SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE)

CSE
(ARTIFICIAL INTELLIGENCE)

R20 Regulation

I B. TECH.
COURSE STRUCTURE AND SYLLABUS

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE)

INSTITUTE VISION

To emerge as one of the premier institutions through excellence in education and research, producing globally competent and ethically strong professionals and entrepreneurs.

INSTITUTE MISSION

M1: Imparting high-quality technical and management education through the state-of-the- art resources.

M2: Creating an eco-system to conduct independent and collaborative research for the betterment of the society

M3: Promoting entrepreneurial skills and inculcating ethics for the socio-economic development of the nation.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE)

DEPARTMENT VISION

To impart quality education and research in Computer Science and Engineering for producing technically competent and ethically strong IT professionals with contemporary knowledge.

DEPARTMENT MISSION

M1: Achieving academic excellence in computer science through effective pedagogy, modern curriculum and state-of-art computing facilities.

M2: Encouraging innovative research in Computer Science and Engineering by collaborating with Industry and Premier Institutions to serve the nation.

M3: Empowering the students by inculcating professional behavior, strong ethical values and leadership abilities

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To provide software solutions for arising problems in diverse areas with strong knowledge in innovative technologies of computer science.

PEO2: To serve in IT industry as professionals and entrepreneurs or in pursuit of higher education and research.

PEO3: To attain professional etiquette, soft skills, leadership, ethical values meld with a commitment for lifelong learning.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: **Analysis & Design:**
Ability to design, develop and deploy customized applications in all applicable domains using various algorithms and programming languages.

PSO2: **Computational Logic:**
Ability to visualize and configure computational need in terms of hardware and software to provide solutions for various complex applications.

PSO3: **Software Development:**
Ability to apply standard procedures, tools and strategies for software development.

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INDUCTION PROGRAM (MANDATORY)	**3 WEEKS DURATION**
Induction program for students to be offered right at the start of the first year.	• Physical activity • Creative Arts • Universal Human Values • Literary • Proficiency Modules • Lectures by Eminent People • Visits to local Areas • Familiarization to Dept./Branch & Innovations

I B. Tech. – I Semester (CAI)

S.No.	**Course Code**	**Subject**	**L**	**T**	**P**	**C**
1	20HS0830	Algebra and Calculus	3	-	-	3
2	20HS0849	Applied Physics	3	-	-	3
3	20EE0250	Principles of Electrical Engineering	3	-	-	3
4	20CS0501	C Programming and Data Structures	3	-	-	3
5	20EC0445	Basic Electronics Engineering	3	-	-	3
6	20HS0851	Applied Physics Lab	-	-	3	1.5
7	20EE0252	Basic Electrical and Electronics Engineering Lab	-	-	3	1.5
8	20CS0502	C Programming and Data Structures Lab	-	-	3	1.5
Contact Periods / Week			**15**	**-**	**9**	**19.5**
			Total/Week 24			

I B. Tech. – II Semester (CAI)

S.No.	**Course Code**	**Subject**	**L**	**T**	**P**	**C**
1	20HS0835	Probability & Statistics	3	-	-	3
2	20HS0802	Applied Chemistry	3	-	-	3
3	20HS0810	Communicative English	3	-	-	3
4	20ME0301	Engineering Graphics	1	-	4	3
5	20CS0503	Digital Logic Design	3	-	-	3
6	20HS0803	Applied Chemistry Lab	-	-	3	1.5
7	20HS0811	Communicative English Lab	-	-	3	1.5
8	20ME0302	Workshop Practice Lab	-	-	3	1.5
Non-Credit Course						
9	20HS0816	Indian Constitution	2	-	-	-
Contact Periods / Week			**15**	**-**	**13**	**19.5**
			Total/Week 28			

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I B.Tech. – I Sem.

L	T	P	C
3	-	-	3

(20HS0830) ALGEBRA AND CALCULUS
(Common to All branches)

COURSE OBJECTIVES

The objectives of this course:

1. *To illuminate the students in the concepts of calculus and linear algebra.*
2. *To equip the students with standard concepts and tools at an intermediate to advanced level mathematics to develop the confidence and ability among the students to handle various real world problems and their applications.*
3. *To estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.*

COURSE OUTCOMES

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

1. *Develop the use of matrix algebra techniques that is needed by engineers for practical applications.*
2. *Utilize mean value theorems to real life problems.*
3. *Familiarize with functions of several variables which is useful in optimization.*
4. *Learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional coordinate systems.*
5. *Interpret the physical meaning of different operators such as gradient, curl and divergence.*
6. *Apply Fundamental Theorem of Line Integrals, Green's Theorem, Stokes' Theorem, or Divergence Theorem to evaluate integrals.*

UNIT - I

Matrices: Rank of a matrix by echelon form, solutions of system of homogeneous and non-homogeneous linear equations. Eigen values and Eigen vectors and their properties, Cayley-Hamilton theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton theorem.

UNIT - II

Mean value theorems: Rolle's theorem-Lagrange's Mean value theorem-Taylor's and Maclaurin's theorems (without proof);

Partial Differentiation: Chain rule, Total derivatives, Jacobians, functional dependence, Maxima and Minima of functions of two variables, method of Lagrange multipliers with three variables only.

UNIT - III

Integral Calculus: Evaluation of definite and improper integrals (single variable), Multiple Integration: Double integrals (Cartesian), change of order of integration in double integrals, Change of variables (Cartesian to polar), Evaluation of Triple integrals (Cartesian).

UNIT - IV

Vector differentiation: Scalar and vector point functions, vector operator del, del applies to scalar point functions- Gradient, del applied to vector point functions-Divergence and Curl, vector identities.

UNIT - V

Vector integration: Line integral-circulation-work done, surface and volume integrals.

Integral theorems: Green's theorem in the plane (without proof), Stoke's theorem (without proof), Divergence theorem (without proof) and applications of these theorems.

TEXT BOOKS

1. Grewal B S, *Higher Engineering Mathematics*, 44thEdition, Khanna Publishers, 2017.
2. Ramana B V, *Higher Engineering Mathematics*, Mc Graw Hill Education, 2010.

REFERENCES

1. Rukmangadachari. E & Keshava Reddy E, *Engineering Mathematics,* Volume-I,II&III, Pearson Publishers, 2010.
2. Satyanarayana Bh, Pradeep Kumar T.V & Srinivasulu D, *Linear Algebra and Vector Calculus*, Studera Press, New Delhi, 2017, ISBN: 978-81-930333-8-8.
3. Iyengar T.K.V, Krishna Gandhi B, Ranganatham S & Prasad M.V.S.S.N, *Engineering Mathematics,* Volume-I,II & III, 12thEdition, S.Chand publication, 2014.

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I B.Tech. – I Sem.

L	T	P	C
3	-	-	3

(20HS0849) APPLIED PHYSICS

COURSE OBJECTIVES

The objectives of this course:

1. *To identify the importance of optical phenomenon i.e. interference and diffraction related to its engineering applications.*
2. *To impart knowledge in basic concepts of free electron theory, energy bands in solids and propagation of Electromagnetic waves.*
3. *To recognize the basic concepts related to the properties of Lasers and Optical Fibers.*
4. *To understand key points, formation and importance of semiconductors in the functioning of electronic devices.*
5. *To understand the fundamental concepts of Superconductivity and Nano Science & Technology.*

COURSE OUTCOMES

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

1. *Analyze the differences between interference and diffraction with applications.*
2. *Explain concepts of free electron theory and energy bands in solids and asses the EM wave propagation in non-conducting medium by using Maxwell Equations.*
3. *Explain the basic principles and properties of Lasers and Optical Fibers.*
4. *Identify the applications of semiconductors in electronic devices*
5. Explain the basic properties and applications of superconductors in various fields.
6. Illustrate methods for synthesis and characterization of nanomaterials and apply basic principles of nanomaterials in various engineering applications.

UNIT-I: WAVE OPTICS

Interference - Principle of Superposition-Interference of light- Conditions for sustained Interference - Interference in thin films (reflected light)-Newton's Rings-Determination of Wavelength of light- Engineering Applications of interference.

Diffraction – Introduction- Fraunhofer Diffraction-Single Slit – Double Slit -Diffraction Grating – Grating Spectrum -Determination of Wavelength of Light - Engineering Applications of diffraction.

UNIT-II: ELECTRON THEORY OF METALS &ELECTROMAGNETIC THEORY

Electron Theory of Metals : Classical free electron theory: postulates- drawbacks- Quantum free electron theory. – Fermi Dirac distribution–Effective mass of electron- sources of electrical resistance- Energy bands in solids - Types of electronic materials: metals, semiconductors and insulators.

Electromagnetic Theory :Divergence and Curl of Electric and Magnetic Fields- Gauss' theorem for divergence and Stokes' theorem for curl- Maxwell's Equations (Quantitative)- Electromagnetic wave propagation (Non-conducting medium).

UNIT-III : LASERS AND FIBER OPTICS

Lasers: Introduction - Characteristics of Laser - Spontaneous and Stimulated emission of radiation - Einstein's coefficients - Population inversion - Pumping Mechanisms - He-Ne laser, Nd-YAG laser - Applications of laser.

Fiber Optics: Introduction to Optical Fibers-Total Internal Reflection-Construction of optical fibers, Critical angle of propagation-Acceptance angle-Numerical Aperture-Classification of fibers based on Refractive index profile & modes –Propagation of electromagnetic wave through optical fiber- Block Diagram of Fiber optic Communication system –Applications.

UNIT-IV: SEMICONDUCTORS

Intrinsic semiconductors- Carrier concentration (qualitative) - Fermi level – Energy Band Structure - Electrical conductivity- Energy band gap - Extrinsic semiconductors- P-type & N-type – Carrier concentration (qualitative) - Fermi level – Energy Band Structure- Life time of charge carriers- Carrier generation and recombination – Drift and Diffusion processes –Einstein's Relation - Hall Effect and it's applications –Theory of p -n junction – Construction and working of LED and Photo Diode

UNIT-V: SUPERCONDUCTIVITY AND PHYSICS OF NANOMATERIALS

Superconductivity: Introduction – Meissner effect - Properties of superconductors Type I and type II superconductors- ac and dc Josephson effects -BCS theory (qualitative) –Applications of superconductors.

Physics of Nanomaterials: Introduction, Nanoscience and Nanotechnology – Surface area to volume ratio and Quantum confinement- Classifications of Nanomaterials – Properties of nanomaterials: Mechanical, Magnetic, Optical - Synthesis of nanomaterials- Top-Down Process-Ball Milling; Bottom-Up Process: Sol-Gel method–Applications of nanomaterials.

TEXT BOOKS

1. B.E.A. Saleh and M.C. Tech, "*Fundamentals of Photonics*", John Wiley & Sons, 2nd ed.2012.
2. K.Thyagarajan ,"*Engineering Physics*" , Mc Graw Hill Education Private Ltd, New Delhi.2nd ed,2019.

REFERENCES

1. M.N.Avadhanulu, P.G.Kshirsagar& TVS Arun Murthy" *A Text book of Engineering Physics*",S.Chand Publications, 11th Edition,2019.
2. J. Singh, "*Semiconductor optoelectronics*: *Physics and Technology*", McGraw-Hill Inc. 2nd 1995.
3. S.M. Sze, "*Semiconductor Devices: Physics and Technology*", Wiley, 2rd ed. 2015.
4. P. Bhattacharya, "*Semiconductor Optoelectronic devices*", Prentice Hall of India , 2nd ed.1997.
5. R. Fitzpdricle , "*Maxwell's equations and the principles of Electromagnetism*", Infinity Science Press, 1st ed.2010.
6. John David Jackson , "*Classical Electrodynamics*".Wiley,3rd ed. 2007.

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I B.Tech. – I Sem.

L	T	P	C
3	-	-	3

(20EE0250) PRINCIPLES OF ELECTRICAL ENGINEERING

COURSE OBJECTIVES

The objectives of this course:

1. *To understand the nature of different circuit elements, fundamental laws and network theorems.*
2. *Understand the operation of dc machines and single-phase transformers.*
3. *To learn the different types measuring instruments*

COURSE OUTCOMES

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

1. *Apply concepts of KVL/KCL in solving DC circuits*
2. *Apply the network theorems to simple circuits*
3. *Analyze single phase AC circuits consisting of series and RL-RC-RLC combination*
4. *Illustrate the principles and operation of DC Generators & Motors*
5. *Understand the principles and operation of Transformers &Induction Motor*
6. *Understand the different types of instruments*

UNIT- I

DC Circuits: Electrical circuit elements (R,L and C),voltage and current sources, Ohm's law, Kirchoff's laws, analysis of circuits with dc excitation (series, parallel and series-parallel). Superposition, Thevenin's, Norton's and Maximum Power transfer Theorems.

UNIT- II

AC Circuits: Representation of sinusoidal waveforms, peak ,average and rms values, form factor 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 (series and parallel)

UNIT- III

DC Machines: Construction details of DC Machine, principle and operation of DC generator, EMF equation, Types of generators, OCC of DC generator, Operation of DC motor, back emf, torque equation. Speed control methods.

UNIT- IV

AC Machines: Construction and working principle of Single-Phase transformer, OC and SC tests, losses in transformers, Regulation and efficiency, Construction & working principle of 3 – phase alternators and three phase induction motor. Regulation of alternator by Synchronous Impedance method.

UNIT- V

Measuring Instruments: Operating principles, essential features of measuring instruments, Moving coil permanent magnet (PMMC) and moving Iron instruments (Voltmeters and Ammeters)- Extension of range of the meters.

TEXT BOOKS

1. D. P. Kothari and I. J. Nagrath, *Basic Electrical Engineering*, Tata McGraw Hill,2010.
2. D. C. Kulshreshtha, *Basic Electrical Engineering*", McGraw Hill, 2009.
3. Soni, Gupta, Bhatnagar, "*A Course in Electrical Power*", DhanpatRai & Sons.

REFERENCES

1. L. S. Bobrow, *Fundamentals of Electrical Engineering*, Oxford University Press,2011.
2. E. Hughes, *Electrical and Electronics Technology*, Pearson, 2010.
3. B.L. Thareja, *Basic* electrical *Engineering (Vol.1)*.

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I B.Tech. – I Sem.

L	T	P	C
3	-	-	3

(20CS0501) C PROGRAMMING AND DATA STRUCTURES
(Common to CSE & CIVIL)

COURSE OBJECTIVES

The objectives of this course:

1. *Teach the syntax and semantics of a C Programming language*
2. *Demonstrate the use of Control structures of C Programming language*
3. *Illustrate the methodology for solving Computational problems*
4. *Explain the approach to algorithm analysis*
5. *Introduce different data structures for solving the problems*

COURSE OUTCOMES (COs)

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

1. *Recognize the programming elements of C language*
2. *Select the control structure for solving the problem*
3. *Apply modular approach for solving the problem*
4. *Solve mathematical problems using C Programming language*
5. *Develop the applications using stacks and queues*
6. *Construct the linked lists for various applications and perform sorting techniques*

UNIT- I

Introduction to C Language - C Language Elements, Variable Declarations and Data Types, General Form of a C Program, Input and Output Statements, Operators, Expressions, Precedence and Associativity, Type Conversions.

Statements: Decision Statements, Loop Control Statements, break, continue, goto statement.

UNIT- II

Arrays - Declaring and Referencing Arrays, Array Subscripts, Multidimensional Arrays.

Functions - Library Functions, Communications among Functions, Using Array Elements as Function Arguments, Scope, Storage Classes,Type Qualifiers, Recursion , Preprocessor Commands.

Strings - String Basics, String Library Functions

UNIT- III

Pointers - Pointer Declaration, Pointers and Arrays, Array of Pointers, Pointers to Pointers, Void Pointers, Memory Allocation Functions, Pointer to Functions, Pointers and Strings.

Structure and Union – Declaration and Initialization of Structures, Structure within Structure, Array of Structures, Pointer to Structure, Structure and Functions, typedef, Bit Fields, Enumerated Data Type, Union, Union of Structures.

UNIT- IV

Data Structures - Overview of Data Structure, Types of data structures, Stacks: Introduction-Definition-Representation of Stack-Operations on Stacks- Applications of Stacks. Queues: Introduction, Definition- Representations of Queues- Various Queue Structures- Applications of Queues.

Linked List -Single linked list, Circular linked list, Double linked list, Circular Double linked list, Applications of linked lists.

UNIT- V

Searching & Sorting - Linear Search, Binary Search, Exchange Sort, Insertion Sort, Selection Sort, Merge Sort, Quick Sort.

TEXT BOOKS

1. J.R.Hanly, Ashok N. Kamthane and A.Ananda Rao, *Programming in C and Data Structures*,Pearson Education.
2. B.A.Forouzan and R.F. Gilberg, *C Programming & Data Structures*,Third Edition, Cengage Learning.

REFERENCES

1. Stephen G. Kochan,*Programming in C* , III Edition, Pearson Education.
2. J.A. Jones & K. Harrow ,*C Programming with problem solving*, Dreamtech Press.
3. Dr.N.B.Venkateswarlu, Dr. E.V.Prasad, S. Chand, *C and Data Structures*, a snapshot oriented treatise with live engineering examples.
4. E.Balaguruswamy, *C and Data Structures*, Tata McGraw Hill.
5. A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein ,*Data Structures using C* , Pearson
6. Education / PHI, Eighth Edition.

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I B.Tech. – I Sem.

L	T	P	C
3	-	-	3

(20EC0445) BASIC ELECTRONICS ENGINEERING

COURSE OBJECTIVES

The objectives of this course:

1. *To understand the basics of Semiconductor materials, characteristics and applications of P-N junction diode.*
2. *To familiarize with the working principle of BJT, JFET and MOSFET and also biasing of the transistors for design of Amplifier circuits.*
3. *To analyze and design various electronic circuits using PN Junction diode, BJT, JFET and MOSFET.*

COURSE OUTCOMES

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

1. *Demonstrate the characteristics of PN Junction Diode, Rectifiers, Filters, BJT, JFET and MOSFET.*
2. *Analyze numerical and analytical problems in Rectifiers, Filters, and Transistor biasing circuits.*
3. *Design and develop electronic circuits such as Rectifiers with and without filters and Transistor biasing circuits.*
4. *Solve engineering problems and arrive at solutions relating to electronic devices and circuits.*
5. *Identify a suitable semiconductor device and transistor for any given specification.*
6. *Select suitable technique for Device modeling.*

UNIT-I

Basics of Semiconductor: Conductors, Insulators, and Semiconductors- crystal structure, Energy band diagrams, valence band, conduction band, and band gap; intrinsic, and extrinsic (p-type and n-type) semiconductors, drift and diffusion currents – expression only, mass action law , charge neutrality in semiconductor.

UNIT-II

P-N Junction diode: Open circuited PN Junction, Forward and Reverse Bias of PN Junction, V-I Characteristics, Quantitative Theory of PN Diode Currents, Temperature dependence of the V-I characteristic, Diode Resistances, Diode Capacitances, Applications, Breakdown Mechanisms-avalanche and Zener breakdown, Zener diode – V-I characteristics and Applications, Zener Diode as Voltage Regulator.

UNIT- III

Rectifiers: Definition and Types, Half-wave Rectifier, Full-wave Rectifier – Derivations for Vdc, Vac, ripple factor, efficiency and PIV, Comparison of Rectifiers, Filter - Definition and Types, Inductor Filter, Capacitor Filter, L-section Filter, CLC or π - section Filter- Derivation for Ripple factor, Comparison of various types of filters.

UNIT-IV

Bipolar Junction Transistor(BJT): Construction, Operation, Transistor configurations, Transistor characteristics- CB, CE and CC, Transistor as an Amplifier, Need for Transistor biasing, operating point, Load line analysis, Stability Factor, Biasing methods- Types, Self-bias, Bias compensation.

UNIT- V

Field Effect Transistor (FET): Classification, JFET-Construction, Working, Characteristics and parameters, MOSFET-Types, Construction, Working, Characteristics, Comparison of BJT and FET, Biasing methods- Types, operating point, Voltage Divider Bias.

TEXT BOOKS

1. J. Millman, C. Halkias, *Electronic Devices and Circuits*, Tata Mc-Graw Hill, 4thEdition, 2010.
2. S.Salivahanan, N.Suresh Kumar, *Electronic Devices and Circuits*, Third Edition, McGraw Hill Education (India) Private Limited, 2012.

REFERENCES

1. C. Halkies, C.D.Parikh, *Integrated Electronics–Jacob Millman*, Tata Mc-Graw Hill, 2009.
2. Sedra and Smith, *Micro Electronic Circuits*, Fourth Edition, Oxford University Press, 2002
3. Boylestead and Nashelsky, *Electronic Devices and Circuits Theory*, 9/e, PHI, 2006.

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I B.Tech – I Sem.

L	T	P	C
-	-	3	1.5

(20HS0851) APPLIED PHYSICS LAB

COURSE OBJECTIVES

The objectives of this course:

1. *To explore the application of Interference and Diffraction by doing concerned experiments.*
2. *Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.*
3. *To understand the concept of Rigidity modulus, energy gap and B-H curve.*
4. *Develop an ability to apply the knowledge of physics experiments in the later studies.*
5. *Recognize the significance of Laser by studying its characteristics and its application in finding the particle size.*

COURSE OUTCOMES

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

1. *Operate various optical instruments.*
2. *Estimate wavelength of laser and particles size using laser.*
3. *Plot the intensity of the magnetic field of induction along the axis of circular coil carrying current with distance.*
4. *Evaluate the acceptance angle of an optical fiber and numerical aperture.*
5. *Determine energy loss by B-H curve.*
6. *Evaluate rigidity modulus of a given wire.*

Suggested list of experiments from the following: (Perform any TEN experiments from the following)

1. Determination of wavelengths of various colors of Mercury vapor lamp using Diffraction Grating – Normal Incidence method.
2. Determination of Dispersive power of prism.
3. Rigidity Modulus – Torsional Pendulum
4. Determination of thickness of thin object by wedge method.
5. Determination of radius of curvature of Plano convex lens – Newton's Rings.
6. Determination of wavelength of a given laser source by using diffraction grating.
7. Determination of particle size (Lycopodium particles deposited on glass plates) using Laser source.
8. Determination of energy gap of a semiconductor using p – n junction diode.
9. B- H curve.
10. Magnetic field along the axis of current carrying coil – Stewart & Gee's Method.
11. Determination of frequency of tuning fork - Melde's Apparatus.
12. Determination of Spring constant – Coupled Oscillator.
13. Determination of di electric constant of dielectric material using charging and discharging of capacitor.

14. Determination of Numerical Aperture of an Optical fiber.
15. Measurement of resistance with varying temperature –Thermistor.

REFERENCES

1. S. Balasubramanian, M.N. Srinivasan "*A Text book of Practical Physics*", S Chand Publishers,2017.
2. http://vlab.amrita.edu/index.php -Virtual Labs, Amrita University.

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I B.Tech. – I Sem.

L	T	P	C
-	-	3	1.5

(20EE0252) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

COURSE OBJECTIVES

The objectives of this course:

1. *To enhance the student with knowledge on electrical and electronic equipment's.*
2. *Students can gain practical knowledge about network theorems.*
3. *To enhance the student with practical knowledge about characteristics of BJT.*

COURSE OUTCOMES

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

1. *Students will understand all the fundamental components about electrical engineering and electronics engineering.*
2. *Make electrical connections by wires of appropriate ratings.*
3. *Understand the usage of common electrical and electronic measuring instruments.*
4. *Understand the basic characteristics of transformers and electrical machines.*

PART – A
ELECTRICAL LAB

1. Verification of Superposition Theorem.
2. Verification of Thevenin's Theorem.
3. Open circuit characteristics of dc shunt generator.
4. Swinburne's Test on DC Shunt Machine
5. Brake Test on DC Shunt Motor.
6. OC & SC Tests on Single-Phase Transformer

PART –B
ELECTRONICS LAB

1. P-N Junction Diode and Zener Diode Volt-Ampere Characteristics.
2. Bipolar Junction Transistor in CB Configuration-Input and Output Characteristics, Computation of α.
3. Half-Wave Rectifier- a) Without Filter b) With Capacitor Filter.
4. Full-Wave Rectifier- a) Without Filter b) With Capacitor Filter.
5. Bipolar Junction Transistor in CE Configuration-Input and Output Characteristics, Computation of β.
6. Verification of Logic Gates- AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.

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I B.Tech. – I Sem.

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-	-	3	1.5

(20CS0502) C PROGRAMMING and DATA STRUCTURES LAB
(Common to CSE & CIVIL)

COURSE OBJECTIVES

The objectives of this course:

1. *Explain basic constructs of C language*
2. *Explain problem solving techniques*
3. *Develop applications in C using strings, pointers, functions, structures*
4. *Explain the different operations that can be performed on data structures*
5. *Introduce the different search and sorting algorithms*

COURSE OUTCOMES

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

1. *Read, understand and trace the execution of programs written in C language*
2. *Develop C programs for simple applications making use of basic constructs, arrays and strings*
3. *Develop C programs involving functions, recursion, pointers, and structures*
4. *Select the data structure appropriate for solving the problem*
5. *Illustrate the working of stack and queue*
6. *Implement searching and sorting algorithms*

LIST OF EXPERIMENTS

1. Write a C program, which takes two integer operands and one operator form the user, performs the operation and then prints the result. (Consider the operators +,-,*,/,% and use Switch Statement)
2. a) Write a C program to find the sum of individual digits of a positive integer.
   b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
3. a) Write a C program to calculate the following Sum:
   Sum=1-x2/2! +x4/4!-x6/6!+x8/8!-x10/10!
   b) Write a C program to find the roots of a quadratic equation.
4. a) Write a C program to determine if the given string is a palindrome or not
   b) Write a C program to determine whether the given number is Armstrong number or not.
5. a) Write a C program to generate Pascal's triangle.
   b) Write a C program to construct a pyramid of numbers.
6. a) Write a C program to find both the larges and smallest number in a list of integers.
   b) Write a C program that uses functions to perform the following:
      i) Addition of Two Matrices
      ii) Multiplication of Two Matrices

7. Write C programs that use both recursive and non-recursive functions
   i) To find the factorial of a given integer.
   ii) To find the GCD (greatest common divisor) of two given integers.
   iii) To solve Towers of Hanoi problem.
8. Write a C program to swap(exchange) values of two integer variables using pointers
9. Write a C program that uses functions to perform the following operations:
   a) To insert a sub-string in to given main string from a given position.
   b) To delete n Characters from a given position in a given string.
10. a) Write a C program to check whether the entered string is palindrome or not.
    b) Write a C program to read student roll no, name and marks in six subjects for n number of students and give class of each student.
11. Write a C programs that implement stack (its operations) using Arrays
12. Write a C programs that implement queue (its operations) using Arrays
13. Write a C program that uses functions to perform the following operations on singly linked list.
    i) Creation ii) Insertion iii) Deletion iv) Traversal
14. Write a C program that uses functions to perform the following operations on doubly linked list:
    i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways
15. a) Write a C program to perform Linear Search on the elements of a given array.
    b) Write a C program to perform Binary Search on the elements of a given array.
16. a) Write a C program to sort the elements using Bubble sort.
    b) Write a C program to sort the elements using Insertion sort.

TEXT BOOKS

1. J.R.Hanly, Ashok N. Kamthane and A.Ananda Rao, *Programming in C and Data Structures*,Pearson Education.
2. B.A.Forouzan and R.F. Gilberg, *C Programming & Data Structures*,Third Edition, Cengage Learning.

REFERENCES

1. P. Padmanabham ,*C programming and Data Structures*, Third Edition, BS Publications
2. E Balaguruswamy ,*C and Data Structures*,TMH publications.

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(20HS0835) PROBABILITY & STATISTICS

COURSE OBJECTIVES

The objectives of this course:

1. *To train the students thoroughly in Mathematical concepts fundamentals of probability, test of hypothesis, Test of significance.*
2. *To prepare students for lifelong learning and successful careers using mathematical concepts of probability, test of hypothesis, Test of significance.*
3. *To develop the skill pertinent to the practice of the mathematical concepts including the Student abilities to formulate and modeling the problems, to think creatively and to synthesize information.*

COURSE OUTCOMES

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

1. *A good understanding of the laws of probability axioms and rules.*
2. *Understanding of moments of discrete and continuous random variables as well as be familiar with common named discrete and continuous random variables.*
3. *Calculate and interpret the correlation between two variables.*
4. *Calculate the simple linear regression equation for a set of data.*
5. *Have acquired ability to participate effectively in group discussions.*
6. *Have developed ability in writing in various contexts.*
7. *Have acquired a proper level of competence for employability.*

UNIT - I

Probability: Sample spaces and Events, Definition of probability, Addition theorem, Conditional probability, Independence, Multiplication theorem, Baye's theorem.

Random variables: Discrete and Continuous random variables- Probability distribution functions and their properties- Expectation of Discrete and Continuous Random Variables.

UNIT- II

Probability distributions: Binomial, Poisson and Normal Distributions -Mean and Variance of Binomial, Poisson and Normal distributions, related problems.

UNIT - III

Basic statistics: Measures of Central tendency (Mean, Median & Mode), Moments, Skewness and Kurtosis. Correlation and regression – Rank correlation.

UNIT – IV

Applied statistics:

Curve fitting: Curve fitting by the method of least squares- fitting a straight line, second degree polynomial and more general curves (Exponential & Power curves).

Test of Hypothesis: Large sample tests for single proportion, difference of proportions, single mean, difference of means.

UNIT –V

Tests of significance: Small sample tests: t-test for single mean, difference of means, F-test, Chi-square test for goodness of fit and independence of attributes.

TEXT BOOKS

1. Grewal B S, *Higher Engineering Mathematics*, 44th edition, Khanna Publishers, 2017.
2. Iyengar T.K.V, Krishna Gandhi B, Ranganatham S & Prasad M.V.S.S.N, *Probability & Statistics*, S.Chand publications, 2018.

REFERENCES

1. Gupta S.P, *Statistical methods*, S.Chand publications, 2011.
2. Rukmangadachari E & Keshava Reddy E, *Probability & Statistics*, Pearson Publisher, 2015.
3. Shankar Rao G, *Probability & Statistics for Science and Engineering*, Universities Press, 2011

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(20HS0802) APPLIED CHEMISTRY

COURSE OBJECTIVES

The objectives of this course:

1. *To familiarize engineering chemistry and its applications.*
2. *To train the concepts of molecular structures and bonding.*
3. *To understand the physical and mechanical properties of polymers helps in selecting suitable materials for different purpose.*
4. *Learn the principles of spectroscopies to analyse them.*
5. *Be exposed to the importance of nano and engineering materials used in their daily life and Industry.*

COURSE OUTCOMES

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

1. *Apply Nernst equation for calculating electrode and cell potentials*
2. *Illustrate the molecular orbital energy level diagram of different molecular species*
3. *Explain the different types of polymers and their synthesis.*
4. *Synthesize of plastics, elastomers, conducting polymers and their applications in our daily life*
5. *Comprehend the principles and applications of spectroscopies.*
6. *Acquire spotlight to the nanomaterials and basic engineering materials used in academics, industry and daily life.*

UNIT - I Electrochemistry and Applications

Introduction to electrochemistry, Electrochemical cell - Nernst equation, Cell potential calculations and Numerical problems -Potentiometry - Potentiometric Titrations (Redox Titrations), Conductometric Titrations (Acid-Base titrations), Photovoltaic cell working and its applications, Photogalvanic cells Electrochemical sensors.

Primary cells – Zinc-air battery, Secondary cells – Lead acid, NICAD batteries, and Lithium ion cells (Rechargeable). Fuel cells - Hydrogen-Oxygen, Methanol-Oxygen fuel cell- Hydrogen-Oxygen, Methanol-Oxygen fuel cell - working of the cells and application.

UNIT - II Structure and Bonding Models

Planck's Quantum Theory, Dual Nature of matter - Schrodinger Equation, Significance of Ψ and Ψ^2, Molecular Orbital Theory – Bonding in Homo and Hetero nuclear Diatomic molecules - Calculation of Bond Order. Energy level diagrams of O_2, F_2, N_2 and CO, etc. π-molecular orbital's Energy Level Diagram of Butadiene and Benzene. Crystal Field Theory – Salient features – Splitting in Octahedral and Tetrahedral geometry, Magnetic properties and Color.

UNIT - III Polymer Chemistry

Introduction to Polymers, Functionality of Monomers, Nomenclature of Polymers. Chain growth and Step growth Polymerization, Co-ordination Polymerization, Co-Polymerization with specific examples and mechanisms of polymer formation

Plastics - Thermoplastics and Thermosetting, Preparation, Properties and Applications of – Bakelite, Nylon-6,6 , Carbon fibers.

Elastomers: Preparation, Properties and applications of Buna-S, Buna-N. Preparation, Properties and applications of Conducting Polymers – Classification, Synthesis and applications of polyacetylene, polyaniline.

UNIT - IV Instrumental Methods and Applications

Regions of Electromagnetic Spectrum, Absorption of radiation: Beer-Lambert's Law., UV-spectroscopy, Infra red Spectroscopy (IR) and Atomic absorption Spectroscopy (AAS).

Chromatography Techniques: Gas Chromatography (GC) and High Performance Liquid Chromatography (HPLC),Thin layer chromatography(TLC), Separation of Gaseous mixtures and Liquid mixtures.

UNIT - V Modern Engineering Materials

Semiconducting and Super Conducting materials- basic concept, band diagrams for conductors, semiconductors and insulators, effect of doping on band structures.

Electrical Insulators or Dielectric materials: Definition and classification, Characteristics of electrical insulators and applications of electrical Insulating materials.Concepts and terms of Supra molecular chemistry, Complementarity, Basic Lock and Key principle, examples of Supramolecules, Applications of Supra molecules (Sensors, Catalysts, Gas storage, Medical and Molecular switches).

Nano Chemistry: Introduction, Classification, Properties of Nanomaterials. Fullerenes, CarbonNanotubes.

TEXT BOOKS

1. Jain and Jain, *Engineering Chemistry*, 16 Ed., Dhanpat Rai Publishers, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' *Physical Chemistry*, 10 Ed., Oxford University Press, 2010.

REFERENCES

1. GVSubba Reddy, KNJayaveera and C. Ramachandraiah,*Engineering Chemistry*,
2. McGraw Hill Higher Education,, New Delhi 2019.
3. K Sesha Maheswaramma and Mridula Chugh, Engineering Chemistry, 1 Ed., Pearson India Education Services Pvt. Ltd, 2016.
4. Dr. S.S. Dara and Dr S.S Umare, A Text book of Engineering Chemistry, 1 Ed., Chand & Company Ltd., 2000
5. D. J. Shaw, Introduction to Colloids and Surface Chemistry, 4 Ed., Butterworth Heineman, 2013.

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(20HS0810) COMMUNICATIVE ENGLISH
(Common to CSE & CIVIL)

COURSE OBJECTIVES

The objectives of this course:

1. *Facilitate effective listening skills for better comprehension of academic lectures and English spoken by native speakers.*
2. *Focus on appropriate reading strategies for comprehension of various academic texts and authentic materials*
3. *Help improve speaking skills through participation in activities such as role plays, discussions and structured talks/oral presentations.*
4. *Impart effective strategies for good writing and demonstrate the same in summarizing, writing well organized essays, record and report useful information.*
5. *Provide knowledge of grammatical structures and vocabulary and encourage their appropriate use in speech and writing.*

COURSE OUTCOMES (COs)

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

1. *To understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information.*
2. *To ask and answer general questions on familiar topics and introduce oneself/others.*
3. *To employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information.*
4. *To recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs.*
5. *To form sentences using proper grammatical structures and correct word forms.*
6. *To use effective sentence structure for their professional activities.*

UNIT – I

Part 1

Listening: Identifying the topic, the context and specific pieces of information by listening to short audio texts. **Speaking:** Asking and answering general questions on familiar topics such as home, family, work, studies and interests; introducing oneself and others. **Reading:** Skimming to get the main idea of a text; scanning to look for specific pieces of information. **Writing:** Beginnings and endings of paragraphs - introducing the topic; Letter writing. **Grammar and Vocabulary:** Parts of speech, Function words, Content words; Tenses**. Soft Skills:** Attitude is Everything; Positive attitude Positive thinking- thought provoking ideas – creative thinking.

Part 2

Half a Rupee Worth by R K Narayan from Engage with English.

UNIT – II

Part 1

Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts. **Speaking:** Discussion in pairs/ small groups on specific topics followed by short structured talks. **Reading:** Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in a paragraph together. **Writing:** Mechanics of writing –punctuations. **Grammar and Vocabulary:** Voice; Cohesive devices; Articles. Types of sentences – Simple, Complex, and Compound.

Soft skills: The factors of human mindset; self-confidence- self-belief, self-learning – self motivation.

Part 2

The Thakur's Well byPremchand from Paths to Skills in English

UNIT – III

Part 1

Listening: Listening for global comprehension and summarizing what is listened to. **Speaking:** Discussing specific topics in pairs or small groups and reporting what is discussed **Reading:** Reading a text in detail by making basic inferences -recognizing and interpreting specific context clues; strategies to use text clues for comprehension. **Writing:** Summarizing Report Writing. **Grammar and Vocabulary: S**ubject-verb agreement; If- clauses; Direct and Indirect speech.wh-questions.

Soft skills: Emotional intelligence; Work efficiency- peace of mind- Broad nature in ideas- having patience in multiple ways.

Part 2

I am not that Woman by KishwarNaheed.

UNIT – IV

Part 1

Listening: Making predictions while listening to conversations/ transactional dialogues without video; listening with video. **Speaking:** conversational English in academic contexts (formal and informal).**Reading:** Studying the use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicate processes or display complicated data. **Writing:** Information transfer **Grammar and Vocabulary:** Quantifying expressions - adjectives and adverbs; comparing and contrasting; degrees of comparison; use of synonyms and antonyms.

Soft skills: Time management; the priority of the task – the task you take- Urgent and importance- not urgent, important- not important, urgent- Not important, not urgent.

Part 2

What is my name? By Sathyavathi from Paths to Skills in English.

UNIT – V

Part 1

Listening: Identifying key terms.**Speaking:** Formal oral presentations on topics from academic contexts - without the use of PPT slides.**Reading:** Reading for comprehension. **Writing:** Writing structured essays on specific topics using suitable claims and evidences. **Grammar and**

Vocabulary: Editing short texts –identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement).

Soft skills: Goal setting; Immediate goal – Short goal- midterm goal – Life goal.

Part 2

The Power of Prayer by A P J Abdul Kalam from Paths to Skills in English.

TEXT BOOKS

1. Pushpa Relia .P & Sanjay Mihhra .K, *English All Round: Communication Skills for Undergraduation Learners,* Vol. I, Orient Black Swan Publishers, First Edition, 2019.
2. Prof.Sundaravalli.G et al. ,*Paths to Skills in English*, Orient Blackswan, Publishers, First Edition 2015

REFERENCES

1. Bailey, Stephen., *Academic writing: A handbook for international students*. Routledge, 2014.
2. Chase, Becky Tarver., *Pathways: Listening, Speaking and Critical Thinking.*, Heinley ELT;2nd Edition, 2018.
3. Hewings, Martin., *Cambridge Academic English (B2)*. CUP, 2012.
4. Eric H. Glendinning et al, *Study Reading: A Course in Reading Skills for Academic* Purposes, Cambridge University Press; 2 edition, 14 October 2004.
5. Pattabiram, B.V, *Soft Skills*, Sonmez Publication, 2011(2nd Edition).
6. Virendranath Yandamuri, *Soft Skills for Engineer*, Yaswin Publication, 2nd Edition, 2009.

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(20ME0301) ENGINEERING GRAPHICS

(Common to all branches)

COURSE OBJECTIVES

The objectives of this course:

1. *Draw simple curves like ellipse, cycloid and Involutes.*
2. *Describe the Orthographic projections of points, lines and planes.*
3. *Construct the projection of solids like cylinders, cones, prisms and pyramids.*
4. *Sketch the development of the surfaces for practical cut sections of cylinders, cones, prisms and pyramids.*
5. *Depict the isometric and Orthographic Projections of simple objects.*

COURSE OUTCOMES

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

1. *Interpret the engineering drawing fundamentals to draw the curves like ellipse, cycloid and Involutes.*
2. *Know the projection of points and implement the same in the construction of projection of lines and planes.*
3. *Recognize the basic solids like cylinders, cones, prisms and pyramids and sketch the projections of them.*
4. *Explain the sectional views of Right regular Solids and Apply visualization skills in developing new products.*
5. *Understand the basic principles of isometric and Orthographic Projections.*
6. *Construct the isometric and orthographic projections of simple objects.*

UNIT – I

Introduction to Engineering Drawing: Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections – Eccentricity method, Rectangle Method, Parallelogram Method, Cycloids- Epi & Hypo-Cycloids and Involutes.

UNIT – II

Projections of Points: Principles of Orthographic Projections-Conventions - Projections of Points.

Projections of straight lines: Inclined to both the planes (Trapezoidal Method & Rotating line method) - simple problems only, Traces

UNIT – III

Introduction to plane surfaces: Surface Inclined to one plane - Surface inclined to both reference planes

Projections of Solids: Introduction– Projections of right regular solids-Prisms, Pyramids in different positions (Inclined to one plane only).

UNIT – IV

Section of solids - Sectional Views of Right regular Solids - Prisms, Pyramids

Development of surfaces - Development of surfaces of Right Regular Solids - Prisms, Pyramids.

UNIT – V

Orthographic Projections - Principles of Orthographic projection, Conversion of objects from 3D to 2D

Isometric Projections - Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids, Conversion of 2D to 3D.

TEXT BOOKS

1. K. L. Narayana, P.Kannaiah , *A text Book of Engineering Drawing*, Scitech Publishers, 23rd Reprint Edition, 2010.
2. N. D. Bhatt, *Engineering Drawing*, Charotar Publishers, 49th Edition, 2008.

REFERENCES

1. K. Venugopal, *A text Book of Engineering Drawing and Graphic,* New Age Publishing, 5th Edition, 2008.
2. Warren J. Luzadder & Jon M, *Fundamentals of Engineering Drawing,* Peach Pit Press, 11th Edition, 1992.
3. Dhananjay A Jolhe, *Engineering Drawing with An introduction to AutoCAD,* McGraw Hill Education; 1st Edition, 2017.

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(20CS0503) DIGITAL LOGIC DESIGN

COURSE OBJECTIVES

The objectives of this course:

1. *Impart basic knowledge of digital logic levels*
2. *Describe various digital electronic circuits.*
3. *Introduce the concepts of Random Access Memory and Programmable Logic Arrays*

COURSE OUTCOMES

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

1. *Compare various Number systems and implement Boolean Algebra operations*
2. *Design and implement Combinational and Sequential logic circuits*
3. *Implement Analog to Digital conversion and Digital to Analog conversion*
4. *Design and develop sequential logic circuits*
5. *Understand the working of logic families and logic gates*
6. *Implement the given logical problem using PLDs*

UNIT- I

Binary systems and Boolean algebra: Digital Systems - Binary Numbers - Number Base Conversions - Octal and Hexa decimal Numbers – Complements - Signed Binary Numbers - Binary Codes - Binary Storage and Registers - Axiomatic Definition of Boolean Algebra - Basic Properties of Boolean Algebra - Boolean Functions - Canonical and Standard Forms - Other Logic Operations - Digital Logic Gates.

UNIT- II

Gate–Level Minimization: The Map Method - Four Variable Map - Five-Variable Map - Product of Sums Simplification - Don‘t-Care Conditions - NAND and NOR Implementation - Other Two Level Implementations - EX-OR Function.

UNIT- III

Combinational Logic: Combinational Circuits - Analysis Procedure - Design Procedure - Binary Adder - Subtractor - Decimal Adder-Binary Multiplier - Magnitude Comparator - Decoders-Encoders – Multiplexers - De-Multiplexers.

UNIT- IV

Synchronous Sequential Logic: Sequential Circuits – Latches - Flip-Flops - Analysis of Clocked Sequential Circuits - State Reduction and Assignment - Design Procedure – Registers - Shift Registers - Ripple counters - Synchronous counters - Ring Counter and Johnson Counter.

UNIT- V

Memory And Programmable Logic: Random access memory - Memory decoding - Error Detection and Correction - Read-only Memory - Programmable Logic Array Programmable Array Logic - Sequential Programmable Devices - Integrated circuits.

TEXT BOOKS

1. M.Morris Mano & Micheal D.,Digital Design, Ciletti, Pearson, 5th Edition, 2013.
2. David J. Comer, Digital Logic & State Machine Design, Oxford University Press, 3rd Reprinted Indian Edition, 2012.

REFERENCES

1. R.D. Sudhakar Samuel, Digital Logic Design, Elsevier
2. Roth, Cengage,Fundamentals of Logic Design, 5/e
3. Malvino, Saha,Digital Logic Design, Leach, TMH
4. R.P. Jain, Modern Digital Electronics,TMH
5. A.P.Godse, D.A.Godse, Digital Logic Design,Technical Publications Pune, 2009.

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(20HS0803) APPLIED CHEMISTRY LAB

COURSE OBJECTIVES

The objectives of this course:

1. *Learn to estimate the chemical impurities present in water such as hardness, alkalinity, chlorine*, etc.
2. *Understand and experience the formation of inorganic complex and analytical technique for trace metal determination*.
3. *Be trained to use the instruments to practically understand the concepts of electrochemistry.*
4. *Bridge theoretical concepts and their practical engineering applications, thus highlighting the role of chemistry in engineering.*
5. *Learn and understand the practical implementation of fundamental concepts*

COURSE OUTCOMES

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

1. *Develop and perform analytical chemistry techniques to address the water related problems (for e.g., hardness, alkalinity present in water) technically*.
2. *Prepare advanced polymer materials*
3. *Estimate the Iron in cement*
4. *Handle electro-analytical instruments like digital conductivity meter and potentiometer to perform neutralization, precipitation and redox titrations respectively.*
5. *Think innovatively and improve the creative skills that are essential for solving engineering problems*

LIST OF EXPERIMENTS

1. Conductometric Titration of Strong acid vs Strong base
2. Conductometric Titration of Weak acid vs. Strong base
3. Determination of Hardness of a Groundwater sample.
4. pH metric titration of Strong acid vs. Strong base,
5. Potentiometry - Determination of Redox potentials and emfs
6. Determination of Strength of an Acid in Pb-Acid battery
7. Preparation of a Polymer
8. Determination of viscosity of an oil by Redwood viscometer .
9. Determination of percentage of Iron in Cement sample by Colorimetry
10. Determination of acidity of water sample.
11. Determination of Alkalinity of water sample.
12. Determination of Percentage Moisture content in a Coal sample

TEXT BOOKS

1. J. Mendham et al, *Vogel's Text book of Quantitative Chemical Analysis,* Pearson Education, Sixth Edition, 2002.
2. Chandra Sekhar, G.V. Subba Reddy and Jayaveera, *Chemistry Practical – Lab Manual*, McGraw Hill Higher Education, 2015.

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(20HS0811) COMMUNICATIVE ENGLISH LAB
(Common to CSE & CIVIL)

COURSE OBJECTIVES
The objectives of this course:

1. *Students will be exposed to a variety of self-instructional, learner friendly modes of language learning.*
2. *Students will cultivate the habit of reading passages from the computer monitor. Thus providing them with the required facility to face computer based competitive exams like GRE, TOEFL, and GMAT etc.*
3. *Students will learn better pronunciation through stress, intonation and rhythm.*
4. *Students will be trained to use language effectively to face interviews, group discussions, and public speaking*
5. *Students will be initiated into greater use of the computer in resume preparation, report writing, format making etc.*

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

1. *Remember and understand the different aspects of the English language proficiency with emphasis on LSRW skills.*
2. *Apply communication skills through various language learning activities.*
3. *Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension.*
4. *Evaluate and exhibit acceptable etiquette essential in social and professional Settings.*
5. *Create awareness on mother tongue influence and neutralize it in order to improve fluency in spoken English.*
6. *Use effective communicative approaches by preparing job application, report and other kinds of writing correspondences.*

LIST OF EXPERIMENTS
1. PHONETICS

a. Definition - Articulation - Phonetic Chart - Pure Vowels and Diphthongs.

2. MINIMAL PAIRS

a. Definition - Minimal Pairs 1 -Minimal Pairs 2

3. CLUSTERS AND MARKERS

a. Consonant Clusters - Initial Consonant Cluster -Final Consonant Clusters

b. Past Tense Markers - Plural Markers.

4. ICE BREAKING ACTIVITY

5. Ice Breakers Overview - Ice Breakers Activity - Why Ice Breaker.

6. SYLLABLE

a. Syllable Overview -Syllable Types.

7. **STRESS**

a. Syllable Stress - Stress Pattern -Stress and Rhythm - Word Stress - Sentence Stress.

8. **Accent & Intonation**

a. Intonation overview- Intonation making lists – Intonation questions – Intonation – yes or no questions – notes.

9. **JAM**

a. Jam tips - Sample topics.

10. **Listening skills**

a. Listening skills - Effective listening - Listening importance - Barriers to listening.

11. **ROLE PLAY 1**

a. Greetings - Giving compliments - Making requests – Hobbies - Asking permission – Thanking.

12. **ROLE PLAY 2**

a. Comparing and contrasting - Agreeing and dis agreeing - Expressing opinions - Likes and dis likes - Formal and informal – Suggestions - Polite requests - Meeting people.

13. **ROLE PLAY 3**

a. Phone calls – Directions.

14. **Description**

a. Describing a person- Adjectives to describe – Giving direction – Asking giving direction – describing a product – Describing products – Personal narrative – narrative writing Notes.

15. **Book review**

a. Introduction – Book review over view- Book review tips – Book review notes.

16. **Information Transfer**

a. Information writings –Text to Diagram- Diagram to Text.

Minimum requirements for Communicative English Lab

1. Computer Assisted Language Learning (CALL) Lab: The Computer Assisted Language Lab for 60 Students with 60 systems one Master Console, LAN facility and English Language Software for self-study by learners.
2. Communicative English Lab with movable chairs and audio-visual aids with a P. A. system, Projector, a Digital stereo audio & video system and Camcorder etc.

System Requirement (Hardware component)

Computer network, LAN with minimum 60 multimedia systems with the following:

Specifications

1. a) Intel (R) core (TM) i3
2. Speed 3.10 GHZ
3. RAM – 4 GB
4. Hard Disk – 320 GB
5. Headphones with High quality

Software

Walden Info Tech Software

REFERENCES

1. T. Balasubramanian.,*A Textbook of English Phonetics for Indian Students,* second edition, (Mcmillian) 2012.
2. DhamijaSethi,*A Course in Phonetics and spoken English*, Prentice-hall of India Pvt. Ltd, 2000.
3. Krishna Mohan & NP Singh, Speaking *English Effectively*, Second Edition 2011 (Mcmillian).
4. E.Sureshkumar ,P.Sreehari, *A Hand Book of English Laboratories*, Foundation books, 2011.
5. M Ashraf Rizvi, Director, Jaipuria Institute of Management, Lucknow, *Effective Technical Communication*, McGraw Hill Education; Second edition (27 July 2017).

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(20ME0302) WORKSHOP PRACTICE LAB

COURSE OBJECTIVES

To make the student

1. *Familiarize with the different types of wood and carpentry joints.*
2. *Develop Tapered Tray and Conical funnel using sheet metal.*
3. *Acquire practical knowledge on Fitting and Electrical Wiring.*
4. *Learn about various peripherals of a computer.*
5. *Know about installation of MS Windows & Linux.*
6. *Gain knowledge on Productivity tools & Networking.*

COURSE OUTCOMES(COs)

Upon Completion of the course the students will be able to

1. *Describe the different types of wood and carpentry joints.*
2. *Produce Tapered Tray and Conical funnel using sheet metal.*
3. *Understands about Fitting and Electrical Wiring.*
4. *Identify various peripherals of a computer.*
5. *Explain the procedure to install MS Windows & Linux.*
6. *Understand about Productivity tools & Networking.*

PART A

LIST OF EXPERIMENTS:

CARPENTRY: Familiarity with different types of woods and tools used in wood working and make following joints

1.T-Bridle joint

2.Corner Dovetail joint

SHEET METAL WORKING: Familiarity with different types of tools used in sheet metal working, Developments of following sheet metal jobs using GI sheets.

1.Tapered tray

2.Conical funnel

FITTING: Familiarity with different types of tools used in fitting and do the following fitting exercises

1.Step Fitting

2.V-Fit

ELECTRICAL WIRING: Familiarity with different types of basic electrical circuits and makes the following connections

1. Parallel and series
2. Two way switch
3. Go down lighting
4. Tube light
5. Three phase motor
6. Soldering of wires

PART B

Task 1:
Identification of the peripherals of a computer: To prepare a report containing the block diagram of the CPU along with the configuration of each peripheral and its functions. Description of various I/O Devices

Task 2:
A practice on disassembling the components of a PC and assembling them.

Task 3:
1.Basic DOS commands, Installation of MS windows.
2.Basic Linux Commands, Installation of Linux.

Task 4:
Hardware Troubleshooting (Demonstration): Identification of a problem and fixing the solution (improper assembly or defective peripherals). Software Troubleshooting (Demonstration): Identification of a problem and fixing the PC for any software issues

Productivity tools
Task 5:
1. **MS Word Orientation:** Accessing, overview of toolbars, saving files, Using help and resources, rulers, formatting ,Drop Cap , Applying Text effects, Using Character Spacing, using templates, Borders and Colors, Inserting Header and Footer, Using Date and Time option, security features in word, converting documents while saving

2. **Presentations:** Creating, opening, saving and running the presentations, selecting the style for slides, formatting the slides with different fonts, colors, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyper linking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

3. **Spread sheet:** Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet application considered.

Task 6:
Networking: Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using switch/hub and share information. Crimpling activity, logical configuration etc should be done by the student. The entire process has to be documented.

TEXT BOOKS

1. V Ramesh Babu, *Engineering Workshop for JNTU*, VRB Publishers Pvt. Ltd., 2009.
2. Peter Norton, *"Introduction to Computers*", McGraw Hill, 7th Edition, 2017.
3. Joan Lambert, Joyce Cox, *MOS study guide for word, Excel, Power point & amp; Outlook Exams*, PHI. 1st Edition, 2011.

REFERENCES

1. P. Kannaiah & K.L. Narayana, *Workshop Manual,* SciTech Publishers, 2010.
2. *Introduction to Information Technology*, ITL Education Solutions limited, Pearson Education.2009.
3. Rusen, *Networking your computers and devices*, PHI, 2009.
4. Bigelows, *Trouble shooting, Maintaining & amp; Repairing PCs*, TMH, 2010.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

I B.Tech. – II Sem.

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(20HS0816) INDIAN CONSTITUTION
(Common to All Branches)

COURSE OBJECTIVES
The objectives of this course:

1. *To know the premises informing the twin themes of liberty and freedom from a civil rights perspective.*
2. *To address the growth of Indian opinion regarding modern Indian intellectuals 'constitutional role.*
3. *To address entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.*
4. *To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.*
5. *To acquire knowledge for various competitive examinations.*

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

1. *Explain the key concepts of political economy.*
2. *Analyse the significant developments in the political ideologies.*
3. *Describe the salient features of the constitution of India interpret, integrate and critically.*
4. *Analyse the political economy of Indian international relations and gain knowledge in Judiciary system.*
5. *Apply their knowledge and skills acquired to write various competitive examinations.*
6. *Analyse the constitutional rights in relating to Practical life.*

UNIT-I
Constitution: Definition, Introduction, Meaning of the term,- Indian Constitution: Sources and Features

UNIT-II
Historical Perspective of Indian Constitution: The Government Act of 1919and1935 - A Dual Form of Government – The Constitutional Reforms of Simon commission –Formation of Drafting Committee – The Role of Constitution Assembly. Salient features and characteristics of the Constitution of India: Structure of the Indian Union: Federalism, Centre- State relationship.

UNIT-III
Scheme of the Fundamental Rights: Concept of Fundamental Rights in India, Justifiability of Fundamental Rights - Reach of Fundamental Rights -The scheme of the Fundamental Duties and its Legal Status: Fundamental Duties in India – Article 51A - Introduction to Fundamental Duties in India – Importance of Fundamental Duties. The Directive Principles of State Policy - Its

importance and implementation - The Potential of Directive Principles of State Policy for the Judicial Enforcement of Socio-Economic Rights.

UNIT-IV

Parliamentary Form of Government in India: Origin, growth and development of the parliamentary system in India – Chief Characteristics of Indian Parliament – Constitutional Powers and Functions of Indian Parliamentary system. The President of India: Qualifications of President - Election of President, Tuner of President - Status, Powers and Functions of President. The Historical Perspectives of the Constitutional Amendments in India: Types of Amendments & Constitutional Amendment Process in India - Indian Polity-Judiciary System Introduction to Indian Judiciary System - Independent Indian Judiciary - Indian Judiciary Structure - Powers and Functions of Indian Judiciary

UNIT-V

Local Self Government – Constitutional Scheme in India - District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation, Pachayati raj: Introduction, PRI: Zila Pachayat, Elected officials and their roles, CEO Zilla Pachayat: Position and role, Block level: Organizational Hierarchy (Different departments),Village level: Role of Elected and Appointed officials, Importance of grass root democracy.

Election Commission: Role and Functions of Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning, Institute and Bodies for the welfare of SC/ST/OBC and women

TEXT BOOKS

1. Government of India Ministry of Law and Justice (Legislative Department), *The Constitution of India, 1950 (Bare Act)*Government Publication, 2015
2. Dr.Busi, S.N *Dr.B.R.*Ambedkar, *framing of Indian Constitution*, 1st Edition,GovernmentPublication 2015

REFERENCES

1. Jain M. P, *Indian Constitution Law* LexisNexis Publishers 7th Edition.2014.
2. Basu D.D, *Introduction to the Constitution of India* Lexis Nexis,8th Edition 2015
3. BakshiP.M, Constitution *of India* Universal Law Publishing.15th Edition,2018