122ENI01	PROFESSIONAL ENGLISH – I (EMBEDDED) (Common to all branches)	L	T	P	C
		2	0	2	3

OBJECTIVES:
The Course prepares first semester Engineering and Technology students to:
- Strengthen their listening skill which will help them comprehend lectures and talks in their areas of specialization.
- Present information in an appropriate oral form.
- Develop strategies and skills to enhance their ability to read and comprehend engineering and technology texts.
- Foster their ability to write anything convincingly with grammatical accuracy.

UNIT I–Listening

Theory

Listening to news and understanding its perspectives - Listening to motivational speech to comprehend the purpose - Listening to technical talks to understand its significance - Listening to classroom lecture to equip content knowledge - Listening comprehension.

English Laboratory

Listening audios and answering MCQs - Watching video clips on famous speeches, motivational videos, documentaries and answering MCQs - TED talks.

UNIT II–Speaking

Theory

Everyday activities for day-to-day communication - Extempore/Impromptu to develop spontaneous thoughts -Self introduction to face interviews - Public speaking for persuading the audience - Movie reviews to promote critical thinking.

English Laboratory

Prepared talk - Story knitting - Picture talk - Brainstorming - Debate - Group discussion - Elevator speech - Mock HR interviews - Story narration - Miming - Short skits.

UNIT III- Reading

Theory

Newspaper reading to upgrade world knowledge –Reading Comprehension to analyse the text –Novels to improve creativity - Biography/Autobiography to synthesise experience - Technical articles for upgrading technical knowledge.

English Laboratory

Classification - Alphabet test - Logical sequence of words - Statement &conclusions-Statement &courses of action - Situation reaction test - Theme detection - Deriving conclusions from passages.

UNIT IV- Writing

Theory

Definitions –Instructions – Checklists – Recommendations-Essays-Invitation and quotation letters -Email etiquettes-Reports - Minutes of a meeting

English Laboratory

Resumewriting - Letter writing (Covering letter – Follow up letter - Letter of thanks giving - appreciation –Gratitude) - Paragraph writing – Jumbled paragraph – Error spotting.

UNIT V- Language Development

Theory

Technical vocabulary -Parts of speech-Articles - Tenses - Voices - Numerical adjectives – Question tags - Misspelled words –Singular and plural nouns - Modals – Conditionals.

English Laboratory - Career Skills

Vocabulary Test (GRE, TOEFL, TOEIC & CAT Exam words) - Confused Pair of words - Contronyms – Time management – Stress management– Decision making – Negotiation - Sentence correction.

TOTAL:60 HOURS

Lab Requirements:

1. Teacher console and systems for students.

2. English Language Lab Software

3. Career Lab Software

OUTCOMES:

At the end of the course, learners will be able to:

CO1: Listen and comprehendthe various strategies of listening and its significancein their area of specialisation successfully.

CO2: Speak appropriately and effectively in varied formal and informal contexts.

CO3: Read and comprehend texts effortlessly and understand the prevailing practices of testing in the recruitment process by the corporates and the institutional selection processes.

CO4: Communicate the corporate and social requirements in an impressive written mode.

CO5: Understand the basic grammatical structures and its applications and enhance their verbal skills in the screening tests competently both for recruitment and pursuing higher studies as well.

TEXT BOOKS:

1. Board of editors. **Fluency in English: A Course book for Engineering and Technology**. Orient Blackswan, Hyderabad: 2016.
2. Sudharshana. N. P and Saveetha. C. **English for Technical Communication**. Cambridge University Press: New Delhi, 2016.
3. Uttham Kumar. N. **Professional English - I** (with work book). Sahana Publications, Coimbatore, 2016.
4. Agarwal R. S. A Modern Approach to Verbal and Non-verbal Reasoning. Chand & Co., New Delhi, 2012.
5. Ashraf Rizvi M. Effective Technical Communication. TATA McGraw Hill, New Delhi, 2007.

REFERENCES:

1. Raman, Meenakshi and Sharma, Sangeetha- Technical Communication Principles and Practice.Oxford University Press: New Delhi,2014.
2. Kumar, Suresh. E. Engineering English. Orient Blackswan: Hyderabad,2015.
3. Booth-L. Diana, Project Work, Oxford University Press, Oxford: 2014.
4. Grussendorf, Marion, English for Presentations, Oxford University Press, Oxford: 2007
5. Means, L. Thomas and Elaine Langlois, English & Communication For Colleges. Cengage Learning, USA: 2007.
6. Lingua: Essays for TOEFL/IELTS, Dreamtech Press, New Delhi, 2016.
7. Lily Mangalam, Global English Comprehension, Allied Publishers Pvt. Ltd., New Delhi, 2014.

8. Sharon Weiner Green and Ira K. Wolf, Barron's GRE, Glagotia Publications Pvt. Ltd.,

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
122ENI01 PROFESSIONAL ENGLISH - I												
CO1	-	-	-	-	-	-	-	-	1	1	1	1
CO2	-	-	-	1	-	-	-	-	3	3	2	1
CO3	-	2	-	2	-	-	-	-	2	2	1	1
CO4	-	1	-	2	-	-	-	-	3	3	2	1
CO5	-	-	-	-	-	-	-	-	1	3	-	1
AVG	-	1	-	1	-	-	-	-	2	2	1	1

18th Edition, New Delhi, 2011.
9. Mohamed Elias, R. Gupta's IELTS/TOEFL Essays, Ramesh Publishing House, 6th Edition, New Delhi, 2016.

CO's-PO's & MAPPING

3-HIGH, 2- MODERATE, 1-LOW, '- 'NO CORRELATION

122MAT02	MATRICES AND CALCULUS	L	T	P	C
	(Common to all branches)	3	1	0	4

Course Objectives

- To understand the eigenvalue problems.
- To learn the derivatives of multivariable functions and applications.
- To solve differential equations of certain types, including systems of differential equations that they might encounter in engineering subjects.
- To understand double and triple integration concepts.
- To study vector calculus comprising of surface and volume integrals along with the classical theorems involving them.

Prerequisite

Matrices-Introduction, Properties, Basic Differentiation and Integration concepts.

UNIT I   MATRICES   9+3

Eigenvalues and eigenvectors of a real symmetric matrix –Properties – Cayley - Hamilton theorem (Statement and applications only) – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic form –Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT II   FUNCTIONS OF SEVERAL VARIABLES   9+3

Partial derivatives – Euler's theorem for homogenous functions – Total derivatives – Jacobians – Taylor's expansion– Maxima and Minima – Method of Lagrangian multipliers.

UNIT III   ORDINARY DIFFERENTIAL EQUATIONS   9+3

Second order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients-Applications to Engineering Problems-Electric Circuits, Simple Harmonic Motions and Bending of beams.

UNIT IV   MULTIPLE INTEGRALS   9+3

Double integration – Cartesian and polar co-ordinates – Change of order of integration – Change of variables between Cartesian and polar coordinates –Triple integration in Cartesian co-ordinates – Area as double integral – Volume as triple integral.

UNIT-V   VECTOR CALCULUS   9+3

Gradient, Divergence and Curl – Directional derivative – Irrotational and Solenoidal, vector fields – Vector integration – Green's theorem in a plane, Gauss divergence theorem and Stokes' theorem (Statement and applications only) – Simple applications involving cubes and rectangular parallelopipeds.

TOTAL: 45+15= 60 PERIODS

Course Outcomes:

After completing this course, the student will be able to

CO 1: Apply the matrix algebra concepts for solving practical problems.
CO 2: Compute extremities of a function using multivariable derivatives.
CO 3: Determine the solutions of ordinary differential equations by various methods which have an application in their core subjects.
CO 4: Determine the area and volume in 2-dimension and 3-dimension respectively using multiple integrals.
CO 5: Expertise the concept of vector calculus and apply in core subjects.

TEXT BOOKS

1. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India, 10th edition New Delhi 2016.
2. Grewal. B.S, "Higher Engineering Mathematics", 44th Edition, Khanna Publications, Delhi, 2017.

REFERENCES

1. T.Veerarajan, "Engineering Mathematics" ,Tata McGraw-Hill Publishing company, New Delhi, 2014.
2. Kandasamy.P, Thilagavathy,K., &Gunavathi.K., "Engineering Mathematics for first year "., S.Chand & Company Ltd., New Delhi,2014.
3. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd., New Delhi, 11th Reprint, 2010.
4. Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 3rd Edition, 2007.
5. V.Prameelakaladharan and G.Balaji, "Engineering Mathematics - I", 3rd Edition, Amrutha marketing, Chennai, 2017.

CO's-PO's & PSO's MAPPING

122MAT02 MATRICES AND CALCULUS														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	2	2	-
CO2	3	3	2	-	-	-	-	-	-	-	-	2	2	2	-
CO3	3	3	3	-	-	-	-	-	-	-	-	2	2	2	-

CO4	3	3	3	-	-	-	-	-	-	-	-	2	2	2	-
CO5	3	3	3	-	-	-	-	-	-	-	-	2	2	2	-
AVG	3	3	3	-	-	-	-	-	-	-	-	2	2	2	-

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

122PHT03	ENGINEERING PHYSICS (Common to all branches)	L	T	P	C
		2	0	0	2

COURSE OBJECTIVES

At the end of the course the students would be exposed to fundamental knowledge in

- Different engineering subjects and applications.
- Acoustics in building and Non-destructive techniques.
- Application of lasers in engineering and technology.
- Basics of Quantum theory.
- Atomic and nuclear related theories.

UNIT-1: ACOUSTICS AND ULTRASONICS   6

Sound – classification – characteristics of musical sound – loudness – Decibel – Intensity of sound – Weber-Fechner law – Reverberation and Reverberation time – Sabine's law – Absorption coefficient – Measurement of absorption coefficients – Factors affecting acoustics of buildings and their remedies.

Ultrasonics – production – Magnetostriction effect – Magnetostriction oscillator – Piezoelectric effect – Inverse piezoelectric effect – Piezoelectric oscillator-Detection of ultrasonic waves-properties-Cavitations.

UNIT-2: OPTICAL PHYSICS   6

Lasers – Spontaneous and Stimulated emissions-Types of lasers-Nd-YAG, Helium-Neon,CO_2-Semiconductor lasers(Homojunction and Hetrojunction (qualitative))-Interference-Airwedge and its applications.

UNIT-3: QUANTUM PHYSICS   6

Blackbody radiation-Laws of blackbody radiation-Planck's quantum theory of blackbody radiation(derivation)- Compton effect (derivation)-Matter waves-De-broglie's concept-Schrodinger wave equation-Time independent and Time dependent equations (derivations)

UNIT-4: PROPERTIES OF MATTER AND THERMAL PHYSICS   6

Elasticity-Hook's law-stress- strain diagram-factors affecting elasticity-Poisson's ratio-Bending moment-Cantilever-Heavy cantilever-Young's modulus-Uniform and Non-uniform bending (Theory and Experiment).

UNIT-5: NUCLEAR AND ATOMIC PHYSICS   6

Nuclear fission-chain reaction-Nuclear reactor-condition for sustained chain reaction-Controlled chain reaction-Pressurized water reactor (PWR)-Boiling water reactor (BWR)-Nuclear power plant-Nuclear fusion.

TOTAL : 45 HOURS

REFERENCES

1. Dr. R.N. Jayaprakash, Engineering Physics, Dhanam Publications, 2007.
2. Rajendran V, Applied Physics, Tata McGraw Hill Publishing Company Limited, New Delhi,2003.
3. Palanisamy P.K.,Engineering Physics I,Scitech Publications, Chennai,2011.
4. Avadhanulu M.N. and Kshirsagar P.G., A textbook of Engineering physics, S.Chand &Company Ltd, New Delhi,2005.

COURSE OUTCOMES

After successful completion of this course, the students should be able to:

CO1: Apply the Acoustics and modern engineering tools necessary for engineering

practice.

CO2: Categorize and illustrate the Lasers and its application to engineering

CO3: Apply the quantum concepts in engineering field.

CO4: Examine the elastic properties in various materials.

CO5: Discuss the role of nuclear physics in energy production.

CO's-PO's & PSO's MAPPING

122PHT03 ENGINEERING PHYSICS															
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
CO1	3	2	3	3	3	3	3	-	2	-	-	-	3	2	-
CO2	3	3	3	3	3	3	3	-	2	-	-	-	3	2	-
CO3	3	3	3	3	3	3	3	-	2	-	-	-	3	2	-
CO4	3	3	3	3	3	3	3	-	2	-	-	-	3	2	-
CO5	3	3	3	3	3	3	3	-	2	-	-	-	3	2	-
AVG	3	3	3	3	3	3	3	-	2	-	-	-	3	2	-

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

		L	T	P	C
122CYT04	**ENGINEERING CHEMISTRY** (Common to all branches)	2	0	0	2

Course objectives:

At the end of the course the students would be exposed to fundamental knowledge in
- To understand the chemistry behind water technology
- To understand the chemistry of Corrosion

- To acquaint the student with concepts of important photo physical and photochemical processes and spectroscopy
- To acquaint the students with the basics of fuels, and chemistry behind combustion process.
- To understand the basic concepts of phase equilibrium

UNIT I WATER TECHNOLOGY 9

Physical, Chemical & Biological characteristics -Hardness of water - estimation of hardness (EDTA method) - Dissolved oxygen –determination and significances, Alkalinity – determination and significances - disadvantages of using hard water in boilers- Internal conditioning - phosphate, calgon and carbonate conditioning methods – External treatment: Zeolite, ion exchange methods - desalination – reverse osmosis and electrodialysis - domestic water treatment.

UNIT II CORROSION SCIENCE 9

Basic concepts - mechanism of chemical, electrochemical corrosion - Pilling Bedworth rule – Types of Electrochemical corrosion - galvanic corrosion - differential aeration corrosion –Measurement of corrosion (wt. loss method only) - factors influencing corrosion. Corrosion control: Cathodic protection - sacrificial anodic method and impressive cathode current method. Electroplating (Copper plating) and Electrolessplating (Nickel plating).

UNIT III PHOTOCHEMISTRY AND SPECTROSCOPY 9

Photochemistry: Laws of photochemistry - Grotthuss–Draper law, Stark–Einstein law and Lambert-Beer Law. Quantum efficiency –Photophysical Process-Fluorescence, Phosphorescence, Chemiluminescence and Photo-sensitization. Spectroscopy: Electromagnetic spectrum - Absorption of radiation – Electronic, Vibrational and rotational transitions. UV-visible and IR spectroscopy – principles, instrumentation – applications.

UNIT IV FUELS AND COMBUSTION 9

Fuel: Introduction- classification of fuels- calorific value- higher and lower calorific values- coal- analysis of coal (proximate and ultimate)- carbonization- manufacture of metallurgical coke (Otto Hoffmann method) – petroleum – Fractional distillation - manufacture of synthetic petrol (Bergius process)- knocking- octane number - diesel oil- cetane number - natural gas- compressed natural gas(CNG)- liquefied petroleum gases(LPG). Combustion of fuels – (simple problems) flue gas analysis (ORSAT Method).

Gibbs phase rule-definition of terms involved- Thermal analysis-application of phase rule to one Component system-water system – Sulphur system. Reduced Phase rule-application of phase rule to two Component system- lead-silver system - KI-water system and Ferric Chloride water system

Course Outcomes:

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

   CO1: Developing the knowledge of chemistry behind water technology
   CO2: Understanding the chemistry of Corrosion
   CO3: Applying the basic concepts of photon on matter
   CO4: Understanding basics of fuels, and chemistry behind combustion process.
   CO5: Understanding the basic concepts of phase equilibrium

Text Books

   1. P.C. Jain and Monika Jain, Engineering Chemistry, DhanpatRai and Sons, NewDelhi 2004.16th Edition.
   2. N. Krishnamurthy, P. Vallinayagam and D. Madhavan, Engineering Chemistry,2ndEdition.PHI Learning PVT., LTD, New Delhi, 2008. 3rd Edition.
   3. K. Sivakumar, Applied Chemistry, Sahana Publishers, Coiambatore 2022.4th Edition.

Reference Books

   1. S. S. Dara, A Textbook of Engineering Chemistry, S. Chand & Co., Ltd. NewDelhi. 2008. Reprint edition.
   2. B. K. Sharma, Engineering Chemistry, 3rd edition Krishna Prakashan Media (P)Ltd., Meerut, 2001.
   3. ArunBhal, B.S. Bhal, G. D. Tuli, Essentials of Physical Chemistry, S. Chand & Co., Ltd. New Delhi. 26th Edition.
   4. P. W. Atkins & Julio de Paula, Atkins' Physical Chemistry, Oxford University Press York, 7thEdn, 2002.
   5. ShashiChawla, A Text Book of Engineering Chemistry, 3rd Edition, DhanpatRai&New Delhi, 2007.
   6. S. Vairam, P. Kalyani&Suba Ramesh, Engineering Chemistry, IstEdn, John Wiley &Sons, India, 2011.
   7. Lee J.D., Concise Inorganic Chemistry, 7th Edn, Blackwel Science Publications Oxford, London, 2004.

122CYT04 ENGINEERING CHEMISTRY												
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	-	-	-	2	-	-	-	-	-
CO2	3	3	3	-	-	-	2	-	-	-	-	-
CO3	3	3	3	2	-	-	-	-	-	-	-	-
CO4	3	3	3	-	-	-	2	-	-	-	-	-
CO5	3	3	3	2	-	-	-	-	-	-	-	-
AVG	3	3	3	1	-	-	1	-	-	-	-	-

CO's-PO's & MAPPING

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

122EGT05	ENGINEERING GRAPHICS (Common to all Non-Circuit branches)	L	T	P	C
		2	0	4	4

OBJECTIVES:
1. To gain knowledge on graphical skills for drawing the object.
2. To comprehend the principle of orthographic projection of points, lines and plane surfaces.
3. To study the principle of simple solids.
4. To comprehend the principle of section and development of solids.
5. To comprehend the principle of Isometric and Orthographic projections.

Concepts and conventions (Not for Examination)   **03**

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE AND SPECIAL CURVES   **9**

Conics – Construction of Ellipse, Parabola and Hyperbola by Eccentricity method – Construction of cycloid – Construction of Involutes of Square and Circle – Drawing of tangents and normal to the above curves.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES   **12**

Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to both reference planes.

UNIT III PROJECTION OF SOLIDS   **12**

Projection of simple solids like Prisms, Pyramids, Cylinders and Cones when the axis is inclined to one reference plane by change of position method.

UNIT IV SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES   **12**

Sectioning of simple solids like Prisms, Pyramids, Cylinders and Cones in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section.
Development of lateral surfaces of simple and truncated solids – Prisms, Pyramids, Cylinders and Cones – Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

UNIT V ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS   **12**

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated Prisms, Pyramids, Cylinders and Cones.

Representation of Three-Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

TOTAL:60 Hours

COURSE OUTCOMES:

The student will be able to

- Recognize the conventions and apply dimensioning concepts while drafting simple objects.
- Draw the orthographic projection of points, line, and plane surfaces.
- Draw the orthographic projection of simple solids.
- Draw the section of solid drawings and development of surfaces of the given objects.
- Apply the concepts of Isometric and Orthographic projections in engineering practice.

TEXT BOOKS:

1. Ranganath G, "Engineering Graphics", Second Edition, Sahana Publishers, Reprint, 2021.
2. Bhatt. N.D., "Engineering Drawing" Charotar Publishing House, 53rd Edition, 2014.

REFERENCE BOOKS:

1. Dhananjay A. Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw Hill Publishing Company Limited, 2017.
2. Gopalakrishnana. K. R, "Engineering Drawing" (Vol. I & II), Subhas Publications, 27th Edition, 2017.
3. Basant Agarwal and C.M.Agarwal, "Engineering Drawing", Tata McGraw Hill, 2019.
4. Natrajan K. V, "A Text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.
5. M.B.Shaw and B.C.Rana, "Engineering Drawing", Pearson Education India, 2011.

CO's-PO's & PSO's MAPPING

122EGT05 ENGINEERING GRAPHICS															
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
CO1	-	2	-	1	-	-	-	-	-	-	-	1	1	-	1
CO2	2	1	-	1	-	-	-	-	-	-	-	1	-	2	-
CO3	2	2	-	2	-	-	-	-	-	-	-	1	-	3	-
CO4	-	1	-	2	-	-	-	-	-	-	-	2	-	-	-
CO5	1	1	1	-	-	-	-	-	-	-	-	-	-	-	2
AVG	1	1	0.2	-	-	-	-	-	-	-	-	3	0.2	1	1

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

122PPT05	PYTHON PROGRAMMING	L	T	P	C
	(Common to all Circuit Branches)	3	0	0	3

OBJECTIVE(S):
- To know the basics of algorithmic problem solving
- To develop Python programs with conditionals and loops.
- To define Python functions and call them.
- To use Python data structures –- lists, tuples, dictionaries.
- To do input/output with files in Python.

Prerequisite: Nil

UNIT I   ALGORITHMIC PROBLEM SOLVING   9
Fundamentals of Computing, Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, and guess an integer number in a range, Towers of Hanoi.

UNIT II   DATA EXPRESSIONS, STATEMENTS   9
Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT III   CONTROL STATEMENTS AND FUNCTIONS   9
Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search

UNIT IV   LISTS, TUPLES, DICTIONARIES   9
Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: **Create- add- delete from a Dictionary- Operations associated with pairs of data**, and methods; advanced list processing - list comprehension; Illustrative programs:**To test if a variable is a list or tuple or a set**, selection sort, insertion sort, merge sort, histogram, ,**Retail Bill Preparation**.

UNIT V   FILES, MODULES, PACKAGES   9
Files and exception: text files, reading and writing files, format operator; command line arguments, date and time, errors and exceptions, handling exceptions, debugging, modules, packages; Illustrative programs: word count, copy file. **Case Study: Python Libraries (Numpy, Pandas, Matplotlib, PyGame)**

COURSE OUTCOMES:

Upon completion of the course, students will be able to

CO1: Develop algorithmic solutions to simple computational problems

CO2: Develop and execute simple python programs

CO3: Structure simple Python programs for solving problems and decompose into functions.

CO4: Represent compound data using Python lists, tuples, and dictionaries.

CO5: Read and write data from/to files in Python Programs.

TOTAL: 45

TEXT BOOKS:

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.

2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd Edition, Updated   for Python 3, Shroff/O'Reilly Publishers, 2016 (http://greenteapress.com/wp/think-python/)

REFERENCE BOOKS:

1. Martin C. Brown, "Python: The Complete Reference", 4th Edition, Mc-Graw Hill, 2018.

2. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", Third Edition, MIT Press, 2021

CO's-PO's & PSO's MAPPING

122PPT05 PYTHON PROGRAMMING															
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
CO1	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
CO2	3		2	2	-	-	-	-	-		-	1	2	-	-
CO3	3		3	2	-	-	-	-	-	-	-	-	-	3	-

CO4	2			2	-	-	-	-	-	2	-	1	-	-	-
CO5	-	2	3		-	-	-	-	-	-	-	-	-	-	1
AVG	2	1	2	2	-	-	-	-	-	0.4	-	0.4	0.4	1	0.2

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

122EET06	Basic Electrical Electronics and Instrumentation Engineering (Common to CSE, IT, MECH, CHEM, AERO, BT, CIVIL)	L	T	P	C
		3	0	0	3

OBJECTIVES:
- To learn the basics of electrical elements.
- To introduce the fundamental concepts of DC and AC circuits.
- To interpret the principle and characteristics of semiconductor devices.
- To analyze the various logic gates and switching theory.
- To understand the principles of measurement systems and transducers.

UNIT – I INTRODUCTION TO BASIC ELECTRICAL ELEMENTS   9

Electrical circuit: passive elements - Resistor, Inductor and Capacitor; active elements-Current, Voltage, Power and Energy – Ohm's Law and limitations - Kirchhoff's Laws – relationship between current, voltage and power – Resistors in series, parallel and series -parallel circuits

UNIT – II FUNDAMENTALS OF DC AND AC CIRCUITS   9

DC Circuits: Sources of Electrical Energy - Independent and Dependent Source, Source Conversion - Star –Delta conversion- Mesh and Nodal Analysis.
AC Circuits: Generation of sinusoidal - voltage, average - RMS value, form factor and peak factor- Phasor diagrams of R, L, C, combination of R-L, R-C and R-L-C circuits.

UNIT – IIISEMICONDUCTOR DEVICES AND APPLICATIONS   9

Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics – Half wave and Full wave Rectifiers – Voltage Regulation. Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics – Elementary Treatment of Small Signal Amplifier.

UNIT - IV DIGITAL ELECTRONICS   9

Binary Number System – Logic Gates – Boolean Algebra – Half and Full Adders – Flip-Flops – Registers and Counters – A/D and D/A Conversion (single concepts).

Measurements-Significance of measurements-Methods of Measurement-Direct methods, indirect methods-Instrument and measurement systems-Mechanical, Electrical and Electronic instruments-Classification of instruments- characteristics of instruments and measurement systems-Errors-Type of Errors –Units and Standards. Moving coil and moving iron meters, Energy meter and watt meter. Transducers- RTD, Strain gauge, LVDT.

TOTAL HOURS: 45

Course Outcomes:
Upon Completion of this course, students will be able to:
CO1: Recognize the different combinations of circuit elements and solving the circuit by applying basic circuital laws.
CO2: Acquire a good understanding of DC and AC circuits.
CO3: Demonstrate the characteristics of semiconductor devices.
CO4: Design the various logic gates for switching applications.
CO5: Understand the principles of measurement systems and transducers.

TEXT BOOKS:
1.   Muthusubramanian R, Salivahanan S, "Basic Electrical and Electronics Engineering", Tata McGraw Hill Education Private Limited, 2010.
2.   M. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 / Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.
3.   Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 9thEdition, Pearson Education / PHI, 2007.
4.   A.K.Sawhney, "A course in Electrical and Electronic Measurements and Instrumentation" DhanpatRai& Co, 2016.

REFERENCE:
1.   B.L.Theraja, A.K.Theraja, "A Text Book of Electrical Technology, Volume I ", S.Chand and company Ltd., 2006.

CO's-PO's & PSO's MAPPING

122EET06 BASIC ELECTRICAL ELECTRONICS AND INSTRUMENTATION ENGINEERING														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
CO1	2	2	3	-	-	-	-	-	-	-	-	-	2	-	-

CO2	3	3	3	-	-	-	-	-	-	-	-	-	2	2	-
CO3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	3		-	-	-	-	-	-	-	-	-	-	-	-
AVG	3	2	1	-	-	-	-	-	-	-	-	-	1	0.4	-

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

122HST07	HERITAGE OF TAMILS (Common to all branches)	L	T	P	C
		1	0	0	1

UNIT I: LANGUAGE AND LITERATURE   3

Language Families in India - Dravidian Languages – Tamil as aClassical Language – Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry – Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

UNIT II : HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE 3

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNIT III: FOLK AND MARTIAL ARTS   3

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT IV : THINAI CONCEPT OF TAMILS   3

Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

UNIT V: CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE   3

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.

TOTAL: 15 PERIODS

REFERENCES:
1. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by:
3. International Institute of Tamil Studies.
4. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu)(Published by: International Institute of Tamil Studies).

5. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by:International Institute of Tamil Studies.)
6. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by:DepartmentofArchaeology& Tamil Nadu Text Book and Educational Services Corporation,Tamil Nadu)
7. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay)(Publishedby: The Author)

122PHP08	ENGINEERING PHYSICS LABORATORY (Common to all Circuit Branches)	L	T	P	C
		0	0	2	1

Course Objectives:
- To understand the practical concepts of interference and diffraction.
- To understand the concept of velocities of sound in different liquids.
- To get better knowledge of modulus of elasticity.
- To understand the concepts of thermal conductivity.
- To understand the concept of viscosity of liquids.

LIST OF EXPERIMENTS
1. (a) Determination of laser Parameters-Wavelength.
   (b) Particle size determination using diode laser.
1. Determination of Young's modulus of the material- uniform bending.
2. Determination of (i) the moment of inertia of the disc and (ii) the rigidity modulus of the material of a wire.
3. Determination of thickness of a thin Wire-Air wedge method.
4. Determination of velocity of sound and compressibility of liquid- Ultrasonic interferometer.
5. Determination of wavelength of mercury spectrum-spectrometer grating.
6. Determination of Young's modulus of the material-Non uniform bending.
7. Determination of viscosity of liquid-Poiseuille's method.
8. Determination of acceleration due to gravity 'g' – Compound pendulum.
9. Determination of thermal conductivity of a bad conductor – Lee's Disc method.
10. Determination of wavelength of monochromatic light – Newton's ring method.

Course Outcomes:
At the end of the course students will be able to:
1. Understand the moduli of elasticity of various materials.
2. Understand the phenomenon of diffraction and interference of light using optical components.
3. Acquire knowledge of viscosity and compressibility of various liquids.
4. Understand the concept of heat transfer through conductors and bad conductors using Lee's disc.
5. Acquire knowledge about acceleration due to gravity.

CO's-PO's & PSO's MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
			122PHP08 ENGINEERING PHYSICS LABORATORY									
CO1	3	3	3	3	3	3	3	-	2	-	3	-
CO2	3	3	3	3	3	3	3	-	2	-	3	-
CO3	3	3	3	3	3	3	3	-	2	-	3	-
CO4	3	3	3	3	3	3	3	-	2	-	3	-
CO5	3	3	3	3	3	3	3	-	2	-	3	-
AVG	3	3	3	3	3	3	3	-	2	-	3	-

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

122PPP09	PYTHON PROGRAMMING LABORATORY (Common to all Circuit Branches)	L	T	P	C
		0	0	2	1

OBJECTIVE(S):
- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Represent compound data using Python lists, tuples, and dictionaries.
- Read and write data from/to files in Python.

LIST OF PROGRAMS:
1. To Implement python scripts using Variables and operators
2. To Demonstrate Operator precedence to evaluate an expression
3. Display grade of a student using elif statement
4. Implement Floyd triangle using for loop
5. Check the given number is prime or not using while loop
6. Compute the GCD of Numbers and **largest number in a list** using functions
7. Finding factorial of a given number using recursive function.
8. Take a list of words and return the length of longest one using strings
9. To perform linear and binary search using strings
10. To implement list as arrays (multiply 2 matrices)
11. To demonstrate use of list & related functions
12. To demonstrate use of tuple, set& related functions
13. To demonstrate use of Dictionary& related functions
14. Programs that take command line arguments (word count)
15. **Implementing programs using written modules and Python Standard Libraries.**
16. **Developing a game activity using Pygame like bouncing ball, car race etc.**

TOTAL: 45

COURSE OUTCOMES:
Upon completion of the course, students will be able to:
   CO1: Develop and execute simple python programs
   CO2: Implement Python programs with conditionals and loops.
   CO3: Deploy functions to decompose a Python program.
   CO4: Use Python lists, tuples, dictionaries for representing compound data.
   CO5: Utilize Python packages in developing software applications

CO's-PO's & PSO's MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
122PPP09 PYTHON PROGRAMMING LABORATORY															
CO1	3	2	2	-	-	-	-	1	1	-	1	2	2	-	-
CO2	2	3	-	-	1	-	-	-	1		1	1	-	-	-
CO3	2	3	2	3		-	-	-	1	-	1	1	-	3	-
CO4	-	2	3	2		-	-	-	1	-	1	-	-	-	-
CO5	-	-	3	3	2	-	-	-	1	-	1	2	-	-	2
AVG	1	2	2	2	1	-	-	0.2	1		1	1	0.4	1	0.4

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

LIST OF EQUIPMENTS AND SOFTWARE FOR A BATCH OF 30 STUDENTS

Hardware:

LAN System with 30 Nodes (OR) Stand-alone PCs -30 No's.

Printer – 3 No's.

Software:

Operating System   : Linux / Windows.
Open Source Software: Python.
Database   : MySQL.
Open Source Platform: XAMPP, Eclipse IDE

Regulation-2022 (CBCS)
Semester-II -Syllabus

222ENI01	PROFESSIONAL ENGLISH-II (Embedded Course - Common to all Programs)	L	T	P	C
		2	0	2	3

OBJECTIVES:

The Course prepares second semester Engineering and Technology students to:
- Strengthen their listening skill which will help them comprehend lectures and talks in their areas of specialisation.
- Present information in an appropriate oral form.
- Develop strategies and skills to enhance their ability to read and comprehend engineering and technology texts.
- Foster their ability to write anything convincingly with grammatical accuracy.
- Nurture the holistic perspective of industry readiness

UNIT I: Listening
Theory
Conversation - Telephonic conversation - Class memory quiz - Interviews of famous persons - Ascene from a film - Podcast -Stories - Product description - Process description.
English Laboratory
Scientific lectures - Educational videos - Gap filling exercises - Presentations - Formal job interviews -Introduction to classmates - Debates - Panel discussion - INK talks
UNIT II: Speaking
Theory
Exchanging personal information- Greeting - Leave taking - Introducing friends -Reporting - Role play- Describing a person/place/thing - Small talk - Celebrity interview
English Laboratory
Narrating personal experiences - Presentation - Information gap - Simulations - Find the difference - Giving and asking for directions -News brief - Alibi - Untranslatable
UNIT III: Reading
Theory
Short stories: The Gift of the Magi, A Service of Love and The Last Leaf by O. Henry- Magazines- Jigsaw - Newspaper reports - Newspaper articles - Journals - Travelogues
English Laboratory
Brochures - Social media messages - Excerpts from literature - Editorials - Case studies - Critical reviews - Excerpts of interview with professionals - Technical texts - One word splash
UNIT IV: Writing
Theory
Developing hints-Note-making - Note-taking - Agenda -Advertisement - Transfer of information (Pie chart, Bar chart and Flow chart) - Précis writing and summarizing - Free writing - Short stories
English Laboratory
Letter writing - Essay writing - What if? - Poetry - Cubing - Defining technical terms - Character description -One minute paper - Feedback
UNIT V: Language Development

Theory

Consonants & vowels -Phonetic transcription - British and American English -Infinitive and gerund - Types of sentences - Information and emphasis - Cause and effect -Purpose and function - Phrasal verbs

English Laboratory - Career Skills

Abbreviations and acronyms - Homonyms and homophones - Word formation - One word substitution - Compound nouns - Concord - Life etiquettes - Emotional intelligence - Notable Indian start-ups - Work ethic

TOTAL: 60 HOURS

Lab Requirements:
1. Teacher console and systems for students.
2. English Language Lab Software
3. Career Lab Software

OUTCOMES:
At the end of the course, learners will be able to:
CO1: Listen and comprehend the various strategies of listening and its significance in their area of specialisation successfully.
CO2: Speak appropriately and effectively in varied formal and informal contexts.
CO3: Read and comprehend texts effortlessly and understand the prevailing practices of testing in the recruitment process by the corporates and the institutional selection processes.
CO4: Communicate the corporate and social requirements in an impressive written mode.
CO5: Understand the basic grammatical structures and its applications and enhance their verbal skills in the screening tests competently both for recruitment and pursuing higher studies as well.

TEXT BOOKS:
1. Board of editors. **Fluency in English: A Course book for Engineering and Technology**. Orient Blackswan, Hyderabad: 2016.
2. Sudharshana. N. P and Saveetha. C. **English for Technical Communication**. Cambridge University Press: New Delhi, 2016.
3. Uttham Kumar. N. **Professional English - II** (with work book). Sahana Publications, Coimbatore, 2023.
4. Agarwal R. S. A Modern Approach to Verbal and Non-verbal Reasoning. Chand & Co., New Delhi, 2012.
5. Ashraf Rizvi M. Effective Technical Communication. TATA McGraw Hill, New Delhi, 2007.

REFERENCES:
1. Raman, Meenakshi and Sharma, Sangeetha- Technical Communication Principles and Practice. Oxford University Press: New Delhi, 2014.
2. Kumar, Suresh. E. Engineering English. Orient Blackswan: Hyderabad, 2015.
3. Booth-L. Diana, Project Work, Oxford University Press, Oxford: 2014.
4. Grussendorf, Marion, English for Presentations, Oxford University Press, Oxford: 2007

5. Means, L. Thomas and Elaine Langlois, English & Communication for Colleges. Cengage Learning, USA: 2007.
6. Lingua: Essays for TOEFL/IELTS, Dreamtech Press, New Delhi, 2016.
7. Lily Mangalam, Global English Comprehension, Allied Publishers Pvt. Ltd., New Delhi, 2014.
8. Sharon Weiner Green and Ira K. Wolf, Barron's GRE, Glagotia Publications Pvt. Ltd., 18th Edition, New Delhi, 2011.
9. Mohamed Elias, R. Gupta's IELTS/TOEFL Essays, Ramesh Publishing House, 6th Edition, New Delhi, 2016.

CO's-PO's & MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	222ENI01 PROFESSIONAL ENGLISH - II											
CO1	-	-	-	-	-	-	-	-	1	1	1	1
CO2	-	-	-	1	-	-	-	-	3	3	2	1
CO3	-	2	-	2	-	-	-	-	2	2	1	1
CO4	-	1	-	2	-	-	-	-	3	3	2	1
CO5	-	-	-	-	-	-	-	-	1	3	-	1
AVG	-	1	-	1	-	-	-	-	2	2	1	1

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

222MAT02	PROBABILITY AND STATISTICS	L	T	P	C
	(Common to all B.E. / B.Tech. Degree Programs)	3	1	0	4

Course Objectives

- To impart the knowledge of basic probabilistic theory.
- To learn one dimensional discrete and continuous probability distributions occurring in natural phenomena.
- To extend the probability theory to two-dimensional random variable and to study the statistical measures.
- To introduce the concept of sampling distributions and testing hypothesis techniques useful in decision making.
- To expose the statistical methods for analysis of variance and control limits.

Prerequisite : Basic Probability Concepts.

UNIT I PROBABILITY AND RANDOM VARIABLES   9 + 3

Axioms of probability - Conditional probability - Total probability – Baye's theorem- Random variables - Probability mass function - Probability density function - Properties - Moments - Moment generating functions and their properties.

UNIT II PROBABILITY DISTRIBUTIONS   9 + 3

Binomial, Poisson, Geometric, Uniform, Exponential, and Normal distributions and their properties - applications.

UNIT III TWO-DIMENSIONAL RANDOM VARIABLES   9 + 3

Joint Probability Distributions – Marginal and Conditional distributions – Covariance – Correlation and Linear regression – Central limit theorem (Statement and applications only for independent and identically distributed random variables).

UNIT IV TESTING OF HYPOTHESIS   9 + 3

Sampling distributions - Tests for single mean, proportion, difference of means (large and small samples) – Tests for single variance and equality of variances – Chi-square test for Independence of attributes using contingency table and Goodness of fit.

UNIT V DESIGN OF EXPERIMENTS   9 + 3

Analysis of variance – Completely Randomized Design (CRD) (one way classification) – Randomized Block Design (RBD) (two-way classification) - Latin Square Design (LSD) - Control charts for measurements - $\overline{x}$ chart, R-chart.

TOTAL: 45 + 15 = 60 PERIODS

Note: Use of approved statistical table is permitted in the examination.

Course outcomes

At the end of the course the student will be able to

CO 1: Apply probability concepts in real life problems.

CO 2: Identify and design probability distribution models and interpret.

CO 3: Use the concept of two dimensional random variables that helps to understand and analyze the statistical measures of probability functions.
CO 4: Draw inference & conclusion through hypothesis testing.
CO 5: Implement the knowledge of analysis of variance and control limits in real time applications.

TEXT BOOKS
1. Miller and Freund., "Probability and Statistics for Engineers", Pearson Education, Asia, 7th edition, 2012.
2. Veerarajan.T., "Probability, Statistics and Random Processes", Tata McGraw-Hill publishing company Limited, New Delhi, 2014.

REFERENCES
1. Spiegel, M.R, Schiller, J and Alu Srinivasan, R, "Schaum's Outlines Probability and Statistics", Tata McGraw-Hill Publishing Company Ltd. New Delhi , 2010.
2. Gupta.S.C., & Kapoor,V.K., "Fundamentals of mathematical statistics", 11th edition, Sultan Chand & Sons publishers, New Delhi, 2013.
3. Ibe, O.C.,"Fundamentals of Applied Probability and Random Processes", Elsevier, U.P., 1st Indian Reprint, 2007.
4. Kandasamy.P, Thilagavathy,K. & Gunavathi.K., "Probability, Statistics and Queueing Theory" -S.Chand & Company Ltd., New Delhi, 2014.
5. Hwei Hsu, "Schaum's Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata McGraw Hill edition, New Delhi, 2014.

CO's-PO's & PSO's MAPPING

222MAT02 PROBABILITY AND STATISTICS														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
CO1	3	2	3	1	1	-	-	-	-	-	-	2	2	2	-
CO2	3	3	2	1	1	-	-	-	-	-	-	2	2	2	-
CO3	3	3	3	2	2	-	-	-	-	-	-	2	2	2	-
CO4	3	3	3	2	2	-	-	-	-	-	-	2	2	2	-
CO5	3	3	2	2	2	-	-	-	-	-	-	2	2	2	-
AVG	3	3	3	2	2	-	-	-	-	-	-	2	2	2	-

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

222EST03	ENVIRONMENTAL SCIENCE AND SUSTAINABILITY (Common to all Programs)	L	T	P	C
		2	0	0	2

OBJECTIVES:

- To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
- To impart knowledge on the causes, effects and control or prevention measures ofenvironmental pollution and natural disasters.
- To facilitate the understanding of global and Indian scenario of renewable and nonrenewableresources, causes of their degradation and measures to preserve them.
- To familiarize the concept of sustainable development goals and appreciate the interdependence of economic and social aspects of sustainability, recognize and analyse climate changes, concept of carbon credit and the challenges of environmentalmanagement.
- To inculcate and embrace sustainability practices and develop a broader understanding ongreen materials, energy cycles and analyze the role of sustainable urbanization.

UNIT I ENVIRONMENT AND BIODIVERSITY   6

Definition, scope and importance of environment – need for public awareness. Eco-system andEnergy flow– ecological succession. Types of biodiversity: genetic, species and ecosystemdiversity– values of biodiversity, India as a mega-diversity nation – hot-spots of biodiversity – threatsto biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemicspecies of India – conservation of biodiversity: In-situ and ex-situ.

UNIT II ENVIRONMENTAL POLLUTION   6

Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions.Solid, Hazardous and E-Waste management. Case studies on Occupational Health and SafetyManagement system (OHASMS). Environmental protection, Environmental protection acts.

UNIT III RENEWABLE SOURCES OF ENERGY   6

Energy management and conservation, New Energy Sources: Need of new sources. Different typesnew energy sources. Applications of- Hydrogen energy, Ocean energy resources, Tidal energyconversion. Concept, origin and power plants of geothermal energy.

UNIT IV SUSTAINABILITY AND MANAGEMENT   6

Development, GDP, Sustainability- concept, needs and challenges-economic, social and aspects ofsustainability-from unsustainability to sustainability-millennium development goals,

and protocolsSustainable Development Goals-targets, indicators and intervention areas Climate change- Global,Regional and local environmental issues and possible solutions-case studies. Concept of CarbonCredit, Carbon Footprint. Environmental management in industry-A case study.

UNIT V SUSTAINABILITY PRACTICES   6

Zero waste and R concept, Circular economy, ISO 14000 Series, Material Life cycle assessment,Environmental Impact Assessment. Sustainable habitat: Green buildings, Green materials, Energyefficiency, Sustainable transports. Sustainable energy: Non-conventional Sources, Energy Cyclescarbon cycle, emission and sequestration, Green Engineering: Sustainable urbanization- Socio-economical and technological change.

TOTAL: 30 PERIODS

OUTCOMES:

1. To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.
2. To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.
3. To identify and apply the understanding of renewable and non-renewable resources and
4. contribute to the sustainable measures to preserve them for future generations.
5. To recognize the different goals of sustainable development and apply them for suitable
6. technological advancement and societal development.
7. To demonstrate the knowledge of sustainability practices and identify green materials,
8. energy cycles and the role of sustainable urbanization.

TEXT BOOKS:

1. Anubha Kaushik and C. P. Kaushik's "Perspectives in Environmental Studies", 6th Edition, New Age International Publishers ,2018.
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2016.
3. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education, 2004.
4. Allen, D. T. and Shonnard, D. R., Sustainability Engineering: Concepts, Design and Case Studies, Prentice Hall.
5. Bradley. A.S; Adebayo, A.O., Maria, P. Engineering applications in sustainable design and development, Cengage learning.
6. Environment Impact Assessment Guidelines, Notification of Government of India, 2006.
7. Mackenthun, K.M., Basic Concepts in Environmental Management, Lewis Publication,London, 1998.

REFERENCES:

1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances andStandards', Vol. I and II, Enviro Media. 38. Edition 2010.
2. Cunningham, W.P. Cooper, T.H. Gorhani, 'Environmental Encyclopedia', Jaico Publ., House, Mumbai, 2001.
3. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2007.
4. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, Third Edition, 2015.
5. ErachBharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient BlackswanPvt. Ltd. 2013.**CO's-PO's & MAPPING**

CO's-PO's & MAPPING

222EST03 ENVIRONMENTAL SCIENCE AND SUSTAINABILITY											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	-	-	-	2	3	-	-	-	-	2
CO2	3	2	-	-	-	3	3	-	-	-	-	2
CO3	3	-	1	-	-	2	2	-	-	-	-	2
CO4	3	2	1	-	-	2	2	-	-	-	-	2

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

222EGT04	ENGINEERING GRAPHICS (Common to all Circuit branches)	L	T	P	C
		2	0	4	4

OBJECTIVES:
1. To gain knowledge on graphical skills for drawing the object.
2. To comprehend the principle of orthographic projection of points, lines and plane surfaces.
3. To study the principle of simple solids.
4. To comprehend the principle of section and development of solids.
5. To comprehend the principle of Isometric and Orthographic projections.

Concepts and conventions (Not for Examination)   **03**

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE AND SPECIAL CURVES   **9**

Conics – Construction of Ellipse, Parabola and Hyperbola by Eccentricity method – Construction of cycloid – Construction of Involutes of Square and Circle – Drawing of tangents and normal to the above curves.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES   **12**

Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to both reference planes.

UNIT III PROJECTION OF SOLIDS   **12**

Projection of simple solids like Prisms, Pyramids, Cylinders and Cones when the axis is inclined to one reference plane by change of position method.

UNIT IV SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES   **12**

Sectioning of simple solids like Prisms, Pyramids, Cylinders and Cones in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section.

Development of lateral surfaces of simple and truncated solids – Prisms, Pyramids, Cylinders and Cones – Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

UNIT V ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS   **12**

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated Prisms, Pyramids, Cylinders and Cones.

Representation of Three-Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

COURSE OUTCOMES:

The student will be able to

- Recognize the conventions and apply dimensioning concepts while drafting simple objects.
- Draw the orthographic projection of points, line, and plane surfaces.
- Draw the orthographic projection of simple solids.
- Draw the section of solid drawings and development of surfaces of the given objects.
- Apply the concepts of Isometric and Orthographic projections in engineering practice.

TEXT BOOKS:

1. Ranganath G, "Engineering Graphics", Second Edition, Sahana Publishers, Reprint, 2021.
2. Bhatt. N.D., "Engineering Drawing" Charotar Publishing House, 53rd Edition, 2014.

REFERENCE BOOKS:

1. Dhananjay A. Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw Hill Publishing Company Limited, 2017.
2. Gopalakrishnana. K. R, "Engineering Drawing" (Vol. I & II), Subhas Publications, 27th Edition, 2017.
3. Basant Agarwal and C.M.Agarwal, "Engineering Drawing", Tata McGraw Hill, 2019.
4. Natrajan K. V, "A Text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.
5. M.B.Shaw and B.C.Rana, "Engineering Drawing", Pearson Education India, 2011.

CO's-PO's & PSO's MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
222EGT04 ENGINEERING GRAPHICS
CO1	-	2	-	1	-	-	-	-	-	-	-	1	1	-	1
CO2	2	1	-	1	-	-	-	-	-	-	-	1	-	2	-
CO3	2	2	-	2	-	-	-	-	-	-	-	1	-	3	-
CO4	-	1	-	2	-	-	-	-	-	-	-	2	-	2	-
CO5	1	1	1	-	-	-	-	-	-	2	-	-	-	-	1
AVG	1	1	0.2	1	-	-	-	-	-	0.4	-	1	0.2	1	0.4

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

222PIT05	PHYSICS FOR INFORMATION SCIENCE (Common to CSE, IT& AI&DS)	L	T	P	C
		2	0	0	2

COURSE OBJECTIVES:

- To make the students to understand the basics of crystallography and its importance in
- studying materials properties.
- To make the students understand the importance in studying electrical properties of
- materials.
- To enable the students to gain knowledge in semiconductor physics.
- To establish a sound grasp of knowledge on different optical properties of materials.
- To inculcate an idea of significance of nano structures and quantum confinement.

UNIT I CRYSTALLOGRAPHY   **6**

Crystal structures: Crystal lattice – basis - unit cell and lattice parameters – crystal systems andBravais lattices – Structure and packing fractions of SC, BCC, FCC and HPC structures – Miller indices –distance between successive planes.

UNIT II ELECTRICAL PROPERTIES OF MATERIALS   **6**

Classical free electron theory - Expression for electrical conductivity – Thermal conductivity, expression - Wiedemann-Franz law – Success and failures - Fermi- Dirac statistics – Density of energy states.

UNIT III SEMICONDUCTOR PHYSICS   **6**

Intrinsic Semiconductors – Properties - Energy band diagram – Types of semiconductors - direct and indirect band gap, Elemental and Compound semiconductors - carrier concentration in intrinsic semiconductors– Hall Effect.

UNIT IV OPTICAL PROPERTIES OF MATERIALS   **6**

Classification of optical materials – carrier generation and recombination processes – Absorption emission and scattering of light in metals, insulators and semiconductors (concepts only) – photocurrent in a P-N diode – solar cell – LED.

UNIT V NANO MATERIALS AND QUANTUM COMPUTING   **6**

Introduction - quantum confinement – quantum structures: quantum wells, wires and dots – bandgap of nanomaterials - preparation - ball milling - Plasma arcing method - Electro deposition -applications.

                                                 TOTAL: 30 PERIODS

COURSE OUTCOMES:
At the end of the course, the students should be able to
1. Know basics of crystallography and its importance for varied materials properties.
2. Gain knowledge on classical and quantum electron theories, and energy band structures.
3. Acquire knowledge on basics of semiconductor physics and its applications in various devices.
4. Have the necessary understanding on the functioning of optical materials for optoelectronics
5. Understand the basics of quantum structures and their applications and basics of quantum computing

TEXT BOOKS:
1. R. N. Jayaprakash, Physics for information science, Sahana publication, 2022
2. S.O. Kasap. Principles of Electronic Materials and Devices, McGraw Hill Education (Indian Edition), 2020.
3. Jasprit Singh, "Semiconductor Devices: Basic Principles", Wiley (Indian Edition), 2007.
4. S.O. Kasap. Principles of Electronic Materials and Devices, McGraw-Hill Education (Indian Edition), 2020.
5. Parag K. Lala, Quantum Computing: A Beginner& Introduction, McGraw-Hill Education (Indian Edition), 2020.

REFERENCES:
1. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019.
2. Y.B.Band and Y.Avishai, Quantum Mechanics with Applications to Nanotechnology and Information Science, Academic Press, 2013.
3. V.V.Mitin, V.A. Kochelap and M.A.Stroscio, Introduction to Nanoelectronics, Cambridge Univ.Press, 2008.
4. G.W. Hanson, Fundamentals of Nanoelectronics, Pearson Education (Indian Edition) 2009.
5. B.Rogers, J.Adams and S.Pennathur, Nanotechnology: Understanding Small Systems, CRC Press, 2014.

CO's-PO's & PSO's MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
... 222PIT05 PHYSICS FOR INFORMATION SCIENCE															
CO1	3	3	3	2	-	-	-	-	-	-	-	2	3	-	-
CO2	3	3	3	2	-	-	-	-	-	-	-	2	3	-	-
CO3	3	3	3	2	-	-	-	-	-	-	-	2	3	-	-
CO4	3	3	3	2	-	-	-	-	-	-	-	2	3	-	-
CO5	3	3	3	2	-	-	-	-	-	-	-	2	3	-	-
AVG	3	3	3	2	-	-	-	-	-	-	-	2	3	-	-

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

222CPI06	PROGRAMMING IN C	L	T	P	C
		2	0	2	3

OBJECTIVE(S):
- To introduce students to the basic knowledge of programming fundamentals of C language.
- To develop C programs using arrays and strings
- To impart the concepts like functions, pointers and structure
- To develop applications in C using file processing

UNIT-I   BASICS OFC LANGUAGE   9

Introduction to C Programming – Fundamentals –**Applications of C Language**-Structure of a C Program – Compilation and Linking Processes – Constants, Variables – Data Types – **Precedence and Associativity**- Expressions Using Operators in C – Managing Input and Output Operations – Decision Making and Branching – Looping Statements – Solving Simple Scientific and Statistical Problems.

UNIT-II   ARRAYS AND STRINGS   9

Arrays – Initialization – Declaration - One Dimensional and Two Dimensional Arrays - Strings- String Operations – String Arrays. Simple Programs - Sorting- Searching - Matrix Operations-Preprocessor Directives.

UNIT-III   FUNCTIONS,STRUCTURES &UNIONS   9

Functions:Definition of function – Declaration of function – Pass by value - Pass by reference – Recursion - **Binary Search using recursive functions**.Structures and Unions**:** Introduction -Need for structure data type - Structure definition – Structure declaration - Structure within a structure - Union - Programs using Structures and Unions.

UNIT-IV   POINTERS   9

Definition – Initialization – Pointer Operators -Pointers Arithmetic – Pointers and one dimensional array -Pointers and Multi-Dimensional array: Array of Pointers - Pointer to Pointer, Pointer to an array -void Pointer -Pointer to function - Dynamic memory allocation -**typedef**-Command Line Arguments.

UNIT-V   STORAGE CLASSES AND FILES   9

Storage classes**:**auto, static, extern, and register-**Visibility** - scope rules**-**Files**:** Introduction – Using files in C - Operations on files-Types of file processing**:** Sequential access, Random access - Sequential access file working with text files- File Handling Functions - Error handling

COURSE OUTCOMES:

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

CO1: Demonstrate the use of Operators & Expressions, Decision Making and Looping statements.

CO2: Design and implement applications using arrays and strings

CO3: Write programsin C using functions and structures.

CO4: Develop applications in C usingpointers.

CO5: Use storage class and files using sequential and random access processing.

CO's-PO's & PSO's MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
						222CPI06 PROGRAMMING IN C									
CO1	-	3	3	3	-	-	-	-	-	-	-	3	3	-	3
CO2	-	2	3	2	2	-	-	-	-	-	-	2	3	3	3
CO3	-	2	3	2	-	-	-	-	-	-	-	2	3	3	3
CO4	-	2	3	2	-	-	-	-	-	-	-	2	3	-	3
CO5	-	1	3	3	3	-	-	-	-	-	-	3	-	-	3
AVG	-	2	3	2	1	-	-	-	-	-	-	2	3	1	3

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

TEXT BOOKS:

1.ReemaThareja "Programming in C".Oxford University Press,Second Edition 2016

2. Kernighan B. W., Ritchie D.M. "The C Programming Language", Pearson., New Delhi, 2015 , Second Edition

REFERENCES:

1. PradipDey, ManasGhoush, -"Programming in C", Oxford University New Delhi, 2018

2. Byron Gottfried, - "Programming with C",2nd Edition, (Indian Adapted Edition), TMH

Publications, 2018.
3. YashwantKanetkar "Let us C", BPB Publications., New Delhi, 2017 , Sixteenth Edition
4. Ashok.N.Kamthane,- "Computer Programming" , Pearson Education,Second edition(India),
   2012

LIST OF EXPERIMENTS:

1. Programs using I/O statements, Operators and expressions.

2. Programs using decision-making and looping statements

3. Programs using 1-D and 2-D array.

4. Write a program for scientific and statistical problem.

5. Solving problems using string functions

6. Programs using user defined functions.

7. Program using call by value and call by reference

8. Program using recursive function and **passing arrays to function**

9. Sort the list of numbers using pass by reference.

10. Program using pointers and structures.

11. Program using structures and functions.

12. Program using Union

13. Program using i) Sequential access file.

   ii) Random access file.

LIST OF EQUIPMENTS AND SOFTWARE FOR A BATCH OF 30 STUDENTS
Hardware:
LAN System with 30 Nodes (OR) Stand_alone PCs -30 No's.
Printer – 3 No's.
Software:
OS: Windows / Linux.
Turbo C.

222HST07	TAMILS AND TECHNOLOGY (Common to ALL)	L	T	P	C
		1	0	0	1

UNIT 1 WEAVING AND CERAMIC TECHNOLOGY   3

Weaving Industry during Sangam Age-Ceramic technology-Black and Red Ware Potteries-Graffiti on potteries.

UNIT II DESIGN AND CONSTRUCTION TECHNOLOGY   3

Designing and Structural construction House &Designs in household materials during Sangam Age –Building materials and Hero stone of Sangam Age- Details of stage constructions in Silappathikaram-Sculptures and temples of Mamallapuram-Great Temples of Cholas and other worship places –Temples of Nayaka period –Type study (Madurai Meenakshi Temple)-Thirumalai Nayakar Mahal-Chetti Nadu Houses,Indo-Saracenic architecture at Madras during Bristish period.

UNIT III MANUFACTURING TECHNOLOGY   3

Art of ship Building- Metallurgical studies-Iron industry-Iron smelting steel-Copper and gold-Coins as source of history –Minting of coins-Beads making industries Stone beads-Glass beads-Terracotta beads-Shell beads/ bone beads-Archeological evidences-Gem stone types described in Silappathikaram.

UNIT IV AGRICULTURE AND IRRIGATION TECHNOLOGY   3

Dam ,Tank,Ponds,Sluice,Significance of kumizhiThoompu of Chola period, Animal Husbandry-Wells designed for cattle use –Agriculture and Agro Processing- Knowledge of sea –Fisheries-Pearl-Conche diving-Ancient Knowledge of Ocean-Knowledge specific Society.

UNIT V SCIENTIFIC TAMIL &TAMIL COMPUTING   3

Development of Scientific Tamil- Tamil computing –Digitalization of Tamil Books-Development of Tamil Software-Tamil virtual Academy-Tamil Digital Library-Online Tamil Dictionaries-Sorkuvai project.

TOTAL: 15 PERIODS

REFERENCES:
1. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by:
3. International Institute of Tamil Studies.
4. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu)(Published by: International Institute of Tamil Studies).

5. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by:International Institute of Tamil Studies.)
6. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by:DepartmentofArchaeology& Tamil Nadu Text Book and Educational Services Corporation,Tamil Nadu)
7. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay)(Publishedby: The Author)

222CYP08	ENGINEERING CHEMISTRY LABORATORY (Common to all Circuit Branches)	L	T	P	C
		0	0	2	1

Objectives:

Students will be conversant with the estimation of various compounds using volumetric and instrumental analysis.

LIST OF EXPERIMENTS

1. Estimation of Total hardness by EDTA
2. Determination of percentage of calcium in Lime Stone by EDTA
3. Estimation of chloride in water sample
4. Estimation of alkalinity of Water sample
5. Determination of DO in Water (Winkler's Method)
6. Determination of Rate of Corrosion of the given steel specimen by weight loss method (Without inhibitor)
7. Determination of Rate of Corrosion of the given steel specimen by weight loss method (With inhibitor)
8. Conduct metric titration (Simple acid base)
9. Conduct metric titration (Mixture of weak and strong acids)
10. Conduct metric titration using $BaCl_2$ vs Na_2SO_4
11. Potentiometric Titration (Fe^{2+} / $KMnO_4$ or $K_2Cr_2O_7$)
12. PH titration (acid & base)
13. Determination of water of crystallization of a crystalline salt -Copper sulphate
14. Preparation of Bio-Diesel by Trans etherification method.

A minimum of TEN experiments shall be offered.

Course Outcomes:

CO1: Carry out the volumetric experiments and improve the analytical skills.

CO2: Understand the maintenance and usage of analytical instruments and thereby develop their skills in the field of engineering.

CO3: Understand the principle and handling of electrochemical instruments and Spectrophotometer.

CO4: Apply their knowledge for protection of different metals from corrosion by using different inhibitors

Reference(s):

1. Arthur I. Vogel's, "Quantitative Inorganic Analysis including Elementary Instrumental Analysis", ELBS, Group, 7th Edition, 2000.
2. Dr. K .Sivakumar, "Engineering Chemistry lab manual", S.S publishers, 2022.

CO's-PO's & MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	-	-	-	2	-	-	-	-	1
CO2	3	3	3	-	-	-	2	-	-	-	-	1
CO3	3	3	3	2	-	-	-	-	-	-	-	1
CO4	3	3	3	-	-	-	2	-	-	-	-	1
CO5	3	3	3	2	-	-	-	-	-	-	-	1
AVG	3	3	3	1	-	-	1	-	-	-	-	1

222CYP08   ENGINEERING CHEMISTRY LABORATORY

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

222EPP09	ENGINEERING PRACTICE LABORATORY (Common to all Circuit Branches)	L	T	P	C
		0	0	2	1

Part –A (Mechanical)

OBJECTIVES:

1. To get the knowledge on welding techniques and sheet metal operation..
2. To know the principle involved in plumbing work and in carpentry work.
3. To know about wiring various electrical joints in common household electrical and wire work.
4. To know about the working procedure of electrical appliances.
5. To get the knowledge about basics of electronics and to know the characteristics of switching devices.

LIST OF EXPERIMENTS

1. **WELDING:**
   Study of Electric Arc welding equipment's.
   Preparation of welding joints:
   i) Butt joint   ii) Lap joint   iii) T - joint.

2. **SHEET METAL WORK:**
   Study of sheet metal tools and operations
   Preparation of sheet metal models: i) Rectangular Tray   ii) Funnel

3. **PLUMBING WORKS:**
   Study of pipeline joints and house hold fittings.
   Preparation of plumbing models: Basic pipe connections with PVC and GI pipe fittings.

4. **CARPENTRY:**
   Study of wooden joints and tools used in roofs, doors, windows, furniture.
   Preparation of carpentry models:
   i) Lap joint   ii) Dovetail joint   iii) T-Joint

Part –B (Electrical and Electronics)

LIST OF EXPERIMENTS

1. Introduction to House Wiring.
2. Staircase Wiring.
3. Fluorescent lamp Wiring.
4. Measurement of single phase energy meter.
5. Measurement of Power, Power factor by using two- wattmeter Method.
6. Study of Electrical iron box and fan with regulator.
7. Characteristics of SCR and Diode
8. Introduction to color coding of resistor.

COURSE OUTCOMES:

The students will be able to

- Weld various joints in steel plates using arc welding work, make a tray out of metal sheet using sheet metal work.
- Draw pipe line plan, lay and connect various pipe fittings used in common household plumbing work, Sawing, Planning and make joints in wood materials used in common household wood work.
- Wire various electrical joints in common household electrical wire work.
- Know about the basic knowledge about electrical appliances.
- Know about the basic knowledge about electronics devices.

CO's-PO's & PSO's MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
	222EPP09 ENGINEERING PRACTICE LABORATORY														
CO1	1	-	2	2	1	-	-	1	1	-	1	1	1	-	2
CO2	2	-	2	2	1	-	-	-	1	-	1	1	1	-	2
CO3	1	-	1	2	1	-	-	-	1	-	1	1	1	-	2
CO4	1	-	1	2	1	-	-	-	1	-	1	1	1	-	2
CO5	1	-	1	1	2	-	-	-	1	-	1	1	1	-	2
AVG	1	-	1	2	1	-	-	-	1	-	1	1	1	-	2

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

ADHIYAMAAN COLLEGE OF ENGINEERING (AUTONOMOUS), HOSUR
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(CYBER SECURITY)
REGULATION 2022

SEMESTER – III

S.No	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	322DMT01	Discrete Mathematics	BS	3	1	0	2	4
2	322CBT02	Object Oriented Software Engineering	PC	3	0	0	2	3
3	322CSI03	Foundation of Data Science	PC	3	0	2	2	4
4	322CIT04	Object Oriented Programming	PC	3	0	0	2	3
5	322CIT05	Data Structures	PC	3	0	0	3	3
6	322CBT06	Fundamentals of Cyber Security	PC	3	0	0	3	3
PRACTICALS								
7	322CIP07	Object Oriented Programming Laboratory	PC	0	0	2	2	1
8	322CIP08	Data Structures Laboratory	PC	0	0	2	2	1
9	322GEV01	Professional Development	EEC	0	0	2	2	1

Chairman, Board of Studies
Faculty of CSE (Cyber Security)
Adhiyamaan College of Engineering
(Autonomous), Hosur 635 130.

322DMT01   **DISCRETE MATHEMATICS**   **3 1 0 4**

(B.E. Computer Science and Engineering, B. Tech. Information Technology and B. Tech. Artificial Intelligence and Data Science)

Course Objectives:

- To master combinatorics which deals with the counting principles.
- To identify the basic properties of graph and model simple applications.
- To understand the concept of logic and hence to construct valid mathematical arguments.
- To expose the basic properties and concepts of algebraic structures.
- To introduce the concept of Lattices and Boolean algebra.

UNIT I   COMBINATORICS   9+3

Mathematical Induction – The basics of Counting Principle - The Pigeonhole principle - Permutations and Combinations – Recurrence relations- Solving linear recurrence relations - Generating functions – Inclusion and exclusion principle.

UNIT II   GRAPHS   9+3

Graphs – preliminaries - Types of graphs – properties – walks, trials and paths – Isomorphism of graphs – Matrix representations of graphs - Connectivity of a graph – Bipartite graphs - Euler and Hamilton graphs - Coloring of graphs - Chromatic number of a graph.

UNIT III   LOGICS AND PROOFS   9+3

Propositional Logic – Propositional equivalences - Predicates and quantifiers – Nested Quantifiers – Rules of inference - introduction to proofs – proof methods and strategy.

UNIT IV   ALGEBRAIC STRUCTURES   9+3

Algebraic systems – Semi groups and monoids – Groups-Subgroups and homomorphism's – Cosets and Lagrange's theorem – Rings & Fields (basic definitions and problems): Elementary properties of Rings-Isomorphism-Types of Rings-Sub Rings-Homomorphism of rings - Fields of quotients of an integral domain.

UNIT V   LATTICES AND BOOLEAN ALGEBRA   9+3

Partial ordering – Posets – Lattices as Posets – Properties of Lattices-Lattices as algebraic systems – Sub lattices – direct product and Homomorphism – Some special lattices – Boolean algebra.

TOTAL = 45 + 15 = 60 PERIODS

COURSE OUTCOMES:

On successful completion the students will be able to
CO 1: Demonstrate the applications of basic concepts of an algorithm and counting principles in combinatorial mathematics.
CO 2: Acquaint with the graph theory concepts which serves as the base for the real time applications in network analysis.
CO 3: Expertise the knowledge of logics helps to verify the correctness of computer programs and to draw conclusions from scientific experiments.
CO 4: Internalize the abstract algebraic structures which provide the ability to deal the theory of

sequential machines, formal languages and syntactic analysis.
CO 5: Apply the concept of Lattices and Boolean algebra.

TEXT BOOKS:

1. Kenneth H.Rosen, "Discrete Mathematics and its Applications", Seventh edition, Special Indian edition, Tata McGraw – Hill Pub. Co. Ltd., New Delhi, 2011.
2. T. Veerarajan, "Discrete Mathematics with Graph Theory and Combinatorics", Tata McGraw– Hill Pub. Co. Ltd, New Delhi, 2006.

REFERENCES:

1. Trembly J.P. and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, thirtieth re-print 2007.
2. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, 2007.
3. Thomas Koshy, ``Discrete Mathematics with Applications", Elsevier Publications, 2006.
4. Herstein. I .N., "Topics in Algebra", Second Edition, Wiley India Pvt. Ltd., 2006.
5. Narsingh Deo, "Graph Theory with Applications to Engineering and Computer Science", Dover Publications Inc., First edition, 2016.

CO's-PO's & PSO's MAPPING
3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
322DMT01 DISCRETE MATHEMATICS
CO1	3	2	2	2	1	-	-	-	-	-	-	2	2	2	-
CO2	3	3	1	2	1	-	-	-	-	-	-	2	2	2	-
CO3	3	3	3	2	-	-	-	-	-	-	-	2	2	2	-
CO4	3	2	1	-	-	-	-	-	-	-	-	2	2	2	-
CO5	3	2	2	1	1	-	-	-	-	-	-	2	2	2	-
AVG	3	2	2	2	1	-	-	-	-	-	-	2	2	2	-

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

Chairman, Board of Studies
Faculty of CSE (Cyber Security)
Adhiyamaan College of Engineering
(Autonomous), Hosur 635 130.

322CBT02 OBJECT ORIENTED SOFTWARE ENGINEERING   **L T P C**
                                                                             3 0 0 3

COURSE OBJECTIVES:

- To understand Software Engineering Lifecycle Models
- To Perform software requirements analysis
- To understand various design patterns
- To understand software testing and testing tools
- To work on project management concepts and its activities

Prerequisite: Nil

UNIT I SOFTWARE PROCESS AND AGILE DEVELOPMENT   9

Introduction to Software Engineering - Software Process - Perspective and Specialized Process Models - Introduction to Agility-Agile process-Extreme Programming-XP Process-Case study**.**

UNIT II REQUIREMENTS ANALYSIS AND SPECIFICATION   9

Requirement analysis and specification – Requirements gathering and analysis – Software Requirement Specification – Formal system specification – Finite State Machines – Petri nets -Introduction to OOAD with OO Basics- Object modelling using UML – Use case Model – Class diagrams – Interaction diagrams – Activity diagrams – State chart diagrams – Functional modelling – Data Flow Diagram

UNIT III DESIGN PROCESS AND PATTERNS   9

Software Design-Design Process-Design Concepts-Coupling-Cohesion-Design Patterns - Creational - Factory

Method - Structural - Bridge - Adapter - Behavioral- Strategy-Observer-Applying GoF -Design Patterns-

Mapping Design to Code.

UNIT IV SOFTWARE TESTING   9

Software Testing Fundamentals - Internal and External Views of Testing - White box Testing - Basis Path Testing - Control Structure Testing - Black Box Testing - Regression Testing - Unit Testing - Integration Testing - User Acceptance Testing - Validation Testing - System Testing - Case Study : Software testing tool – Selenium.

UNIT V PROJECT MANAGEMENT   9

Software Project Management- Software Project Management principles- Software Configuration Management - Project Scheduling- Case Study

                                                      TOTAL HOURS: 45 PERIODS

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

CO1: Understand and Compare various software process models

CO2: Perform formal analysis on specifications and use UML diagrams for analysis

CO3: Illustrate design activities and design patterns

CO4: Apply various software testing techniques to ensure the quality and reliability of Software

CO5: Develop software projects based on Project management Activities

TEXT BOOKS:

1. Bernd Bruegge and Allen H. Dutoit, "Object-Oriented Software Engineering: Using UML, Patternsand Java", Third Edition, Pearson Education, 2009.
2. Roger S. Pressman, Object-Oriented Software Engineering: An Agile Unified Methodology, First Edition, Mc Graw-Hill International Edition, 2014.

REFERENCE BOOKS:

1. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, Fundamentals of Software Engineering, 2nd edition,PHI Learning Pvt. Ltd., 2010.
2. Craig Larman, Applying UML and Patterns, 3rd ed, Pearson Education, 2005.
3. Len Bass, Ingo Weber and Liming Zhu, "DevOps: A Software Architect's Perspective", Pearson Education, 2016
4. Rajib Mall, Fundamentals of Software Engineering, 3rd edition, PHI Learning Pvt. Ltd., 2009.
5. Stephen Schach, Object-Oriented and Classical Software Engineering, 8th ed, McGraw-Hill, 2010.
6. Unmesh Gundecha, Selenium Web Driver 3 Practical Guide: End-to-End Automation Testing for Web and Mobile Browsers with Selenium Web Driver, Second Edition,2018

CO's-PO's & PSO's MAPPING

CO's / PO's	322CBT02-OBJECT ORIENTED SOFTWARE ENGINEERING

CO's / PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	2	3	-	-	-	2	1	2	3	2	3	3
CO2	2	3	2	2	3	-	-	-	2	1	2	3	2	3	3
CO3	2	3	2	2	3	-	-	-	2	1	2	3	2	3	3
CO4	2	3	2	2	3	-	-	-	2	1	2	3	2	3	3
CO5	2	3	2	2	3	-	-	-	2	1	2	3	2	3	3
AVG	2	3	2	2	3	-	-	-	2	1	2	3	2	3	3

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

322CSI03 **FOUNDATIONS OF DATA SCIENCE** **L T P C**
3 0 2 4

COURSE OBJECTIVES

- To understand the data science fundamentals and process.
- To learn to describe the data for the data science process.
- To learn to describe the relationship between data.
- To utilize the Python libraries for Data Wrangling.
- To present and interpret data using visualization libraries in Python

UNIT I INTRODUCTION   9

Data Science: Benefits and uses – facets of data - Data Science Process: Overview – Defining research goals – Retrieving data – Data preparation - Exploratory Data analysis – build the model– presenting findings and building applications - **Machine Learning – Applications for machine learning in data science – The Modeling process**

UNIT II DESCRIBING DATA   9

Types of Data - Types of Variables -Describing Data with Tables and Graphs –Describing Data with Averages - Describing Variability - Normal Distributions and Standard (z) Scores

UNIT III DESCRIBING RELATIONSHIPS   9

Correlation –Scatter plots –correlation coefficient for quantitative data –computational formula for correlation coefficient – Regression –regression line –least squares regression line – Standard error of estimate – interpretation of r2 –multiple regression equations –regression towards the mean

UNIT IV PYTHON LIBRARIES FOR DATA WRANGLING   9

Basics of Numpy arrays –aggregations –computations on arrays –comparisons, masks, Boolean logic – fancy indexing – structured arrays – Data manipulation with Pandas – data indexing and selection – operating on data – missing data – Hierarchical indexing – combining datasets – aggregation and grouping – pivot tables

Unit V DATA VISUALIZATION   9

Importing Matplotlib – Line plots – Scatter plots – visualizing errors – density and contour plots – Histograms – legends – colors – subplots – text and annotation – customization – three dimensional plotting - Geographic Data with Basemap - Visualization with Seaborn

TOTAL: 45 PERIODS

PRACTICAL EXERCISES: **15 PERIODS**

1. Download, install and explore the features of NumPy, SciPy, Jupyter, Stats models and Pandas packages.
2. Working with Numpy arrays
3. Working with Pandas data frames
   Reading data from text files, Excel and the web and exploring various commands for doing descriptive analytics on the Iris data set.
4. Use the diabetes data set from UCI and Pima Indians Diabetes data set for performing the following:
   a. Univariate analysis: Frequency, Mean, Median, Mode, Variance, Standard Deviation, Skewness and Kurtosis.
   b. Bivariate analysis: Linear and logistic regression modeling
   c. Multiple Regression analysis
   d. Also compare the results of the above analysis for the two data sets.
5. Apply and explore various plotting functions on UCI data sets.
   a. Normal curves
   b. Density and contour plots
   c. Correlation and scatter plots
   d. Histograms
   e. Three dimensional plotting
6. Visualizing Geographic Data with Basemap

COURSE OUTCOMES

On successful completion the students will be able to

CO1: Gain knowledge on data science process

CO2: Understand different types of data description for data science process

CO3: Explore the relationships between data using correlation and regression techniques

CO4: Perform Data Wrangling using Python Libraries

CO5: Apply visualization Libraries in Python to interpret and explore data

TEXT BOOKS:

1. David Cielen, Arno D. B. Meysman, and Mohamed Ali, "Introducing Data Science", Manning Publications, 2016.

2. Robert S. Witte and John S. Witte, "Statistics", Eleventh Edition, Wiley Publications, 2017.

3. Jake VanderPlas, "Python Data Science Handbook", O'Reilly, 2016.

REFERENCES:

1. Allen B. Downey, "Think Stats: Exploratory Data Analysis in Python", Green Tea Press,2014.

CO's-PO's & PSO's MAPPING:

CO/PO	322CST03 FOUNDATIONS OF DATA SCIENCE

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
CO1	3	3	2	3	1	1	-	-	1	1	1	1	2	2	2
CO2	3	3	2	3	1	1	-	-	1	1	1	1	2	2	2
CO3	3	3	2	3	1	1	-	-	1	1	1	1	2	2	2
CO4	3	3	2	3	1	1	-	-	1	1	1	1	2	2	2
CO5	3	3	2	3	1	1	-	-	1	1	1	1	2	2	2
AVG	3	3	2	3	1	1	-	-	1	1	1	1	2	2	2

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

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322CIT04   OBJECT ORIENTED PROGRAMMING   L T P C
                                                                        3 0 0 3

OBJECTIVE(S):
- To understand Object Oriented Programming concepts and basics of Java programming language
- To know the principles of packages, inheritance and interfaces
- To develop a java application with threads and generics classes
- To define exceptions and use I/O streams
- To design and build Graphical User Interface Application using JAVAFX

UNIT - I   INTRODUCTION TO OOP AND JAVA   9

Overview of OOP – Object oriented programming paradigms – Features of Object Oriented Programming – Java Buzzwords – Overview of Java – Data Types, Variables and Arrays – Operators – Control Statements – Programming Structures in Java – Defining classes in Java – Constructors- Methods -Access specifiers - Static members- Java Doc comments

UNIT- II   INHERITANCE, PACKAGES AND INTERFACES   9

Overloading Methods – Objects as Parameters – Returning Objects –Static, Nested and Inner Classes. Inheritance: Basics– Types of Inheritance -Super keyword -Method Overriding – Dynamic Method Dispatch –Abstract Classes – final with Inheritance. Packages and Interfaces: Packages – Packages and Member Access –Importing Packages – Interfaces.

UNIT - III EXCEPTION HANDLING AND MULTITHREADING   9

Exception Handling basics – Multiple catch Clauses – Nested try Statements – Java's Built-in Exceptions – User defined Exception. Multithreaded Programming: Java Thread Model–Creating a Thread and Multiple Threads – Priorities – Synchronization – Inter Thread Communication Suspending –Resuming, and Stopping Threads –Multithreading. Wrappers – Auto boxing.
Introduction to Collection Framework: Array List – Map – Set.

UNIT- IV   I/O, GENERICS, AND DATABASE CONNECTIVITY   9

I/O Basics – Reading and Writing Console I/O – Reading and Writing Files. Generics: Generic Programming – Generic classes – Generic Methods – Bounded Types – Restrictions and Limitations. Accessing database using JDBC - Applet Architecture- Applet Lifecycle-Simple Applet.

UNIT- V   STRING HANDLING AND EVENT HANDLING   9

Strings: Basic String class, methods and String Buffer Class, JAVAFX Events and Controls: Event Basics – Handling Key and Mouse Events. Controls: Checkbox, Toggle Button – Radio Buttons – List View – Combo Box – Choice Box – Text Controls – Scroll Pane. Layouts – Flow Pane – HBox and VBox – Border Pane – Stack Pane – Grid Pane, Menus.

                                                                TOTAL:45PERIODS

COURSE OUTCOMES:

On successful completion the students will be able to

CO1: Apply the concepts of classes and objects to solve simple problems

CO2: Develop programs using inheritance, packages and interfaces

CO3: Make use of exception handling mechanisms and multithreaded model to solve real world Problems

CO4: Build Java applications with I/O packages, Collections and generics concepts using Database connectivity

CO5: Integrate the concepts of event handling and JavaFX components for developing GUI based applications.

TEXT BOOKS:

1. Herbert Schildt, "Java: The Complete Reference", 13th Edition, McGraw Hill Education,
   New Delhi, 2019

2. Herbert Schildt, "Introducing JavaFX 8 Programming",1stEdition, McGraw Hill Education,
   New Delhi, 2015

REFERENCES:

1. Cay S. Horstmann, "Core Java Fundamentals", Volume 1, 11 th Edition, Prentice Hall, 2018.

2. PaulDeitel HarveyDeitel, Java - How to Program, PrenticeHall;9th edition, 2011.

3. Cay Horstmann BIG JAVA,4th Edition, JohnWileySons,2009

4. NicholasS.Williams, Professional Java for Web Applications, Wrox Press,2014

5. T. Budd (2009), An Introduction to Object Oriented Programming, Addison Wesley Longman, 2002

6. E. Balagurusamy. "Programming with JAVA" A primer, Tata McGraw Hill Publication company,
   sixth edition, 2019.

CO's-PO's & PSO's MAPPING

322CIT04 OBJECT ORIENTED PROGRAMMING														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
CO1	1	1	3	1	3	1	1	1	3	2	2	2	3	1	2
CO2	2	1	3	2	1	1	1	1	2	1	1	3	3	3	2
CO3	3	3	1	2	2	1	1	1	3	2	1	2	3	1	3
CO4	3	1	2	2	2	-	-	-	1	2	1	3	3	1	1
CO5	1	1	2	3	2	-	-	-	3	2	1	2	3	3	3
AVG	2	1	2	2	2	1	1	1	2	2	1	2	3	2	2

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

322CIT05	**DATA STRUCTURES**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

OBJECTIVES
- Understand the need and fundamental concepts of List ADT.
- Acquire knowledge in Stack and Queue data structures.
- Learn Trees, graph data structure to solve problems.
- Familiar with Sorting, Searching and Hashing algorithms.

PREREQUISITES: Programming in C

UNIT I LINEAR DATA STRUCTURES – LIST   6

Introduction-Abstract Data Types - The List ADT - Array based Implementation - Linked List Implementation- Doubly Linked List - Circular Linked List - Applications of Linked List - Polynomial Operations- Multi lists

UNIT II   LINEAR DATA STRUCTURES – STACKS AND QUEUES   9

The Stack ADT - Array Implementation - Linked List Implementation - Applications of Stack - Balancing Symbols - Postfix Expressions - Infix to Postfix Conversion - The Queue ADT - Array Implementation - Linked List Implementation - Circular Queue - Application of Queue- BFS-Printer Queue.

UNIT III   NON LINEAR DATA STRUCTURES – TREES   10

Preliminaries - Binary Trees - Array Implementation - Linked List Implementation - Tree Traversals - Expression Trees - Binary Search Tree - Operations on Binary Search Tree – AVL Trees - Heaps - Binary Heaps - Operations of Heaps -Binomial Queues - B-Tree -B^+ Trees.

UNIT IV   NON LINEAR DATA STRUCTURES –GRAPHS   10

Representation of Graphs –Breadth First Traversal- Depth First Traversal - Bi-connectivity – Cut vertex – Euler circuits– Topological Sorting– Application of Graphs - Shortest Path Algorithm: Floyd Warshall - Bellman Ford - Dijkstra's Algorithm -Minimum Spanning Trees: Prim's Algorithm - Kruskal's Algorithm.

UNITV   SEARCHING, SORTING AND HASH TECHNIQUES   10

Searching: Linear Search - Binary Search. **Sorting:** Insertion Sort - Selection Sort - Shell Sort - Bubble Sort - Quick Sort - Merge Sort - Radix Sort. **Hashing**: Hash Functions - Separate Chaining -Open Addressing - Rehashing - Extendible Hashing.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

On successful completion the students will be able to

CO1: Implement List ADT to solve real time problems.

CO2: Develop applications using Stack and Queues data structures.

CO3: Design and Implement applications on trees.

CO4: Implement graph data structure for solving problems.

CO5: Develop various Sorting, Searching and Hashing algorithms to small and large data sets.

TEXT BOOKS:

1.Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction

to Algorithms", Fourth Edition, McGraw Hill/ MIT Press, 2022.

2.Data Structures and Algorithms in Java, An Indian Adaptation 2022by Michael T.Goodrich; Roberto

Tamassia; Michael H. Goldwasser; Subhasish Banerjee , 6 edition, wiley– 21 June

3.Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Second edition, Pearson

Education, January 2020

REFERENCES:

1.Data Structures and Algorithms Made Easy in Java, Narasimha Karumanchi (Author)- 16 December

2011

2.Data Structures, Algorithm, and Software Principles in C, Thomas A Standish, Addison –Wesley 2017

3.Problem Solving in Data Structures & Algorithms Using Java Book by Hemant Jain October2016

CO's-PO's & PSO's MAPPING

322CIT05 DATA STRUCTURES															
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	3	3	3	2	2	-	-	-	2	-	-	3
CO2	3	2	1	3	3	3	2	2	-	-	-	2	-	-	3
CO3	3	2	1	3	3	3	2	2	-	-	-	2	-	-	3
CO4	3	2	1	3	3	2	3	2	-	-	-	2	-	-	3
CO5	3	2	1	3	3	2	3	2	-	-	-	2	-	-	3
AVG	3	2	1	3	3	3	2	2	-	-	-	2	-	-	3

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

322CBT06   FUNDAMENTALS OF CYBER SECURITY   **L T P C**
                                                                       3 0 0 3

OBJECTIVES:
- To learn cybercrime and cyber law.
- To understand the cyber-attacks and tools for mitigating them.
- To understand information gathering.
- To learn how to detect a cyber-attack.
- To learn how to prevent a cyber-attack.

UNIT I: INTRODUCTION   9

Cyber Security – History of Internet – Impact of Internet – CIA Triad; Reason for CyberCrime – Need for Cyber Security – History of Cyber Crime; Cybercriminals – Classification of Cybercrimes – A Global Perspective on Cyber Crimes; Cyber Laws – The Indian IT Act – Cybercrime and Punishment.

UNIT II: ATTACKS AND COUNTERMEASURES   9

OWASP; Malicious Attack Threats and Vulnerabilities: Scope of Cyber-Attacks – Security Breach – Types of Malicious Attacks – Malicious Software – Common Attack Vectors – Social engineering Attack – Wireless Network Attack – Web Application Attack – Attack Tools – Counter measures. Case study: MITRE Framework, CVE, CWE

UNIT III: RECONNAISSANCE   9

Harvester – Whois – Netcraft – Host – Extracting Information from DNS – Extracting Information from E-mail Servers – Social Engineering Reconnaissance; Scanning – Port Scanning – Network Scanning and Vulnerability Scanning – Scanning Methodology – Ping Sweep Techniques – Nmap Command Switches.

UNIT IV: INTRUSION DETECTION   9

Host Based Intrusion Detection – Network -Based Intrusion Detection – Distributed or Hybrid Intrusion Detection – Intrusion Detection Exchange Format – Honeypots – Example System Snort.

UNIT V: INTRUSION PREVENTION   9

Firewalls and Intrusion Prevention Systems: Need for Firewalls – Firewall Characteristics and Access Policy – Types of Firewalls – Firewall Basing – Firewall Location and Configurations –Intrusion Prevention Systems – Example Unified Threat Management Products.

TOTAL : 45 PERIODS

COURSE OUTCOMES:
At the end of the course, the student should be able to:
CO1: Explain the basics of cyber security, cybercrime and cyber law
CO2: Classify various types of attacks and learn the tools to launch the attacks
CO3: Demonstrate reconnaissance and scanning techniques to gather target system information using open-source tools.
CO4: Apply intrusion techniques to detect intrusion
CO5: Apply intrusion prevention techniques to prevent intrusion

TEXT BOOKS:
1. Anand Shinde, "Introduction to Cyber Security Guide to the World of Cyber Security", Notion Press, 2021.
2. William Stallings, Lawrie Brown, "Computer Security Principles and Practice",Third Edition, Pearson Education, 2015.

REFERENCE BOOKS:
1. Patrick Engebretson, "The Basics of Hacking and Penetration Testing: EthicalHacking and Penetration Testing Made easy", Elsevier, 2011.
2. David Kim, Michael G. Solomon, "Fundamentals of Information SystemsSecurity", Jones & Bartlett Learning Publishers, 2013.
3. Nina Godbole, Sunit Belapure, "Cyber Security: Understanding Cyber Crimes,Computer Forensics and Legal Perspectives", Wiley Publishers, 2011.
4. Ross Anderson, Security Engineering. 2nd Edition. John Wiley and Sons. 2008, ISBN-13: 978-0470068526

322CBT06 FUNDAMENTALS OF CYBER SECURITY														
CO's/ PO's	PO 1	PO 2	PO 3	PO 4	PO5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	2	2	2	2	-	-	-	2	-	-	3	3	3	3
CO2	3	2	1	1	1	-	-	-	2	-	-	3	3	3	3
CO3	3	3	1	1	2	-	-	-	2	-	-	3	3	3	3
CO4	3	2	2	2	-	-	-	-	2	-	-	3	3	3	3
CO5	3	1	1	2	-	-	-	-	2	-	-	3	3	3	3
AVG	3	2	1.4	1.6	1.5	-	-	-	2	-	-	3	3	3	3

3- High,2Moderate,1-Low,'-'NoCorrelation

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322CIP07   **OBJECT ORIENTED PROGRAMMING LABORATORY**   **L   T   P   C**
                                                                0   0   2   1

COURSE OBJECTIVES:

- To build software development skills using java programming for real-world applications.
- To understand and apply the concepts of classes, packages, interfaces, inheritance, exception handling and file processing.
- To develop applications using generic programming and event handling

LIST OF EXPERIMENTS:

1. Implement class, method and static member.

2. Implement Inheritance (overriding).

3. Implement packages and interfaces.

4. Implement method and constructor overloading.

5. Implement exception handling and creation of user defined exceptions.

6. Write a java program that implements a multi-threaded application

7. Implement collection class (Array list, Map, Set).

8. Write a program to perform file operations.

9. Implement string handling functions.

10. Develop an application using Java concepts, JavaFX controls, layouts and menus with

    Database Connectivity.

                                                                        TOTAL: 30
COURSE OUTCOMES:

On successful completion the students will be able to

CO1: Design and develop java programs using object oriented programming concepts

CO2: Develop simple applications using object oriented concepts such as package, exceptions

CO3: Implement multithreading, and generics concepts

CO4: Create GUIs and event driven programming applications for real world problems

CO5: Implement and deploy web applications using Java.

CO's-PO's & PSO's MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
322CIP07-OBJECT ORIENTED PROGRAMMING LABORATORY															
CO1	3	3	3	2	2	-	-	-	2	-	-	3	3	3	3
CO2	3	3	3	2	2	-	-	-	2	-	-	3	3	3	3
CO3	3	3	3	2	2	-	-	-	2	-	-	3	3	3	3
CO4	3	3	3	2	2	-	-	-	2	-	-	3	3	3	3
CO5	3	3	2	2	1	-	-	-	2	-	-	3	3	3	3
AVG	3	3	2.8	2	1.8	-	-	-	2	-	-	3	3	3	3

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

DATA STRUCTURES LABORATORY   **L T P C**
                                                                                            0 0 2 1

COURSE OBJECTIVES:
- To demonstrate array and list implementation of linear data structure algorithms.
- To implement the applications using stack.
- To implement Binary search tree, AVL tree algorithms and Heap algorithm.
- To implement Dijkstra's, Prim's and krushkal algorithm.
- To implement Sorting, Searching and hashing algorithms.

LIST OF EXERCISES:
1. Array implementation & linked list of Singly, Doubly and Circular Linked List
2. Array implementation of Stack and Queue.
3. Implementation of Evaluating Postfix Expressions, Infix to Postfix conversion
4. Implementation of Binary Search Trees
5. Implementation of Tree Traversal
6. Implementation of Heaps using Priority Queues
7. Implementation of Dijkstra's Algorithm, Prim's Algorithm and krushkal Algorithm
8. Implementation of Linear Search and Binary Search
9. Implementation of Insertion Sort, Selection Sort, Quick sort, Merge Sort
10. Implementation of Open Addressing (Linear Probing and Quadratic Probing)

TOTAL: 30 PERIODS

COURSE OUTCOMES:

On successful completion the students will be able to

CO1: Implement Linear data structures algorithm.

CO2: Build applications using stack and queue data Structure

CO3: Design Tree data structures and develop application using it.

CO4: Apply different graph algorithms to find shortest path

CO5: Develop the various searching, sorting algorithms and Hash techniques

CO's-PO's & PSO's MAPPING

322CIP08							DATA STRUCTURES LABORATORY								
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
CO1	1	2	2	1	-	-	-	-	2	1	2	2	2	2	3
CO2	3	3	1	1	-	-	-	-	1	1	1	3	1	2	2
CO3	2	1	3	1	-	-	-	-	1	1	2	3	3	3	3
CO4	3	1	3	3	-	-	-	-	1	2	3	3	2	1	2
CO5	3	2	1	1	2	-	-	-	3	3	3	1	3	1	3
AVG	2	2	2	1	2	-	-	-	2	2	2	2	2	2	3

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

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322GEV01	PROFESSIONAL DEVELOPMENT	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES:

To be proficient in important Microsoft Office tools: MS WORD, EXCEL, POWERPOINT.

● To be proficient in using MS WORD to create quality technical documents, by using standard templates, widely acceptable styles and formats, variety of features to enhance the preventability and overall utility value of content.

● To be proficient in using MS EXCEL for all data manipulation tasks including the common statistical, logical, mathematical etc., operations, conversion, analytics, search and explore, visualize, interlink, and utilizing many more critical features offered

● To be able to create and share quality presentations by using the features of MS PowerPoint, including: organization of content, preventability, aesthetics, using media elements and enhance the overall quality of presentations.

MS WORD: **10 Hours**

Create and format a document

Working with tables

Working with Bullets and Lists

Working with styles, shapes, smart art, charts

Inserting objects, charts and importing objects from other office tools

Make a custom cover page in Microsoft Word

Creating and Using document templates

Inserting equations, symbols and special characters

Working with Table of contents and References, citations

Insert and review comments

Create bookmarks, hyperlinks, endnotes footnote

Viewing document in different modes

Working with document protection and security

Inspect document for accessibility

MS EXCEL   **10 Hours**

Create worksheets, insert and format data

Work with different types of data: text, currency, date, numeric etc. Split, validate, consolidate, and Convert Data

Sort and filter data

Perform calculations and use functions: (Statistical, Logical, Mathematical, date, Time etc.,) Work with Lookup and reference formulae

Create and Work with different types of charts

Use pivot tables **and power pivot** to summarize and analyse data Perform data analysis using own formulae and functions

Combine data from multiple worksheets using own formulae and built-in functions to generate results

Export data and sheets to other file formats

Working with macros, Index Match and offset function

Protecting data and Securing the workbook

MS POWERPOINT: **10 Hours**

Select slide templates, layout and themes

Formatting slide content and using bullets

and numbering Insert and format images,

smart art, tables, charts

Using Slide master, notes and

handout master Working with

animation and transitions

Organize and Group slides

Import or create and use media objects: audio, video, animation

Perform slideshow recording and Record narration and create presentable videos

TOTAL: 30 PERIODS

COURSE OUTCOMES:

On successful completion the students will be able to

CO1: Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements

CO2: Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding

CO3: Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.

CO's-PO's & PSO's MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PSO3
322GEV01   PROFESSIONAL   DEVELOPMENT
CO1	3	3	-	-	-	-	-	-	-	-	-	3	-	-	-
CO2	-	3	-	-	-	-	3	-	-	-	-	3	-	1	-
CO3	-	-	-		2	-	3	-	-	-	-	3	-	1	-
AVG	1	2	-	-	0.6	-	2	-	-	-	-	3	-	0.6	-

3-HIGH, 2 MODERATE, 1-LOW, '- 'NO CORRELATION

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