MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE

MADANAPALLE

(UGC-AUTONOMOUS)

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Estd 1998

COMPUTER SCIENCE & ENGINEERING

(Data Science)

Course Structure

&

Detailed SYLLABI

For the students admitted to

B. Tech. Regular Four Year Degree Programme from the academic year 2020-21

and

B. Tech. Lateral Entry Scheme from the academic year 2021-22

B.TECH. COMPUTER SCIENCE & ENGINEERING (Data Science)

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

Branch: COMPUTER SCIENCE & ENGINEERING (Data Science)

Total Credits: 160 (4 Year Course)

I. Induction Program and Holistic Development Activities

Sl.No.	Title	Duration
1	Induction Program (Mandatory)	Threeweeks duration at the start of First Year (Refer Annexure - I)
2	Holistic Development Activities (Every Student from Semester 2 – 8 should register for at least one activity)	Three hours per week (Activity list is enclosed in Annexure - I)
3	Virtual Laboratory (Students are encouraged to choose and register for any of the Virtual laboratories he /she is interested)	As specified by the Virtual Laboratory

II. Semester-wise Structure of Curriculum

(L = Lecture, T = Tutorial, P = Practical, C = Credit)

I Year I Semester

Sl.No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total Contact Hours	
1	Basic Science Course	18MAT101	Engineering Calculus	3	1	0	4	4
2	Basic Science Course	18PHY102	Modern Physics	3	1	0	4	4
3	Engineering Science Course	18EEE101	Basic Electrical Engineering	3	0	0	3	3
4	Engineering Science Course	18CSE101	Programming for Problem Solving (Python)	2	0	2	4	3
5	Basic Science Course	18PHY201	Physics Laboratory	0	0	3	3	1.5
6	Engineering Science Course	18EEE201	Electrical Engineering Laboratory	0	0	3	3	1.5
			Total	**11**	**2**	**8**	**21**	**17**

I Year II Semester

Sl.No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total Contact Hours	
1	Humanities, Social Sciences including Management	18ENG101	Professional English	2	0	2	4	3
2	Basic Science Course	18MAT110	Linear Algebra	3	1	0	4	4
3	Basic Science Course	18CHE101	Engineering Chemistry	3	0	0	3	3
4	Engineering Science Course	18CSE102	C Programming and Data Structures	3	0	0	3	3
5	Engineering Science Course	18ME101	Engineering Graphics	2	0	3	5	3.5
6	Basic Science Course	18CHE201	ChemistryLaboratory	0	0	3	3	1.5
7	Engineering Science Course	18CSE201	C Programming and Data Structures Laboratory	0	0	3	3	1.5
8	Engineering Science Course	18CSE202	Engineering and IT Workshop	0	0	3	3	1.5
			Total	**13**	**1**	**14**	**28**	**21**

Note: Higher semester structure and syllabus will be prepared and will be submitted to academic council later on.

B. Tech I Year I Semester

B.Tech. I Year I Semester

18MAT101 ENGINEERING CALCULUS

L	T	P	C
3	1	0	4

Course Prerequisite: Intermediate

Course Description :
The course introduces the concepts of single variable and multivariable calculus with the view of its applications in various engineering fields. The course will well prepare the students to develop the solution methods and enrich their experience in critical analysis and problem solving.

Course Objectives:
The objective of this course is to familiarize the prospective engineers with techniques in calculus and multivariate analysis. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

UNIT I: CALCULUS
Definite integrals; Applications of definite integrals to evaluate area and length of curves, surface areas and volumes of revolutions; Beta and Gamma functions and their properties **(12)**

UNIT II: CALCULUS
Rolle's Theorem, Mean value theorems, Taylor's and Maclaurin theorems with remainders; indeterminate forms, Maxima and minima. **(12)**

UNIT III: SEQUENCES AND SERIES
Convergence of sequence and series, tests for convergence, power series, Taylor's series. Series for exponential, trigonometric and logarithmic functions; Fourier series: Half range sine and cosine series, Parseval's theorem. **(12)**

UNIT IV: MULTIVARIABLE CALCULUS (DIFFERENTIATION)
Limit, continuity and partial derivatives, directional derivatives, total derivative; Tangent plane and normal line; Maxima, minima and saddle points; Method of Lagrange multipliers. **(12)**

UNIT V: MULTIVARIABLE CALCULUS (INTEGRATION)
Multiple Integration: double integrals (Cartesian and polar), change of order of integration in double integrals, Change of variables (Cartesian to polar), Applications: areas and volumes by (double integration), triple integrals, curl and divergence, Theorems of Green, Gauss and Stokes (without proofs). **(12)**

Course Outcomes:
Upon successful completion of the course, students will be able to
1. Evaluate the definite integrals to curvatures and infer the Beta and Gamma functions.
2. Analyze the fundamental theorems of calculus to Engineering problems.

3. Use the power series and Fourier series for learning advanced Engineering Mathematics.
4. Apply the functions of several variables and geometrical ideas to engineering.
5. Calculate the area and volume of quantities and connecting them to single double and triple integrals.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 42th Edition, 2012.
2. G. B. Thomas, Maurice D. Weir, Joel Hass, Frank R. Giordano, Thomas' Calculus Pearson education 11th Edition, 2004.

Reference Books:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
5. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
6. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.

Mode of Evaluation: Assignments, Mid Term Tests, End Semester Examination.

B. Tech. I Year I Semester

18PHY102 MODERN PHYSICS

L	T	P	C
3	1	0	4

Course Prerequisite: Intermediate

Course Description:
Waves & optics is a basic physics course, which will cover Waves, Optics, Quantum Mechanics, Semiconductors and Lasers.

Course Objectives:
1. Expose students to recognize and use a mathematical wave equation using the principles of oscillations and waves understanding the basic laws of nature through physics.
2. Educate students to think and participate deeply, creatively, and analytically in applying various kinds of forces in day today life.
3. Demonstrate the ability to identify and apply the appropriate analytic, numerical, computational and other mathematical reasoning, to situations of the physical world.
4. Analyze and understand the subjects Mechanics, Oscillations, Waves and Optics in preparing the students for advanced level courses.
5. Expose students to theoretical and mathematical aspects of Interference, Diffraction techniques and Lasers for mechanical testing of materials.
6. Adaptability to new developments in science and technology by successfully completing or pursuing graduate education in engineering.

UNIT I: WAVES
Simple Harmonic Motion, damped harmonic oscillations, forced harmonic oscillations, resonance, and quality factor. Superposition of vibrations along same direction (equal frequency) and in perpendicular directions, Lissajous figures. Transverse waves, solution of wave equation, velocity of a transverse wave along a stretched string, modes of vibration of stretched string, standing waves, standing wave ratio. **(12)**

UNIT II: OPTICS
Light as an electromagnetic wave, Huygens' Principle, superposition of waves, interference of light by division of wavefront- Young's double slit experiment, expression for fringe width, intensity distribution graph, interference of light by division of amplitude- interference in thin film by reflection, Newton's rings experiment, Michelson interferometer,Mach Zehnder interferometer. Diffraction, Diffraction grating, Farunhofer diffraction due to single slit, double slit and N-slit, Rayleigh criterion for limit of resolution-resolving power. **(12)**

UNIT III: QUANTUM MECHANICS
Introduction to Quantum Mechanics, Wave nature of Particles, Time-dependent and time-independent Schrodinger equations for wave function, Free-particle wave function and wave-packets, Uncertainty principles. Solution of Wave Equation. Solution of stationary-state Schrodinger equation for one dimensional problems–particle in a box, square-well potential,

linear harmonic oscillator. Scattering from a potential barrier and tunnelling-scanning tunnelling microscope. **(12)**

UNIT IV: SEMICONDUCTORS

Introduction to Solids and Semiconductors, Free electron theory of metals, Fermi level, density of states, Bloch's theorem for particles in a periodic potential, Kronig-Penney model and origin of energy bands, metals, semiconductors, and insulators. Direct and indirect bandgap semiconductors, Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), Carrier generation and recombination (radiative and non-radiative), Carrier transport: diffusion and drift, p -n junction. **(12)**

UNIT V: LASERS

Introduction to Lasers, characteristics of Laser, interaction of radiation with matter-spontaneous and stimulated emission, Einstein's coefficients; amplification of light by population inversion, excitation mechanisms, types of lasers: solid-state lasers – ruby laser, gas lasers - He-Ne Laser, semiconductor p-n junction diode laser, dye laser; applications of lasers **(12)**

Course Outcomes:

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

1. Describe a mathematical wave equation using the principles of oscillations and waves and explain the behaviour of the oscillations.
2. Define and evaluate the fundamentals of mechanical testing of materials using Interference and Diffraction techniques.
3. Understand the idea of wave function and to solve Schroedinger equation for simple potentials.
4. Explain the role of semiconductors in different realms of physics and their applications in both scientific and technological systems.
5. Identify the four elements of different lasers and estimate laser operation parameters for material processing.

Text Books:

1. H. J. Pain, "The physics of vibrations and waves", Wiley, 2006.
2. A. Ghatak, "Optics", McGraw Hill Education, 2012.
3. D. J. Griffiths, "Quantum mechanics", Pearson Education, 2014.
4. B.G. Streetman, "Solid State Electronic Devices", Prentice Hall of India, 1995.
5. O. Svelto, "Principles of Lasers", Springer Science & Business Media, 2010

Reference Books:

1. H. J. Pain, "The physics of vibrations and waves", Wiley, 2006.
2. Physics Vol I & II, Halliday/Resnick/Krane 5th Edition, John Wiley, 2003.
3. D. A. Neamen, "Semiconductor Physics and Devices", Times Mirror High Education Group, Chicago, 1997.
4. Berkeley Physics Course Volume I, Tata-McGraw Hill.

Mode of Evaluation: Assignments, Mid Term Tests, End Semester Examination.

B. Tech. I Year I Semester

18EEE101 BASIC ELECTRICAL ENGINEERING

L	T	P	C
3	0	0	3

Course Prerequisite: Nil

Course Description:
This course equips the students with a basic understanding of Electrical circuits and machines for specific applications. In specific, the course covers basic of DC circuit & its analysis, introduction to single-phase and three-phase AC Systems, magnetic circuits, transformers, DC & AC electrical machines, basic converters and Components of LT Switchgear.

Course Objectives:
1. To learn the basics of the D.C. circuit analysis.
2. To have an idea about single-phase and three-phase A.C. electrical circuits.
3. To gain knowledge about basic magnetic circuits and transformers.
4. To learn the construction and operation of D.C. and A.C. machines.
5. To understand the operation of basic rectifiers and various components of LT Switchgear.

UNIT I: DC CIRCUIT ANALYSIS
Electrical circuit elements (R, L and C), voltage and current sources, Series and parallel resistive circuits, Kirchhoff's current and voltage laws, Nodal and Mesh analysis of simple circuits with dc excitation. Source Transformation, Star-Delta Transformation, Superposition Theorem. **(9)**

UNIT II: AC CIRCUIT ANALYSIS
Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations. Three phase balanced circuits, voltage and current relations in star and delta connections. **(9)**

UNIT III: MAGNETIC MATERIALS AND TRANSFORMERS
Magnetic materials, B-H characteristics, ideal and practical transformer, principle of operation, emf equation, equivalent circuit, losses in transformers, regulation and efficiency. **(9)**

UNIT IV: DC AND AC MACHINES
Construction, working, emf equation of DC generator, methods of excitation, speed control of dc motor. Generation of rotating magnetic fields, construction and working of a three-phase induction motor. Introduction of Single-phase induction motor. **(9)**

UNIT V: RECTIFIERS AND ELECTRICAL INSTALLATIONS
PN junction diode, half wave, full wave and bridge rectifiers. Components of LT Switchgear: switch fuse unit (SFU), MCB, ELCB, MCCB, types of wires and cables, earthing. **(9)**

Course Outcomes:

Upon successful completion of the course, students will be able to

1. To understand and analyze basic DC electric circuits.
2. To measure and analyze various electrical quantities of single phase and three AC electric circuits.
3. To develop magnetic circuits to experiment and analyze the transformers.
4. To study the working principles of electrical machines.
5. To create power converters for domestic applications with LT switchgear.

Text Books:

1. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
2. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
3. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
4. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
5. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

References:

1. Abhijit Chakrabarti, "Circuit Theory : Analysis and Synthesis", Dhanpat Rai & Co., 2014
2. J.B. Gupta, "Theory & Performance of Electrical Machines", S. K. Kataria & Sons, 2013.
3. John Bird, "Electrical Circuit Theory and Technology", Fourth edition, Elsevier Ltd., 2010.

Mode of Evaluation: Assignments, Mid Term Tests, End Semester Examination.

B. Tech I Year I Semester

18CSE101 PROGRAMMING FOR PROBLEM SOLVING (PYTHON)

Course Prerequisite: None

L	T	P	C
2	0	2	3

Course Description:
Python is a language with a simple syntax, and a powerful set of libraries. It is an interpreted language, with a rich programming environment. While it is easy for beginners to learn, it is widely used in many scientific areas for data exploration. This course is an introduction to the Python programming language for students without prior programming experience. This course provides knowledge on how to implement programs in python language and to solve computational problems using the various programming constructs including data structures, functions, string handling mechanisms and file handling concepts.

Course Objectives:
1. Learn Python programming constructs.
2. Implement Python programs with conditional structures and loops.
3. Use functions for structuring Python programs.
4. Handle compound data using Python lists, tuples, and dictionaries.
5. Manipulate data using files handling in Python.

UNIT-I
Introduction: Algorithms, building blocks of algorithms (flow chart), History of Python, features of Python Programming, Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation. **Data Types** - Integers, Strings, Boolean.

a) Develop a flowchart for the various arithmetic operations on numbers.
b) Develop a flowchart to check whether the number is positive or negative.
c) Develop a flowchart for finding whether a given number is even or odd.
d) Develop a flowchart for finding biggest number among three numbers.
e) Develop a flowchart for displaying reversal of a number.
f) Develop a flowchart to print factorial of a number using function.
g) Develop a flowchart to generate prime numbers series up to N using function.
h) Develop a flowchart to check given number is palindrome or not using function.
i) Alexa travelled 150 kms by train. How much distance in miles she actually covered?

(12)

UNIT-II
Operators and Expressions: Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations. **Control Flow** - if, if-elif-else, for, while, break, continue, pass.

a) Swapping of two number with and without using temporary variable.
b) If the age of Ram, Sam, and Khan are input through the keyboard, write a python program to determine the eldest and youngest of the three.
c) Develop a program that performs arithmetic operations (Addition, Subtraction, Multiplication, and Division) on integers. Input the two integer values and operator for performing arithmetic operation through keyboard. The operator codes are as follows:
   - For code '+', perform addition.
   - For code '-', perform subtraction.
   - For code '*', perform multiplication.
   - For code '/', perform division.
d) Implement the python program to generate the multiplication table.
e) Implement Python program to find sum of natural numbers
f) If the first name of a student is input through the keyboard, write a program to display the vowels and consonants present in his/her name.
g) The marks obtained by a student in 5 different subjects are input through the keyboard. Find the average and print the student grade as per the MITS examination policy as shown below.

% OBTAINED	GRADE
90 - 100	O (Outstanding)
80 - 89	A+ (Excellent)
70 - 79	A (Very Good)
60 - 69	B+ (Good)
50 - 59	B (Above)
45 - 49	C (Average)
40 - 44	P (Pass)
< 40	F (Fail)

h) Implement Python Script to generate prime numbers series up to N.
i) Given a number x, determine whether it is Armstrong number or not. Hint: For example, 371 is an Armstrong number since 3**3 + 7**3 + 1**3 = 371. Write a program to find all Armstrong number in the range of 0 and 999. **(12)**

UNIT-III

Data Structures Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences. Comprehensions. **Functions** - Defining Functions, Calling Functions, Passing Arguments, variable in python-Global and Local Variables.

a) Write a Python script to
   - create a list
   - access elements from a list
   - slice lists

- change or add elements to a list
- delete or remove elements from a list

b) Write a Python script to read the values from a list and to display largest and smallest numbers from list.
c) Write a Python script to compute the similarity between two lists.
d) Write a Python script to read set of values from a Tuple to perform various operations.
e) Write a Python script to perform basic dictionary operations like insert, delete and display.
f) Write a Python program to count the occurrence of each word in a given sentence.
g) Define a dictionary named population that contains the following data.

Keys	Values
Shanghai	17.8
Istanbul	13.3
Karachi	13.0
Mumbai	12.5

h) Write a Python script to create Telephone Directory using dictionary and list to perform basic functions such as Add entry, Search, Delete entry, Update entry, View and Exit.
i) Implement Python script to display power of given numbers using function.
j) Implement a Python program that takes a list of words and returns the length of the longest one using function. **(12)**

UNIT-IV

String Handling -Modules: Creating modules, import statement, from.import statement, name spacing-**Files and Directories**

a) Implement Python program to perform various operations on string using string libraries.
b) Implement Python program to remove punctuations from a given string.
c) Write a Python program to change the case of the given string (convert the string from lower case to upper case). If the entered string is “computer”, your program should output “COMPUTER” without using library functions.
d) Implement Python program to capitalize each word in a string. For example, the entered sentence “god helps only people who work hard” to be converted as “God Helps Only People Who Work Hard”
e) Write a Python script to display file contents.
f) Write a Python script to copy file contents from one file to another.

g) Write a Python script to combine two text files contents and print the number of lines, sentences, words, characters and file size.

h) Write a Python commands to perform the following directory operations.

- List Directories and Files
- Making a New Directory
- Renaming a Directory or a File
- Removing Directory or File **(12)**

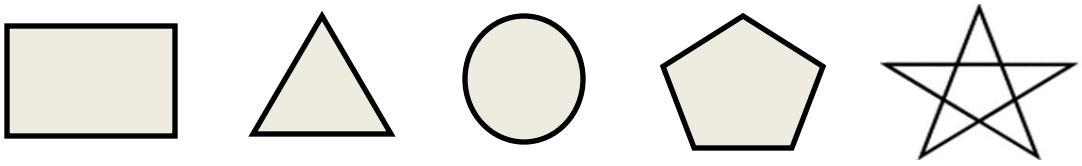
UNIT-V

Python packages, Introduction to PIP, Installing Packages via PIP(Numpy, Pandas etc.., Using PythonPackages.

Brief Tour of the Standard Library - Dates and Times, Data Compression, Turtle Graphics.

a) Create a package named Cars and build three modules in it namely, BMW, Audi and Nissan. Illustrate the modules using class. Finally we create the __init__.py file. This file will be placed inside Cars directory and can be left blank or we can put the initialization code into it.

b) Write a python script to display following shapes using turtle.



(12)

Course Outcomes:

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

1.Understand problem solving techniques and their applications
2.Understand the syntax and semantics of python.
3.Demonstrate the use of Python lists and dictionaries.
4.Demonstrate the use of Python File processing, directories.
5.Describe and apply object-oriented programming methodology and Standard Library.

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/think-python/)

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

References:

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

Mode of Evaluation: Model Lab Examinations, External Lab End Examination.

B. Tech I Year I Semester

18PHY201 PHYSICS LABORATORY

Course Prerequisite: Nil

L	T	P	C
0	0	3	1.5

Course Description:
Physics Practical course is meant for making the students to gain practical knowledge to co relate with the theoretical studies. It covers experiments on Principles of Mechanics and Optics, Measurement of Magnetic field and studying Resonance using LCR Circuit.

Course Objectives:
1. Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.
2. Illustrate the basics of mechanics, waves and opticsto analyze the behavior and characteristics of various materials for its optimum utilization.
3. Develop an ability to apply the knowledge of physics experiments in the later studies.

LIST OF EXPERIMENTS: (Any 10 Out of 12)

1. Spring constant - Coupled Pendulums
2. Study of resonance effect in series and parallel LCRcircuit
3. Determination of radius of curvature of a curved surface - Newton's Rings
4. Wavelength of a laser - Diffraction Grating
5. Wavelength of the spectral lines - Diffraction Grating
6. Magnetic field along the axis of a current carrying coil - Stewart Gees' Apparatus
7. Ferroelectric hysteresis
8. Thickness of a given wire - Wedge Method
9. Dispersive power of prism – Spectrometer
10. Frequency of the tuning fork - Melde's apparatus
11. Energy gap of a material of p-n junction.
12. Width of single slit - Diffraction due to Single Slit

Course Outcomes:
Upon successful completion of this course, the students should be able to:
1. Apply the scientific process in the conduct and reporting of experimental investigations.
2. Understand measurement technology, usage of new instruments and real time applications in engineering studies.
3. Verify the theoretical ideas and concepts covered in lecture by doing hands on in the experiments.
4. Know about the characteristics of various materials in a practical manner and gain knowledge about various optical technique methods.
5. Acquire and interpret experimental data to examine the physical laws.

Mode of Evaluation: Continuous Internal Evaluation and End Semester Examination.

B. Tech. I Year I Semester

18EEE201 ELECTRICAL ENGINEERING LABORATORY

L	T	P	C
0	0	3	1.5

Course Prerequisite: Nil

Course Description:

The laboratory facilitates the students to deal with electrical instruments which further strengthen the concepts & operation of various AC & DC circuits, and machines, and their characteristics. The lab also reinforce the concepts discussed in class with a hands-on approach which enable the students to gain significant experience with electrical instruments such as ammeter, voltmeter, digital multimeters, oscilloscopes, tachometer, switches, fuses and power supplies.

Course Objectives:

1. To provide hands on experience in setting up simple electrical circuits (DC and AC).
2. To get exposure to handle different electrical equipment's.
3. To measure various electrical parameters with different measuring instruments.
4. To get hands on experience in operating DC and AC machines.
5. To understand the operation of basic converters and various components of LT Switchgear.

LIST OF LABORATORY EXPERIMENTS/DEMONSTRATIONS

DEMONSTRATIONS:

1. Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real-life resistors, capacitors and inductors.
2. Demonstration of voltage and current relationships (line-line voltage, phase-to-neutral voltage, line and phase currents). In star and delta connections.
3. Demonstration of cutout sections of transformer and DC & AC machines.
4. Demonstration of induction machine. Motor operation and generator operation of an induction machine driven at super-synchronous speed.
5. Familiarization of (i) different types of cables/wires and switches and their uses, (ii) different types of fuses & fuse carriers; MCB, ELCB, MCCB their ratings and uses (components of LT switchgear).

EXPERIMENTS:

1. Wiring of a simple circuit for controlling a lamp/fan point.
2. Wiring of a power circuit for controlling an electrical appliance (16A Socket).
3. Verification of Kirchhoff's current and voltage laws (KCL & KVL).
4. Verification of superposition theorem
5. Sinusoidal steady state response of R-L, and R-C circuits (impedance calculation and verification).
6. Measurement of voltage, current and power in a single phase circuit using voltmeter, ammeter and wattmeter. Also, calculate the power factor of the circuit.
7. Measurement of active power for star and delta connected balanced loads (single wattmeter method).

8. Open-circuit and short-circuit test on a single phase transformer.
9. Speed control of separately excited DC motor.
10. Wiring of a power distribution arrangement using single phase MCB distribution board with ELCB, main switch and energy meter (or residential house wiring).

Course Outcomes:

Upon successful completion of the course, the students are expected to

1. Get an exposure to common electrical components and their ratings.
2. Make electrical connections by wires of appropriate ratings.
3. Understand the usage of common electrical measuring instruments.
4. Understand the basic characteristics of transformers and electrical machines.
5. Get an exposure to the working of various power electronic converters.

Mode of evaluation: Continuous Internal Evaluation and End Semester Examination.

B. Tech I Year II Semester

B. Tech I Year II Semester

18ENG101 PROFESSIONAL ENGLISH
(Common to all branches)

L	T	P	C
2	0	2	3

Course Prerequisite: Nil

Course Description: Communication takes place in many forms, however the major impact and effectiveness is in its professionalism. This course defines, enlightens and enables learners to engage in Professional Communication by addressing all the areas of communication – Listening, Speaking, Reading and Writing. This course also deals with various types of communication – Verbal, Non-verbal, Storytelling, Crucial Conversations, Written Communication, Vocalics, Eye Contact, Posture, etc.

Course Objectives:
This course enables the student to:
1. Engage effectively in a professional environment
2. Understand the intricacies and implications of professional communication
3. Use linguistic skills in any given context
4. Conduct self in a learning environment
5. Be better prepared for employment

UNIT I GRAMMAR & VOCABULARY
Grammar - Tense, Reported Speech, Modals, Conditionals; Vocabulary development - prefixes, suffixes, compound words, synonyms & antonyms. **(6)**
Practical: Dumb Charade, Giving Direction, Talking about an experiment (Tenses), Running Commentary. **(6)**

UNIT II READING SKILLS & WRITTEN COMMUNICATION
Reading - short comprehension passages, practice in skimming, scanning and predicting;
Writing- completing sentences, developing hints; Paragraph writing- topic sentence, main ideas, coherence. **(6)**
Practical: Short Passages – Reading Comprehension, Paragraph Writing, Skit Writing. **(6)**

UNIT III VERBAL & NON-VERBAL ASPECTS
Verbal - Introducing oneself, exchanging personal information, Using 'Wh'- Questions, asking and answering, yes or no questions- asking about routine actions and expressing opinions;
Non-Verbal – Use of body language, combating nervousness. **(6)**
Practical: Daily Activities, Role Play, JAM **(6)**

UNIT IV CONVERSATIONS
Listening-short texts & conversing, formal and informal conversations, short group conversations, speaking about oneself, speaking about one's friend. **(6)**

Practical: Speaking: formal and informal conversations, short group conversations, speaking about oneself, speaking about one's friend, Character Portrayal.
Listening: Listening/watching interviews, conversations, documentaries, etc.; Listening to lectures ,discussions from TV/Radio/Podcast. **(6)**

UNIT V BUSINESS ENVIRONMENT & ETIQUETTES
Sharing information of a personal kind - greeting & taking leave; Writing e-mails, memos, reports, etc. **(6)**

Practical: Mock Interview, Oral Presentation **(6)**

Course Outcomes: At the end of the course, learners will be able to
1. Read articles and understand professional communication
2. Participate effectively in informal conversations
3. Introduce themselves and their friends and express opinions in English
4. Comprehend conversations and short talks delivered in English
5. Write short essays of a general kind and personal letters and emails in English.

Suggested Reading/Textbooks:
1. Guy Brook Hart & Norman Whitby; *Cambridge English-Business Benchmark: Pre-Intermediate to Intermediate*; Published by: Cambridge University Press.
2. Adrian Doff, Craig Thaine, Herbert Puchta, et al; *Empower: Intermediate (B1+)*; Published by: Cambridge University Press.

References:
1. AJ Thomson & AV Martinet; *A Practical English Grammar*; Oxford University Press, 2015.
2. Raymond Murphy; *English Grammar in Use with CD*; Cambridge University Press, 2013.
3. K.S. Yadurajan; *Modern English Grammar*; Oxford University Press, 2014.
4. William Strunk Jr; *The Elements of Style*; ITHACA, N.Y.; W.P. HUMPHREY, 2006.
5. Joseph Devlin; *How to Speak and Write Correctly*; ITHACA, N.Y.; W.P. HUMPHREY, 2006
6. Anjana Agarwal; *Powerful Vocabulary Builder*; New Age Publishers, 2011.
7. *Writing Tutor*; Advanced English Learners' Dictionary; Oxford University Press, 2012.
8. *www.cambridgeenglish.org/in/*
9. https://learnenglish.britishcouncil.org/en/english-grammar
10. https://www.rong-chang.com/

Mode of Evaluation: Assignments, Mid Term Tests, End Semester Examination.

Dept. of Computer Science & Engineering (Data Science)

B.Tech. I Year II Semester

18MAT110 LINEAR ALGEBRA
(Common to CSE, CSIT & CST)

L	T	P	C
3	1	0	4

Course Prerequisite: 18MAT101

Course Description:
Linear algebra is one of the most important subjects in the study of engineering because of its widespread applications in electrical, communications and computer science. The objective of this course is to give a presentation of basic concepts of linear algebra to illustrate its power and utility through applications to computer science and engineering.

Course Objectives:
1. Understanding basic concepts of linear algebra (systems of linear equations, matrix calculus, vectors and basic vector operations).
2. Learn about vector spaces and sub spaces.
3. To become proficiency in solving computational problems of linear algebra.
4. To understand the axiomatic structure of modern mathematics and learn to construct simple proof.
5. Learn to solve Engineering problem.

UNIT I : LINEAR EQUATIONS AND MATRICES
System of linear equations – Gaussian elimination/Jordan – block matrices –finding inverse of matrices – elementary matrices – permutation matrix – LDU factorization – applications to cryptography and electrical network **(12)**

UNIT II: VECTOR SPACE
The n-space R^n and vector space – subspaces – bases – linear combination– span linearly dependent – independent – dimensions – finite dimensional – Row and column spaces – Rank and nullity – Bases for subspace – invertibility – application in interpolation. **(12)**

UNIT III : LINEAR TRANSFORMATIONS
Basic Properties of Linear transformations – invertible linear transformation – matrices of linear transformations. **(12)**

UNIT IV: VECTOR SPACE OF LINEAR TRANSFORMATIONS
Vector space of linear transformations – change of bases – similarity – application to computer graphics. **(12)**

UNIT V: INNER PRODUCT SPACES
Dot Products and Inner products–the lengths and angles of vectors–matrix representations of inner products–Gram-Schmidt orthogonalization–orthogonal projections–relations of fundamental subspaces–orthogonal matrices and isometrics–applications to least square solutions. **(12)**

Course Outcomes:

This course meets the following student outcomes:

1. Solve systems of linear equations using Gaussian elimination and matrix inversion.
2. Demonstrate understanding of the concepts of vector space and subspace, linear independence, span, and basis.
3. Apply principles of matrix algebra to linear transformations.
4. Apply principles of vector space to linear transformations.
5. Demonstrate understanding of inner products and associated norms.

Text Book:

1. Jin Ho Kwak and Sungpyo Hong, "Linear Algebra", Second edition, Birkhaüser, 2004

Reference Books:

1. Stephen Andrilli and David Hecher, Elementary Linear Algebra, 3rd Edition, Academic Press(2006)
2. Charles W. Curtis, Linear Algebra, Springer (2004)
3. Howard Anton and Robert C Busby, Contemporary linear algebra, John Wiley (2003).
4. Gilbert Strang, Introduction to Linear Algebra.

Mode of Evaluation: Assignments, Mid Term Tests, End Semester Examination.

B. Tech I Year II Semester

18CHE101 ENGINEERING CHEMISTRY

L	T	P	C
3	0	0	3

Course Pre-requisite: Basic Chemistry at Intermediate or equivalent level.

Course Description:
Deals with the basic principles of various branches of chemistry like physical, organic, analytical and nanomaterial chemistry.

Course Objectives:
1. Students will understand, analyse and determine the impurities present in the water.
2. Appreciate the synthetic organic reactions used in daily life
3. Learn the principles of spectroscopies to analyse them.
4. Value the basic concepts of thermodynamics and electrochemistry.
5. Be exposed to the importance of nano and engineering materials used in their daily life.

UNIT I : IMPURITIES PRESENT IN WATER AND WATER TREATMENT
Impurities in water (BIS and WHO standards), Hardness of water, determination of hardness by EDTA Method (numerical problems), Disadvantages (industry level) of using hard water, Alkalinity of water and its importance, Chlorides, Softening of water by Reverse Osmosis method. Water treatment for civic applications: coagulation, sedimentation, filtration, sterilization - chlorination and ozonization. Concept of break point chlorination. **(9)**

UNIT II: PERIODIC PROPERTIES AND ORGANIC REACTIONS
Electronic configurations, atomic and ionic sizes, ionization energies, oxidation states, molecular geometries.
Introduction to substitution, addition, elimination, oxidation and reduction reactions. **(9)**

UNIT III: SPECTROSCOPY
Basic principle and applications of Electronic, Fluorescence, Vibrational and Rotational spectroscopy. Magnetic resonance imaging. **(9)**

UNIT IV: FREE ENERGY IN CHEMICAL EQUILIBRIA
Thermodynamics: Systems, State Functions, Thermodynamic functions: Work, Energy, Entropy and Free energy. Estimations of entropy in various processes and free energies. Free energy and emf. Cell potentials, the Nernst equation and applications. Batteries (Pb-acid, Li-ion) and Fuel-Cells (H_2-O_2). Corrosion: Factors influencing Corrosion, Protective coatings. **(9)**

UNIT V: ENGINEERING MATERIALS, NANOSCIENCE & NANOTECHNOLOGY
Cement Materials - Lime, Cement, Gypsum. Lubricants – definition, classification, Extreme pressure lubrication mechanism, important properties – viscosity, viscosity index, saponification number, flash point and pour point. Nanomaterials: Introduction, Classes/Types, Structure-Property relationship; Chemical synthesis of nanomaterials: sol-gel, Hydrothermal and Chemical Vapor Deposition method, Characterization by powder XRD (Scherrer's equation), SEM.

Applications of nanomaterials – Catalysis, Electronics & Telecommunication, Medicines, Energy and Environmental Sciences. **(9)**

Course Outcomes:

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

1. Analyze and determine the impurities in water such as hardness, alkalinity for sustainable development.
2. Prepare organic compounds/polymers for environmental, safety and society need.
3. Comprehend the principles and applications of spectroscopies
4. Apply the concept of free energy in thermodynamics, electrochemistry for solving the problems evolve in the engineering processes.
5. Acquire spotlight to the nanomaterials and basic engineering materials used in academics, industry and daily life.

Text Books:

1. "Atkins' Physical Chemistry", P.W. Atkins & Julio de Paula, Ninth edition (Oxford University Press, Oxford 2010).
2. Fundamentals of Molecular Spectroscopy, by C. N. Banwell, Fourth Edition, (Tata McGraw Hill, 2008).
3. Engineering Chemistry, Dr. S. S. Dara and Dr. S. S. Umare, (S. Chand & Company Ltd., 2013).
4. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan.

Reference Books:

1. 'Physical Chemistry', D. W. Ball, First Edition, India Edition (Thomson, 2007).
2. Perry's Chemical Engineers' Handbook, Perry and Green, 9th Edition, Section 2, McGraw Hill
3. Engineering Chemistry, Dr. Suba Ramesh and others, 1st Edition, Wiley India, 2011.
4. Engineering chemistry, K. N Jayaveera, G. V. Subba Reddy and C. Rama Chandraiah, 1st Edition, McGraw Hill education 2013.

Mode of Evaluation: Assignments, Mid Term Tests, End Semester Examination.

B. Tech. I Year II Semester

18CSE102 C PROGRAMMING AND DATA STRUCTURES

Course Prerequisite: 18CSE101

L	T	P	C
3	0	0	3

Course Description:
This course includes C program basics, control structures, arrays, files, pointers and data structures.

Course Objectives:
1. To make the student understand problem solving techniques and their applications
2. Students will be able to understand the syntax and semantics of C programming language
3. Develop algorithms for manipulating linked lists, stacks, queues, searching and sorting.

UNIT I C PROGRAMMING
Structure of C Program, C Tokens: Variables, Data types, Constants, Identifiers, key words and Operators, Expressions.
Control Structures: Conditional Statements (Simple if, if-else, Nested -if-else, Switch). Iterative Statements (for, While, Do-While), Jump Statements (break, Continue). **(9)**

UNIT II FUNCTIONS & ARRAY
Functions Introduction, User defined function, accessing a function, Function prototypes, Recursion, storage classes **Arrays**: Defining an array, processing an array, one dimensional arrays, two dimensional arrays. **Searching:** Linear and Binary search **Sorting:** Bubble Sort and Insertion Sort. **(9)**

UNIT III POINTERS, STRUCTURES
Pointers: Fundamentals of pointer, Pointer Declarations, Parameter passing: Pass by value, Pass by reference – Example Program: Swapping of two numbers and changing the value of a variable using pass by reference. Dynamic memory allocation. **Structures:** Defining a structure, Processing a structure. **(9)**

UNIT IV STACK AND QUEUE
Classification of Data Structure, **Stack and Queues:** stack, stack operations, stack implementations using arrays. Queue, queue operations, queue implementations using array, types of queues, applications of stack and queue. **(9)**

UNIT V STRINGS & FILES
Declaring and Defining a string, Initialization of strings, Strings Library functions
Files: File Definition, Opening and closing a data file, Reading and Writing a data file, Files I/O Functions. **(9)**

Course Outcomes:
Upon successful completion of the course, students will be able to
1. Understand problem solving techniques for a wide-range of problems.

2. Design and implement applications using functions, arrays, searching and sorting techniques.
3. Design and implement applications using pointers, structure and list.
4. Choose appropriate data structure depending on the problem to be solved.
5. Design and implement applications using Strings, Pointers and File processing.

Text Books:

1. The C Programming Language, Kernighan and Ritchie, 2 nd Edition, Prentice Hall, India 1988.
2. Alfred V. Aho, John E. Hopcroft and Jeffry D. Ullman, Data Structures and Algorithms, Pearson Education, New Delhi, 2006.

References:

1. Programming in ANSI C, E. Balagurusamy, Sixth Edition, Tata Mc-Graw Hill Publishing Co.Ltd.-New Delhi
2. Problem Solving & Program Design in C, Hanly, Jeri R and Elliot. B Koffman, Pearson Education,5th edition, 20007.
3. K. N. King ,"C Programming ": A Modern Approach, 2nd Edition 2nd Edition
4. Byron Gottfried , Jitender Chhabra , Programming with C (Schaum's Outlines Series)

Mode of evaluation: Continuous Internal Evaluation and End Semester Examination.

B. Tech I Year II Semester

18ME101 ENGINEERING GRAPHICS

L	T	P	C
2	0	3	3.5

Course Prerequisite: None

Course Description:
Introduction to AutoCAD commands, simple drawings, orthographic projections, projection of points, lines, planes; auxiliary projections; projections and sections of solids; development and intersection of surfaces; isometric projections.

Course Objectives:
1. Engineering Graphics is the primary medium for development and communicating design concepts.
2. Through this course the students are trained in Engineering Graphics concepts with the use of AutoCAD.
3. The latest ISI code of practice is followed while preparing the drawings using AutoCAD.
4. Computerized drawing is an upcoming technology and provides accurate and easily modifiable graphics entities.
5. Storage and Retrieval of Drawings is also very easy and it takes very less time to prepare the drawings. Also enhances the creativity.

UNIT I: INTRODUCTION TO AUTO CAD
Introduction to AutoCAD commands, simple drawings, Orthographic Projections-Theory, techniques, first angle projections and third angle projections. **(10)**

UNIT II: PROJECTIONS OF POINTS & LINES
Projections of points: Positions, notation system and projections.
Projections of lines: positions, terms used, different cases, traces of lines and finding true lengths, auxiliary projections. **(10)**

UNIT III: PROJECTIONS OF PLANES & SOLIDS
Projections of planes: positions, terms used, different cases and projections procedure. Projections of Solids: Projections of Regular Solids inclined to one planes. **(10)**

UNIT IV: SECTIONS AND DEVELOPMENTS OF SOLIDS
Section Planes and Sectional View of Right Regular Solids-Prism, cylinder. True shapes of the sections. Development of Surfaces of Right Regular Solids-Prism, Cylinder and their Sectional Parts. **(10)**

UNIT V: INTERSECTIONS & ISOMETRIC PROJECTIONS
Intersections of surfaces of solids: Intersection between: Line-plane, Plane-plane, line-solid, solid-solid. **Isometric Projections**: Theory of isometric drawing, construction of isometric projection from orthographic. **(10)**

Course Outcomes:

The students after completing the course will be able to:

1. Identify various commands in AutoCAD and their usage for engineering graphics
2. Draw the projections of points and straight lines with AutoCAD
3. Draw the projections of the planes and sections of solids.
4. Sketch the intersections of surfaces and developments of solids
5. Draw the conversion of the orthographic views to isometric views and vice versa.

Text Book:

1. D.M. Kulkarni, A.P. Rastogi and A.M. Sarkar., Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi 2009.

References:

1. Dhananjay A Jolhe, Engineering Drawing: with an introduction to AutoCAD, Tata McGraw Hill, 2008
2. Warren J. Luzadder& Jon M. Duff Fundamentals of Engineering Drawing, 11th edition, Prentice Hall of India, New Delhi.ss

Mode of Evaluation: Continuous Internal Evaluation, Mid Term Tests and End Semester Examination

B. Tech I Year II Semester

18CHE201 CHEMISTRY LABORATORY

L	T	P	C
0	0	3	1.5

Course Prerequisites: Intermediate

Course Description:
It deals with basic principles of volumetric and instrumental analytical methods.

Course Objective:
This Engineering Chemistry Laboratory is common to all branches of I Year B Tech. At the end of the course the student is expected to Students will learn to estimate the chemical impurities present in water such as hardness, alkalinity, chlorine, etc.

1. Understand and experience the synthetic methods for the preparation of a polymer / inorganic (or) organic compounds.
2. Be trained to use the instruments for to practically understand concepts of electrochemistry.
3. Bridge theoretical concepts and their practical engineering applications, thus highlighting the role of chemistry in engineering
4. Learn and understand the practical implementation of fundamental concepts.

CHOICE OF 10 EXPERIMENTS FROM THE FOLLOWING

1. Estimation of total, permanent and temporary hardness of water by EDTA method.
2. Estimation of Chloride content in bleaching powder.
3. Estimation of alkalinity of water sample.
4. Determination of rate constant of a chemical reaction/process
5. Adsorption of acetic acid by charcoal.
6. Determination of rate of corrosion by colorimetry (Galvanized steel and $CuSO_4$).
7. Synthesis of a polymer and determination of molecular weight by measuring viscosity.
8. Saponification/acid value of an oil.
9. Synthesis of an inorganic complex.
10. Synthesis of a simple organic compound / Preparation of Thiokol Rubber.
11. Determination of strength of an acid Pb-Acid battery by conductometric titration (Neutralisation Titration).
12. Conductometric titration of BaCl2 Vs Na2SO4 (Precipitation Titration).
13. Dissociation constant of weak electrolyte by Conductometry.
14. Determination of percentage of Iron in Cement sample by colorimetry.

15. Estimation of ferrous ion by potentiometric titration (Redox Titration).

Course Outcomes:

After the completion of the Engineering Chemistry Laboratory experiments, students will be able to

1. Develop and perform analytical chemistry techniques to address the water related problems (for e.g., hardness, alkalinity, dissolved oxygen present in water) technically.
2. Synthesize and analyse the given chemical compound / material for engineering applications towards the needs of the society, environment, etc.
3. Procure practical skills to handle spectroscopic methods to understand the rate of corrosion, colour and much more topics applicable in industry.
4. Operate various instruments for the analysis of materials and produce accurate results in a given time frame.
5. Think innovatively and improve the creative skills that are essential for solving engineering problems.

Text Books:

1. Engineering Chemistry Lab Manual, Dept. of Chemistry, Madanapalle Institute of Technology and Science, Madanapalle – 517325, Chittoor Dist., Andhra Pradesh, India.
2. "Vogel's Textbook of Qualitative Chemical Analysis", Arthur Israel Vogel, Prentice Hall, 2000.

Mode of evaluation: Continuous Internal Evaluation and End Semester Examination.

Dept. of Computer Science & Engineering (Data Science)

B. Tech. I Year II Semester

18CSE201 C PROGRAMMING AND DATA STRUCTURES LABORATORY

Course Prerequisite: 18CSE101

L	T	P	C
0	0	3	1.5

Course Description:
This course includes C program basics, control structures, arrays, files, pointers and data structures.

Course Objectives:
1. To make the student understand problem solving techniques and their applications
2. Students will be able to understand the syntax and semantics of C programming language
3. Develop algorithms for manipulating linked lists, stacks, queues, searching and sorting.

LIST OF EXPERIMENTS

1. a) Write a C program to swap the two numbers.
   b) Write a C Program to find the eligibility of admission for a Professional course based on
   the following criteria:
   Marks in Maths >=65
   Marks in Physics >=55
   Marks in Chemistry>=50
   OR
   Total in all three subject >=180

2. a) Write a C program to compute the factorial of a given number.
   b) Write a program that reads numbers which are in the range 0 to 100, till it encounters -1.
   Print the sum of all the integers that you have read before you encountered -1

3. a) Given three points (x1, y1), (x2, y2) and (x3, y3), write a program to check if all the three
   points fall on one straight line.
   b) The digital root (also called repeated digital sum) of a number is a single digit value obtained by an iterative process of summing digits. Digital sum of 65536 is 7, because 6+5+5+3+6=25 and 2+5 = 7.Write a program that takes an integer as input and prints its digital root.

4. a) Write a C program to find the series of prime numbers in the given range.
   b) Write a C program to generate Fibonacci numbers in the given range.

5. a) Write a c program to check whether a given number is a perfect number or not. (Perfect number is a positive number which sum of all positive divisors

excluding that number is equal to that number. For example 6 is perfect number since divisor of 6 are 1, 2 and 3. Sum of its divisor is 1 + 2+ 3 = 6)
b) Write a C program to find Factorial, GCD, Fibonacci, (Using recursion)

6. Write a C program to find sum of digits, base conversions, reversal of numbers.**(using functions).**

7. Your program should take as input: dimension of a square matrix N, two matrices of size N x N with integer values, and one operator symbol (+, - ,*). It must perform the Corresponding operation given below
a) Matrix Addition b) Matrix Subtraction c) Matrix Multiplication

8. One needs to first input a set of N number of ALPHABETIC Strings each representing a name of a student in an array studname [N]. Assume each string can be Max. 40 Characters long. subsequently, one needs to input Marks obtained by those students in another array marks [N] Assume that studname [I] i.e. ith student in the list of student names has obtained Marks [I] in the Marks List. You need to find out and print the Max Marks obtained by a student and also print the name of the student who has obtained this marks.

9. Implement the following searching techniques
a) Linear Search b) Binary Search

10. a) Bubble sort is a sorting algorithm that works by repeatedly stepping through lists that need to be sorted, comparing each pair of adjacent items and swapping them if they are in the wrong order. This passing procedure is repeated until no swaps are required, indicating that the list is sorted. Bubble sort gets its name because smaller elements bubble toward the top of the list. Consider an array of size 10. It will be filled it by reading 10 integers. The final output will be sorted output in Ascending Order.
b) Insertion sort is a sorting algorithm in which the elements are transferred one at a time to the right position. Here the first element in the array is considered as sorted, even if it is an unsorted array. Then each element in the array is checked with the previous elements, resulting in a growing sorted output list. With each iteration, the sorting algorithm removes one element at a time and finds the appropriate location within the sorted array and inserts it there. The iteration continues until the whole list is sorted. First an array of size 10 will be taken. We will fill it by reading 10 integers. The final output will be sorted output in Ascending Order.

11 a) Write a C program to swap two integers using pointers. You have to write a swap function that will accept the address of two integer and swap their values
b) Write a program in C to add two numbers using pointers. You have to write the fsum() function which accepts the address of two variables and returns the sum of their values to the main function.

12. Write a C program to compute internal marks of students for five different subjects using Structures.

13. Implement the following Data Structures
    a) Stack ADT b) queue ADT c) Circular queue ADT

14. Write a C program to implement all string operations (string length, string copy, string compare, string concatenation and string reverse) without using standard string library functions.
    b) Write a C program to count total number of vowel or consonant in a string

15. Write a C program to copy the file contents from one file to another file(pass file names as Command line arguments).

Course Outcomes:

After completing this course the students should be able to

1. Understand problem solving techniques for a wide-range of problems.
2. Design and implement applications using functions and arrays.
3. Design and implement applications using Strings, Pointers and File processing.
4. Choose appropriate data structure depending on the problem to be solved.
5. Use appropriate searching and sorting technique to suit the application.

Mode of Evaluation: Continuous Internal Evaluation and End Semester Examination.

B. Tech. I Year II Semester

18CSE202 ENGINEERING & IT WORKSHOP

Course Prerequisite: None

L	T	P	C
0	0	3	1.5

Course Description:

This course will provide students with a hands-on experience on various basic engineering practices CSE and presenting the final product design.

Course Objectives:

1. Introduction to the use of Tools and Machinery in foundry, forging, tinsmith, carpentry, welding, fitting, working, fabrication of plastic components, fabrication of polymer composite materials, simple machine turning and wood turning, basic electrical connections
2. Introduction of basic electrical engineering
3. Fabrication of final product design at end of the semester

LIST OF EXPERIMENTS

1. Carpentry (Cross half lap Joint and Miter Joint)
2. Fitting (Square and'V' fit)
3. Sheet Metal - Tin smithy (Square tray)
4. Foundry (Solid and Split pattern)
5. Welding (Arc and Gas welding) – SingleV Butt Joint, T-fillet Joint
6. Plastic fabrication (Pen Stand)
7. Metrology (Internal and External dimension)
8. Introduction of Power Tools and CNC(Demo Only)
9. Introduction to 3D Printing (Demo Only)

Course Outcomes:

On successful completion of this course, the student will be able to

1. Fabricate carpentry components with suitable joint and pipe connections including plumbing works.
2. Practice the welding equipment to join the structures
3. Effective the basic machining operations
4. Create the models using sheet metal and plastic works.
5. Illustrate the operations of foundry, fitting and smithy
6. Fabrication product in composite material and product in plastic material
7. Conduct experiment basic electrical wire connection
8. Design and fabrication of final product design

Mode of Evaluation: Continuous Internal Evaluation and End Semester Examination.

Suggested Text/Reference Books:

1. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
2. Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition, Pearson Education India Edition, 2002.
3. Gowri P. Hariharan and A. Suresh Babu, "Manufacturing Technology – 1" Pearson Education, 2008.
4. Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India, 1998. (v) Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.

IT WORKSHOP

Course Prerequisite: None

Course Description:
This course helps the students to understand the basic components of a computer, installation of operating systems, working on productivity tools Word power, point excel. Also it gives a basic understanding of using Google tools and various emails setting in Gmail.

Course Objectives:
1. The course focuses on enhancing student knowledge in computer peripherals and assembling.
2. To install operating system on computers and create new email account.
3. To understand basic software like WinRAR, WinZip, PDF readers and web browser.
4. To provide technical training to the students on Google tools like forms, calendar, drive, translate and Photo.
5. To make the students to install software like JDK, Turbo C compiler ,and .net

LIST OF EXPERIMENT

1. Components of Computer & Assembling a Computer:

Learning about the different parts of the computer and its advancement

- Processor
- Memory – Types
- Motherboard
- Peripheral interfaces – I/O devices
- Learn about the proper connectivity among the devices inside the PC
- Assembling the different parts of the computer inside the cabinet

2. Install Operating System

- Partition the disk drive based on the capacity and the OS to be installed using utility tools
- Install Windows
- Install Linux or Ubuntu - use command line installation

3. Basic PC Troubleshooting

- Awareness on the possible issues in a computer
- Troubleshooting the problems using the available tools
- Removal and repair of existing software
- Identification of suitable Device driver for Hardware Devices.

4. Learning Basic Software:

- Installation of Productivity tools like WinRAR, WinZip, and PDF Reader.
- Installation of Image Editor and Web browsers.
- Basic Software installation in Linux based system.
- Connect the Printer and Scanner Devices perform printing and scanning operation.

5. Productivity Tools (Office 365):

- Generate, manipulate, search, aligning content using MS Word.
- Creation of Excel sheet with various column and rows applying various Excel formulas.
- Create Presentation and Visualization – graphs, charts, 2D, 3D.
- Create a database template using MS Access.
- Draw flowchart using the Drawing tools – Google Quick draw,sketchup,

6. Introduction to Google Tools

- Design a Google form and collect a response date among students using Google Form.
- Schedule One day of your activities using Google Calendar.
- Store and Retrieve Date from cloud storage using Google Drive.
- Translate the English language sentence to Telugu sentence using Google Translate
- Organizing photo and editing photo using Google Photos.

7. Exploring Email

- Creation, Composing and Sending the E-mail.
- Use High Priority setting to categories the mail.
- Create a Folder in different Categories and move the received mail to Folder.
- Unsubscribing unwanted emails
- Enable settings for automatic reply

Add_on content:

- Networking Commands: ping, ssh, ifconfig, scp, ipconfig, traceroute, nslookup, getmac

Technical Stack: Windows 7 / UbantuOs – Winrar, Winzip,PDF reader, Office Package.

Course Outcomes:

Upon successful completion of the course, students will be able to

1. Attain complete knowledge of a computer hardware
2. Install Operating Systems and troubleshooting using Utility software.
3. Able to do document task through MS office .
4. Attain technically strong usage of Google Tools and Email handling .
5. Able to install basic computer engineering software.

Mode of Evaluation: Continuous Internal Evaluation, End Semester Practical Examination.