MALLA REDDY UNIVERSITY
Common to CSE / CSE(IOT) / IT

COURSE STRUCTURE

I Year B. Tech – II Semester

S No	Subject Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	MR20-1CS0104	Data Visualization	3	0	0	3	40	60
2	MR20-1BS0102	Mathematics – II	3	0	0	3	40	60
3	MR20-1BS0121	Applied Physics	3	0	0	3	40	60
4	MR20-1ES0104	Computer Aided Engineering Graphics	2	0	2	3	40	60
5	MR20-1ES0105	Python Programming	3	0	0	3	40	60
6	MR20-1BS0131	Applied Physics Lab	-	0	3	1.5	40	60
7	MR20-1ES0133	Python Programming Lab	-	0	3	1.5	40	60
8	MR20-1ES0134	Engineering and IT Workshop	-	0	2	1	40	60
9	MR20-1HS0133	Human Values and Professional Ethics	1	1	0	1	40	60
		TOTAL	**15**	**1**	**10**	**20**	**360**	**540**

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MR20-1BS0121

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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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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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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

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MATHEMATICS–II

COURSE OBJECTIVES:
1. Evaluation of multiple integrals.
2. In many engineering fields the physical quantities involved are vector valued functions. Hence the vector calculus aims at basic properties of vector-valued functions and their applications to line, surface and volume integrals.
3. The properties of Laplace Transform, Inverse Laplace Transform and Convolution theorem.

UNIT–I

Integral Calculus–I

Beta and Gamma integrals; Double integrals (Cartesian and Polar coordinates), Change of order of integration (only Cartesian form),Change of Variables (Cartesian to Polar)

UNIT–II

Integral Calculus–II

Triple integrals – Evaluation of triple integrals.

Change of variables- Cylindrical polar coordinates and Spherical polar coordinates.

UNIT–III

Vector Differentiation

Scalar and vector fields, Vector differentiation, Directional derivative, Gradient of a scalar field,Divergence and Curl of a vector field, Solenoidal and Irrotational vectors, Laplacian.

UNIT–IV

Vector Integration

Line, Surface and Volume integrals, Green's theorem in a plane, Stoke's theorem, Gauss Divergencetheorem (Statement & Verification).

UNIT–V

Laplace Transforms

Laplace Transforms, Laplace Transform of standard functions; first shifting theorem; Laplace transforms of functions when they are multiplied and divided by 't'. Laplace transforms of derivatives and integrals of function, Evaluation of integrals by Laplace transforms, Laplace transforms of unit step function, impulse function and periodic functions.

Inverse Laplace transform by different methods, convolution theorem (without Proof), Applications of Laplace transforms - Solving certain initial value problems.

TEXT BOOKS

1. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.

2. Higher Engineering Mathematics by B.S. Grewal, Kanna 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. Engineering Mathematics by N.P. Bali and Manish Goyal, Laxmi Publications.

3. Advanced Engineering Mathematics by Michael Greenberg, Pearson publishers.

COURSE OUTCOMES:

1. Analyze improper integrals.
2. Evaluate multiple integrals in various coordinate systems.
3. Apply the concepts of gradient, divergence and curl to formulate engineering problems.
4. Convert line integrals into surface integrals and surface integrals into volume integrals.
5. Apply Laplace transforms to solve physical problems arising in engineering.

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DATA VISUALIZATION

COURSE OBJECTIVES:
1. To learn different statistical methods for Data visualization.
2. To learn basics of R and Python.
3. To learn usage of Watson studio.
4. To learn about packages NumPy, pandas and matplotlib.
5. To learn functionalities and usages of Seaborn.

UNIT-I

Introduction to Statistics
Introduction to Statistics, Difference between inferential statistics and descriptive statistics, Inferential Statistics- Drawing Inferences from Data, Random Variables, Normal Probability Distribution, Sampling, Sample Statistics and Sampling Distributions.

R overview and Installation- Overview and About R, R and R studio Installation, Descriptive Data analysis using R, Description of basic functions used to describe data in R.

UNIT-II

Data manipulation with R packages- Readr, Reshape2, Tidyr, lubridate, dplyr
Data visualization in R- ggplot2-working with axes, working with legends, line plot, jitter plot, scatter plot, bar plot, box plot, histogram, pie chart and subplots.

UNIT-III

Introduction to Python-mutable and immutable data types, looping and conditional statements. Python installation, Introduction to Jupyter Note book.
Numpy – Creating ndarray, data types, array attributes, indexing, slicing.

UNIT-IV

Data Manipulation and Visualization Tools in Python
Pandas- series, data frame, how to read write CSV and Excel files, indexing, adding columns, aggregations, handling missing data, groupby and merging.
Matplotlib-working with axes, working with legends, line plot, jitter plot, scatter plot, bar plot, box plot, histogram, pie chart and subplots.

UNIT-V

Introduction to Seaborn- using seaborn with matplotlib, customizing seaborn plots, color palette, multiple plots.
Data visualization in Watson Studio- Adding data to data refinery, Visualization of Data on Watson Studio.

TEXT BOOKS

1. Introduction to statistics by Pk Giri and Banerjee, Acaemic publishers

2. R for Data Science by Garrett Grolemund and Hadley Wickham, O'REILLY

3. Python for Data Analysis by Wes McKinney, 2nd Edition, O'REILLY

COURSE OUTCOMES:

At Completion of this course, students would be able to -

• Apply statistical methods for Data visualization.

• Gain knowledge on R and Python

• Understand usage of various packages in R and Python.

• Demonstrate knowledge of Watson studio.

• Apply data visualization tools on various data sets.

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PYTHON PROGRAMMING

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 call them.
4. To use Python data structures –- lists, tuples, dictionaries.
5. To do Exception handling in Python.
6. To implement object-oriented concepts in Python.

UNIT- I

INTRODUCTION TO PYTHON:

Features of Python, Execution of a Python Program, Viewing the byte code, Flavors of Python, Python Virtual Machine, Comparisons between C and Python, installing python for windows, numpy, pandas and Matplotlib, executing a python using command Line Window and Python's IDLE.

DATATYPES IN PYTHON:

Comments in Python, Docstrings, Built-in data types: None, Numeric and bool Data type, Sequences in python: str, bytes, byte array data types, list, tuple, dictionaries, user-defined datatypes, constants in python, identifiers and reserved words, naming conventions in python.

UNIT -II

VARIABLES AND OPERATORS:

Understanding Python variables, multiple variable declarations, Operators in Python: Arithmetic operators, Assignment operators, Relational Operators, Logical operators, Boolean Operators, Bitwise operators, Membership operators, Identity operators, Operator Precedence and Associativity, Output statements, Input Statements and Command Line Arguments.

CONTROL STATEMENTS:

Indentation, The if Statement, if…else, if … elif … else statement, while loop, for loop, Infinite loop, Nested Loops, The else suite, break, continue, pass statement, assert and return statement

UNIT- III ARRAYS:

Advantages of Arrays, Creating an Array, Importing the Array Module, Indexing and Slicing on Arrays, Types of arrays, working with arrays using numpy.

UNIT- IV
FUNCTIONS:

Defining a Function, calling a function, Formal and Actual Arguments, Positional Arguments, keyword Arguments, Default Arguments, variable length arguments, local and global variables, Anonymous Functions or Lambdas

UNIT -V

Exceptions in Python

Errors in a Python Program: Compile-Time Errors, Runtime Errors, Logical Errors, Exception Handling, Types of Exceptions, the Except Block.

Files in Python:

Types of Files in python, Opening a File, Closing a File, Working with Text Files Containing Strings, the seek () and tell () methods

TEXT BOOKS

1. R. Nageswara Rao, "Core Python Programming", dream tech
2. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016.
3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson

REFERENCE BOOKS:

1. Core Python Programming, W.Chun, Pearson.
2. Introduction to Python, Kenneth A. Lambert, Cengage.
3. Learning Python, Mark Lutz, Orielly.

COURSE OUTCOMES:

1. Read, write, execute by hand simple Python programs.
2. Structure simple Python programs for solving problems.
3. Decompose a Python program into functions.
4. Represent compound data using Python lists, tuples, and dictionaries.

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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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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.

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PYTHON PROGRAMMING LAB

COURSE OBJECTIVES:
1. Learn Basics of Python Programming.
2. Learn syntax and semantics and create Functions in Python.
3. Discover how to work with List and sequence data.
4. Learn core python scripting elements such as variables and flow control structures.
5. To Learn how to design and program python applications.
6. Learn different sorting techniques.

Week 1:
A.   List out Different IDE's? Write and execute how to install python and setting Path?
B.   Write a Python Program to declare and assign a Value to a variable? C. Write a Python Program to change the value of variable?
D. Write a Python Program to assign multiple values to multiple variables?

Week 2:
A.   Write a python program to perform Arithmetic operators in python?
B.   Given 2 variables and perform a = 0011 1100, b = 0000 1101 bitwise operation?
C.   Write a program to find sum, difference, product, multiplication, division of two numbers by taking the input from user?
D.   Write a program to find that given year is leap year or not?

Week 3:
A.   Create a list and perform the following methods
     1) insert() 2) remove() 3) append() 4) len() 5) pop() 6)clear()
B.   Create a dictionary and apply the following methods
     1) Print the dictionary items 2) access items 3) use get() 4)change values 5) use len()
C.   Create a tuple and perform the following methods
     1) Add items 2) len() 3) check for item in tuple 4)Access iems
D.   Create a set and perform the following methods
     1) add() 2) update()

Week 4:
A.   Write a python program to add two numbers?
B.   Write a python program to print a number is positive/negative using if-else? C. Write a python program to find largest number among three numbers?
D. Write a python Program to read a number and display corresponding day using if_elif_else?

Week 5:
A.   Write a python program to find the sum of all numbers stored in a list
B.   Write a python program to print numbers from 20 to 100 using range()
C.   Write a python program to add natural numbers up to sum = 1+2+3+…. +n take the input from the user by using While Loop
D.   Write a python program to perform different String methods like lower(), upper(), join(),split(),find(), replace()

Week 6:

A.   Write a program to create a menu with the following options

   1. To Perform Addititon

   2. To Perform Subtraction

   3. To Perform Multipication

   4. To Perform Division

Accepts users input and perform the operation accordingly. Use functions with arguments.
B.   Demonstrate a python code to implement abnormal termination?
C.   Demonstrate a python code to print try, except and finally block statements.

Week 7:
A.   Using a numpy module create an array and check the following:

   1. Type of array 2. Axes of array 3. Shape of array 4. Type of elements in array
B.   Using a numpy module create array and check the following:

   1. List with type float 2. 3*4 array with all zeros 3. From tuple4. Random values
C.   Using a numpy module create array and check the following:

   1. Reshape 3X4 array to 2X2X3 array.

   2. Sequence of integers from 0 to 30 with steps of 5.

   3. Flatten array.

   4. Constant value array of complex type.

Week 8:
A.   A python program to handle the ZeroDivisonError exception.
B.   A python program to demonstrate multiple except block with a single try block

Week 9:
A.   A python program to append data to an existing file and then displaying the entire file.
B.   A python program to open a new file, add some data into it and display the contents of that file.

Week 10:
A.   A Python program to know whether a file exists or not, if it is existed display the content of a file.
B.   A python program to know whether a file exists or not, if it is existed append the new contents to it.

Week11:
A.   A Python Program to know whether directory exists or not using os.path.isdir() Method
B.   A python program to copy the existing file contents into a new file.

Week12:
A.   A Python program to count number of lines, words and characters in a text file
B.   A Python program to count number of vowels are in the a text file.

COURSE OUTCOMES:
1.   Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python.
2.   Express different Decision Making statements and Functions.
3.   Write python functions to facilitate code reuse.
4.   Define the structure and components of a python programmer.