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NH-16, Near Valluramma Temple, ONGOLE - 523272. A.P. Contact No: 08592 278315, 9581456310 | www.pace.ac.in

PACE R-21 UNDER GRADUATE (B.Tech) COURSE STRUCTURE

Department : CSIT **Sem:- I**

S.No	Category	Course Code	Course Title	L	T	P	C	Marks
1	Humanities and Social Science	P21HST01	Communicative English	3	0	0	3	100
2	Basic Science Course	P21BST01	Linear Algebra & Differential Equations	3	0	0	3	100
3	Basic Science Course	P21BST02	Applied Physics	3	0	0	3	100
4	Engineering Science Courses	P21EST03	C-Programming for Problem Solving	3	0	0	3	100
5	Engineering Science Courses	P21EST04	Computer Engineering Workshop	2	0	2	3	100
6	Humanities and Social Science Lab	P21HSL01	English Language Communication Skills Lab	0	0	3	1.5	50
7	Basic Science Course Lab	P21BSL01	Applied Physics Lab	0	0	3	1.5	50
8	Engineering Science Courses Lab	P21ESL02	C-Programming for Problem Solving Lab	0	0	3	1.5	50
9	Induction program (AICTE Suggested)	P21MCT01	Induction program	2	0	0	0	100
TOTAL							**19.5**	750

S.No	Category	Credits as per APSCHE	Alloted Credits	Deviation in Credits
1	Humanities and Social Science	4.5	4.5	0
2	Basic Science Course	7.5	7.5	0
3	Engineering Science Courses	7.5	7.5	0
TOTAL CREDITS		19.5	19.5	0

B.Tech. I Year I Semester **Course Structure**

L	T	P	C
3	0	0	3

Communicative English

(Common to all Branches)

Internal Marks: 30

Course Code: P21HST01 **External Marks: 70**

Course Prerequisite: The students should have basic knowledge of English grammar and LSRW skills.

COURSE OBJECTIVES:

1. To enable the engineering students to develop their basic communication skills in English for academic and social purposes.
2. To equip the students with appropriate oral and written communication skills.
3. To inculcate the skills of listening, reading and critical thinking.
4. To integrate English Language learning with employability skills and training.
5. To enhance the students' proficiency in reading skills enabling them to meet the academic demands of their course.

COURSE OUTCOMES:

On completion of this course, the student is able to:

1. Use English Language effectively in spoken and written forms
2. Interpret the contextual meaning of words
3. Comprehend the given texts and respond appropriately
4. Recall and reproduce the theme in a given context
5. Communicate confidently in formal and informal contexts

UNIT – I (9 Lectures)

a. Reading Skills

Leela's Friend – R.K. Narayan

b. Vocabulary: Synonyms, Antonyms and Word formation, Root Words

c. Grammar: Parts of Speech, Sentence structure and Types of sentences

d. Writing: Letter Writing, Note Making and Note Taking

UNIT – II

a. Reading Skills (10 Lectures)

Dr. A.P.J. Abdul Kalam's Biography

b. Vocabulary: Prefixes, Suffixes and Affixes

c. Grammar: Prepositions and Articles

d. Writing: Paragraph Writing and Precis Writing

UNIT –III (9 Lectures)

a. Reading Skills

Three Days to See – Helen Keller

b. Vocabulary: Collocations, One word substitutes & Idioms

c. Grammar: Tenses, Active voice & Passive voice

d. Writing: Technical Report Writing

UNIT- IV (9 Lectures)

a. Reading Skills

Satya Nadella's Email to His Employees on His First Day as CEO of Microsoft

b. Vocabulary: Phrasal verbs and Commonly confused words

c. Grammar: Subject–Verb Agreement (Concord) and Question tags

d. Writing: Curriculum vitae, Cover Letter and Resume Writing. (Functional, Chronological and standard Resumes)

UNIT – V (8 Lectures)

a. Reading Skills

Mokshagundam Visveswaraya

b. Vocabulary: Homonyms, Homophones and Homographs

c. Grammar: Modal Auxiliaries, Degrees of Comparison and Direct speech & Indirect Speech

d. Writing: E- mail Writing and Essay Writing

Text books:

1. New Horizons – Pearson Publishers
2. Fluency in English", A Course Book for Engg. Students, Published by Orient Black Swan, Hyderabad, 2016 print.
3. "Technical Communication- Principles and Practice", Third Edition. New Delhi: Oxford University press.
4. Epitome of Wisdom – Maruthi Publications

References:

1. Meenakshi raman, Sangeetha, Sharma Fundamentals of technical communication, Pg: 119-153 Oxford University press, 2015
2. Rutherford, Andhrea. J, Communication skills for technology. Pearson, New Delhi.2001
3. Raymond Murphy, Murphy's English Grammar, Cambridge University Press 2004
4. Meenakshi raman, Sangeetha, Sharma,Technical communication: English Skills for Engineers, Oxford University press, 2009
5. Michael Swan, Practical English Usage, Oxford University press, 1996

Web Resources:

1. www.englishhints.com
2. www.enchantedlearning.com
3. www.learnenglish.de/grammar/prefixtext.html
4. http://www.magickeys.com/books/riddles/words.html
5. http://www.pinnacle.edu.in/campusfiles/1826_campusFile_1.pdf
6. http://www.yourdictionary.com
7. http://www.learnenglish.com
8. http://www.cambridge.org
9. http://www.eslcafe.com
10. http://www.eslgames.com
11. http://www.penguin.co.uk
12. http://www.edufind.com/english/practice
13. www.englishhints.com,www.enchantedlearning.com,
14. www.learnenglish.de/grammar/prefixtext.html
15. http://www.magickeys.com/books/riddles/words.html

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B.Tech. I Year I Semester **Course structure**

L	T	P	C
3	0	0	3

Linear Algebra & Differential Equations

(Common to All Branches)

Internal Marks: 30

Course code: P21BST01 **External marks: 70**

Course Pre-Requisites:

1) Basics of Matrix Algebra
2) Differentiation
3) Integration

Course Objectives: To learn

1. The concept of rank of a matrix which is used to know the consistency of system of linear equations and find the solution by using various analytical and numerical methods.
2. Eigen values and eigenvectors of a given matrix. Cayley-Hamilton theorem to find the inverse and power of a matrix and determine the nature of the quadratic form,
3. Recognize and model differential equations, apply analytical techniques to compute solutions for engineering problems.
4. The general solution to the higher order linear differential equations and applies to calculate the current in electrical circuits.
5. Explore the use of Laplace transform method to solve with initial value problems of ordinary differential equations.

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

1. **Demonstrate** the understanding of rank of a matrix. **Analyze** the solution of the system of linear equations.
2. **Find** the Eigen values and Eigenvectors of a matrix, **apply** Cayley-Hamilton theorem to determine inverse and power of a matrix and **identify** the nature of the quadratic form.
3. **Solve** the differential equations of first order and first degree related to various engineering fields.
4. **Find** the complete solution to the higher order linear differential equations and **apply** these methods to **find** the current in complex electrical circuits.
5. **Apply** the technique of Laplace transform and **solve** differential equations for analytical solutions with the initial conditions.

UNIT I: Solving System of Linear Equations: (8 Lectures)

Rank of a matrix by Echelon form-Normal form- Normal form through PAQ method – Solving system of homogeneous and non-homogeneous linear equations – Gauss elimination – Gauss Jordon methods.

UNIT II: Eigen values – Eigenvectors, Cayley-Hamilton Theorem and Quadratic forms: (10 Lectures)

Eigen values - Eigenvectors– Properties – Cayley-Hamilton theorem (without proof)–Finding inverse and power of a matrix by Cayley-Hamilton theorem–Reduction to Diagonal form. Quadratic forms: Rank, index, signature and nature of the quadratic forms–Reduction of quadratic form to canonical forms by orthogonal transformation.

UNIT-III: Differential Equations of First Order and First Degree: (10 Lectures)

Linear differential equation - Bernoulli's differential equation–Exact equations and equations reducible to exact form.

Applications: Newton's Law of cooling-Law of natural growth and decay-Orthogonal trajectories-Electrical circuits.

UNIT-IV: Linear Differential Equations of Higher order: (8 Lectures)

Non-homogeneous equations of higher order with constant coefficients-with RHS term of the type e^{ax}, sin ax, cos ax, polynomials in x, e^{ax}V(x), x^n V(x) and general method - Method of Variation of parameters.

Applications: LCR circuit.

UNIT-V: Laplace Transforms: (9 Lectures)

Laplace transforms of standard functions– First shifting Theorem-Change of scale property-multiplication by t^n-division by t, transforms of derivatives and integrals – Second shifting theorem– Laplace transform of Periodic functions.

Inverse Laplace transforms – Convolution theorem (without proof)

Applications: Evaluation of integrals using Laplace transforms - Solving ordinary differential equations (Initial value problems) using Laplace transforms.

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 44th Edition, Khanna Publishers.
2. B.V. Ramana, Higher Engineering Mathematics, 2007 Edition, Tata Mc. Graw Hill Education.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India.
2. H. K. Das, Advanced Engineering Mathematics, 22ndEdition, S. Chand & Company Ltd.
3. David Poole, Linear Algebra- A modern introduction, 4th edition, Cengage.
4. Peter O' Neil, Advanced Engineering Mathematics, Cengage
5. Srimantha Pal, S C Bhunia, Engineering Mathematics, Oxford University Press.

Web Resources:

1. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
2. http://mathworld.wolfram.com/topics
3. http://www.nptel.ac.in/course.php

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B.Tech. I Year I Semester **Course structure**

L	T	P	C
3	0	0	3

APPLIED PHYSICS

(Common to ECE, CSIT, IT, CSE (IOT&CSBT) and AIML branches)

Internal Marks: 30

Course code: P21BST02 **External Marks: 70**

Course Prerequisites: The basics of analytical and conceptual understanding of physics.

Course Objectives

1. To study the wave nature of light through Interference and diffraction.
2. To learn the basic principles of Lasers and fiber optics.
3. To express the physics of electrostatics and electromagnetic wave concepts through Maxwell's equations.
4. To study the basic concepts of Quantum mechanics.
5. Aware of limits of classical free electron theory and apply band theory of solids.
6. Acquire the knowledge of semiconductor physics.

Course Outcomes

1. Understanding the basic concepts of optics and how to apply them for engineering applications.
2. Acquire the knowledge of fundamentals of Lasers and fiber optics enables the students to develop Laser devices to apply them in various systems like communications, Industries and medicine.
3. Set students to be exposed to Electrostatics, Maxwell's equations, electromagnetic waves and fundamental concepts of quantum mechanics.
4. Enable to learn the fundamental concepts of free electron theory and band theory of solids.

5. Develop knowledge of band theory of solids for fundamentals of Semiconductor physics enables the students to apply the knowledge to various systems like communications, solar cell, photo cells and so on.

UNIT-I

WAVE OPTICS (9 lectures)

Interference: Introduction, Principle of Superposition of waves, colors in thin films, interference in thin films, Newton's rings: Determination of wavelength and refractive index.

Diffraction: Introduction, differences between interference and diffraction, difference between Fraunhofer and Fresnel's diffraction, Fraunhofer diffraction at single slit, Fraunhofer diffraction due to double slit, Diffraction grating (N-slits qualitative), resolving power of grating.

UNIT-II

LASERS AND FIBER OPTICS (9 lectures)

Lasers: Introduction, Characteristics of laser, absorption, spontaneous emission, stimulated emission, Einstein's coefficients, population inversion, pumping, pumping mechanisms, Types of Lasers: Ruby laser, He-Ne laser, diode laser, Applications of Lasers.

Fiber optics: Introduction, Total internal reflection-wave propagation in optical fiber, Acceptance angle, numerical aperture, applications of optical fiber.

UNIT-III

ELECTROSTATICS, MAXWELL'S EQUATIONS AND ELECTROMAGNETIC WAVES (9 lectures)

Electrostatics: Coulombs law, electric field, electric field intensity, electric flux density, electrostatic potential, divergence of electric field, Laplace's and Poisson's equations for electrostatic potential, Gauss theorem in electrostatics.

Maxwell's equations and electromagnetic waves: Gauss theorem in magneto statics, Faraday's law of electromagnetic induction, Ampere's law, displacement current, Maxwell's equations in vacuum, electromagnetic wave equation in dielectric medium, velocity of propagation of electromagnetic wave, poynting vector and poynting theorem.

UNIT-IV

QUANTUM MECHANICS, FREE ELECTRON THEORY AND BAND THEORY

(10 lectures)

Quantum Mechanics: Introduction to quantum physics, de-Broglie's hypothesis and properties of matter waves, Schrodinger's time independent wave equation, Schrodinger's time dependent wave equation, Particle in one dimensional box.

Free electron theory: classical free electron theory of metals- assumptions and failures, quantum free electron theory of metals-assumptions and failures, Fermi Dirac distribution function- Fermi level, Femi energy, density of states.

Band theory of solids: Introduction, Bloch's theorem, Kronig penny model (qualitative), E-K diagram, Brillouin's zones, classification of solids into metals, semiconductors and insulators, effective mass of electron and concept of hole.

UNIT-V

SEMICONDUCTOR PHYSICS **(8 lectures)**

Semiconductor physics: Introduction**,** intrinsic and extrinsic semiconductors, carrier concentration in intrinsic semiconductors, electrical conductivity of intrinsic semiconductor, Fermi energy, carrier concentration in N-type and P-type semiconductors, dependence of Fermi energy on carrier-concentration and temperature, drift and diffusion, Hall effect and its applications, mechanism in LED, solar cell and photo conductor.

TEXT BOOKS:

1. A Textbook of Engineering Physics by Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - S. Chand.
2. Optics by Ajoy Ghatak, Tata McGraw-Hill Publishing company limited
3. Introduction to Electrodynamics by David Griffiths, Cambridge University Press
4. Introduction to Quantum physics by Eisberg and Resnick.

REFERENCES:

1. Applied physics by Palanisamy (Scitech publications)
2. Optics by Eugene Hecht, Pearson Education.
3. Principle of Lasers by O. Svelto
4. Electricity, magnetism and light by W. Saslow

5. Semiconductor Optoelectronics by J. Singh, Physics and Technology, Mc Graw-Hill inc
6. Engineering Physics by B.K. Pandey, S. Chaturvedi - Cengage Learing.

WEB REFERENCES:

1. https://nptel.ac.in/courses/115/106/115106066/
2. https://ocw.mit.edu/high-school/physics/exam-prep/electromagnetism/maxwells-equations/#1
3. https://ocw.mit.edu/courses/materials-science-and-engineering/3-091sc-introduction-to-solid-state-chemistry-fall-2010/electronic-materials/14-semiconductors/

B.Tech I Year - I Semester **Course structure**

L	T	P	C
3	0	0	3

C - Programming for Problem Solving

(Common for EEE, ME, ECE, CSE, CSIT, IT, CSE (IOT&CSBT), AIDS & AIML branches)

Course Code: P21EST03 **Internal Marks: 30**
External Marks: 70

Course Prerequisite: Nil

Course Objectives:

1. To impart adequate knowledge on the need of programming languages and problem solving techniques.
2. To impart problem solving skills.
3. To enable student to write programs in C and to solve the problems.

Course Outcomes:

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

1. Design algorithms and flowchart / Pseudo code for a given problem.
2. Design programs involving decision structures and loops.
3. Implement different operations on arrays and solve problems using functions.
4. Understand pointers and strings.
5. Implement structures, unions and file operations in C programming for a given application problem.

Unit-I: (8 Lectures)

Introduction to Programming: Computer hardware, Bits and Bytes, programming languages, application and system software, the software development process.

Idea of algorithm: steps to solve logical and numerical problems. Representation of algorithm: flowchart/pseudo code with examples, from algorithms to programs.

Unit-II: (9 Lectures)

Introduction to C: Overview of C, Constants, Variables and Data Types, Operators and Expressions, Managing Input and Output. Decision Making - Branching and Looping. Enumerated Data type, Renaming Data type with type def, Type Casting.

UNIT-III (10 Lectures)

Arrays: Definition, Declaration, Initialization, Assignment, Processing array, Passing array to a function, Two and multi dimensional array.

Functions: Defining a function, Accessing a function, Passing argument to functions, Function prototypes, Nested function call, Storage classes.

UNIT-IV (9 Lectures)

Pointers: Definition, initialization, operations on pointers, functions and pointers, arrays and pointers, pointers to pointers, dynamic memory allocation.

Strings: C Strings, String Input / Output functions, arrays of strings, string manipulation functions.

UNIT-V (9 Lectures)

Structures: Definition, declaration, initialization, accessing members, array of structures, arrays within structure, functions and structures, pointers to structures, nested structures, unions.

File Handling: Types, operations on files, modes, file I/O functions, Random Access Functions.

Text Books:

1. Byron S Gottfried, ―Programming with C, Schaums Outlines, Second Edition, Tata McGraw-Hill, 2006.
2. Problem Solving and Program Design in C, 4th edition, by jeri R. Hanly and Elli B.Koffman.
3. Balagurusamy. 2011. C Programming. Tata Mc Graw Hills, New Delhi, India.

Reference Books:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
2. Yashavant P. Kanetkar. ―Let Us C, BPB Publications, 2011.

Web References:

1. https://www.studytonight.com/c/
2. https://www.cprogramming.com/tutorial/c-tutorial.html
3. https://www.javatpoint.com/c-programming-language-tutorial
4. https://www.tutorialspoint.com/cprogramming/

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B.Tech I Year - I Semester **Course structure**

L	T	P	C
2	0	2	3

COMPUTER ENGINEERING WORKSHOP

(Common for CSE, CSIT, IT, CSE (IOT&CSBT), AIDS & AIML branches)

Course Code: P21EST04 **Internal Marks: 30**

External Marks: 70

Course Prerequisite: Nil

Course Objectives:

1. To make the students aware of the basic hardware components of a computer and installation of operating system.
2. To introduce Raptor Tool for flowchart creation.
3. To introduce programming through Visual Programming tool using scratch.
4. To get knowledge in awareness of cyber hygiene that is protecting the personal computer from getting infected with the viruses, worms and other cyber-attacks.
5. To introduce the usage of Productivity tools in crafting professional word documents, excel spreadsheets and power point presentations using open office tools.

UNIT I

Simple Computer System: Central processing unit, the further need of secondary storage, Types of memory, Hardware, Software and people. Peripheral Devices: Input, Output and storage, Data Preparation, Factors affecting input, Input devices, Output devices, Secondary devices, Communication between the CPU and Input/ Output devices.

TASK 1: PC Hardware: PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered.

Every student should identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor. Every student should disassemble and assemble the PC back to working condition.

TASK 2: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition.

Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.

UNIT II

Problem Solving and Programming: Algorithm development, Flowcharts, Looping, some programming features, Pseudo code, the one-zero game, some structured programming concepts, documents. Programming Languages: Machine Language and assembly language, high –level and low level languages, Assemblers, Compilers, and Interpreters.

TASK 3: **Drawing flowcharts (Raptor Tool)**

a) Create flowcharts for take-off landing of an Aeroplane.
b) Create a flowchart to validate an email id entered by user.
c) Create flowchart to print first 50 prime numbers.

TASK 4: Productivity tool:LaTeX and Microsoft (MS) office: Importance of MS office, Details of the three tasks and features that should be covered in each, MS word, Power Point, Excel.

UNIT III

Operating systems: Introduction, Evolution of operating systems, , Command Interpreter, Popular operating systems- Microsoft DOS, Microsoft Windows, UNIX and Linux.
Introduction to Unix Shell Commands, directory management commands, file operations, users commands, Time and Date commands.

TASK 5: Operating System Installation: Every student should individually install operating system like Linux or MS windows on the personal computer. The system should be configured as dual boot with both windows and Linux.

TASK 6: Basic Commands: Unix Shell Commands, directory management commands, file operations, users commands, Time and Date commands.

UNIT IV

Computer Networks: Introduction to computer Networks, Network topologies-Bus topology, star topology, Ring topology, Mesh topology, Hybrid topology, Types of Networks: Local area Network, Wide Area Networks, Metropolitan Networks, Campus/ Corporate Area Network, Personal Area Network, Network Devices- Hub, Repeater, Switch, Bridge, Router, Gateway, Network interface Card, Basic Networking Commands.

TASK 7: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IPsetting. Finally students should demonstrate how to access the websites and email.

TASK 8: Networking Commands:
ping, ssh, ifconfig, scp, netstat, ipstat, nslookup, traceroute, telnet, host, ftp, arp, wget,route

UNIT V

Introduction to HTML : Basics in Web Design, Brief History of Internet ,World Wide Web Why create a web site ,Web Standards, HTML Documents ,Basic structure of an HTML document Creating an HTML document ,Mark up Tags ,Heading-Paragraphs ,Line Breaks ,HTML Tags. Elements of HTML: Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls.

TASK 9: Basic HTML tags

a) Head Section and Elements of Head Section, Paragraphs, Formatting Styles.
b) Colour tags, Creating Hyperlinks, Images, Tables, lists
c) HTML Forms, Form Attributes, Form Elements.

TASK 10: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured. Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. Usage of search engines like Google, Yahoo, ask.com and others should be demonstrated by student.

TASK 11: Cyber Hygiene: Students should learn about viruses on the internet and install antivirus software. Student should learn to customize the browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

Text Books:

1. Fundamentals of Computers –ReemaThareja-Oxford higher education
2. Computer Fundamentals, Anita Goel, Pearson Education, 2017
3. PC Hardware Trouble Shooting Made Easy, TMH
4. Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.

Reference Books:

1) An Introduction to Web Design, Programming, 1st Edition, Paul S Wang, Sanda S Katila, Cengage Learning, 2003.
2) An Introduction to Computer studies –Noel Kalicharan-Cambridge

B.Tech. I Year I Semester **Course Structure**

L	T	P	C
0	0	3	1.5

English Language Communication Skills Lab

(Common to all Branches)

Internal Marks: 15

Course Code: P21HSL01 **External Marks: 35**

Course Prerequisite:

- Basic knowledge of English grammar
- Basic understanding of English vocabulary.
- Ability to speak simple sentences.
- Have interest to learn the language

Course Objectives:

1. To facilitate computer assisted multimedia instructions enabling individualized and independent language learning.
2. To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm.
3. To bring about a consistence accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking.
4. To improve the fluency of students in spoken English and neutralize their mother tongue influence.
5. To train students to use language appropriately for public speaking, group discussion and interviews.

Course Outcomes:

1. Better understanding of nuances of English language through audio visual experience and group activities.
2. Neutralization of accent for intelligibility.

3. Speaking skills with clarity and confidence which in turn enhances their employability skills.
4. Better understanding of the production of sounds of language.
5. Suitable body language for employability.

Scope:

The curriculum of the **ELCS Lab** is designed to focus on the production and practice of sounds of language and to familiarize the students with the use of English in everyday situations and contexts.

EXERCISE – I (3 Sessions)

- **A.** Introduction to Phonetics

  Consonant sounds

  Vowel sounds – Pure Vowels & Diphthongs
- **B.** Greeting, Introducing & taking leave and Ice – Breaking Activity

EXERCISE – II (2 Sessions)

- **A.** Structure of Syllables - Plural markers & Past tense Markers
- **B.** JAM Session & Situational Dialogues

EXERCISE – III (2 Sessions)

- **A.** Word Stress & Rules of 'r' pronunciation
- **B.** Role play, Giving Directions & Story Narration

EXERCISE – IV (2 Sessions)

- **A.** Consonant Cluster, Neutralization of Mother Tongue Influence and Listening Comprehension – Listening for General Details
- **B.** Describing objects, events, places etc. & Presentation Skills – Extempore, Public Speaking.

EXERCISE – V (3 Sessions)

- **A.** Intonation & Listening Comprehension – Listening for Specific Details
- **B.** Interview Skills & Group Discussion

Textbooks:

1. Strengthen your Communication Skills - Maruthi Publication, Hyderabad 2013
2. A textbook of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)

References:

1. INFOTECH English (Maruthi Publications).
2. Personality Development and Soft Skills (Oxford University Press, New Delhi)
3. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation
4. Speaking English Effectively 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
5. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
6. Hancock, M. 2009. English Pronunciation in Use. Intermediate. Cambridge: CUP
7. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad
8. Hewings, M. 2009. English Pronunciation in Use. Advanced. Cambridge: CUP
9. Marks, J. 2009. English Pronunciation in Use. Elementary. Cambridge: CUP
10. Nambiar, K.C. 2011. Speaking Accurately. A Course in International Communication. New Delhi : Foundation
11. Soundararaj, Francis. 2012. Basics of Communication in English. New Delhi: Macmillan
12. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
13. English Pronouncing Dictionary Daniel Jones Current Edition with CD.

Web Resources:

1. http://www.cambridge.org
2. http://www.edufind.com/english/practice
3. http://www.learnenglish.com
4. http://www.penguin.co.uk

B.Tech. I Year I Semester **Course Structure**

L	T	P	C
0	0	3	1.5

APPLIED PHYSICS LAB

(Common to ECE, CSIT, IT, CSE (IOT&CSBT) & AIML branches)

Internal Marks: 15

Course code: P21BSL01 **External Marks: 35**

Course Prerequisites: The basics of analytical and conceptual understanding of physics.

Course Objective:

1. Deploy scientific method of experiments in the laboratory.
2. Develop the procedures and observational skills for appropriate use of simple and complex apparatus.
3. Enable analytical techniques, statistical analysis and graphical analysis.
4. Reinforce ideas and concepts covered in lecture host of experiments.
5. Train to find the radius of curvature of a Plano-convex lens forming Newton's rings.

Course Outcomes:

1. Apply the phenomenon of interference and diffraction of light waves.
2. Implement the concept of resonance in LCR circuit and sonometer.
3. Analyze the SHM to determine its dependent properties.
4. Evaluate the behavior of electronic components and its characteristics.

List of Experiments

(Any eight of the following to be done)

1. Determination of Radius of Curvature of Plano-Convex lens by forming Newton's Rings.
2. Determination of Wavelengths of various spectral lines using diffraction grating with the normal incidence method.

3. Study of magnetic field along the axis of a current carrying coil and to verify Stewart-Gee's method.
4. Determination of energy gap of PN junction Diode.
5. Determination of hall coefficient and carrier concentration using Hall effect
6. Study of V-I characteristics of Zener diode.
7. Determination of frequency of a vibrating bar or electrical tuning fork using Melde's apparatus.
8. Determination of acceleration due to gravity using compound pendulum
9. Verification of laws of transverse waves by Sonometer.
10. Determination of Velocity of sound by volume resonator.
11. Determination of rigidity modulus by Torsional Pendulum.

TEXT BOOKS:

1. Physics lab manual, department of physics, PACE Institute of Technology and Sciences.
2. Madhusudhanrao, "Engineering Physics lab manual" Ist edition, Scietech Publication, 2015.

B.Tech. I Year I & I Semesters **Course Structure**

L	T	P	C
0	0	2	0

APPLIED/ENGINEERING PHYSICS - VIRTUAL LABS – ASSIGNMENTS

Objective: *Training Engineering students to prepare a technical document and improving their writing skills.*

LIST OF EXPERIMENTS

1. Hall effect
2. Crystal structure
3. Hysteresis
4. Brewster's angle
5. Numerical aperture of optical fiber
6. Photoelectric effect
7. Simple Harmonic Motion
8. LASER – Beam Divergence and Spot size
9. B-H curve
10. Michelson's interferometer
11. Black body radiation

URL: ***www.vlab.co.in***

Outcome: *Physics Virtual laboratory curriculum in the form of assignment ensures an engineering graduate to prepare a /technical/mini-project/ experimental report with scientific temper.*

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B.Tech. I Year I Semester **Course Structure**

L	T	P	C
0	0	3	1.5

C - Programming for Problem Solving Lab

(Common for EEE, ME, ECE, CSE, CSIT, IT, CSE (IOT&CSBT), AIDS & AIML branches**)**

Course Code: P21ESL02 **Internal Marks: 15**

External Marks: 35

Course Prerequisite: Nil

Course Objectives:

1. To understand the various steps in program development.
2. To understand the basic concepts in C Programming Language.
3. To understand different modules that includes conditional and looping expressions.
4. To understand how to write modular and readable C Programs.
5. To write programs in C to solve problems using arrays, structures and files.

EXPERIMENT WISE PROGRAMS

Experiment-1

a) Write a simple C program to Print "Hello World"
b) Write a simple C Program to Calculate Area and Circumference of Circle
c) Write a simple C program to implement basic arithmetic operations - sum, difference, product, quotient and remainder of given numbers.

Experiment-2

Write C programs to demonstrate the following operators

a) Assignment Operator.
b) Relational and Logical Operator.
c) Increment and decrement operator.
d) Bitwise operators.
e) Ternary operator.

Experiment-3

a) Write a C programs - to find the largest and smallest of 2 numbers(if – else), to find the largest and smallest of 3 numbers(Nested if – else), roots of quadratic equation(else – if ladder).

b) The total distance travelled by vehicle in‘t’ seconds is given by distance=ut+1/2at2 where ‘u’ and ‘a’ are the initial velocity and acceleration.
Write a c program to find the distance travelled at regular intervals of time given the Values of ’u’ and ‘a’. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of ‘u’ and ‘a’.

c) Write a c program, which takes two integer operands and one operator from the user, performs the operation and the prints the result. (consider the operators +,-,*,/,% and use switch statement).

Experiment-4

a) Write a C program to find the sum of individual digits of a positive integer
b) A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1.Subsequent terms are found by adding the preceding two terms in the sequence .Write a c program to generate the first n terms of the sequence.
c) Write a c program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Experiment-5

a) Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:
$1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$.
b) Write a C program to generate Pascal's triangle.
c) Write a C program to construct a pyramid of numbers

Experiment-6

a) Write a c program to find both the largest and smallest number in a list of integers.
b) Write a c program that uses functions to perform the following:
    i) Addition of Two Matrices.
    ii) Multiplication of Two Matrices.

Experiment-7

a) Write a programs that use both recursive and non-recursive functions
b) To find the factorial of a given integer.
c) To find the GCD of two given integers.

Experiment-8

a) Write a c program that uses functions to perform the following operations:
    i) To insert a sub-string in given main string from a given position.
    ii) To delete n Characters from a given position in a given string.
b) Write a C program to determine if the given string is a palindrome or not.

Experiment-9

a) Write a C program that displays the position or index in the string S Where the string T begins, or - 1 if S doesn't contain T.
b) Write a C program to count the lines, words and characters in a given text .

Experiment-10

a) Write a program to print the details of a student like(Name, Rollno, marks) using nested structures.
b) Write a C Program to Calculate Difference Between Two Time Period.

Experiment-11

a) Write a C program that uses functions to perform the following operations:
   i) Reading a complex number
   ii) Writing a complex number
   iii) Addition of two complex numbers
   iv) Multiplication of two complex numbers
   (Note: represent complex number using a structure.)

Experiment-12

a) Write a C program which copies one file to another and display the contents of a file
b) Write a C program to reverse the first n characters in a file.
c) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)

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PACE R-21 UNDER GRADUATE (B.Tech) COURSE STRUCTURE

Department : **CSIT** **Sem:- II**

S.No	Category	Course Code	Course Title	L	T	P	C	Marks
1	Basic Science Course	P21BST02	Applied Physics	3	0	0	3	100
2	Basic Science Course	P21BST06	Numerical Methods & Vector calculus	3	0	0	3	100
3	Engineering Science Courses	P21EST10	Digital Electronics	3	0	0	3	100
4	Engineering Science Courses	P21EST11	Data Structures	3	0	0	3	100
5	Engineering Science Courses	P21EST13	Python Programming	3	0	0	3	100
6	Basic Science Course Lab	P21BSL01	Applied Physics Lab	0	0	3	1.5	50
7	Engineering Science Courses Lab	P21ESL06	Data Structures Lab	0	0	3	1.5	50
8	Engineering Science Courses Lab	P21ESL07	Python Programming Lab	0	0	3	1.5	50
TOTAL							**19.5**	650

S.No	Category	Credits as per APSCHE	Alloted Credits	Deviation in Credits
1	Basic Science Course	7.5	7.5	0
2	Engineering Science Courses	12	12	0
TOTAL CREDITS		19.5	19.5	0

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B.Tech. I Year - II Semester

Course structure

L	T	P	C
3	0	0	3

APPLIED PHYSICS

(Common to EEE, CSE and AIDS branches)

Internal Marks: 30

Course code: P21BST02 **External Marks: 70**

Course Prerequisites: The basics of analytical and conceptual understanding of physics.

Course Objectives

1. To study the wave nature of light through Interference and diffraction.
2. To learn the basic principles of Lasers and fiber optics.
3. To express the physics of electrostatics and electromagnetic wave concepts through Maxwell's equations.
4. To study the basic concepts of Quantum mechanics.
5. Aware of limits of classical free electron theory and apply band theory of solids.
6. Acquire the knowledge of semiconductor physics.

Course Outcomes

1. Understanding the basic concepts of optics and how to apply them for engineering applications.
2. Acquire the knowledge of fundamentals of Lasers and fiber optics enables the students to develop Laser devices to apply them in various systems like communications, Industries and medicine.
3. Set students to be exposed to Electrostatics, Maxwell's equations, electromagnetic waves and fundamental concepts of quantum mechanics.
4. Enable to learn the fundamental concepts of free electron theory and band theory of solids.

5. Develop knowledge of band theory of solids for fundamentals of Semiconductor physics enables the students to apply the knowledge to various systems like communications, solar cell, photo cells and so on.

UNIT-I WAVE OPTICS (9 Lectures)

Interference: Introduction, Principle of Superposition of waves, colors in thin films, interference in thin films, Newton's rings: Determination of wavelength and refractive index.

Diffraction: Introduction, differences between interference and diffraction, difference between Fraunhofer and Fresnel's diffraction, Fraunhofer diffraction at single slit, Fraunhofer diffraction due to double slit, Diffraction grating (N-slits qualitative), resolving power of grating.

UNIT-II LASERS AND FIBER OPTICS (9 Lectures)

Lasers: Introduction, Characteristics of laser, absorption, spontaneous emission, stimulated emission, Einstein's coefficients, population inversion, pumping, pumping mechanisms, Types of Lasers: Ruby laser, He-Ne laser, diode laser, Applications of Lasers.

Fiber optics: Introduction, Total internal reflection-wave propagation in optical fiber, Acceptance angle, numerical aperture, applications of optical fiber.

UNIT-II ELECTROSTATICS, MAXWELL'S EQUATIONS AND ELECTRO-MAGNETIC WAVES (9 Lectures)

Electrostatics: Coulombs law, electric field, electric field intensity, electric flux density, electrostatic potential, divergence of electric field, Laplace's and Poisson's equations for electrostatic potential, Gauss theorem in electrostatics.

Maxwell's equations and electromagnetic waves: Gauss theorem in magneto statics, Faraday's law of electromagnetic induction, Ampere's law, displacement current, Maxwell's equations in vacuum, electromagnetic wave equation in dielectric medium, velocity of propagation of electromagnetic wave, poynting vector and poynting theorem.

UNIT- IV QUANTUM MECHANICS, FREE ELECTRON THEORY AND BAND THEORY (10 Lectures)

Quantum Mechanics: Introduction to quantum physics, de-Broglie's hypothesis and properties of matter waves, Schrodinger's time independent wave equation, Schrodinger's time dependent wave equation, Particle in one dimensional box.

Free electron theory: classical free electron theory of metals- assumptions and failures, quantum free electron theory of metals-assumptions and failures, Fermi Dirac distribution function- Fermi level, Femi energy, density of states.

Band theory of solids: Introduction, Bloch's theorem, Kronig penny model (qualitative), E-K diagram, Brillouin's zones, classification of solids into metals, semiconductors and insulators, effective mass of electron and concept of hole.

UNIT-V SEMICONDUCTOR PHYSICS (8 Lectures)

Semiconductor physics: Introduction**,** intrinsic and extrinsic semiconductors, carrier concentration in intrinsic semiconductors, electrical conductivity of intrinsic semiconductor, Fermi energy, carrier concentration in N-type and P-type semiconductors, dependence of Fermi energy on carrier-concentration and temperature, drift and diffusion, Hall effect and its applications, mechanism in LED, solar cell and photo conductor.

TEXT BOOKS:

1. A Textbook of Engineering Physics by Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - S. Chand.
2. Optics by Ajoy Ghatak, Tata McGraw-Hill Publishing company limited
3. Introduction to Electrodynamics by David Griffiths, Cambridge University Press
4. Introduction to Quantum physics by Eisberg and Resnick.

REFERENCES:

1. Applied physics by Palanisamy (Scitech publications)
2. Optics by Eugene Hecht, Pearson Education.
3. Principle of Lasers by O. Svelto
4. Electricity, magnetism and light by W. Saslow
5. Semiconductor Optoelectronics by J. Singh, Physics and Technology, Mc Graw-Hill inc
6. Engineering Physics by B.K. Pandey, S. Chaturvedi - Cengage Learing.

WEB REFERENCES:

1. https://nptel.ac.in/courses/115/106/115106066/
2. https://ocw.mit.edu/high-school/physics/exam-prep/electromagnetism/maxwells-equations/#1
3. https://ocw.mit.edu/courses/materials-science-and-engineering/3-091sc-introduction-to-solid-state-chemistry-fall-2010/electronic-materials/14-semiconductors/

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B. Tech. I Year - II Semester **Course structure**

L	T	P	C
3	0	0	3

NUMERICAL METHODS & VECTOR CALCULUS

(Common to All Branches)

Internal Marks: 30

Course code: P21BST06 **External marks: 70**

Course Pre-Requisites:

1) Differentiation
2) Partial differentiation
3) Integration
4) Differential Equations

Course Objectives: To learn

1. The different numerical techniques to solve algebraic and transcendental equations and evaluate the polynomials from the numerical data.

2. The approximate solutions using numerical methods in the absence of analytical solutions of various systems of ordinary differential equations and integrations.

3. Enhance the knowledge level to visualize integrals in higher dimensional coordinate systems, possible representation and evaluation of geometrical and physical quantities in terms of multiple integrals.

4. Interpret concepts of vector functions, vector fields, differential calculus of vector functions in Cartesian coordinates and apply them for various engineering problems.

5. Evaluate line, surface and volume integrals and construct relation between line, surface and volume integrals using vector integral theorems.

Course Outcomes: The student will be able to

1. Evaluate approximate roots of the polynomial and transcendental equations by different algorithms and apply Newton's forward, backward interpolation and Lagrange's formulae for equal and unequal intervals.

2. Apply different algorithms for approximating the integrals of numerical data and solutions of ordinary differential equations to its analytical computations.

3. Evaluate the multiple integrals by using change of variables and change of order of integration. Also apply double and triple integration techniques in evaluating areas and volumes bounded by regions and solids.

4. Interpret the physical meaning of different operators such as gradient, curl and divergence.

5. Determine line, surface and volume integrals. Apply Green's, Stoke's and Gauss divergence theorems to calculate line, surface and volume integrals.

UNIT – I: Iterative Methods, Finite differences and Interpolation (10 **Lectures**)

Introduction-Solution of algebraic and transcendental equations-Bisection method -Method of false position-Newton-Raphson method (Single variable only)

Interpolation: Introduction-Errors in polynomial interpolation-Finite differences – Forward differences-Backward differences-Relations between operators-Newton's forward and backward formulae for interpolation -Interpolation with unequal intervals -Lagrange's interpolation formula.

UNIT – II: Numerical integration, Solution of ordinary differential equations with initial conditions: (9 **Lectures**)

Trapezoidal rule – Simpson's 1/3rd and 3/8th rule– Solution of ordinary differential equations by Taylor's series – Picard's method of successive approximations – Euler's method – Modified Euler's method-Runge-Kutta method (second and fourth order).

UNIT – III: Multiple Integrals: (9 **Lectures**)

Double integrals (Cartesian and Polar) – Change of order of integration – Change of variables (Cartesian to Polar coordinates) –Triple integrals- Change of variables (Cartesian to Cylindrical and Spherical coordinates).

Applications: Areas by double integrals and Volumes by triple integrals.

UNIT IV: Vector Differentiation: (8 **Lectures**)

Scalar and Vector point functions-Vector Differential operator- Gradient – Directional derivatives – Divergence – Curl – Laplacian second order operator- Vector identities- Applications: Scalar Potential function.

UNIT V: Vector Integration: (9 **Lectures**)

Line integral – Work done – Circulation- Surface integral- Volume integral

Vector Integral Theorems (without proof): Application of Green's theorem in a plane- Stoke's theorem- Gauss Divergence theorem.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, 44th Edition, Khanna Publishers.
2. B.V. Ramana, Higher Engineering Mathematics, 2007 Edition, Tata Mc. Graw Hill Education.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India.
2. H. K. Das, Advanced Engineering Mathematics, 22ndEdition,S. Chand & Company Ltd.
3. David Poole, Linear Algebra- A modern introduction, 4th edition, Cengage.
4. Peter O' Neil, Advanced Engineering Mathematics, Cengage
5. Srimantha Pal, S C Bhunia, Engineering Mathematics, Oxford University Press.

Web Resources:

1. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
2. http://mathworld.wolfram.com/topics
3. http://www.nptel.ac.in/course.php

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B. Tech I Year II Semester

Course Structure

L	T	P	C
3	0	0	3

DIGITAL ELECTRONICS

(Common to CSE, CSIT, IT, CSE (IOT & CSBT), AIDS, AIML)

Internal Marks: 30

Course Code: P21EST12 **External Marks: 70**

Course Prerequisite: NIL

Course Objective:

1. Relate the conversion among different number systems.
2. Outline of basic logic gates -- AND, OR & NOT, XOR, XNOR and understand Boolean algebra and basic properties of Boolean algebra.
3. Able to optimize simplelogic using Karnaugh maps, understand "don't care" concepts.
4. Design simple combinational using basic gates.
5. Understand different memories and able to design different programmable devices.

Course Outcome:

1. Demonstrate the various number systems and conversion of number systems.
2. Develop Boolean algebra & the underlying features ofvarious logic gates.
3. Conceptualize Design mapping method upto 4-variables.
4. Apply the concepts of Boolean algebra for the analysis & design of various combination logic circuits.
5. Able to compare different memories and their programmable devices.

UNIT- I: **(9 Lectures)**

Number Systems and Binary Codes : Number System, Types of Number Systems, Number base Conversions from one radix to another radix, Representation of Signed Binary Numbers,1's complement arithmetic, 2's complement arithmetic. Gray code, Excess-3 code, BCD code. Conversions.

UNIT -II: **(9 Lectures)**

Boolean algebra : Logic gates, Laws of Boolean algebra, Principle of Duality, Principle of Complements, Reducing Boolean Expressions using Boolean algebra, Canonical and Standard Forms, M- Notations: Minterms and Maxterms.

UNIT- III: **(9 Lectures)**

Gate level Minimization : Map Method, Two-Variable K-Map, Three-Variable K-Map, Four Variable K-Maps: Sum of Products Simplification, Products of Sum Simplification, Don't – Care Conditions. Implementation using NAND and NOR.

UNIT- IV: **(9 Lectures)**

Combinational Logic Design: Introduction, Design Procedure, Adders, Subtractors, Binary Adder–Subtractor, Decoders, Encoders, Multiplexers and Demultiplexers.

UNIT- V: **(9 Lectures)**

Programmable Logic Devices: Classification of memories, PROM,PAL,PLA – basic Structures, Realization of Boolean function with PLDs , Comparison of PROM, PAL, PLA.

TEXT BOOKS:

1. Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA, 2011.
2. Fundamentals of Logic Design, 5/e, Roth, Cengage, 2010.
3. A.K.Singh,Digital Logic Circuits, New Age International Publishers.

REFERENCE BOOKS:

1. Switching Theory and Logic Design, A.Anand Kumar, 2016.
2. Digital Electronics and Logic Design, Dr. Sanjay Sharma, 2010.
3. Modern Digital Electronics, R.P. Jain, TMH, 2010.

WEB REFERENCES:

1. www.researchgate.net
2. www.digital-logic-design.en.softonic.com
3. https://nptel.ac.in/courses/117/106/117106086/
4. https://www.coursera.org/learn/digital-systems

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B.Tech I Year II Semester

Course Structure

L	T	P	C
3	0	0	3

DATA STRUCTURES
(Common to EEE, ECE, CSE, CSIT.IT, CSE (IOT&CSBT), AIDS, AIML)

Internal Marks: 30

Course Code: P21EST13 **External Marks: 70**

Course Prerequisite: C Programming

Course Objectives:

1. Comprehensive knowledge of data structures and ability to implement the same in software applications.
2. Exposure to algorithmic complexities, recursive algorithms, searching techniques.
3. Exposure to sorting technique, Applying stack techniques for logical operations.
4. Applying queue techniques for logical operations, Exposure to list representation models in various types of applications.
5. Implementation of tree in various forms, Advanced understanding of other variants of trees and their operations.
6. Orientation on graphs, representation of graphs, graph traversals, spanning trees Graphs.

Course Outcomes:

1. Student will be able to choose appropriate data structure as applied to specified problem definition.
2. Implement appropriate sorting/searching technique for given problem
3. Implement operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures.
4. Students will be able to implement Linear and Non-Linear data structures

UNIT-I: (9 Lectures)

Data Structure, Recursion & **Searching:** Preliminaries of algorithm, Algorithm analysis and complexity. **Data Structure:** Definition, types of data structures.

Recursion: Definition, Design Methodology and Implementation of recursive algorithms, Types of recursion (Linear, binary and Tail), recursive algorithms for factorial function, GCD Computation, Fibonacci sequence.

Searching: List Searches using Linear Search, Binary Search.

UNIT-II: (10 Lectures)

Sorting Techniques: Basic Concepts, Sorting by: Insertion (Insertion Sort), Selection (heap sort), Exchange(Bubble sort, Quick Sort) Merging(Merge sort) Algorithms.

Stacks: Basic Stack operations, Representation of a stack using arrays, Stack Applications: Reversing list, Infix to postfix transformation.

UNIT-III: (10 Lectures)

Queues: Introduction, Representation of a Queue using arrays, Queue Operations, Applications of queues- Round Robin Algorithm, Circular Queues, Priority Queues.

Linked List: Introduction, single linked list, representation of a linked list in memory, Operations on a single linked list, Reversing a single linked list, Applications: single linked list to represent polynomial expressions, Double linked list. , Circular linked list

UNIT-IV: (9 Lectures)

Trees: Basic tree concepts, Binary Trees: Properties, Representation of Binary Trees using arrays, operations on a Binary tree, Binary Tree Traversals (recursive).

Advanced Tree Concepts: Binary search tree, Basic concepts, BST operations: Searching, insertion, deletion, Balanced search trees-AVL Trees.

UNIT-V: (7 Lectures)

Graphs: Basic concepts, Graph Representations- Adjacency matrix, Adjacency lists, Graph algorithms: Graph Traversals (BFS & DFS), applications: Dijkstra's shortest path, Minimum Spanning Tree using Prim's & Kruskal's Algorithm.

Text Books:

1. Data Structures, 2/e, Richard F, Gilberg , Forouzan, Cengage,2007.
2. Data Structures and Algorithms, G.A.V.Pai, TMH, 2008
3. Data Structures and Algorithms Made Easy, Narasimha Karumanchi , Second Edition, 2011.

Reference Books:

1. Data Structure with C, Seymour Lipschutz, TMH,2010.
2. Classic Data Structures, 2/e, Debasis ,Samanta,PHI,2009
3. Fundamentals of Data Structure in C, 2/e, Horowitz, Sahni, Anderson Freed, University Press.

Web References:

1. www.geeksforgeeks.org
2. www.hackr.io.
3. www.letsfindcourse.com

B.Tech I Year - II Semester

Course structure

L	T	P	C
3	0	0	3

PYTHON PROGRAMMING

(Common to MECH, CSE, CSIT, IT, CSE (IOT&CSBT), AI&DS, AI&ML Branches)

Internal Marks: 30

Course Code: P21EST14 **External Marks: 70**

Course Prerequisite: **Nil**

Course Objectives:

1. To read and write simple Python programs.
2. To develop Python programs with conditionals and loops.
3. To define Python functions and apply OOP concept.
4. To use Python data structures –- lists, tuples, dictionaries.
5. To develop GUI applications in Python.

Course Outcomes:

At the end of this course, the students will be able to

1. Understand the basics of python programming.
2. Understand control flow and implement various data structures provided by python.
3. Implement packages, methods and functions.
4. Develop real-world applications using oops and exception handling.
5. Build GUI Applications in Python.

UNIT-I (8 Lectures)

Introduction: History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

UNIT-II (9 Lectures)

Types, Operators and Expressions: Types - Integers, Strings, Booleans, Expressions and order of evaluations, Control Flow- if, if-elif-else, for, while, break, continue, pass.

Data Structures Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences, Comprehensions.

UNIT III (10 Lectures)

Functions - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions (Function Returning Values), Scope of the Variables in a Function - Global and Local Variables.

Modules: Creating modules, import statement, from. Import statement, name spacing,

Python packages: Introduction to PIP, Installing Packages via PIP, Using Python Packages

UNIT IV (9 Lectures)

Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, Data hiding.

Error and Exceptions: Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions.

UNIT V (9 Lectures)

Brief Tour of the Standard Library & Files - Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics, file operations.

Text Books

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

Reference Books

1. John V Guttag, "Introduction to Computation and Programming Using Python'', Revised and expanded Edition, MIT Press , 2013
2. Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012.
3. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
4. Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem Solving Focus, Wiley India Edition, 2013.

Web References:

1. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/
2. https://www.codecademy.com/learn/learn-python
3. https://www.codementor.io/collections/learn-python-bwbc63ulz
4. http://www.diveintopython3.net/
5. https://www.python.org/3/
6. https://www.learnpython.org

B.Tech I Year- II Semester

Course Structure

L	T	P	C
0	0	3	1.5

APPLIED PHYSICS LAB

(Common to EEE, CSE and AIDS branches)

Internal Marks: 15

Course code: P21BSL01 **External Marks: 35**

Course Prerequisites: The basics of analytical and conceptual understanding of physics.

Course Objective:

1. Deploy scientific method of experiments in the laboratory.
2. Develop the procedures and observational skills for appropriate use of simple and complex apparatus.
3. Enable analytical techniques, statistical analysis and graphical analysis.
4. Reinforce ideas and concepts covered in lecture host of experiments.
5. Train to find the radius of curvature of a Plano-convex lens forming Newton's rings.

Course Outcomes:

1. Apply the phenomenon of interference and diffraction of light waves.
2. Implement the concept of resonance in LCR circuit and sonometer.
3. Analyze the SHM to determine its dependent properties.
4. Evaluate the behavior of electronic components and its characteristics.

List of Experiments

(Any eight of the following to be done)

1. Determination of Radius of Curvature of Plano-Convex lens by forming Newton's Rings.
2. Determination of Wavelengths of various spectral lines using diffraction grating with the normal incidence method.

3. Study of magnetic field along the axis of a current carrying coil and to verify Stewart-Gee's method.
4. Determination of energy gap of PN junction Diode.
5. Determination of hall coefficient and carrier concentration using Hall effect
6. Study of V-I characteristics of Zener diode.
7. Determination of frequency of a vibrating bar or electrical tuning fork using Melde's apparatus.
8. Determination of acceleration due to gravity using compound pendulum
9. Verification of laws of transverse waves by Sonometer.
10. Determination of Velocity of sound by volume resonator.
11. Determination of rigidity modulus by Torsional Pendulum.

TEXT BOOKS:

1. Physics lab manual, department of physics, PACE Institute of Technology and Sciences.
2. Madhusudhanrao, "Engineering Physics lab manual" Ist edition, Scietech Publication, 2015.

B.Tech I Year - II Semesters **Course Structure**

L	T	P	C
0	0	2	0

APPLIED/ENGINEERING PHYSICS - VIRTUAL LABS – ASSIGNMENTS

Objective: *Training Engineering students to prepare a technical document and improving their writing skills.*

LIST OF EXPERIMENTS

1. Hall effect
2. Crystal structure
3. Hysteresis
4. Brewster's angle
5. Numerical aperture of optical fiber
6. Photoelectric effect
7. Simple Harmonic Motion
8. LASER – Beam Divergence and Spot size
9. B-H curve
10. Michelson's interferometer
11. Black body radiation

URL: ***www.vlab.co.in***

Outcome: *Physics Virtual laboratory curriculum in the form of assignment ensures an engineering graduate to prepare a /technical/mini-project/ experimental report with scientific temper.*

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B.Tech I Year- II Semester

Course Structure

L	T	P	C
0	0	3	1.5

DATA STRUCTURES LAB
(Common to EEE, ECE, CSE, CSIT.IT, CSE (IOT&CSBT), AIDS, AIML)

Internal Marks: 15

Course Code: P21ESL06 **External Marks: 35**

Course Prerequisites: C- Programming

Course Objectives:

1. To choose the appropriate data structure and algorithm design method for a specified application.
2. To solve problems using data structures such as linear lists, stacks, queues, hash tables, binary trees, heaps binary search trees, and graphs and writing programs for these solutions.

Course Outcomes:

1. Analyze worst-case running times of algorithms using asymptotic analysis and implement various data structures like linked lists.
2. Understand and implement stacks and queues using arrays and linked lists.
3. Analyze and implement various searching and sorting algorithms.
4. Design and implement appropriate hash function and collision-resolution algorithms

Exercise 1:

Write recursive program for the following

a) Write recursive C program for calculation of Factorial of an integer

b) Write recursive C program for calculation of GCD (n, m)

c) Write recursive program which computes the n^{th} Fibonacci number

Exercise 2:

a) Write recursive C program for functions to perform Linear search for a Key value in a given list.

b) Write recursive C program for functions to perform Binary search for a Key value in a given list.

Exercise 3:

a) Write C program that implement Bubble sort, to sort a given list of integers in ascending order.

b) Write C program that implement Quick sort, to sort a given list of integers in ascending order

Exercise 4:

a) Write C program that implement Insertion sort, to sort a given list of integers in ascending order

b) Write C program that implement merge sort, to sort a given list of integers in ascending order

Exercise 5:

a) Write C program that implement stack (its operations) using arrays

b) Write C program that implement stack (its operations) using Linked list

Exercise 6:

a) Write a C program that uses Stack operations to Convert infix expression into postfix expression

b) Write C program that implement Queue (its operations) using arrays.

c) Write C program that implement Queue (its operations) using linked lists

Exercise 7:

a) Write a C program that uses functions to create a singly linked list

b) Write a C program that uses functions to perform insertion operation on a singly linked list

c) Write a C program that uses functions to perform deletion operation on a singly linked list.

Exercise 8:

a) Write a C program to Create a Binary Tree of integers

b) Write a recursive C program for Traversing a binary tree in preorder, inorder and postorder.

Exercise 9:

Write a C program for BST operations (insertion, deletion)

Exercise 10:

a) Write a C program for finding minimum spanning tree in a graph by using Prim's algorithm.

b) Write a C program for finding minimum spanning tree in a graph by using Kruskal's algorithm.

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B.Tech I Year - II Semester

Course Structure

L	T	P	C
0	0	3	1.5

PYTHON PROGRAMMING LAB

(Common to MECH, CSE, CSIT, IT, CSE (IOT&CSBT), AI&DS, AI&ML Branches)

Internal Marks: 15

Course Code: P21ESL07 **External Marks: 35**

Course Outcomes:

1. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python.
2. Express different Decision Making statements and Functions.
3. Interpret Object oriented programming in Python.
4. Understand File handling operations.
5. Design GUI Applications.

Exercise1 - Basics

a) Running instructions in Interactive interpreter and a Python Script
b) Write a program to purpose fully raise Indentation Error and Correct it

Exercise 2 - Operations

a) Write a program to compute distance between two points taking input from the user (Pythagorean Theorem).
b) Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

Exercise 3 – Control Flow

a) Write a Program for checking whether the given number is a even number or not.
b) Using a for loop, write a program that prints out the decimal equivalents of 1/2,1/3,1/4,...,1/10.
c) Write a program using a for loop that loops over a sequence. What is sequence?
d) Write a program using a while loop that asks the user for a number, and prints a count down from that number to zero.

Exercise 4 – Control Flow-Continued

a) Find the sum of all the primes below two million. Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be:

    1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...

b) By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

Exercise 5 - DS

a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure.

b) Write a program to use split and join methods in the string and trace a birth day with a dictionary data structure.

Exercise 6- DS-Continued

a) Write a program combine_lists that combines these lists into a dictionary.

b) Write a program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file?

Exercise 7 - Files

a) Write a program to print each line of a file in reverse order.

b) Write a program to compute the number of characters, words and lines in a file.

Exercise 8 - Functions

a) Write a function dups to find all duplicates in the list.

b) Write a function unique to find all the unique elements of a list.

Exercise 9 - Functions –Problem Solving

a) Write a function cumulative_product to compute cumulative product of a list of numbers.

b) Write a function reverse to reverse a list. Without using the reverse function.

c) Write function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

Exercise 10 – Multi - D Lists

a) Write a program to perform addition of two square matrices.

b) Write a program to perform multiplication of two square matrices.

Exercise 11 - OOP

Class variables and instance variable and illustration of the self variable

i)Robot.

ii)ATM Machine.

Exercise - 12 GUI, Graphics

a) Write a GUI for an Expression Calculator using tk.

b) Write a program to implement the following figures using turtle