MALLA REDDY UNIVERSITY
Common to CSE (AI&ML) / CSE(DS) / CSE(CS)
COURSE STRUCTURE

I Year B. Tech – I Semester

S No	Subject Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	MR20-1HS0101	English	2	0	0	2	40	60
2	MR20-1BS0101	Mathematics – I	3	1	0	4	40	60
3	MR20-1BS0121	Applied Physics	3	0	0	3	40	60
4	MR20-1ES0102	Programming for Problem Solving	3	0	0	3	40	60
5	MR20-1ES0104	Computer Aided Engineering Graphics	2	0	2	3	40	60
6	MR20-1ES0132	Programming for Problem Solving Lab	-	0	3	1.5	40	60
7	MR20-1ES0134	Engineering and IT Workshop	-	0	2	1	40	60
8	MR20-1BS0131	Applied Physics Lab	-	0	3	1.5	40	60
9	MR20-1HS0133	Human Values and Professional Ethics	1	1	0	1	40	60
		TOTAL	**14**	**2**	**10**	**20**	**360**	**540**

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L/T/P/C
2/-/-/2

MR20-1HS0101

ENGLISH

INTRODUCTION

The syllabus focuses on the communication skills through the selected excerpts' support as resources for the students to develop the appropriate skills. The lessons stimulate discussions, debates and help in comprehending the content effectively. The main objective is on language skills enhancement through nurturing ideas and implementing them.

COURSE OBJECTIVES:

Students will be able:
1. To enhance their lexical and grammatical skills.
2. To develop reading competencies for academic and competitive requirements.
3. To write effectively to meet professional needs.
4. To hone the speaking proficiency and effective listening skills.
5. To improve character traits and interpersonal skills.

UNIT-1:Poem: Weare Indians firstby Dr.Prashanth Bhatt

Reading – Reading and its importance, techniques of effective reading.

Writing - Phrases, clauses and sentences & Paragraph Writing

Expansion of Proverbs "Action speaks louder than words"

Speaking – Role plays and Informal Conversations.

Grammar – Parts of Speech, Parsing. Vocabulary – Word formation: Affixations and Root words.

UNIT-2: TheCutoff byChetanBhagat

Reading – Techniques for effective comprehension(Comprehension Practice Tests).
Writing – Techniques for writing precisely and Punctuations
Speaking - Small Talk and Extempore speaking.
Grammar – Question tags and Subject-verb agreement.
Vocabulary – Homophones, Homographs, Homonyms and Loan Words.

UNIT-3: SatyaNadella'sEmailtoEmployeesonFirstDayasCEO

Reading – Skimming and scanning (Comprehension Practice Tests).
Writing - Formal, Informal Letters and E-mails.
Speaking – Group Discussions.
Grammar – Modals and Tenses.
Vocabulary - Synonyms, Antonyms &Phrasal verbs.

UNIT-4:RhetoricalSpeeches intheplayJuliusCaesar

Reading - Intensive and extensive reading (Comprehension Practice Tests).

Writing – Note making, Note Taking.

Speaking - Presentations &Public Speaking.

Grammar – Active and passive voice.

Vocabulary - One-word substitutes.

UNIT-5: Soft Skills-Adaptability, First things first, Goal Setting & Career Planning.

Reading – Reading Comprehension passages.

Writing – Essay Writing

Speaking - Debates.

Grammar – Conditional sentences.

Vocabulary – Technical vocabulary.

REFERENCE BOOKS

1. *Practical English Usage* by Michael Swan.OUP.1995.
2. *On Writing Well* by William Zinsser, Harper Resource Book. 2001.
3. *Communication Skills* by Sanjay Kumar and PushpaLata. Oxford University Press.2011.
4. *Technical Communication* by Meenakshi Raman, Sangeeta Sharma. Oxford University Press. 2016.
5. *Cornerstone Developing Soft Skills* by Robert M. Sherfield. Pearson India. Fourth edition.2011.
6. *Cambridge Advanced Learner's Dictionary* by Cambridge Publication. Fourth edition. 2013.
7. *Exercises in Spoken English*. Parts. I-III.CIEFL, Hyderabad. Oxford University Press.

COURSE OUTCOMES:

Students will have attained to:

1. Construct grammatically correct sentences with appropriate vocabulary.
2. Speak fluently and accurately in formal and informal situations.
3. Analyze, interpret and synthesize a diverse range of concepts through better comprehension of the text.
4. Make effective presentations.
5. Adhere to ethical norms of scientific communication through soft skills

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MR20-1BS0101

L/T/P/C
3/1/-/4

MATHEMATICS –I

COURSE OBJECTIVES:
1. The concept of a Rank of the matrix and applying the concept to know the consistency and solving the system of linear equations.
2. The concept of Eigen values, Eigen vectors and Diagonalization.
3. The maxima and minima of functions of single and several variables.
4. The Applications of first order ordinary differential equations and methods to solve higher order differential equations.

UNIT–I: Matrix Theory

Introduction, Rank of a Matrix – Echelon form, Normal form, Consistency of system of Linear equations (Homogeneous and Non–Homogeneous), Gauss Elimination, Linear dependence and independence of vectors, Eigen values and Eigen vectors and their properties (without proof), Cayley-Hamilton theorem (without proof), Diagonalization of a matrix.

UNIT–II: Differential Calculus–I

Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem, Taylor's theorem with remainders, Taylor's and Maclaurin's expansions.

UNIT–III: Differential Calculus–II

Functions of several variables, Partial differentiation, Total differentiation, Change of variables – Jacobian's, Functional dependence and independence, Maxima and Minima of functions of several variables (2 and 3 variables) - Lagrange's method of multipliers, Taylors theorem for two variables.

UNIT–IV: First Order Ordinary Differential Equations

Geometric interpretation of solutions of first order ODE $y' = f(x, y)$, Exact differential equations, Integrating factors, Linear and Bernoulli's equations, Applications– Orthogonal trajectories, Newton's Law of cooling, law of natural growth/decay.

UNIT–V: Higher Order Ordinary Differential Equations

Higher order linear differential equations with constant coefficients - Homogeneous and Non-homogeneous term of the type e^{ax}, $\sin ax$, $\cos ax$, x^k, $e^{ax}V$ and $x^k V$, Equations with Variable Coefficients: Cauchy's and Legender's differential equations, Method of variation of parameters, Applications: Electrical Circuits.

TEXT BOOKS

1. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Advanced Engineering Mathematics by RK Jain & SRK Iyengar, Narosa Publishers.

REFERENCE BOOKS

1. Higher Engineering Mathematics by B.V. Ramana, Tata McGraw Hill.
2. Ordinary and Partial Differential Equations by M.D. Raisinghania, S. Chand Publishers.
3. Engineering Mathematics by N.P. Bali and Manish Goyal, Laxmi Publications.

COURSE OUTCOMES

After learning the concepts of this paper, the student will be able to

1. Analyze the solutions of the system of linear equations and find the Eigen values and Eigen vectors of a matrix, which are used to analyze the long-term behavior of any system.
2. Find the extreme values of functions of two variables with/without constraints.
3. Solve arbitrary order linear differential equations with constant coefficients.
4. Apply the concepts in solving physical problems arising in engineering.
5. Form a differential equation for typical engineering problems and hence can solve those higher order differential equations.

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MR20-1BS0121

L/T/P/C
3/-/-/3

APPLIED PHYSICS

COURSE OBJECTIVES:

1. Understand the basic concepts of principles of physics in a broader sense with a view to lay foundation for the various engineering courses.
2. Demonstrate competency and understanding the concepts found in quantum mechanics, lasers &fiber optics, classification of solid materials and a broad base of knowledge in physics.
3. The knowledge of fundamental quantum mechanics, semiconductors, lasers &fiber optics and quantum computing enable the students to apply to various systems.
4. Solve non-traditional problems that potentially draw on knowledge in multiple areas of physics.
5. Explore the physics concepts for different engineering applications

UNIT-I

LASER & FIBER OPTICS

LASER: Interaction of light with matter: Absorption, Spontaneous and Stimulated emissions of light, Einstein coefficients, population inversion, Meta-stable state, Types of pumping: Electrical & Optical, three and four level laser schemes**,** Construction and working of laser: Ruby, Helium-Neon and Semiconductor diode, Applications of laser.

FIBER OPTICS: Introduction to optical fiber, Construction and working principle of an Optical Fiber, Acceptance angle and numerical aperture, Types of Optical fibers: Step and Graded index fibers**,** Attenuation in optical fiber**,** Applications of optical fiber: Optical fiber communication system.

UNIT-II

QUANTUM MECHANICS

Wave particle duality, de Broglie's Hypothesis, characteristics of matter waves, Davisson and Germer's experiment, Heisenberg's uncertainty principle, Illustration-Non-existence of electron in the nucleus, Schrödinger time-independent wave equation – Physical significance and characteristics of wave function, Particle in a one-dimensional rigid box.

UNIT -III

BAND THEORY OF SOLIDS

Classical and Quantum Free electron theory: Assumptions, Merits and drawbacks, Fermi level, Density of states. Periodic potential, Bloch theorem, Kronig-Penny model (qualitative), E-k diagram, Concept of effective mass, Origin of energy bands in solids: Classification of Solids -Conductors, Semiconductors and Insulators.

UNIT-IV

SEMICONDUCTOR PHYSICS

Direct and indirect band gap semiconductors, Intrinsic and Extrinsic semiconductors, Carrier concentration in Intrinsic semiconductor - density of holes in valence band and density of

electrons in conduction band, Carrier concentration in Extrinsic semiconductor- donor concentration in n-type and acceptor concentration in p-type semiconductors , Variation of Fermi level with temperature and doping concentration; Hall effect, Measurement of Hall coefficient of semiconductor, Applications of Hall effect, Formation of PN junction**,** V-I characteristics of PN diode, Construction and working of LED and Photodiode.

UNIT-V

QUANTUM COMPUTING
Introduction, Classical & quantum bits, Superposition and Entanglement, Qubits Operators and Measurement: Bra-Ket (Dirac) notation, Bloch sphere representation of a Qubit, Classical logic gates, Quantum logic gates: Single qubit gates (Pauli's gates, Hadamard), multiple qubit gates (CNOT gate), Applications of quantum computing.

TEXT BOOKS:

1. Avadhanulu M N., Kshirsagar P G, A text book of Engineering Physics, S Chand publications Pvt. Ltd, 2014.
2. D.K Bhattacharya and Poonam Tandon,Engineering Physics,Oxford Higher Education press,2015
3. Bhavana P. Butey, Applied Physics for Engineering, Oxford University Press, 2017.

REFERENCE BOOKS:

1. Gaur R K., Gupta S L, Engineering Physics, Dhanpat Rai Publications, 2012.

2. AjoyGhatak, Basic Quantum Mechanics, 5th Edition, Trinity/Laxmi Publications Ltd., 2014.

3. Mehta V K., Mehta Rohit, Principles of Electronics, S.Chand Publications Pvt. Ltd, 2014.

4. David Halliday, Robert Resnick, Jearl Walker, Fundamentals of Physics, 10th Edition, Wiley Publishers, 2013.

5. Jack D. Hidary, Quantum Computing: An Applied Approach, Springer, 2019.

6. Seiki Akama, Elements of Quantum Computing: History, Theories and Engineering Applications, Springer, 2015.

COURSE OUTCOMES:

1. Learn the fundamental concepts on quantum behaviour of matter in its microstate.
2. Summarize the fundamentals of quantum mechanics, semiconductors, lasers &fiber optics and quantum computing enable the students to apply in the systems like communications, fast computing and so on.
3. Understand the working and limitations of existing devices and techniques, which eventually leads to new innovations and improvements.
4. Solve the problems related to various chapters and exposed them into practically by set of experiments.
5. Establish a strong foundation on the different kinds of characters of several materials and pave a way for them to use in at various technical and engineering applications.

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L/T/P/C

MR20-1ES0102   **3/-/-/3**

PROGRAMMING FOR PROBLEM SOLVING

COURSE OBJECTIVES:
1. To understand the use of computer system in problem solving.
2. Enable the student to build program logic with algorithms and flowcharts.
3. Explain the features and constructs of C programming such as data types, expressions
4. Loops, arrays, strings and pointers.
5. To learn how to write modular Programs using Functions.
6. Understand the use of Structures, Unions and Files.

UNIT - I

Introduction to Computing – Computer Systems, Computing Environments, Computer Languages, Algorithms and Flowcharts, Steps for Creating and Running programs.
Introduction to C – History of C, Features Of C, Structure of C Program, Character Set,C Tokens-keywords, Identifiers, Constants, Data types, Variables.

UNIT-II

C Operators, Expressions, Precedence and Associativity, Expression Evaluation, Type conversion
Statements- Selection Statements (Decision Making) – if and switch statements, Repetition statements (Loops)-while, for, do-while statements, other statements related to looping –break, continue, goto.

UNIT – III

Functions-Designing Structured Programs, Types of Functions- user defined functions, Standard Functions, Categories of functions, Parameter Passing techniques, Scope, Storage classes, Recursion- Recursive functions.

Arrays – Declaration and Initialization, Arrays with functions, Two dimensional arrays,Multi-dimensional arrays.

UNIT-IV

Strings – Declaration and Initialization, String Input / Output functions, Arrays of strings, String manipulation functions.

Pointers-Introduction, Definition and uses of pointers, Pointer variables, Pointer arithmetic, Pointers to Pointers, Pointers with Arrays, Pointers with Functions, Command line arguments.

Dynamic Memory Management functions: malloc (), calloc(), realloc() and free ()

UNIT-V

Structures and Unions - Introduction, Declaration and Initialization, Structure within a structure, Array of Structures, Pointer to Structure, Unions.

Files – Concept of a file, Streams, Text files and Binary files, Opening and Closing files, File input / output functions.

CASE STUDIES

CASE 1: Student & Employee Record System

The main features of this project include basic file handling operations given below

- Add Record
- List Record
- Modify Record
- Delete Record

CASE 2: Library Management System

This Project has 2 Modules

1. Librarian
2. Student

Librarian: A librarian can add, search, edit and delete books. This section is password protected. This means you need administrative credentials to log in as librarian.

Student: A Student can search for the book and check the status of the book if it is available. List of all features

that you can add to the project.

TEXT BOOKS:

1. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. Mastering C, K.R.Venugopal, S R Prasad, Tata McGraw-Hill Education.

REFERENCE BOOKS:

1. The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI.
2. Programming for Problem Solving, E.Balagurusamy, McGraw-Hill Education.
3. C and Data structures – P. Padmanabham, Third Edition, B.S. Publications.
4. Programming in C, Ashok Kamthane. Pearson Education India.
5. Let us C ,YashwanthKanethkar, 17th Edition, BPB Publications.

COURSE OUTCOMES:

1. Understand a problem and build an algorithm/flowchart to solve it.
2. Define variables and construct expressions using C language.
3. Construct C programs using various conditional statements and loops.
4. Develop efficient, modular programs using functions.
5. Utilize arrays, structures and unions for storing and manipulating data.

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L/T/P/C

MR20-1ES0104   **2/-/2/3**

Computer Aided Engineering Graphics

COURSE OBJECTIVES:
1. To learn basic engineering graphic communication concepts.
2. To learn the principles of orthographic projections
3. To know the projections of planes and solids
4. To learn principles of isometric projections of simple solids
5. To learn conversion of orthographic views to isometric views and vice-versa.

UNIT-I

Introduction to Computer Aided Engineering Graphics
Introduction AutoCAD User Interface, BIS conventions, Dimensioning. Generation of points, lines, curves, polygons, dimensioning, layers, blocks. Geometrical constructions

UNIT-II:

Orthographic Projections: Projections of Points. Projections of Lines parallel and inclined to both the planes.

UNIT– III

Projections of Planes: Projections of regular planes, plane inclined to both the planes.
Projections of Solids: Projections of regular solids, Solids inclined to one plane.

UNIT– IV

Isometric Projections: Principles – Isometric Scale – Isometric Views. AutoCAD 3D interface. Plane Figures and
Simple Solids.

UNIT– V

Transformation of Projections: Conversion of Isometric Views to Orthographic Views andVice-Versa in AutoCAD

TEXT BOOKS:
1.   Engineering Drawing – N.D. Bhatt & V.M. Panchal, Charotar Publishing House, Gujarat.

2.   Computer Aided Engineering Graphics by Rajashekar Patil, New Age International Pvt. Ltd.

REFERENCE BOOKS:

1. Computer Aided Engineering Drawing – S. Trymbaka Murthy, - I.K. International Publishing House Pvt. Ltd., New Delhi.

2. Engineering Graphics with AutoCAD 2020 by James D. Bethune, Pearson Publications

3. Engineering Graphics Essentials with AutoCAD 2018 Instruction Text and Video Instruction. by Kirstie Plantenberg, SDC Publications.

COURSE OUTCOMES:

1. Communicate engineering graphics by doing geometric constructions and dimensioning.

2. Produce basic orthographic projections on projections of points and lines.

3. Produce orthographic projections on planes and solids.

4. Develop isometric drawings of simple objects using AutoCAD 3D interface.

5. Make Conversion of Isometric Views to Orthographic Views and Vice-Versa using AutoCAD

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MR20-1HS0133

L/T/P/C
1/1/-/1

HUMAN VALUES AND PROFESSIONAL ETHICS

COURSE OBJECTIVES:

1. To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
2. To facilitate the development of a holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of value-based living in a natural way.
3. To highlight plausible implications of such a holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature.

UNIT - I

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education: Understanding the need, basic guidelines, content and process for Value Education.

Self-Exploration - what is it? - its content and process; 'Natural Acceptance' and Experiential Validation - as the mechanism for self-exploration. Continuous Happiness and Prosperity

A look at basic Human Aspirations- Right understanding, Relationship and Physical Facilities - the basic requirements for fulfillment of aspirations of every human being with their correct priority.

Understanding Happiness and Prosperity correctly - A critical appraisal of the current scenario. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

UNIT - II

Understanding Harmony in the Human Being - Harmony in Myself: Understanding human being as a co- existence of the sentient 'I' and the material 'Body'.

Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer).

Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail. Programs to ensure Sanyam and Swasthya.

UNIT - III

Understanding Harmony in the Family and Society - Harmony in Human - Human Relationship: Understanding harmony in the Family the basic unit of human interaction. Understanding values in human - human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.
Understanding the meaning of Vishwas; Difference between intention and competence.
Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship.

Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astiva as comprehensive Human Goals. Visualizing a universal harmonious order in society - Undivided Society (AkhandSamaj), Universal Order (SarvabhaumVyawastha) - from family to world family!

UNIT - IV

Understanding Harmony in the nature and Existence - Whole existence as Coexistence: Understanding the harmony in the Nature. Interconnectedness and mutual fulfillment among the four orders of nature - recyclability and self-regulation in nature.

Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space. Holistic perception of harmony at all levels of existence.

UNIT - V

Implications of the above Holistic Understanding of Harmony on Professional Ethics: Natural acceptance of human values, Definitiveness of Ethical Human Conduct, Basic for Humanistic Education, Humanistic Constitution and Humanistic Universal Order. Competence in professional ethics:
a. Ability to utilize the professional competence for augmenting universal human order.
b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems.
c. Ability to identify and develop appropriate technologies and management patterns for above production systems.

TEXT BOOKS:

1. R. R. Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.

2. Prof. K. V. Subba Raju, 2013, Success Secrets for Engineering Students, Smart Student Publications, 3rd Edition.

REFERENCE BOOKS:

1. Ivan IIlich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA

2. E. F. Schumancher, 1973, Small is Beautiful: a study of economics as if people mattered. Blond & Briggs, Britain.

3. A Nagraj, 1998 Jeevan Vidya ekParichay, Divya Path Sansthan, Amarkantak.

4. Sussan George, 1976, How the Other Half Dies, Penguin Press, Reprinted 1986, 1991.

5. P. L. Dhar, R. R. Gaur, 1990, Science and Humanism, Commonwealth Publishers.

6. A. N. Tripathy, 2003, Human Values, New Age International Publishers.

7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.

8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth - Club of Rome's report, Universe Books.

9. E G Seebauer& Robert L.Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.

10. M Govindarajan, S Natrajan& V. S Senthil kumar, Engineering Ethics (includingHumna Values), Eastern Economy Edition, Prentice Hall of India Ltd.

Relevant CDs, Movies, Documentaries & Other Literature:

1. Value Education website, http://www.uptu.ac.in
2. Story of Stuff, http://www.storyofstuff.com
3. AI Gore, An Inconvenient Truth, Paramount Classics, USA.
4. Charle Chaplin, Modern Times, United Artists, USA.
5. IIT Delhi, Modern Technology - the Untold Story.

COURSE OUTCOMES:

1. The students will be able to obtain happiness and prosperity in their life.
2. They will develop harmony at all levels.
3. They can have satisfying human behavior throughout their life

MALLA REDDY UNIVERSITY

L/T/P/C

MR20-1BS0131   **-/-/3/1.5**

APPLIED PHYSICS LAB

COURSE OBJECTIVES:
1. Study the wavelength and V-I characteristics of Laser diode.
2. Understand the numerical aperture and bending loss of an optical fiber.
3. Study the variation of current with voltage for optoelectronic devices.
4. Understand the Hall Effect in semiconductor.
5. Acquire the knowledge to find the Planck's constant experimentally.

LIST OF EXPERIMENTS:

1. Laser diode Characteristics: To study the V-I characteristics of semiconductor diode Laser.
2. Laser Diffraction: To determine the wavelength of given Laser light.
3. Numerical aperture: To calculate the numerical aperture of an optical fiber.
4. Losses in Optical fiber: To estimate the bending loss in an optical fiber.
5. Energy Band gap: To determine the energy band gap of given semiconductor diode.
6. LED: To study the V-I characteristics of Light Emitting Diode.
7. Photodiode: To study the V-I characteristics and also measure the dark current in the photodiode.
8. Hall Effect: To evaluate the Hall coefficient of given semiconductor.
9. Planck's constant: To determine the Planck's constant using photoelectric effect.
10. Solar Cell: To find the fill factor of solar cell using V-I characteristics.

REFERENCE BOOKS:

1. Ruby Das, Rajesh Kumar, C. S. Robinson, Prashant Kumar Sahu, A Textbook of Engineering Physics Practical, Second Edition, University Science Press, New Delhi, 2016.
2. Applied Physics Laboratory Manual-Malla Reddy University, 2020.

COURSE OUTCOMES:

1. Identify the V-I characteristics of Laser diode.
2. Evaluate the numerical and bending loss of given optical fiber.
3. Analyze the V-I characteristics of LED and photodiode devices.
4. Identify the type of semiconductor by using Hall Effect experiment.
5. Measure the Planck's constant using Photocell.

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MR20-1ES0132

PROGRAMMING FOR PROBLEM SOLVING LAB

COURSE OBJECTIVES:
1. Familiarity with the C programming environment.
2. Systematic introduction to programming constructs
3. Learning basic concepts of C through illustrative examples and small exercises
4. Understanding concept of Arrays, Strings and Structures with examples
5. Perform basic operations on Files.

Week1:
A. Write a C program to find sum and average of three numbers
B. Write a program to calculate simple interest for a given P, T, and R (SI = P*T*R/100)

Week2:
A. Write a program to swap two variables values with and without using third variable
B. Write a program to find the roots of a quadratic equation.

Week3:
A. Write a program to find the sum of individual digits of a given positive integer.
B. Write a program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

Week4:
A. Write a program to find both the largest and smallest number in a list of integers. B. Write a program to find the sum of integer array elements using pointers

Week5:
A. Write a program to perform addition of two matrices.
B. Write a program to perform multiplication of two matrices.

Week6:
A. Write a program to find the length of the string using Pointer.
B. Write a program to count the number of lines, words and characters in a given text

Week7:
A. Write a program to find factorial of a given integer using non-recursive function and recursive function. B. Write program to find GCD of two integers using non-recursive function and recursive function.

Week8:
A.   Write a program using user defined functions to determine whether the given string is palindrome or not. B. Write a Program to swap the values of two variables using
     i) Call by Value ii) Call by Reference

Week9:
A.   Write a program to find the sum of integer array elements using pointer, use dynamic memory allocation to allocate memory.
B.   Write a program to perform subtraction of two matrices, Design functions to perform read, display and subtract

Week10:
A.   Write a program to create a structure named book and display the contents of a book. B. Write a Program to Calculate Total and Percentage marks of a student using structure.

Week11:
A.   Write a 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
B.   Write a program to reverse the first n characters in a file.
     (Note: The file name and n are specified on the command line.).

Week12:
A.   Write a program to copy the contents of one file to another.
B.   Write a 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.

COURSE OUTCOMES:
1.   Translate mathematical expressions to C notation using operators.
2.   Develop C programs using loops and nested loops.
3.   Construct custom functions for solving problems using modular approach.
4.   Solve problems related to arrays and strings.
5.   Use structures and unions for storing dissimilar data items.

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MR20-1ES0134

L/T/P/C
-/-/2/1

ENGINEERING AND IT WORKSHOP LAB

Course Objectives:
1.   Understand the internal structure and layout of the computer system.
2.   Learn to diagnose minor problems with the computer functioning.
3.   Know the proper usage and threats of the world wide web.
4.   Study in detail about the various features of MS-Word, Excel, PowerPoint.
5.   To learn the 2D principles of orthographic projections & gain the capability of designing 3D objects with isometric principles by using computer aided sketches.
6.   To get acquaintance with Residential house wiring procedure.
7.   To obtain the knowledge about fluorescent lamp wiring procedure.
8.   To get familiarized with staircase wiring.
9.   To perform soldering and de soldering practice.
10.   Able to sketch the 2D projections and develop isometric drawings and simple objects reading he orthographic projections.

It is consisting of 3 parts: Part I: IT Workshop; Part-II: Engineering Workshop;
Part III: Auto CAD Workshop

Part I: IT Workshop:
1.   Understand the internal structure and layout of the computer system.
2.   Learn to diagnose minor problems with the computer functioning.
3.   Know the proper usage and threats of the world wide web.
4.   Study in detail about the various features of MS-Word, Excel, PowerPoint.
5.   To learn the 2D principles of orthographic projections & gain the capability of designing 3D objects with isometric principles by using computer aided sketches.

Task- 1: PC HARDWARE

Identification of the peripherals of a computer, components in a CPU and its functions. Block diagram of the CPU along with the configuration of each peripherals. Functions of Motherboard. Assembling and Disassembling of PC. System Software and application software installation.

Task- 2: TROUBLESHOOTING

Hardware Troubleshooting: Students are to be given a PC which does not boot due to proper assembly or defective peripherals and the students should be taught to identify and correct the problem.
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.

Task 3: INTERNET

Web Browsers, Access of websites, Surfing the Web, Search Engines, Customization of web browsers, proxy settings, bookmarks, search toolbars, pop-up blockers. Antivirus downloads, Protection from various threats.

Task 4: MICROSOFT WORD

Introduction to Word Processor, Editing and Formatting features, overview of toolbars, saving files, Using help and resources, rulers, fonts, styles, format painter, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and colors, Inserting Header and Footer, Using Date and Time option in Word &Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes. Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word. Using Word to create Project Certificate, Project Abstract, News Letter, Resume.

Task 5: MICROSOFT EXCEL

Excel Orientation: The importance of Excel as a Spreadsheet tool, Accessing, overview of toolbars, saving excel files, Using help and resources. Excel formulae &Functions: formulae, logical functions, text functions, statistical functions, mathematical functions, lookup functions, conditional formatting, Charts, Hyper linking, Renaming and Inserting worksheets, Data Analysis functions.

Creating a Scheduler (Features: - Gridlines, Format Cells, Summation, auto fill, Formatting)
Calculating GPA (Features: - Cell Referencing, Formulae and functions in excel)

Task 6: MICROSOFT POWER POINT

Basic power point utilities and tools, PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Drawing toolbar-Lines and Arrows, Text boxes, Clipart, Insertion of images, slide transition, Custom animation, Hyperlinks.

Task 7: LIBRE OFFICE

Overview of Libre Office and it's features of Writer, Calc, Impress, Draw, Base, Math, Charts.

Libre office Math: Introduction, Creating & Editing Formulas, formulas as separated documents or files, formulas in office document, Creating formulas, Formula layout

Libre Office Draw: Introduction, Basic shapes, working with objects, flowcharts, organization charts,

PART II: ELECTRICAL AND ELECTRONICS ENGINEERING WORKSHOP

List of Experiments:
1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring
3. Stair case wiring
4. Soldering and Desoldering practice – components, devices and circuits using general purpose PCB.

PART III: AUTOCAD WORKSHOP
1. **Introduction to AutoCAD**

Design Process, AutoCAD Installation Process, AutoCAD user Interface, Function Keys.
1. **Commands:** Drawing Commands, Editing Commands, Drawings aids.
2. **D Wireframe Modeling.**
3. **CAD Practice Exercises**
CAD -2D, CAD – Isometric.

TEXT BOOKS:

1.   Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2.   PC Hardware and A+ Handbook-Kate J.Chase PHI(Microsoft).
3.   Excel Functions and Formulas, Bernd held, Theodor Richardson, Third Edition.
4.   Libre Office Documentation: https://documentation.libreoffice.org/en/english-documentation.

COURSE OUTCOMES:

1.   Ability to identify the major components of a computer and its peripherals. They are capable of assembling a personal computer, and can perform installation of system software like MS Windows and required device drivers.
2.   Students can detect and perform minor hardware and software level troubleshooting.
3.   Capacity to work on Internet & World Wide Web and make effective usage of the internet for academics.
4.   Students will able to understand domestic wiring procedures practically.
5.   Students will able to do Fluorescent lamp wiring.
6.   Students will able to do staircase wiring.
7.   Student will able to soldering and disordering practice.