course Code	Course	Teaching Scheme			Examination Schemes					Total	Credits Total
					Theory			Practical			
		TH	Tut	Lab	ISE (15)	MSE (25)	ESE (60)	TW	Lab	Total	Total
ES1106	Introduction to, Statistics, Probability and Calculus.	3	1	-	15	25	60	25	-	125	4
ES1107/ ES1111	Fundamentals of Physics / Environmental Science and Engineering	3	-	2	15	25	60	-	25	125	4
ES1108	Discrete Mathematics	3	1	-	15	25	60	25	-	125	4
EC 1102/ EE 1102	Principles of Electronics Engineering/ Principles of Electrical Engineering	3	-	2	15	25	60	-	25	125	4
CS1103	Fundamentals of Computer Programming	3	-	4	15	25	60	-	50	150	5
HS1105	Business Communication and Value Science -I	-	-	2	-	-	-	-	25	25	1
ES 1104 HS1101/ HS1102/ HS1103/ HS1104	Engineering Design and Development **OR** Language Proficiency-I: # English / German / Japanese / French	-	-	2	-	-	-	-	25	25	1
HS1108	Induction Training$	Non Credit									
Total		**15**	**2**	**12**	**75**	**125**	**300**	**50**	**150**	**700**	**23**

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F. Y. B. Tech.
Structure for Group 3
1. Computer Engineering 2. Information Technology Engineering
Academic Year – 2021-2022 Semester –II

Course Code	Course	Teaching Scheme			Examination Schemes					Total	Credits
					Theory			Practical		Total	Total
		TH	Tut	Lab	ISE (15)	MSE (25)	ESE (60)	TW	Lab		
ES1109	Linear Algebra	3	1	-	15	25	60	25	-	125	4
ES1110	Statistical Methods	3	1	-	15	25	60	25	-	125	4
CS1104	Data Structure and Algorithms	3	-	4	15	25	60	-	50	150	5
ES1111/ ES1107	Environmental Science and Engineering/ Fundamentals of Physics	3	-	2	15	25	60	-	25	125	4
EC1102/ EE1102	Principles of Electronics Engineering/ Principles of Electrical Engineering	3	-	2	15	25	60	-	25	125	4
HS1106	Business Communication and Value Science -II	-	-	2	-	-	-		25	25	1
ES 1104 / HS1101/ HS1102/ HS1103/ HS1104	Engineering Design and Development OR Language Proficiency-I# English / German / Japanese / French	-	-	2	-	-	-	-	25	25	1
	Total	**15**	**2**	**12**	**75**	**125**	**300**	**50**	**150**	**700**	**23**

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Instructions:

Every student should appear for Fundamentals of Physics, Environmental Science and Engineering, Principles of Electrical Engineering, Principles of Electronics Engineering during the year.

1.# Every student should appear for language Proficiency-I and Engineering Design Development (EDD) during the year.

2.$For the Induction Training, the branch wise allocation in a group of 20-22 students is to be formed with one faculty as mentor for each group.

3. ISE, MSE and ESE indicates In Semester Evaluation, Mid Semester Evaluation and End Semester Evaluation respectively.

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F. Y. B. Tech (Group 2&3)
Academic Year – 2021-2022 Semester -I
[ES1106]: Introduction to Statistics, Probability and Calculus

Teaching Scheme: TH: 03Hours/Week TU: 01Hours/Week	Credit TH:03 TU:01	Examination Scheme: In Sem. Evaluation:15 Marks Mid Sem. Exam: 25 Marks End Sem. Exam: 60Marks Term Work: 25 Marks

Course Prerequisites: Permutation and Combinations, Differentiation, Definite and Indefinite Integration, Curves and Surfaces.

Course Objective: To make the students familiarize with concepts and techniques in Statistics, Probability, Differential and Integral calculus. The aim is to equip them with the tools to understand advanced level Statistics and its applications that would enhance thinking power in their discipline.

Course Outcome:

After successful completion of the course, students will able to:

CO1: Classify Primary and Secondary data, Calculate Measures of Central tendency and Dispersion.

CO2: Explain the basic concepts of Sample Space and Event. Apply Probability theory to study situations involving uncertainties useful in the field of design algorithm in machine learning.

CO3: Apply the concept of Mathematical Expectation, Moments and their properties, Moment Generating functions in probability distributions.

CO4: Apply advanced Integration techniques useful in evaluation of Multiple Integrals and its applications.

Course Contents

UNIT-I	Descriptive Statistics	07Hours
Introduction, Collection of Data, Primary and secondary Data, Frequency curves, Measure of central tendency, Measures of Dispersion. Bivariate data, marginal and conditional frequency distribution.		
UNIT-II	Probability	07 Hours
Experiments, Sample space, event, Conditional Probability, Bayes Theorem.		
UNIT-III	Probability distributions	08 Hours
Random variables, standard discrete & continuous distributions, Binomial, Poisson and Geometric distributions, Uniform, Exponential, Normal distributions, Hypothesis, Chi-square, t, F distributions.		
UNIT-IV	Expected values and moments	07 Hours
Mathematical Expectation, Variance and its properties, Moments and their properties, Moment generating function.		
UNIT-V	Integral Calculus	07Hours
Reduction Formulae, Gamma function, Beta function, Error function and Differentiation under integral sign.		
UNIT-VI	Multiple Integrals and its Applications	08Hours
Double and Triple integrations, change of order of integration, application to find Area and Volume.		

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Guidelines for Tutorial and Term Work
1) Tutorial shall be engaged in batches (batch size of 20 students maximum) per division.
2) Term work shall be based on continuous assessment of six assignments (one per each unit).

Textbooks:

T1: S.M. Ross, "Introduction of Probability Models", Academic Press, N.Y.

T2: A. Goon, M. Gupta and B. Dasgupta, "Fundamentals of Statistics", Vol I & II, World Press.

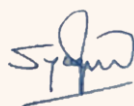**T3:** B. S. Grewal, "Higher Engineering Mathematics", Khanna Publication, Delhi.

Reference Books:

R1: S. M. Ross, "A first course in Probability", Prentice Hall.

R2: I. R. Miller, J.E. Freund and R. Johnson, "Probability and Statistics for Engineers", (Fourth Edition), PHI.

R3: A. M. Mood, F.A. Graybill and D.C. Boes, "Introduction to the Theory of Statistics", McGraw Hill Education.

R4: B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw-Hill.

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F. Y. B. Tech (Group 2&3)
Academic Year – 2021-2022 Semester -I
[ES1107]: Fundamentals of Physics

Teaching Scheme: TH: 03Hours/Week PR: 02Hours/Week	Credit TH:03 PR:01	Examination Scheme: In Sem. Evaluation:15 Marks Mid Sem. Exam :25 Marks End Sem. Exam :60Marks Lab Evaluation :25Marks

Course Prerequisites: Fundamentals of: optics, interference, diffraction polarization, wave-particle duality, crystal structure and magnetism

Course Objective: To teach students basic concepts and principles of physics, relate them to laboratory experiments and their applications.

Course Outcome:
After successful completion of the course, students will able to:

CO1: Explain fundamental concepts, mathematical treatment and related phenomenon of periodic motion, SHM, resonance, damped harmonic oscillator

CO2: Analyze intensity variations of light due to interference and diffraction and their intended applications.

CO3: Infer the basic ideas of Electromagnetism and Maxwell's equations and extend it to analyze the light for its state of polarization

CO4: Explain concepts and principles of quantum mechanics, crystallography, semiconductor physics and its intended applications.

CO5: Explain basics principle construction and working of different types of Lasers and Optical fibers and its applications
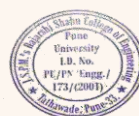
CO6: Explain the basic ideas and laws of Thermodynamics, concept of Engine and Entropy.

Course Contents

UNIT-I	Waves and Oscillation	06 Hours

Periodicmotion-simpleharmonicmotion-characteristicsofsimpleharmonicmotion-vibrationofsimple spring mass system. Resonance-definition. Damped harmonic oscillator – heavy, critical and light damping,energydecayinadampedharmonicoscillator,qualityfactor,forcedmechanicalandelectrical oscillators.

UNIT-II	Interference and Diffraction	06 Hours

Theory of interference fringes-types of Interference-Fresnel's Prism-Newton's rings, Diffraction-Two kindsofdiffraction-Differencebetweeninterferenceanddiffraction-Fresnel'shalfperiodzoneand zoneplate-Fraunhoferdiffractionatsingleslit-planediffractiongrating.TemporalandSpatialCoherence

UNIT-III	Polarization and Electromagnetism	06 Hours

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. Basic Idea of Electromagnetisms: Continuity equation for current densities, Maxwell's equation in vacuum and non-conducting medium.

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UNIT-IV	Quantum Mechanics , Crystallography and Semiconductor Physics	06 Hours

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. 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	Laser and Fiber optics	06 Hours

Einstein's theory of matter radiation interaction, A and B coefficients; amplification of light by population inversion, different types of lasers: Ruby Laser, CO_2 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	Thermodynamics	06 Hours

Zeroth law of Thermodynamics, first law of Thermodynamics, brief discussion on application of first law, second law of Thermodynamics and concept of Engine, entropy, change in entropy in reversible and irreversible processes.

Lab Contents
Guidelines for Assessment

1) Practical for the subject shall be engaged in minimum three batches (batch size of 22 students maximum) per division.
2) LabEvaluationisacontinuousassessmentbasedonexperimentsperformed,submissionofresultsof experiment in the form of report/journal, timely completion, attendance and understanding.

List of Laboratory Experiments	
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:
  T1. A Beiser, "Concepts of Modern Physics", (Fifth Edition), McGraw Hill International.
  T2. David Halliday, Robert Resnick and Jearl Walker, "Fundamentals of Physics", Wiley plus

Reference Books:
  R1. Ajoy Ghatak , "Optics", (Fifth Edition), Tata McGraw Hill.
  R2. Sears &Zemansky University Physics, Addison-Wesley.
  R3. Jenkins and White, "Fundamentals of Optics", (Third Edition), McGraw-Hill.

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F. Y. B. Tech (Group 2&3)
Academic Year – 2021-2022 Semester -I
[ES1108]: Discrete Mathematics

Teaching Scheme:	Credit	Examination Scheme:
TH: 03Hours/Week	TH:03	In Sem. Evaluation:15 Marks
TU: 01Hours/Week	TU: 01	Mid Sem. Exam : 25 Marks
		End Sem. Exam : 60Marks
		Term Work : 25 Marks

Course Prerequisites : Basic concept of Set, Permutations& Combinations and Matrix algebra.

Course Objective:
To make the students familiarize with concepts and techniques in Logic, Boolean algebra, Abstract algebra, Combinatorics and Graph theory. The aim is to equip them with the tools to understand discrete mathematics and its application that would enhance thinking power and useful in their discipline.

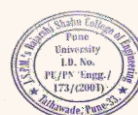**Course Outcome: After completion of this course, students will able to,**

CO1: Explain concept of logic and logic gates and its applications in design of modern scientific computing machine.

CO2: Explain the concept of duality principle, canonical form, Karnaugh map using Boolean algebra.

CO3: Identify type of Equivalence and Partial ordered relations, Explain the concepts of algebraic structures such as Group, Ring and Field useful in cryptography.

CO4: Use the concept of Graph theory and trees in its application to network theory

CO5: Apply the concept of Combinatorics to solve problems related to computer based systems.

Course Contents

UNIT-I	Logic	07 Hours

Propositional calculus - propositions and connectives, syntax; Semantics – truth assignments and truth tables, validity and satisfiability, tautology; Adequate set of connectives; Equivalence and normal forms; Compactness and resolution; Formal reducibility - natural deduction system and axiom system; Soundness and completeness.

UNIT-II	Boolean algebra	08 Hours

Introduction, truth table, basic logic gate, basic postulates of Boolean algebra, principle of duality, canonical form, Karnaugh map.

UNIT-III	Abstract algebra	08 Hours

Set, Relations, Functions, Algebraic structures: Semigroup, Monoid, Group, Abelian group, Cyclic group, Ring and Field.

UNIT-IV	Graph Theory	08 Hours

Graphs, Types of Graphs, connectedness and reachability, Hand shaking lemma, adjacency and incidence matrix, isomorphism, Digraphs, Eulerian and Hamiltonian Graphs. Dijkstra's algorithm.

UNIT-V	Trees	08 Hours

Trees, Planar graphs, Euler's formula, dual of a planer graph, independence number and clique number, chromatic number, Graph coloring, Rooted tree, prefix code and Huffman coding method.

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UNIT-VI	Combinatorics	07 Hours
Basic counting, balls and bins problems, Pigeonhole Principle, Generating functions, Recurrence relations, Principle of Mathematical induction.		

Guidelines for Tutorial and Term Work

i) Tutorial shall be engaged in four batches (batch size of 20 students maximum) per division.
ii) Term work shall be based on continuous assessment of six assignments (one per each unit).

Text Books:

T1. Keneth H.Rosen, "Discrete Mathematics and its applications", Tata MacGraw Hill.

T2. A.R.Vashistha,"Modern Algebra", Krishna Prakashan

T3. Alan Tucker, " Applied Combinatorics" , Wiley

T4. C.V.Sastry,RakeshNaik, "A text book on discrete Mathematics"

Reference Books:

R1. C.Liu, "Elements of Discrete Mathematics" .Tata MacGraw Hill.

R2. Narsing Deo," Graph Theory with Applications to Engineering and Computer Science", Prentice Hall of India

R3. N. Herstein, "Topics in Algebra", John Wiley and Sons.

R4. T.Veerarajan, "Discrete Mathematics", Tata MacGraw Hill.

R5. M. Morris Mano, "Digital Logic & Computer Design", Pearson.

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F. Y. B. Tech (Group 2&3)
Academic Year – 2021-2022 Semester -I
[EE1102]: Principles of Electrical Engineering

Teaching Scheme: TH: 03Hours/Week PR: 02Hours/Week	Credit TH:03 PR:01	Examination Scheme: In Sem. Evaluation:15 Marks Mid Sem. Exam : 25 Marks End Sem.Exam : 60Marks Lab Evaluation : 25Marks

Course Prerequisites: Elementary concept, Modern Electron Theory, E.M.F., Electric Potential, Potential difference and current, Electrical circuit elements (R, L and C).

Course Objective: Objective of this course is to memorize the basic knowledge of electrical quantities& electrical wiring, installation systems. Provide solutions for the network by applying various laws & theorems. Apply the knowledge of magnetic circuits to electrical machines. Extract the knowledge of electrostatics. Understand fundamentals of AC circuits. Relate different sensors& transducers in electrical systems

Course Outcome:
After successful completion of the course, students will able to:
CO1: Recall the elementary concept of Electrical Engineering.
CO2: Simplify various laws and theorems to complex electrical networks**.**
CO3: Recognized the basics of electromagnetism and single-phase transformers.
CO4: Interpret the basics of electrostatics.
CO5: Illustrate different terms applicable to AC fundamentals.
CO6: Summarize measurement devices & transducers.

Course Contents

UNIT-I	Basic Concepts & Wiring Systems	06 Hours

Concept of Potential difference, voltage, current, Fundamental linear passive and active elements to their functional current-voltage relation, Concept of work, power, energy and conversion of energy. Basic layout of distribution system, Types of Wiring System &Wiring Accessories, Necessity of earthing, Types of earthing, Safety devices and system.

UNIT-II	DC Circuits	06 Hours

Terminology and symbols in order to describe electric networks, voltage source and current sources, ideal and practical sources, Concept of dependent and independent sources. Kirchhoff's laws and applications to network solutions using mesh analysis and Nodal analysis, Simplifications of networks using series-parallel, Star/Delta transformation. Current-voltage of electric network by mathematical equations to analyze the network (Superposition theorem, Thevenin's theorem, Norton's Theorem Maximum Power Transfer theorem).

UNIT-III	Principle of Electro mechanics	06 Hours

Electricity and Magnetism, magnetic field and Faraday's law, self and mutual inductance, Ampere's law, Magnetic circuit, Magnetic material and B-H Curve, Single phase transformer, principle of operation, EMF equation, voltage ratio, current ratio, KVA rating, efficiency and regulation, Electromechanical energy conversion
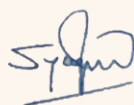
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UNIT-IV	Electrostatics	06 Hours

Electrostatic field, electric field strength, concept of permittivity in dielectrics, capacitor composite, dielectric capacitors, capacitors in series & parallel, energy stored in capacitors, charging and discharging of capacitors, Principle of batteries, types, construction and application.

UNIT-V	AC Fundamentals	06 Hours

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 and rectangular form, concept of impedance, admittance, active, reactive, apparent and complex power, power factor, 3 phase Balanced AC Circuits (Star & Delta).

UNIT-VI	Measurements and Sensors	06 Hours

Introduction to measuring devices/sensors and transducers (Piezoelectric & Thermo-couple) related to electrical signals, Basic concept of indicating and integrating instruments, Elementary methods for the measurement of electrical quantities in DC and AC systems (Current & Single-Phase power).

Lab Contents

Guidelines for Assessment

1) Practical for the subject shall be engaged in minimum three batches (batch size of 22 students maximum) per division.
2) Lab Evaluation is a continuous assessment based on experiments performed, submission of resultsof experiment in the form of report/journal, timely completion, attendance and understanding.

List of Laboratory Experiment

1	Familiarization of electrical Elements, sources, measuring devices and transducers related to electrical circuits.
2	Determination of resistance temperature coefficient.
3	Verification of Network Theorem (Superposition, Thevenin's, Norton, Maximum Power Transfer theorem).
4	Simulation of R-L-C series circuits for $X_L > X_C$, $X_L < X_C$
5	Simulation of Time response of RC circuit.
6	Verification of relation in between voltage and current in three phase balanced star and delta connected loads.
7	Demonstration of measurement of electrical quantities in DC and AC systems.

Text Books:
T1. A.E. Fitzgerald, Kingsely Jr Charles, D. Unmans Stephen, "Electric Machinery",(Sixth Edition), Tata McGraw Hill"
T2.B.L.Theraja,"ATextbookofElectricalTechnology",(vol.I),ChandandCompanyLtd.NewDelhi"
T3. V. K. Mehta, "Basic Electrical Engineering", S. Chand and Company Ltd., New Delhi.
T4. J. Nagrath and Kothari, "Theory and problems of Basic Electrical Engineering", (Second Edition), Prentice Hall of India Pvt. Ltd.

Reference Books:
R1.T. K. Nagsarkar and M. S. Sukhija, "Basic of Electrical Engineering", Oxford University Press 2011"
R2. D. J. Griffiths, "Introduction to Electrodynamics", (Fourth Edition), Cambridge University Press.

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F. Y. B. Tech (Group 2&3)
Academic Year – 2021-2022 Semester -I

[CS1103]: Fundamentals of Computer Programming

Teaching Scheme: TH: 03Hours/Week PR: 04Hours/Week	Credit TH:03 PR:02	Examination Scheme: In Sem. Evaluation:15 Marks Mid Sem. Exam :25 Marks End Sem. Exam : 60 Marks TermWork :25Marks Lab Evaluation: : 25 Marks

Course Prerequisites : Basic mathematics and Science.

Course Objective: Introduction to the concepts of computer basics and programming with particular attention to Engineering examples. Emphasis on fundamental parts of programming language, so that the students will have a basic understanding of other programming languages.

Course Outcome:

After successful completion of the course, students will able to:

CO1: Explain different programming paradigms, different data types and operators used in 'C' language.

CO2: Design algorithm, draw flowchart and write a program using decision structures and loops for given problem in 'C' language.

CO3: Solve complex problems using functions in 'C' language.

CO4: Solve complex problems using arrays, pointers and structures in 'C' language.

CO5: Develop a real time application using sequential file systems in 'C' language

CO6: Describe Unix system Interface.

Course Contents

UNIT-I	Data Types and Operators	04 Hours

Levels of programming language, Introduction to Programming Paradigms, Algorithm, Flowchart, for problem solving with Sequential Logic Structure, Introduction to imperative language; syntax and constructs of a specific language. Types Operator and Expressions: 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, variable naming, Hungarian Notation.

UNIT-II	Branching and Loop Statements	07 Hours

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

UNIT-III	Functions	07 Hours

Functions and Program Structure, 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

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UNIT-IV	Pointers and Array	07 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, Initialization of Pointer Arrays, Command line arguments, Pointer to functions, complicated declarations and how they are evaluated.

UNIT-V	Structures and File System	07 Hours

Structures: Basic Structures, Structures and Functions, Array of structures, Pointer of structures, Self-referral Structures, Table look up, typed ef, 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, p error and error. h, Line I/O, related miscellaneous functions

UNIT-VI	Unix System Interface	04 Hours

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

Lab Contents
Guidelines for Assessment

1) Practical for the subject shall be engaged in minimum three batches (batch size of 22 students maximum) per division.
2) Continuousassessmentoflaboratoryworkisdonebasedonoverallperformanceandlabassignments performance of student.
3) Each lab assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

List of Assignments	
1	Write a C program to display a given pattern using loops.
2	Write a C program to print source code as program output.
3	Write a C program to demonstrate use of array and function (simple and recursive function).
4	Write a C program to count the lines, words and characters in a given text.
5	Write a C program to demonstrate the use of structure and pointers.
6	Write a program to demonstrate Multi file program and user defined libraries.
7	Write a program that accepts only single alphabetical characters. On encountering an non-alphabet it terminates after printing all the alphabets entered so far in sorted order.
8	Write a program to check a C program for rudimentary syntax errors like unbalanced parentheses, brackets and braces, quotes, both single and double, escape sequences and comments.
9	Write a complete well documented C program that accepts an integer from the command line and prints the prime factorization on screen and a file with filename as the input integer and extension as .txt.eg. If input number is 123, the file name should be 123.txt .For any invalid input, it should be able to print an error message and quit.

Text Books:
   T1.B. W. Kernighan and D. M. Ritchi, "The C Programming Language", Second Edition, PHI.
   T2.B. Gottfried, "Programming in C", Second Edition, Schaum Outline Series

Reference Books:
   R1. Herbert Schildt, "C: The Complete Reference", Fourth Edition, McGraw Hill.
   R2. Yashavant Kanetkar, "Let Us C", BPB Publications.

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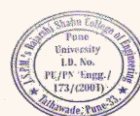
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F. Y. B. Tech (Group 2&3)
Academic Year – 2021-2022 Semester -I
[HS1105]: Business Communication & Value Science – I

Teaching Scheme: PR: 2 Hours/Week	Credit PR: 1	Examination Scheme: Term Work: 25 Marks

Course Prerequisites :Basic knowledge of high school English.

Course Objective:
- Understand what life skills are and their importance in leading a happy and well-adjusted life
- Motivate students to look within and create a better version of self
- Introduce them to key concepts of values, life skills and business communication

Course Outcome:
After successful completion of the course, students will able to:

CO 1: Recognize the need for life skills and values.

CO 2: Recognize own strengths and opportunities.

CO 3: Apply the life skills to different situations.

CO 4: Describe the basic tenets of communication.

CO 5: Apply the basic communication practices in different types of communication.

Course Contents

UNIT-I	Self-Introduction	03 Hours

Class activity–presentation on favorite rick et captain in IPL and the skills and values they demonstrate Self-work with immersion – interview a maid, watchman, sweeper, cab driver, beggar and narrate what you think are the values that drive them Activity: Write a newspaper report on an IPL match Activity: Record a conversation between a celebrity and an interviewer Quiz Time, Self-awareness – Questionnaire.

UNIT-II	Essential Grammar	03 Hours

Refresher on Parts of Speech –Applications of tenses in Functional Grammar,
Sentence formation (general & Technical), Common errors, Voices. Show sequence from film where a character uses wrong sentence structure.

UNIT-III	Communication Skills.	08 Hours

Barriers of communication, Effective communication. Types of communication-verbal and non–verbal – Listening Skills: Law of nature- Importance of listening skills, Difference between listening and hearing, Types of listening Activity: Skit based on communication skills Evaluations on Listening skills- listen to recording and answer questions based on them.

UNIT-IV	E-mails and Verbal Communication.	03 Hours

Email writing: Formal and informal emails, activity Verbal communication: Pronunciation, clarity of speech Vocabulary Enrichment: Exposure to words phrases, idioms, significant abbreviations formal business vocabulary – Group discussion using words learnt.

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UNIT-V	Written Communication & C.V.	03 Hours
Written Communication: Summary writing, story writing. Build your CV – start writing your comprehensive CV including every achievement in your life, no format, no page limit. Life skill: Stress management, working with rhythm and balance, colors, and teamwork		
UNIT-VI	Introduction to life skills	03Hours
Critical life skills, Multiple Intelligences, embracing diversity – Activity on appreciation of diversity, Life skill: Community services - work with an NGO and make a presentation Life skill: Join a trek – Values to be learned: Leadership, teamwork, dealing with ambiguity, managing stress, motivating people, creativity, result orientation.		

Guidelines for Assessment

1) Practical for the subject shall be engaged in minimum three batches (batch size of 22students maximum) per division.
2) Lab Evaluation is a continuous assessment based on experiments performed, submission of results of experiment in the form of report/journal, timely completion, attendance and understanding.

List of Assignments

1	Email writing.
2	Grammar and vocabulary test 1
3	Grammar and vocabulary test 2
4	Group discussion
5	Framing questions for interview
6	Writing Micro blog on given subject.
7	Exercise on life skills and personality types.
8	Speed reading exercise.
9	Writing story.
10	Summary writing exercise.

Text Books:
   T1. Business Communication – Dr. Saroj Hiremath
   T2.English vocabulary in use – Alan McCarthy and O'Dell.

Reference Books:
R1. APAART: Speak Well 1 (English language and communication)
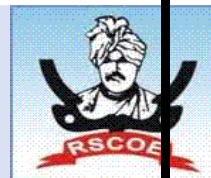R2. APAART: Speak Well 2 (Soft Skills)

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Academic Year – 2021-2022 Semester -II

[ES1109]: Linear Algebra

Teaching Scheme: TH: 03Hours/Week TU: 01Hours/Week	Credit TH:03 TU: 01	Examination Scheme: In Sem. Evaluation:15 Marks Mid Sem. Exam :25 Marks End Sem. Exam : 60Marks TermWork :25Marks

Course Prerequisites : Matrix Algebra, Determinants, Linear equations and Vector algebra.

Course Objective:
To make the students familiarize with concept and techniques in System of linear equations, Vector Space, Eigenvalues and Eigenvectors, Linear transformation, Canonical forms& application and Inner Product Space. The aim is to equip them with the tools to understand Linear algebra and itsapplications that would enhance thinking power and useful in their discipline.

Course Outcome: After completion of this course, students will able to,
CO1: Discuss consistency and solve the system of linear equations.
CO2: Explain the concept of vector space, Linear dependence & independence and Basis & Dimension.
CO3: Explain the concept of linear transformation and rank-nullity theorem.
CO4: Compute eigenvalues & eigenvectors and diagonalize the Matrix useful in Engineering Applications,
CO5: Express quadratic form to canonical form and use the concept of SVD and PCA in image processing and Machine Learning.
CO6: Apply the concept of inner product space to find orthonormal set of vectors by using Gram-Schmidt Method. Find QR decomposition of a Matrix.

Course Contents

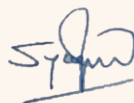| UNIT-I	System of Linear Equations	08 Hours
Rank of a Matrix, System of Linear Equations, Gauss Elimination and LU Decomposition method		
UNIT-II	Vector Space	07 Hours
Vector space, Subspace, Spanning Set, Linear Dependence & Independence and Basis & Dimension.		
UNIT-III	Linear Transformations	07 Hours
Linear Transformations (Mapping), Matrix of Linear transformation, Range and Kernel, Non-singular linear transformation, Rank-Nullity Theorem, Orthogonal transformation.		
UNIT-IV	Eigen Values and Eigen Vectors	07 Hours
Eigen Values and Eigen Vectors, Cayley-Hamilton theorem and its Applications, Diagonalization, Inverse and power of matrix by modal matrix.		

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UNIT-V	Quadratic Forms and Applications	08 Hours
Quadratic forms, Symmetric Matrices, Reduction of Quadratic forms to Canonical form, Definite & Semi- definite forms, Linear and Orthogonal transformation, Singular value decomposition (SVD) and Principal Component Analysis(PCA), Applications to Image Processing and Machine Learning.		
UNIT-VI	Inner Product Space	07 Hours
Inner Product Space, Norm of a Vector, Orthogonality, Orthogonal Projection, Gram-Schmidt orthonormalization and QR decomposition.		
Guidelines for Tutorial and Term Work		
1) Tutorial shall be engaged in four batches (batch size of 20 students maximum) per division. 2) Term work shall be based on continuous assessment of six assignments (one per each unit).		

Text Books:

T1 . Larson, Edwards, Falvo, "Elementory Linear Algebra", HOUGHTON MIFFLIN
HARCOURT PUBLISHING COMPANY *Boston New York*.
T2. Gilbert Strang, "Introduction to linear algebra", 5th Edition.
T3.Kenneth Hoffman, Ray Kunze,"Linear Algebra",Pearson

Reference Books:

R1. Seymour Lipschutz, "Linear Algebra", McGraw Hill
R2. David C Lay, "Linear Algebra and its Applications", Pearson
R3. Kenneth M Hoffman, "Linear Algebra", Prentice Hall India Learning Private Limited
R4. R C Gonzalez and R E Woods , "Digital Image Processing"

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Academic Year – 2021-2022 Semester -II
[ES1110]: Statistical Methods

Teaching Scheme: TH: 03Hours/Week TU: 01Hours/Week	Credit TH:03 TU:01	Examination Scheme: In Sem. Evaluation:15 Marks Mid Sem. Exam : 25 Marks End Sem. Exam : 60Marks Term Work : 25Marks

Course Prerequisites: Collection, Classification and Representation of data, Measures of Central Tendency and Dispersion, Probability and Probability Distributions.

Course Objective: To make the students familiarize with concepts and techniques in Sampling distribution, Linear Statistical models, Estimation, Hypothesis testing, Non Parametric Tests, Time series analysis, Forecasting and Statistical programming using R language. The aim is to equip them with the tools to understand advanced level Statistics and its applications that would enhance thinking power in their discipline.

Course Outcome:
After successful completion of the course, students will able to:
CO1: Explain the techniques of Sampling distributions of Sample mean, Sample proportion and Central limit theorem.
CO2: Apply statistical methods like Correlation, Regression in Forecasting and interpreting experimental data.
CO3: Construct the Point and Confidence intervals for Sample mean and Sample proportion and determine sample size using estimation methods.
CO4: Apply the concept of Type –I, Type-II Errors and compare more than two populations using ANOVA.
CO5: Use Non-Parametric tests for inferences in data analysis.
CO6: Explain Time Series trend by ARIMA Models for forecasting data.

Course Contents

UNIT-I	Sampling Techniques	07 Hours

Random sampling, Sampling from finite and infinite populations, Standard error of sampling with and without replacement, Sampling distribution of sample mean and proportion, stratified random sampling.

UNIT-II	Linear Statistical Models	07 Hours

Scatter diagram, correlation, Rank correlation, Linear regression, least squares method, Multiple correlation and Multiple regression.

UNIT-III	Estimation	07 Hours

Point estimation, interval estimation, criteria for good estimates, unbiasedness, consistency, Sufficiency and Efficiency. Methods of estimation, moments, maximum likelihood, Sufficiency and their applications in estimation.

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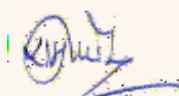H.O.D, Engg. Sciences
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UNIT-IV	Test of hypothesis	07 Hours
Concept & formulation of hypothesis, Type I and Type II errors, Neyman Pearson lemma, Analysis of variance ANOVA one-way, two-way (with and without interactions).		
UNIT-V	Non-parametric Inference	08 Hours
Non-parametric Inference, Comparison with parametric inference, order statistics, Tolerance region, Sign test, Wilcoxon signed rank test, Mann-Whitney test, Run test, Kolmogorov-Smirnov test. Spearman's and Kendall's test.		
UNIT-VI	Basics of Time Series Analysis & Forecasting	08Hours
Stationary, ARIMA Models: Identification, Estimation and Forecasting.		
Guidelines for Tutorial and Term Work:		
1) Tutorial shall be engaged in batches (batch size of 20 students maximum) per division. 2) Term work shall be based on continuous assessment of six assignments (one per each unit).		

Textbooks:

T1: I.R. Miller, J.E. Freund and R. Johnson, "Probability and Statistics for Engineers" (Fourth Edition), Prentice Hall India Learning Private Limited.

T2: A. Goon, M. Gupta and B.Dasgupta, "Fundamentals of Statistics" (vol. I & vol. II), World Press.

T3: Chris Chatfield, Chapman &Hall, "The Analysis of Time Series: An Introduction".

Reference Books:

R1: D.C. Montgomery and E.Peck, "Introduction to Linear Regression Analysis", Wiley-Interscience.

R2: A.M. Mood, F.A. Graybill and D.C. Boes, "Introduction to the Theory of Statistics", McGraw Hill.

R3: N. Draper and H. Smith, "Applied Regression Analysis", Wiley-Interscience.

R4: Sheldon Ross, "A First Course in Probability", Pearson.

R5: B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw-Hill.

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Academic Year – 2021-2022 Semester -II
[CS1104]: Data Structure and Algorithms

Teaching Scheme: TH: 03Hours/Week PR: 04Hours/Week	Credit TH:03 PR:02	Examination Scheme: In Sem. Evaluation:15 Marks Mid Sem. Exam :25 Marks End Sem. Exam : 60Marks Lab Evaluation : 50Marks

Course Prerequisites : Fundamental of Computer Programming

Course Objective:
- To understand the memory requirement for various datastructure.
- To understand various sorting and searching methods with pros andcons.
- To understand various algorithmic strategies to approach the problemsolution.

Course Outcome:
After successful completion of the course, students will able to:
CO1: Design the algorithms to solve the programming problems.
CO2: Write a program in 'C' language to solve complex problems using linear data structures.
CO3: Write a program in 'C' language to solve complex problems using non-linear data structures.
CO4: Apply appropriate sorting and searching technique for given problem.
CO5: Create a real time application using appropriate file organization technique in 'C' language.

Course Contents

UNIT-I	Basic Terminologies & Introduction to Algorithm and Data Organization	06 Hours
	Recursion, Performance analysis- Time Complexity and space Complexity, Asymptotic Notation - The Big-O, Omega and Theta notation, Programming Style, Refinement of Coding - Time-Space Trade Off, Testing, Data Abstraction	
UNIT-II	Linear Data Structure	06 Hours
	Array, Linked-list and its types, Stack, Queue, Various Representations, Operations & Applications of Linear Data Structures	
UNIT-III	Non-linear Data Structure-Tree	06 Hours
	Basic Terminology of Trees, Binary Tree, Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVL Tree, Splay Tree and Applications of Trees	
UNIT-IV	Non-linear Data Structure -Graph	06 Hours
	Basic Terminology of Graphs, Directed Graph, Undirected Graph, Various Representations, Operations on Graph (search and traversal algorithms and complexity analysis) & Applications of Graphs	
UNIT-V	Searching & Sorting	06 Hours
	Searching: Sequential Search, Binary Search, Breadth First Search, Depth First Search. **Sorting:** Insertion Sort, Selection Sort, Shell Sort, Divide and Conquer Sort, Merge Sort, Quick Sort, Heap Sort	

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UNIT-VI	File	06 Hours

Introduction to Hashing, Sequential File Organization, Direct File Organization, Indexed Sequential File Organization, Hashed File Organization and various types of accessing schemes.

Lab Contents
Guidelines for Assessment

1) Practical for the subject shall be engaged in minimum three batches (batch size of 22 students maximum) per division.
2) Continuous assessment of laboratory work is done based on overall performance and lab assignments performance of student.
3) Eachlabassignmentassessmentwillassigngrade/marksbasedonparameterswithappropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.
4) Practical Examination would be based on practical's performed in lab.

List of Laboratory Assignments

1	Write a C Program for Towers of Hanoi using user defined stacks.
2	Write a C Program for Reading, writing, and addition of polynomials.
3	Write a C Program for Line editors with line count, word count showing on the screen.
4	Write a C Program to create a Binary Search Tree, take input from user and Perform following Operations on it. a. Insertion of a node in a tree b. Deletion of anode c. Searching of anode d. Display by using any one traversal method
5	Write a C Program to create an height balance tree by taking input from user and perform following operation on it. a. Insertion of anode b. Searching of anode c. Display by using any one traversal method
6	Write a C Program using Breadth First Traversal and Depth First Traversal for a user defined Graph.
7	Write a C Program to save, read a tree or graph data structure in a file.
8	Write a C Program to Sort the marks of students in ascending/descending order and find the topper of the class.

Text Books:
   T1. Fundamentals of Data Structures, E. Horowitz and S. Sahni, 1977.
   T2. Data Structures and Algorithms, Alfred V. Aho, John E. Hopperoft, Jeffrey D. UIlman.

Reference Books:
   R1. The Art of Computer Programming: Volume 1: Fundamental Algorithms, Donald E. Knuth
   R2. Introduction to Algorithms, Thomas, H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein.
   R3. Open Data Structures: An Introduction (Open Paths to Enriched Learning), 31st ed. Edition , Pat Morin

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F. Y. B. Tech (Group 2&3)
Academic Year – 2021-2022 Semester -II
[EC1102]: Principles of Electronics Engineering

Teaching Scheme: TH: 03Hours/Week PR: 02Hours/Week	Credit TH:03 PR:01	Examination Scheme: In Sem. Evaluation:15 Marks Mid Sem. Exam : 25 Marks End Sem. Exam : 60Marks Lab Evaluation : 25Marks

Course Pre requisites: Semiconductor materials, P-N junction diode, V-I characteristics of Diode, Rectifiers, Zener diode as a voltage regulator, Photodiode, Solar cell, I-V characteristics of LED, Transistor characteristics, Transistor as an amplifier (CE mode), Transistor as a switch, Logic gates (OR, AND, NOT, NAND, NOR), Boolean Algebra

Course Objective: The Principles of Basic Electronics Engineering syllabus is designed to get knowledge of the basic Electronics components and circuits for computer Engineering. The course begins with introduction of semiconductor devices, diodes and transistors, FET's, Op-amps and Oscillator circuits, along with digital systems.

Course Outcome:
After successful completion of the course, students will able to:
CO1: Explain the basic concept and working of semiconductor materials with their types.
CO2: Apply the basics of diode for rectification operation.
CO3: Describe the structure of BJT with their configurations and applications
CO4: Explain the structure of MOSFET with their configurations and applications
CO5: Elaborate the open loop and closed loop configuration of op-amp with their applications
CO6: Explain Logic gates with Boolean algebra along with combinational and sequential circuit

Course Contents

UNIT-I	Semiconductors	06 Hours

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

UNIT-II	Diodes and Diode Circuits	06 Hours

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 itsreversecharacteristics;Junctioncapacitance.Linearpiecewisemodel;Rectifiercircuits:halfwave,full wave, PIV, DC voltage and current, ripple factor, efficiency, idea of regulation.

UNIT-III	Bipolar Junction Transistors	06 Hours

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,basetransportfactorandcurrentamplificationfactorsforCBandCEmodes.BiasingandBias stability: calculation of stability factor.

UNIT-IV	Field Effect Transistors	06 Hours

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	Feed Back Amplifier and Operational Amplifiers	06 Hours

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	Digital Electronics Fundamentals	06 Hours

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.

Lab Contents

Guidelines for Assessment

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2) Continuous assessment of laboratory work is done based on overall performance and lab assignments performance of student.
3) Each lab assignment assessment will assign grade/marks based on parameters with appropriate weightage.Suggestedparametersforoverallassessmentaswellaseachlabassignmentassessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

List of Laboratory Experiments

1	StudyofvariouselectronicscomponentssuchasResistors,Inductors,CapacitorsSwitches,etc
2	Study of different Electronics measuring Instruments such as DMM,CRO, Function Generator
3	Diode VI characteristics in forward and reverse bias
4	Study of DC Regulated Power supply
5	Study of single stage BJT Common Emitter Amplifier
6	FET common source amplifier circuit to find voltage gain and cut off frequencies
7	Study of Op-amp based amplifiers circuits
8	OPAMP based Integrator and Differentiator circuits
9	Study of Digital circuits and verify truth tables of logic gates
10	Interfacing of LED, LCD and temperature sensor to Arduino

Text Books:
T1. Adel S. Sedra and Kenneth Carless Smith, "Microelectronics Circuits"
T2. Jacob Millman, Christos Halkias, Chetan Parikh, "Millman's Integrated Electronics"
T3. M. Morris Mano, "Digital Logic & Computer Design"

Reference Books:
R1. Robert L. Boylestad, Louis Nashelsky,"Electronic Devices and Circuit Theory"
R2. Ben Streetman, Sanjay Banerjee, "Solid State Electronic Devices, 6 th Edition"
R3. Albert Paul Malvino, "Electronic Principle"
R4.D Schilling, C Belove, T Apelewicz, R Saccardi,"Electronics Circuits: Discrete & Integrated"

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F. Y. B. Tech (Group 2&3)
Academic Year – 2019-2020 Semester -II
[HS1106]: Principals of Economics

Teaching Scheme: TH: 3 Hours/Week	Credit 03	Examination Scheme: In Sem. Evaluation:15 Marks Mid Sem. Exam : 25 Marks End Sem. Exam : 60 Marks

Course Prerequisites: Fundamentals of Economics, Understanding the fundamental concepts of Economics and find out the overall utilization of scarce resources.

Course Objective:
1. To equip the students with time tested tools and techniques of managerial economics to enable them to appreciate its relevance in decision making.
2. To explore the economics of information and network industries and to equip students with an understanding of how economics affects the business strategy of companies in these industries.
3. To develop economic way of thinking in dealing with practical business problems and challenges. 4.To understand the market structure and price determination
4. To describe the Break Even Analysis and its practical usage
5. To understand the concept of money market and capital market

Course Outcome:
On completion of the course, student will be able to–
 CO 1: Comprehend the Basic Concepts of Micro Economics in Business decision making.
 CO 2: Identify the theory of demand and its application in consumer market.
 CO 3: Evaluating the Producer's Behavior in context of supply Analysis.
 CO 4: Comprehend the concept of Break Even Point under Graphic Method.
 CO 5: Examine the inter relationships between various facets of micro-economics from perspective of consumer, firms, industry and various Markets.
 CO 6: Evaluating the role played by Reserve Bank of India.

Course Contents

UNIT-I	Basic Concept of Economics	06 Hours

Introduction to Economics, Basic Economic Problem, Circular Flow of Economics (Two, Three and Four Sector Model),Nature of the Firm- Rationale, Micro and Macro Economics and their interdependence on each other, Difference between Micro and Macro Economics

UNIT-II	Theory of Demand	06 Hours

Concept of Demand, Determinants of Demand, Demand function, Law of Demand, Demand Schedule and curve, Movement along and shift of Demand Curve, Exceptions to the law of demand.

UNIT-III	Theory of Supply Analysis	06 Hours

Meaning and concept of supply, Law of supply, Supply Schedule, Supply Curve and Shift of Supply Curve. Exception to Law of Supply

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UNIT-IV	Cost Analysis	06 Hours
Concepts of Cost:- fixed cost, variable cost, total cost, average cost, marginal cost, opportunity cost. Break even analysis, Graphic Method and Algebraic method (Numerical from BEP)		
UNIT-V	Forms of Market and Price Determination	06 Hours
Forms of Market – Perfect Competition, Monopoly and Monopolistic Competition, Market Equilibrium – Price Determination under Perfect Competition, Monopoly and Monopolistic Markets		
UNIT-VI	Money Market and Capital Market	06 Hours
Meaning and concept of money market, Instruments of money market, Capital Market and its instruments, Role and Functions of Reserve Bank of India		

Text Books:

   T1. Economic Analysis of Business Decision – Dr Meenakshi Duggal

   T2. Introductory *Microeconomics and Macroeconomics* , T.R. Jain and Dr V.K. Ohri

   T3.3. *Managerial Economics* – D.N. Dwivedi

Reference Books:

   R1. *Intermediate Microeconomics: A Modern Approach*, Hal R, Varian.

   R2. *Principles of Macroeconomics*, N. Gregory Mankiw.

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F. Y. B. Tech (Group 2&3)
Academic Year – 2021-2022 Semester -II
[HS1106]: Business Communication &Value Science-II

Teaching Scheme: PR: 2 Hours/Week	Credit PR: 1	Examination Scheme: Term Work: 25 Marks

Course Prerequisites : Basic Knowledge of English (verbal and written)

Course Objectives:
- Develop effective writing, reading, presentation and group discussion skills.
- Help students identify personality traits and evolve as a better team player.
- Introduce them to key concepts of:
  - a) Morality
  - b) Behavior and beliefs
  - c) Diversity& Inclusion

Course Outcome:
After successful completion of the course, students will able to:
CO1: Use tools of structured written communication. Use electronic/social media to share concepts.
CO2: Apply effective techniques to make impactful presentations.
CO3: Develop materials to create an identity for an organization dedicated to a social cause.
CO4: Apply the basic concept of speed reading, skimming and scanning.
CO5: Articulate opinions on a topic with the objective of influencing others.

Course Contents

UNIT-I	The join hands movement	04 Hours

Each Individual chooses one particular social issue which they would like to address. Class to be divided in teams for the entire semester. All activities to be done in teams
Research on the social cause each group will work for. Group Practical – As a group, they will work on the social issue identified by them. Research, read and generate a report based on the findings.
Plan and design an E Magazine. Apply and assimilate the knowledge gathered from Sem-1 till date. Share objective & guideline. All members to contribute an article to the magazine, trainer to evaluate the content - Create the magazine. Class discussion- Good and Bad Writing. Common errors, punctuation rules, use of words.

UNIT-II	Forming and Branding your N.G.O.	04 Hours

SATORI – Participants share the personal take away acquired from GD, writing and reading skills activities captured in their handbook Share the most important learning points from the activities done so far and how that learning has brought a change. Launching an E Magazine.
Each group will form an NGO. Create Vision, Mission, Value statement, tagline and Design a logo. Groups to present their NGOs. Apply the learning gathered. Presentation to be recorded by the groups. Group to come back and share their findings from the recording. Post work- individual write up to be written and evaluated for the E- magazine - Prepare and publish the Second episode of the E Magazine. Introduction to basic presentation skills& ORAI app.

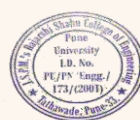Dr. S M Yadav
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UNIT-III	Speed reading and Skit	05 Hours

Speed Reading session: Introduction to skimming and scanning; practice the same. SATORI–Join the dots- Participants to connect their learning gathered from with their existing curriculum. Design a skit- a) write the script articulating the message of their respective NGOs. Read out the script. (Skit time-5 minutes). Feedback of Theory. Promote the play through a social media and gather your audience. Enact the play. Capture the numbers of likes and reviews.

UNIT-IV	Leadership and Term work.	04 Hours

Theory to find out from the participants their views, observations and experiences of working in a team.
Intro of Dr. Meredith Belbin and his research on team work and how individuals contribute.
Belbin's 8 Team Roles and Lindgren's Big 5 personality traits. Belbin's 8 team player styles.
Team falcon exercise.

UNIT-V	Diversity – Inclusion and Empathy	04 Hours

A short film on diversity. Play the video (link to be attached in the FG) Session on Diversity & Inclusion- Different forms of Diversity in our society. Discussion on TCS values, Respect for Individual and Integrity. Discuss key take away of the film. Theory to connect the key take away of the film to the concept of empathy. Touch the target (Blind man) - Debriefing of the Practical. Film: "The fish and I'' by Babak Habibi far" (1.37mins). Debate on the topic of diversity with an angle of ethics, morality and respect for individual (In the presence of an external moderator). Groups will be graded by the professor. Preparedspeech-Everystudentwillnarratethechallengesfacedbyamemberofadiversegroupin4minutes (speech in first person).

UNIT-VI	A day with an N.G.O.	04 Hours

Each team to look for an NGO/social group in the city which is working on the issue their college group is supporting. Spend a day with the NGO/ social group to understand exactly how they work and the challenges they face. Render voluntary service to the group for one day. Invite the NGO/ social group to address their university students for couple of hours. Plan the entire event, decide a suitable venue in the university, gather audience, invite faculty members etc. (they need to get their plan ratified their professor). Outcome-- Host an interactive session with the NGO spokesperson. The groups to present their experience of a day with the NGO and inspire students to work for the cause.

Lab Contents

Guidelines for Assessment

1) Assignment for the subject shall be engaged in minimum three batches (batch size of 22 students maximum) per division.
2) Continuous assessment of assignments based on overall performance of student.
3) Each lab assignment shall be assessed by assigning grade/marks based on timely completion, presentation, punctuality and neatness.

List of Assignments

1	Each group will form an NGO. Create Vision, Mission, Value statement, tagline and Design a logo. The students to present their N.G.O. using presentation skills learnt.
2	As a group, they will work on the social issue identified by them. Research, read and generate a report based on the findings.(Article 1)
3	Debate on the topic of diversity with an angle of ethics, morality and respect for individual (In the presence of an external moderator). Groups will be graded by the professor
4	Research on a book, incident or film based on the topic of your respective NGO- Write a review in a blog on the topics they are covering in their research. (Article 2)

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5	Lindgren's Team Players Roles Team Falcon activity.
6	Punctuation Exercise on Moodle. / Moodle Test.
7	Exercise on Speed Reading session: Introduction to skimming and scanning.
8	Design a skit- a) write the script articulating the message of their respective NGOs. Promote the play through a social media and gather your audience. Enact the play. Capture the numbers of likes and reviews.
9	Project specified by TCS to be completed and E magazine to be published as directed.
10	Write an article on How each of the Lindgren's Team Players Roles helps a team and explain the role played by you in various activities throughout the semester.

Text Books:
   T1. Business Communication – Dr. Saroj Hiremath
   T2. English vocabulary in use – Alan McCarthy and O'Dell

Reference Books:
   R1.APAART: Speak Well 1 (English language and communication)
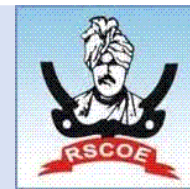   **R2.**APAART: Speak Well 2 (Soft Skills)

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F. Y. B. Tech (Group 2& 3)
Academic Year – 2021-2022 Semester -II
[CE1103]: Environmental Studies

Teaching Scheme: PR: -02 Hours/Week	Credit PR:01	Examination Scheme: LabEvaluation :25Marks

Course Prerequisites : Fundamentals of Environmental Science.

Course Objective:
 To make students aware about natural resources, environment protection and sustainability.

Course Outcome:
After successful completion of the course, students will able to:
ELO1: Explain an ecology, ecosystem and sustainability.
ELO2: Explain different types of pollution.
ELO3: Measure different types of pollution level.

Lab Contents

Guidelines for Assessment

1) Practical for the subject shall be engaged in minimum three batches (batch size of 22 students maximum) perdivision.
2) Continuous assessment of laboratory work is done based on overall performance and lab assignments performance of student.
3) Each lab experiment assessment shall be assigned grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality andneatness

List of Laboratory Experiments

1	To study norms and standards for potable water. (Determination of hardness, alkalinity and Chloride content of water sample)
2	Assignment on ecosystem
3	Assignment on understanding of sustainability concept.
4	Study of different types of pollution
5	Study of traffic pollution in campus.
6	Application of Drone for aerial survey
7	Site visit to water treatment plant.
8	To present a seminar in a group of four students related to Energy/Environment

Text Books:
 T1. Bharucha, E, "Textbook of Environmental Studies", Universities Press
 T2. MahuaBasu, "Environmental Studies", Cambridge University Press

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F. Y. B. Tech (Group 2& 3)

Academic Year 2021-22 Semester –I/II
[CS1111] Environmental Science and Engineering

Teaching Scheme: TH: - 3 Hours/Week PR:- 2 Hours/Week	Credit TH: 3 PR:1	Examination Scheme: In Sem. Evaluation: 15Marks Mid Sem. Exam: 25 Marks End Sem. Exam: 60 Marks Lab Evaluation : 25 Marks

Course Objectives:
1.To make understand different methods of treatment of hard water and industrial waste water.
2.To understand renewable, non-renewable energy, alternate energy, nonconventional energy resources.
3.To understand concept of sustainable development.
4.To understand causes and different methods for controlling air pollution.
5.To understand importance of usage of biodegradable and ecofriendly polymers or plastics in everyday life.
6.To understand importance disaster management.

Course Outcome:
After successful completion of the course, students will able to:
CO1: Explain different methods for treatment of hard water and industrial waste water.
CO2: Explain renewable, non-renewable energy sources and alternate energy sources.
CO3: Formulate action plans for sustainable development.
CO4: Suggest different methods for controlling air pollution.
CO5: Utilize biodegradable and ecofriendly polymers or plastics.
CO6: Demonstrate importance of disaster management.

Course Contents

UNIT-I	Water Resources and Management	06 Hours

Water Quality: Measurement of parameters to determine the status of water bodies and drinking water quality; p^H, turbidity, conductivity and total hardness. Zeolite and Ion exchange method for treatment of hard water. Desalination of water: Reverse Osmosis and Electro dialysis. Waste water management-Characterization treatment and analysis.

UNIT-II	Energy Resources	06 Hours

Renewable and non-renewable energy sources, Use of alternate energy sources: Power alcohol and Biodiesel Hydrogen as a future fuel. Utilization of solar in space heating and water heating. Conversion of solar energy into electricity. Biomass energy resources. Fuel cell (H_2-O_2) and Polymer Electrolyte Membrane Fuel Cell(PEM).

UNIT-III	Introduction to Sustainable Development	06 Hours

Defining sustainable development. Need and concept of sustainability. Social, environmental and economic sustainability concept. Introduction to environmental impact analysis(EIA)- Historical background, Elements of EIA process. Participants in EIA process. Design of EIA. Environmental Audit for sustainable development. Eco labelling of Environment Friendly –Products.

UNIT-IV	Air Pollution Science and Engineering	06 Hours

Composition and structure of atmosphere. Classification of air pollutants and their effects, acid rain, photochemical smog and particulates. Sources, Characteristics and biochemical effects of some important air pollutants. Effects of air pollutants on man and his environment. Air quality standards and monitoring. Atmospheric sampling and analysis. Methods and equipment used to control gaseous pollutants and industrial effluents. Air quality management; Climate effect of air pollutants and Indoor air pollution.

UNIT-V	Green Technology and Ecofriendly Polymers	06 Hours

Twelve Principles of Green Chemistry, zero waste technology, environmental degradation of polymers. Biodegradable Polymers. Bioplastics: Polylactic acid, Poly hydroxy butyratevalerate (BIOPOL), Polycaprolactone. Concept of bioremediation.

UNIT-VI	Disaster management	06 Hours

Basic Concepts of Disaster Management: Introduction, necessity of studying Disaster Management (DM); Types of disasters. Vulnerability. Disaster Risk, Assessing Disaster Risk and ways of minimizing disaster risk. Disaster Risk Management (DRM) plan. Natural Hazards Risk management, Climate Disasters & Agriculture. Industrial hazard Risk Management.

Guidelines for Assessment

Assessment is a continuous assessment based on submission of the assignments, timely completion, attendance and understanding.

List of Experiments/Assignments

1	Determination of hardness of water using EDTA method
2	Determination of alkalinity of water.
3	Estimation of sulphate /chloride in drinking water by conductivity method
4	Determination of volume of acid required to neutralize alkalinity by titration of strong acid (HCl) and alkaline water using pH meter
5	Determination of percentage of moisture and volatile matter using proximate analysis.
6	Preparation of Phenol formaldehyde resin.
7	Determination of molecular weight of Polymer using Ostwald's method.
8	Project on Disaster Management.

Textbook:
T1.A Text book of Environmental Chemistry and Pollution Control – S.S.Dara

Reference Books:
R1. Environmental Pollution: Monitoring and Control-S.M. Khopkar
R2. Sustainability Engineering concepts, design and case studies-Allen ,D.T and Shonnard D.R

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F. Y. B. Tech (Group 1,2&3)
Academic Year – 2021-2022 Semester -I/II
[HS1101]: English

Teaching Scheme: PR:-2 Hours/Week	Credit PR: 1	Examination Scheme: TermWork : 25 Marks

Course Prerequisites: Knowledge of basic grammar. Interface with vocabulary used in day to day life. Strong will power to improve communication skills.

Course Objective: To enhance the systemic and specific knowledge and skills of the learners in the use of English language by improving their ability to listen, speak, read, and write.

Course Outcome:
After successful completion of the course, students will able to:
CO1: Acquire knowledge of basic and fundamental grammar in English including reading and listening comprehension, writing, and speaking skills.
CO2: Construct different types of sentences using effective and new vocabulary to create a good Impression.
CO3: Write, precisely, and competently in different scenarios.
CO4: Acquire structure and written expression required for their profession and enable them to acquire proper behavioral skills
CO5: Present themselves well in front of a large audience on a variety of situations related to group communication and presentation in a relevant scenario. Moreover, they will get the knack for the structured conversation to make their point of view clear to the listeners.

Course Contents

UNIT-I	Sentence Structure	5 Hours

Orientation, Parts of speech- Introduction to Noun, Pronoun, Verbs, Adverbs, Adjectives, Prepositions, Conjunctions, Interjections, Use present, past, and future tenses (2-3) with appropriate time markers .Recognize present perfect, past perfect and future perfect tenses and their progressive forms .Use perfect tenses with increasing accuracy.

UNIT-II	Fundamentals of Communication (Vocabulary Building)	5 Hours

Vocabulary-Synonyms, Antonyms, Root words, Technical Vocabulary Words Idioms and Phrases, Idioms, and Phrasal Verbs. searching the internet, for English resources; reading office, documents; reading safety signs and reading professional texts.

UNIT-III	Nature and Style of Writing	5 Hours

E-mail Writing and etiquettes, Email Writing.Writing Cover Letters. Resume Writing, Report Writing, Creative Writing, writing and communicating through e-mails; writing minutes of meetings.

UNIT-IV	Oral Communication	5 Hours

Orientation about grooming, Fluency, body language, Non-verbal communication, Expressions, Group Discussion, Debate Extempore-Orientation and Mock GD, Debate, Extempore rounds. Speaking Skills, Professional Role Plays Interview Skills, Product/Model/Poster/Company Presentations,Situational

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Tasks and Case Studies On-Floor Communication and Signboards, Telephone Etiquette, Delivering oral presentations; 12.Conversation Skills, Fluency, Voice and accent.		
UNIT-V	**Presentation**	**4 Hours**

PPT presentation/ Poster making, group presentations to boost stage confidence and to inculcate team building skills, practice and implement communication skills practices to gain fluency while communicating.

Guidelines for Assessment
Assessment is a continuous assessment based on submission of the assignments, timely completion, attendance and understanding

List of Assignments	
1	Assignment on Parts of speeches and tenses
2	Assignment on Idioms and Phrasal Verbs
3	Assignment on Prepositions
4	Assignment on Email Writing
5	Assignment on Reading Comprehension.

Text Books:

T1. English for Engineers. Dr.K.Anbazhagan, Dr.B.Cauveri&Dr.M.P.Devika, Cengage Publications. 2016.

T2. Dhanavel, S.P. English and Communication Skills for Students of Science and Engineering. Units 1-5.Chennai: Orient, Blackswan Ltd., 2009.

T3. Raman, Meenakshi, and Sangeetha Sharma. Technical Communication-Principles and Practice. Oxford University Press. 2009.

T4. Day, R A. Scientific English: A Guide for Scientists and Other Professionals. 2nd ed. Hyderabad: Universities Press, 2000

Reference Books:

R1. K.R.Laxminarayanan, English for Technical Communication, Scitech, Sixth Edition, 2008

R2. William Sanborn Pfeiffer, T.V.S. Padmaja, Technical Communication: A Practical Approach, Pearson, Sixth Edition 2012

R3. A.K.Jain, Praveen Bhatia, A.M.Shaikh, Professional Communication Skills, S. Chand and Co: Fifth edition,2009

R4. Ashraf Rizvi, Effective Technical Communication, Tata McGraw Hills Publishing Company 2006

R5. F.T.Wood, Remedial English Grammar, Macmillan, 2007

R6. Andrea J.Rutherford, Ph.D. Basic Communication Skills for Technology, Pearson Education Asia,2001

R7. Exercises in Spoken English, Parts 1 and II CIEFL, Hyderabad, Oxford University Press

R8. Sanjay Kumar, Pushplata, Communication Skills, Oxford University Press, First edition,2012

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F. Y. B. Tech (Group 1,2&3)
Academic Year - 2021-2022 Semester -I/II
[HS1102]: German

Teaching Scheme: PR: 2 Hours/Week	Credit PR: 1	Examination Scheme: Term Work : 25 Marks

Course Prerequisites: Desire to get acquainted to German language.

Course Objective: Introduction of Germany, Greetings, phrases, vocabulary, Understanding of numbers, Grammar- Introductory Sentence Formation, Articles, Pronouns, Tense, Prepositions

Course Outcome:
After successful completion of the course, students will able to:
CO1: Understand the basic information of Germany
CO2: Recognize and identify German letters and numbers
CO3: Describe and introduce themselves
CO4: Formulate basic questions

Course Contents

UNIT-I	Start auf Deutsch: (Begin in German) / Guten Tag! (Good day)	8 Hours

To learn to spell in German; introducing and giving information about oneself and others; to talk about oneself and others. **Grammar** - W-questions; simple statements; basic verbs and personal pronouns. **Vocabulary** - Alphabets; numbers 1 -20; greetings; countries and their languages.

UNIT-II	Freunde, Kollegen und Ich (Friends, Colleagues and Me)	8 Hours

To talk about hobbies to make appointments; to talk about work, profession, work timings; total kabout seasons of theyear;tocreateone'sprofile.**Grammar**-Genderarticles*der,die,das,dieandthesingular plural form sa noun*; personal pronouns II; yes- no questions; verbs *haben* and *sein.* **Vocabulary**- Hobbies; days of the week; months and seasons of the year; numbers 21-100; Professions

UNIT-III	Städte, Länder, Sprachen: (Cities, Countries, Languages)	8 Hours

To name places and buildings; to ask questions about a place; to match texts with images; to enquire about things;to name modes of transport;toaskforordescriberoutes;tounderstandinternationalwords **Grammar** - Definite articles *der, die, das*; indefinite articles *ein, eine, ein*; negative articles *kein,keine, kein*; exclamatory sentences with *Sie* **Vocabulary** - Places and buildings; modes of transport;directions

Guidelines for Assessment

Assessment is a continuous assessment based on submission of the assignments, timely completion, attendance and understanding

List of Assignments

1	Multiple choice questions online assessment after completion of every unit to evaluate the understanding of the grammar.
2	Spoken exercises to evaluate the learning in the conversational aspect of the language.

Text Books:
T1. Funk, Kuhn, &Demme. Studio d A1. Deutsch als Fremd sprache. 2011. Goyal Publishers & Distributors Pvt. Ltd. Delhi, India

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F. Y. B. Tech (Group 1,2&3)
Academic Year - 2021-2022 Semester -I/II
[HS1103]: Japanese

Teaching Scheme: PR:-2 Hours/Week	Credit PR: 1	Examination Scheme: TermWork : 25Marks

Course Prerequisites: Desire to get acquainted to Japanese language.

Course Objective: To meet the needs of ever growing industry with respect to language support, to get introduced to Japanese society and culture through language.

Course Outcome:
After successful completion of the course, students will able to:
   CO1: Acquire basic communication skills.
   CO2: Read basic Japanese script.
   CO3: Acquire basic reading , writing and listening skills

Course Contents

UNIT-I	Introduction to Japanese Language	8Hours
Hiragana basic Script, colors, Days of the week.		

UNIT-II	Hiragana	8 Hours
Modified Kana, double consonant, Letters combined with ya, yu, yo Long vowels, Greetings and expression		

UNIT-III	Self Introduction, Introducing other person,	8 Hours
Numbers, Months, Dates, Telephone numbers, Stating one's age.		

Lab Contents

Guidelines for Assessment

Assessment is a continuous assessment based on submission of the assignments, timely completion, attendance and understanding

List of Assignments

1	Two written Assignments based on Script, oral – Self introduction, Quiz
2	Oral – Self introduction and Quiz

Reference Books:
R1 . Minna No Nihongo, "Japanese for Everyone", Elementary Main Text book 1 (Indian Edition),Goyal Publishers & Distributors Pvt. Ltd.

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F. Y. B. Tech (Group 1,2&3)
Academic Year – 2021-2022 Semester –I/II
[HS1104]: French

Teaching Scheme: PR: 2 Hours/Week	Credit PR: 1	Examination Scheme: TermWork : 25Marks

Course Objective:
1. To make the students understand the importance of learning a foreign language.
2. This module will help students learn the basics of French Language.
3. The learners would be able to greet people, talk about self, talk about where they live, about their family members and likes and dislikes
4. This A1.1 level will lay the foundation to the next A1.2 level learning of the language.

Course Outcome:
After successful completion of the course, students will able to:
 CO 1: Read/Write and understand French at an elementary level
 CO 2: Listen to basic spoken French and demonstrate understanding by responding appropriately

Course Contents

UNIT-I	Vocabulary	6 Hours

Alphabet, Numbers, Family name & Given Name, Residence, Personal items, Classroom objects, Nationalities, Professions, Marital status (married / single),Countries & Cities, Hobbies

UNIT-II	Grammar Topics	6 Hours

Personal subject pronouns, Tonic pronouns, Present tense – State and Description, Common verbs: be, have, do, to be called ER Verbs: to live, to work, to talk, Verb: to understand (I and You forms), Condition for politeness (I would like to), Interrogation(the3forms), Interrogative words: Do you, what do you, Interrogative pronouns: Where, When, How much, Interrogative adjectives (what), It is / Thisis / Here is, Use of definite and indefinite articles in the sentence, Zero article for professions, Cardinal numbers, Demonstrative adjectives   Masculine/Feminine & Singular/Plural concept, Agreement of Adjectives (for nationalities), Some descriptive adjectives (big, small,) ,Position of adjectives

UNIT-III	Speaking Topics	6 Hours

First encounters: Greet somebody, take leave of somebody, ask news or Give your news, Introduction Tell about yourself or somebody else, give your name, spell your name, Tell your age, Tell your ,nationality,Tellyourprofession3.Talkaboutyourdailylife Give your address/email, Give your phone number, Talk about your family, Talk about your hobbies ,Describe an object / a person, Tell about something or someone , Say the price of an object, Talk about ownership, Talk about quantity, Describe the weather , Ask for an information, Ask for personal information ,Ask about the date   Ask   about the time, Ask about a service

UNIT-IV	Sociocultural Knowledge	6 Hours

Greetings (when meeting people), Simple expressions to express politeness: excuse me, please, sorry, thank you, Informal you and Formal you .

Guidelines for Assessment

Assessment is a continuous assessment based on submission of the assignments, timely completion, attendance and understanding.	
List of Assignments	
1	Multiple choice questions online assessment after completion of every unit to evaluate the understanding of the grammar.
2	Spoken exercises to evaluate the learning in the conversational aspect of the language.

Textbook:
T1. Saison 1 (méthode de Français- Livre de l'eleve)(textbook)

Reference Books:
R1. Saison 1 (cahier d'activités)(workbook)
R2. Collins dictionary (French-English) (French-French)

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F. Y. B. Tech (Group 1,2&3)
Academic Year – 2021-2022 Semester –I/II
[ES1104]: Engineering Design and Development

Teaching Scheme: PR:-2 Hours/Week	Credit PR: 1	Examination Scheme: TermWork : 25Marks

Course Prerequisites: Basic knowledge of mathematics and sciences.

Course Objective: Project Based Learning(PBL)connects students to the real world. It prepares students to accept and meet challenges in the real world, mirroring what professional do everyday. The objective is to improve student's attitude towards education by building intrinsic motivation. The course will inculcate values like critical thinking, problem solving, collaboration, self-learning ability, awareness about social issues andcommunication.

Course Outcome:
After successful completion of the course, students will able to:
CO1: Apply science and mathematical principles to solve real life problems.
CO2: Use of modern tools and technologies to find solution for the problems.
CO3: Develop an ability to function in multidisciplinary team and communicate effectively.
CO4: Recognize moral, ethical, legal and social issues and responsibility.

Project Groups:

- Interdisciplinary group of students should be formed (4-5 students pergroup).
- One Mentor is assigned to individualgroup.
- To strengthen team spirit, each group is assigned, task like puzzles, activities etc. underthe observation offacilitator.

Selection of problem for project:
Problem based learning (PBL)is a student centered, inquiry based instructional model in which learners engage to solve real world problems. PBL research begins with small group brain storming sessions where students define, study and investigate the problem. The problem should refer to a particular practical, scientific, social and/ or technical domain. The problem should be designed in accordance with outcomes like deeper understanding of concept, self-directed learning, critical reasoning and development of domain specific and interdisciplinary skills with collaborative approach and use of modern tools/technology.

Guidelines for Assessment And Evaluation

Assessment:
- The facilitator/Mentor is committed to assessing and evaluating students' performance during PBL Weekly review of work assigned during PBL should be monitored and continuous assessment should be done bymentor/supervisor.
- Students must maintain an institutional culture of authentic collaborations, self–motivation, peer –learning and personal responsibility.
- Every group should demonstrate their work and skills by developing it her prototype

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model/Product and/ or report and/or presentation.

- Individual assessment (Understanding individual capacity, role and involvement in project).
- Group assessment (Useofrubricstodeterminewhetherstudentshaveclearlycommunicatedthe problem, background, research methods, solutions (feasible and research based) and resources and to decide whether group members participated meaningfully).
- Report preparation and Presentation.

Evaluation:

Continuous assessment sheet is to be maintained by all mentors of the department.

Parameters for assessment, evaluation and Weightage:

- Defining the problem (10%).
- Outcome of PBL/Problem solving skills/Solution provided/ Final product /Prototype model (50%).
- Documentation (literature survey, gathering requirements, designing/modelling ,implementation execution, use of modern technology and final report(20%).
- Demonstration(Presentation) (10%)
- Patent/Publication (5%)
- Awareness of Environment /social/ethics/safety/legal measures.(5%)

Text Books:

T1. Allen B. Downey, Think Python: How to Think Like a Computer Scientist'', 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016

T2. Guido van Rossum and Fred L. Drake Jr, "An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

Reference Books:

R1. Arduino 101 Beginners Guide: How to Get Started with your Arduino by Erik Savasgard published by Create space Independent Pub.

R2. Internet of things a hands on approach by Arshdeep Bahga, Vijay Madisetti-5 copies published by Arshdeep Bagga.

R3. Modeling and Simulation using MATLAB - Simulink , second edition, by Shailendra Jain, Willey publication.

R4.' Let us C' by Yashwant Kanetkar, BPB Publications.

R5. Theory of Machines by S.S. Ratan, Tata McGraw-Hill Education.

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F. Y. B. Tech Semester-I (Group 1,2&3)
[HS1108]: Induction Training

Training Duration: 3 Weeks	Non-Credit Audit Course

Course Objective: To familiarize the students with new environment and inculcate in them the ethos of the institution with a sense of larger purpose. The aim of induction training is to make the students feel comfortable in the new environment, create bonding in the batch as well as between the faculty and students, people around them, society at large and nature, useful in character building as responsible engineer, a citizen and a human being.

Course Outcome:
After successful completion of the course, students will able to:

CO 1: Incorporate importance of health, fitness, outdoor activities and develop a sense of aesthetics and enhance creativity.

CO 2: Explore one self, experience the joy of learning, take decisions with courage, built relationships between teachers and students and be sensitive to others.

CO 3: Interact with the people who are eminent in industry, social service or in public life.

CO 4: Get familiarize with the institution, department and local area and role of an engineer in society through technology.

Course Contents

I	Physical Activity

Physical activity with games / sports/ yoga. Gardening or other suitably designed activity.

II	Creative Arts

Skills related to Visual or Performing arts e.g painting, music, dance, pottery, sculpture etc.

III	Mentoring and Universal Human Values

Universal Human Values through group discussion and real life activities in small group with faculty as mentor for each group.

IV	Familiarization to Department/Branch and Innovations

Guidelines related to rules and regulation of Choice Based Credit System (CBCS) and Examination Scheme. A College tour to explore common facilities like library, canteen, workshop etc. Visit to their Department and laboratories to understand role, achievements and innovations.

V	Proficiency Modules:

Modules in the form of crash courses to overcome some lacunas that students may have e.g English, skills, computer Familiarity, stress management etc.

VI	Literary Activity:

Reading a book, writing a summary, debating, enacting a play etc

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VII	**Lectures & Workshops by Eminent People:**
Motivational lectures about life, meditation, lectures by eminent personalities from industry, social service or public life, lectures by Training Placement Officer and Alumni	
VIII	**Visits in Local Area**
Visits to the local landmarks including historical monuments, visits to a hospital, orphanage or a village, visits to an industry in local area.	
Guidelines for Assessment	

1) Induction Training is mandatory non-credit audit course.
2) Internal continuous assessment and evaluation has to be carried out based on participation in activities (like creative arts, proficiency, literary, universal human values etc.) for award of grade at college level. Grade awarded for audit course shall not be calculated for grade point &SGPA.
3) Based on experience each group of students shall prepare report on their program feedback.

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