SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CSE

(SPECIAL IN IOT AND AUTOMATION)

R20 Regulation

II B. Tech.
Course Structure and Syllabus

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY

VISION

To become an eminent academic institute for academic and research that producing global leaders in science and technology to serve the betterment of mankind.

MISSION

M1. To provide broad-based education and contemporary knowledge by adopting modern teaching-learning methods.

M2. To inculcate a spirit of research and innovation in students through industrial interactions.

M3. To develop individual's potential to its fullest extent so that they can emerge as gifted leaders in their fields.

DEPARTMENT OF COMPUETR SCIENCE AND ENGINEERING

VISION

To become a well-known department of Computer Science and Engineering producing competent professionals with research and innovation skills, inculcating moral values and societal concerns.

MISSION OF THE DEPARTMENT

M1. To educate students to become highly qualified computer engineers with full commitments to professional ethics.

M2. To inculcate a mind of innovative research in the field of computer science and related interdisciplinary areas to provide advanced professional service to the society.

M3. To prepare students with industry ready knowledge base as well as entrepreneurial skills by introducing duly required industry oriented educational program.

PROGRAM EDUCATIONAL OBJECTIVES STATEMENTS (PEO'S)

PEO1. Graduates with basic and advanced knowledge in science, mathematics, computer science and allied engineering, capable of analyzing, design and development of solutions for real life problems.

PEO2. Graduates who serve the Industry, consulting, government organizations, or who pursue higher education or research.

PEO3. Graduates with qualities of professional leadership, communication skills, team work, ethical values and lifelong learning abilities.

PROGRAMME SPECIFIC OUTCOMES (PSO'S)

PSO1. Architecture of Computer System: Ability to visualize and articulate computer hardware and software systems for various complex applications.

PSO2. Design and develop computer programs: Ability to design and develop computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT, data analytics and mobile applications of varying complexity.

PSO3.Applications of Computing and Research Ability: Ability to use knowledge in various domains to identify research gaps and hence to provide solution to new ideas and innovations.

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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 (CSE)

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 (CSE)

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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II B. Tech. – I Semester

S.No.	Course Code	Subject	L	T	P	C
1	20HS0845	Mathematical and Statistical Methods	3	-	-	3
2	20CS0504	Computer Organization & Architecture	3	-	-	3
3	20CS0505	Database Management Systems	3	-	-	3
4	20CS0507	Operating Systems	3	-	-	3
5	20CS0511	Python Programming	3	-	-	3
6	20HS0864	Human Values and Professional Ethics	3	-	-	3
7	20CS0508	Database Management Systems Lab	-	-	3	1.5
8	20CS0510	Operating Systems Lab	-	-	3	1.5
9	20CS0514	Python Programming Lab	-	-	3	1.5
Skill Oriented Course						
10	20CS0546	Visual Effects-VFX	1	-	2	2
Contact Periods / Week			**18**	**-**	**11**	**24.5**
			Total/Week29			

II B. Tech. – II Semester

S.No.	Course Code	Subject	L	T	P	C
1	20HS0836	Discrete Mathematics	3	-	-	3
2	20CS1301	Sensors and Internet of Things	3	-	-	3
3	20CS0506	Object Oriented Programming through Java	3	-	-	3
4	20CS0513	Computer Networks	3	-	-	3
5	20HS0812	Managerial Economics and Financial Analysis	3	-	-	3
6	20CS1302	Sensors and Internet of Things Lab	-	-	3	1.5
7	20CS0509	Object Oriented Programming through Java Lab	-	-	3	1.5
8	20CS0515	Linux Programming Lab	-	-	3	1.5
Skill Oriented Course						
9	20CS0547	Animation Design	1	-	2	2
Internship 2 Months (Mandatory) during summer vacation						
Contact Periods / Week			**16**	**-**	**11**	**21.5**
			Total/Week27			

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
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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
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(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
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(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.

L	T	P	C
-	-	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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I B.Tech. – II Sem.

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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. 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

The objectives of this course:

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)

On successful completion of this course, the student 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.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
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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, Government Publication 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

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II B.Tech. – I Sem.

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(20HS0845) MATHEMATICAL AND STATISTICAL METHODS

COURSE OBJECTIVES

The objectives of this course:

1. *The Number Theory basic concepts useful for cryptography etc*
2. *To read and understand the current performance analysis and queueing theory.*
3. *Stochastic process and Markov chains.*

COURSE OUTCOMES (COs)

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

1. *Apply the number theory concepts to cryptography domain.*
2. *Design solution for problems using congruence.*
3. *Understand the stochastic processes, Markov chains, Transition probability matrix and various types of states.*
4. *Use statistical reasoning, formulate a problem in statistical terms, perform exploratory analysis of data and carry out a variety of formal inference procedures.*
5. *Resolve the potential misconceptions and hazards in each topic of study.*
6. *Analyze the problem and identify the structures required to generate the mathematical solution.*

UNIT - I

Greatest Common Divisors and Prime Factorization:

The Greatest integer function, Diophantine approximation, Mathematical induction, The Fibonacci numbers, Divisibility, Greatest common divisors, Computer operations with integers, Primes and greatest common divisors and their properties, The Euclidean algorithm, The fundamental theorem of arithmetic, Factorization of integers and the Fermat numbers, Linear Diophantine equations.

UNIT - II

Congruences: Introduction to congruences, Linear congruences, The Chinese remainder theorem, solving polynomial congruences, Systems of linear congruences.

Applications of congruences: Divisibility tests, Wilson's theorem and Fermat's little theorem, Euler's theorem, The Euler's Phi-function, The sum and number of divisors.

UNIT - III

Estimation: Introduction, Statistical Inference, Classical Methods of Estimation. Estimating the Mean, Standard Error of a Point Estimate, Prediction Intervals, Tolerance Limits, Estimating the Variance, Maximum Likelihood Estimation.

UNIT - IV

Stochastic Processes and Markov Chains: Introduction to Stochastic processes- Markov process. Transition Probability, Transition Probability Matrix, First order and Higher order Markov process, nstep transition probabilities, Markov chain, Steady state condition, Markov analysis.

UNIT - V

Queueing theory: Introduction, Pure birth and death process, M/M/1: Finite and Infinite Queueing models, M/M/S: Multiple server with unlimited capacity and their related simple problems.

TEXT BOOKS

1. Kenneth H. Rosen, *Elementary number theory & its applications*, sixth edition, Addison-Wesley, ISBN 978 0-321-50031-1.
2. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, *Probability & Statisticfor Engineers & Scientists*, 9th Ed. Pearson Publishers.

REFERENCE BOOKS

1. Moorthy MBK, *Probability and Queuing Theory*, Scitech Publications (India) Pvt Ltd, 2010.
2. T.T. Soong, *Fundamentals of Probability And Statistics For Engineers*, John Wiley & SonsLtd, 2004.
3. Sheldon M Ross, *Probability and statistics for Engineers and scientists*, Academic Press.

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II B.Tech. – I Sem.

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(20CS0504) COMPUTER ORGANIZATION & ARCHITECTURE

COURSE OBJECTIVES

The objectives of this course:

1. *Explain the fundamentals of computer organization and its relevance to classical and Modern problems of computer design*
2. *Make the students understand the structure and behaviour of various functional modules of a computer.*
3. *Understand the techniques that computers use to communicate with I/O devices.*
4. *Illustrate the concepts of pipelining and the way it can speed up processing.*
5. *Understand the basic characteristics of multiprocessors*

COURSE OUTCOMES (COs)

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

1. *Understand the CPU design and computer arithmetic*
2. *Understand the design of control unit*
3. *Understand the memory hierarchy and its impact of cost and performance.*
4. *Discuss hardware requirements for cache memory and virtual memory.*
5. *Design algorithms to exploit pipelining and multiprocessors*
6. *Use memory and I/O devices effectively*

UNIT- I

Basic Structure of Computers: Functional Units, Basic Operational Concepts, Basic I/O Operations, Bus Structures, Instruction Cycle, Data Transfer, Data Manipulation and Program Control**,** Addressing Modes.

UNIT- II

Data Representation: Signed number representation, Fixed and Floating point representations, Character representation.

Computer Arithmetic: Integer addition and subtraction, Multiplication – shift and add, Booth multiplication, Division, Signed operand multiplication, Floating point arithmetic.

UNIT- III

Register Transfer and Micro operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers: Arithmetic Micro operations, Logic Micro operations, Shift Micro operations.

CPU control unit design: Hardwired control, Micro-programmed control, Address Sequencing.

UNIT- IV

Memory Organization: Concept of hierarchical memory organization, Main memory, Semiconductor memory technologies, Cache memory, Virtual memory, Auxiliary memory, Direct Memory Access(DMA).

UNIT- V

Pipelining: Basic concepts of pipelining, Arithmetic pipeline, Instruction pipeline, Instruction Hazards.

Parallel Processors: Introduction to parallel processors, Multiprocessor, Interconnection structures and Cache coherency.

TEXT BOOKS

1. Carl Hamacher, Zvonko Vranesic, SafwatZaky and Naraig Manjikian, *Computer Organization and Embedded Systems*, Sixth Edition, McGraw Hill Education, 2012.
2. M.Morris Manno, *Computer System Architecture*, Third Edition, Pearson, 2017.

REFERENCES

1. Carl Hamacher, ZvonkoVranesic, and SafwatZaky, *Computer Organization*, Fifth Edition, McGraw Hill Education,2011.
2. John P. Hayes, *Computer Architecture and Organization*, Third Edition, McGraw Hill Education,2017.
3. David A. Patterson and John L. Hennessy, *Computer Organization and Design: The Hardware/Software Interface,* Fifth Edition, 2014.

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II B.Tech. – I Sem.

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(20CS0505) DATABASE MANAGEMENT SYSTEMS

COURSE OBJECTIVES

The objectives of this course:

1. *Understand the different issues involved in the design and implementation of a database system.*
2. *Study the physical and logical database designs, database modelling, relational, hierarchical, and network models*
3. *Understand and use data manipulation language to query, update, and manage a database*
4. *Understand the concept of a database transaction and related database facilities.*
5. *Design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.*

COURSE OUTCOMES (COs)

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

1. *Develop relational algebra expressions for queries and optimize them.*
2. *Design the databases using E_R method for a given specification of requirements.*
3. *Apply Normalization techniques on given database.*
4. *Determine the transaction atomicity, consistency, isolation, and durabilityfor a given transaction-processing system.*
5. *Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.*
6. *Understand Physical Storage Media and RAID concepts.*

UNIT- I

Introduction: Database System Applications, Purpose of Database Systems, View of Data, Data Abstraction, Data Independence, Data Models, Database Languages, Database Architecture, Database Users and Administrators.

Introduction to Data base design: ER diagrams, Entities, Attributes and Entity sets, Relationships and Relationship sets.

UNIT- II

Relational Algebra and Calculus: Relational Algebra - Selection and Projection, Set operations, Renaming, Joins.

Form of Basic SQL Query- Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set - Comparison Operators, Aggregate Operators, NULL values - Comparison using Null values, Disallowing NULL values, Triggers and Active Data bases.

UNIT- III

Introduction to Schema Refinement- Problems Caused by redundancy, Functional Dependencies, Normal Forms - FIRST, SECOND, THIRD Normal forms – BCNF.

Properties of Decompositions: Lossless join Decomposition, Dependency preserving Decomposition - FOURTH Normal Form, FIFTH Normal form.

UNIT- IV

Transaction and Concurrency: Transaction Concepts – ACID Properties –Transactions and Schedules- Transaction States - Concurrent Execution, Serializability - Types of Failures.

UNIT- V

Recoverability: System Recovery – Media Recovery –Two Phase locking – Deadlock-Detection, Recovery and Prevention.

Physical Storage and Database Concepts: Overview of Physical Storage Media and RAID.

TEXT BOOK

1. Abraham Silberschatz, Henry F. Korth and S. Sudharshan, *Database System Concepts*, Sixth Edition, Tata McGraw Hill, 2011.

REFERENCES

1. RamezElmasri and Shamkant, B. Navathe *Fundamentals of Database Systems*, Fifth Edition, Pearson Education, 2008.
2. Raghurama Krishnan, Johannes Gehrke, *Database Management Systems*, 3rd Edition, McGrawHill Education, 2003.
3. J. D. Ullman, *Principles of Database and Knowledge – Base Systems*, Computer Science Press.
4. Peter Rob & Carlos Coronel, *Database Systems Concepts*, Cengage Learning 2008.

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II B.Tech. – I Sem.

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(20CS0507) OPERATING SYSTEMS

COURSE OBJECTIVES

The objectives of this course:

1. *Explain main components of an OS & their functions.*
2. *Describe the process management and scheduling.*
3. *Discuss various issues in Inter Process Communication (IPC) and the role of OS in IPC.*
4. *Illustrate the concepts and implementation of Memory management policies and virtual memory*
5. *Explain working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.*

COURSE OUTCOMES (COs)

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

1. *Describe the important computer system resources and the role of operating system in their management policies and algorithms.*
2. *Understand the process management policies and scheduling of processes by CPU.*
3. *Analyze the requirement for process synchronization and coordination handled by operating system.*
4. *Describe and analyze the memory management and its allocation policies.*
5. *Categorize the storage management policies with respect to different storage management technologies*
6. *Study the need for special purpose operating system with the advent of new emerging technologies.*

UNIT - I

Operating Systems Overview: What is an operating system-History of operating systems-Operating system functions- Operating systems Operations-Types of Operating Systems and Computing Environments.

System Structures: Operating System Services-User and Operating-System Interface-systems calls- Types of System Calls- system programs- Structure of an OS - Layered Monolithic- Microkernel Operating Systems and Concept of Virtual Machine.

UNIT - II

Processes: Process, Process state, Process Scheduling,-Schedulers- Inter process Communication synchronization--Scheduling Algorithms: FCFS-SJF-Priority-RR-Message Passing

Threads: Definition, Multithreading-Advantages-ULTs,-KLTs-Thread Libraries- Difference between ULTs and KLTs.

UNIT - III

Process Synchronization: Critical Section- Mutual Exclusion- Semaphores- Monitors. Classical Problems of Synchronization: The Producer- Consumer Problem -Dinning Philosopher Problem- Reader's & Writer Problem

Deadlocks: Definition- Deadlock Characteristics- Deadlock Prevention and Deadlock Avoidance: Banker's algorithm- Deadlock detection and Recovery.

UNIT - IV

Memory Management: Main Memory-Swapping-Contiguous Memory allocation Paging-Segmentation.

Virtual memory: Basics of Virtual Memory- Demand paging-Page-replacement- Page Replacement algorithms-Thrashing.

Disk scheduling: Overview of Mass Storage Structure- FCFS- SSTF- SCAN- C-SCAN-Disk Management.

UNIT - V

File Management: Concept of File- Access methods-File types-File operation-Directory structure-File System structure- Allocation methods (contiguous, linked, indexed)- Free-space management (bit vector, linked list, grouping)

Protection & Security: Goals of Protection- Principles of Protection- Domain of Protection- Access matrix- Authentication - Threats- Intruders- Basics of Cryptography-Secret key-public key- One-Way Function- Digital Signature.

TEXT BOOKS

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*, Wiley, Eight Edition.
2. Andrew S Tanenbaum, *Modern Operating Systems*, Pearson Education International, Third Edition.

REFERENCES

1. Charles Crowley, *Operating System: A Design-oriented Approach*, Irwin Publishing, 1st Edition.
2. Gary J. Nutt, *Operating Systems: A Modern Perspective*, Wesley, 2nd Edition.
3. Maurice Bach, *Design of the Unix Operating Systems*, Prentice-Hall of India, 8th Edition.

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II B.Tech. – I Sem.

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(20CS0511) PYTHON PROGRAMMING

COURSE OBJECTIVES

The objectives of this course:

1. *Introduce Scripting Language*
2. *Exposure to various problem solving approaches of computer science*
3. *Introduce function-oriented programming paradigm*
4. *Exposure to solve the problems using object oriented concepts, exceptional handling*
5. *Exposure to solve the problems using Files, Regular Expressions and, Standard Libraries*

COURSE OUTCOMES (COs)

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

1. *Solve the problems using control structures, input and output statements.*
2. *Summarize the features of lists, tuples, dictionaries, strings and files*
3. *Experience the usage of standard libraries, objects, and modules*
4. *Solve the problems using Object Oriented Programming Concepts*
5. *Build the software for real time applications using python*
6. *Install various Python packages*

UNIT – I

Introduction: History of Python- Python features- Applications-Programming Using the REPL-Running Python Scripts-Variables – Assignment- Keywords- Input-Output-Indentation.

Data Types: Single-Value data types - int, float, Complex and Boolean.

Multi-Valued Data types - Lists, Tuples, Sets, Dictionaries, Strings- indexing and slicing.

UNIT – II

Operators and Expressions: Operators-Arithmetic Operators, Comparison Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators- Expressions and order of evaluations

Control Flow: Branching- simple if, if-else, if-elif-else, nested if, looping-while and for-jumping – break- continue and pass

UNIT – III

Functions: Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions- Nested functions, Recursive functions- Scope of the Variables in a Function.

Object Oriented Programming in Python: Classes and Objects- self-variable- Methods – Constructor- Inheritance-polymorphism- Method Overloading- Method Overriding.

UNIT – IV

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

Python packages: Introduction to PIP- Installing Packages via PIP (Numpy, Pandas, MatPlotlib etc.,) - Using Python Packages.

Exception Handling: Introduction to Errors and Exceptions, Handing Exceptions, Raising Exceptions, User Defined Exceptions, Regular Expressions-Searching and Matching.

UNIT – V

Functional Programming: Iterators and Generators - Maps and Filters.

Files: Text files- Reading and Writing files- Command line arguments.

Brief Tour of the Standard Library: Dates and Times- Data Compression- Python Runtime Services- Data Management and Object Persistence.

GUI Programming - Turtle Graphics

TEXT BOOKS

1. Reema Thareja, *Python Programming: Using Problem Solving Approach,* First Edition, Oxford University Press.
2. Vamsi Kurama, *Python Programming: A Modern Approach,* Pearson.

REFERENCES

1. Mark Lutz , *Learning Python,* O Reily, 4th Edition, 2009.
2. Tim Hall and J-P Stacey , *Python 3 for Absolute Beginners,* 2009.
3. Magnus Lie Hetland , *Beginning Python: From Novice to Professional*, 2nd Edition, 2009.

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II B.Tech. – I Sem.

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(20HS0864) HUMAN VALUES AND PROFESSIONAL ETHICS

COURSE OBJECTIVES

The Objective of the course:

1. *Create awareness on Human Values.*
2. *Impart knowledge on an Engineering Ethics*
3. *Instill morality, accountability in an engineering experimentation*
4. *Create awareness on an assessment of safety, risk and rights*
5. *Develop knowledge on global issues*
6. *Create an awareness on Human Values and Engineering Ethics, Engineers social responsibility in an experimentation, appreciate the rights of others and ethics in global issues.*

COURSE OUTCOMES (COs)

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

1. *Identify and analyze human values in their relevant field*
2. *Assess their own engineering ethics and have the social consciousness*
3. *Get knowledge on codes of ethics and on an utilitarian thinking*
4. *Identify safety, risks and an ethical concern in research and intellectual contexts*
5. *know necessity of computer and an environmental ethics, give a picture on weapons development*
6. *Upon completion of the course, the student should be able to apply the ethics in society, discuss an ethical issues related to engineering and realize the responsibilities and rights in the society*

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UNIT I

Human Values - Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self-confidence – Character – Spirituality – Necessity of Yoga and meditation for professional excellence and stress management.

UNIT II

Engineering Ethics - Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles - Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories

UNIT III

Engineering As Social Experimentation- Engineering as Experimentation- Engineering Projects VS. Standard Experiments, Engineers as responsible Experimenters–

Conscientiousness- Comprehensive Perspective - Moral Autonomy - Accountability, Industrial Standards, Codes of Ethics – A Balanced Outlook on Law.

UNIT IV

Safety, Responsibilities And Rights- Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk, Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination

UNIT V

Global Issues-Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership –Code of Conduct – Corporate Social Responsibility

TEXTBOOKS

1. R S Nagarajan, *Professional Ethics and Human Values*, New Age International (P) Limited Publishers,3rd Edition,2006
2. M.Govindarajan, S.Natarajananad, V.S.SenthilKumar,*Engineering Ethics includes Human Values* -PHI Learning Pvt. Ltd- 2nd Edition,2009

REFERENCES

1. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, *Engineering Ethics – Concepts and Cases*, Cengage Learning, 2nd Edition, 2009
2. John R Boatright, *Ethics and the Conduct of Business*, Pearson Education, New Delhi, 1st Edition,2003
3. Edmund G Seebauer and Robert L Barry, *Fundamentals of Ethics for Scientists and Engineers*, Oxford University Press, Oxford, 4th Edition,2001
4. PSR Murthy, *Indian Culture, Values and Professional Ethics*, BS Publication, 2nd Edition, 2013

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(20CS0508) DATABASE MANAGEMENT SYSTEMS LAB

COURSE OBJECTIVES

The objectives of this course:

1. *Illustrate the different issues involved in the design and implementation of a database system.*
2. *Use data manipulation language to query, update, and manage a database.*
3. *Design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.*

COURSE OUTCOMES (COs)

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

1. *Develop relational algebra expressions for queries and optimize them.*
2. *Design the databases using E_R method for a given specification of requirements.*
3. *Apply Normalization techniques on given database.*
4. *Determine the transaction atomicity, consistency, isolation, and durability for a given transaction-processing system.*
5. *Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.*
6. *Execute DDL, DML, DCL commands.*

List of Experiments:

1. Practice session: Students should be allowed to choose appropriate DBMS software, install it, configure it and start working on it. Create sample tables, execute some queries, use SQLPLUS features, and use PL/SQL features like cursors on sample database. Students should be permitted to practice appropriate User interface creation tool and Report generation tool.
2. DDL Commands – Table Creation, Altering the table structures, truncating a table and dropping a table.
3. DML Commands – Insert, Select Commands, update & delete Commands.
4. Create relationship between the databases – Nested Queries & Join Queries
5. Create a database and to set various possible constraints.
6. Views – Create a Virtual table based on the result set of an SQL statement.
7. Create PL/SQL functions to implement the stored procedures in SQL (Function and Procedures).
8. Write a PL/SQL program using For loop to insert ten rows into a database table.
9. Write Relational algebra queries for a given set relations.
10. Write a PL/SQL program to execute a number of queries in one block using single command.

TEXT BOOK

1. Raghu Ramakrishnan, Johannes Gehrke, Jeff Derstadt, Scott Selikoff and Lin Zhu, *Database Management Systems solutions manual*, third Edition, 2013.

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(20CS0510) OPERATING SYSTEMS LAB

COURSE OBJECTIVES

The objectives of this course:

1. B*uild 'C' program for process and file system management using system calls*
2. *Analyze the best CPU scheduling algorithm for a given problem instance*
3. *Analyze the performance of various page replacement algorithms*
4. D*evelop algorithm for deadlock avoidance, detection and file allocation strategies*
5. S*imulate frame allocation to process*

COURSE OUTCOMES (COs)

On successful completion of this course, students will be able to:

1. *Understand and implement basic services and functionalities of the operating system using system calls*
2. *Use modern operating system calls and synchronization libraries in software/ hardware interfaces*
3. *Understand the benefits of thread over process and implement synchronized programs using multithreading concepts*
4. *Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority*
5. *Implement memory management schemes and page replacement schemes*
6. *Understand the concepts of deadlock in operating systems and implement them in multiprogramming system.*

LIST OF EXPERIMENTS:

1. Write a C program to simulate the following non-preemptive CPU scheduling algorithms to find turnaround time and waiting time.
   a) FCFS b) SJF c) Round Robin (pre-emptive) d) Priority
2. Write a C program to simulate producer-consumer problem
3. Write a C program to simulate the concept of Dining-Philosophers problem.
4. Write a C program to simulate Bankers algorithm for the purpose of deadlock avoidance.
5. Write a C program to simulate Bankers algorithm for the purpose of deadlock prevention.
6. Write a C program to simulate the MVT and MFT memory management techniques
7. Write a C program to simulate paging technique of memory management.
8. Write a C program to simulate the following file allocation strategies.
   a) Sequential b) Indexed c) Linked
9. Write a C program to simulate the following file organization techniques
   a) Single level directory b) Two level directory c) Hierarchical

10. Write a C program to simulate page replacement algorithms
    a) FIFO b) LRU c) LFU
11. Simulate how operating system allocates frame to process.

TEXT BOOKS

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*, Wiley, Eighth Edition.
2. Andrew S Tanenbaum, *Modern Operating Systems*, Pearson Education International, 3rd Edition.

REFERENCES

1. Charles Crowley, *Operating System: A Design-oriented Approach*, Irwin Publishing, 1st Edition.
2. Gary J. Nutt, *Operating Systems: A Modern Perspective*, Wesley, 2nd Edition.
3. Maurice Bach, *Design of the Unix Operating Systems*, Prentice-Hall of India, 8th Edition.

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(20CS0514) PYTHON PROGRAMMING LAB

COURSE OBJECTIVES

The Objectives of this course:

1. *Exposure to various problem solving approaches of computer science*
2. *Learn how to carry out a range of commonly used statistical methods including analysis of variance and linear regression.*
3. *Explore data-sets to create testable hypotheses and identify appropriate statistical tests.*

COURSE OUTCOMES (COs)

On successful completion of the course students will be able to

1. *Write, Test and Debug Python Programs*
2. *Implement Conditionals and Loops for Python Programs*
3. *Use functions and represent Compound data using Lists, Tuples and Dictionaries*
4. *Read and write data from & to files in Python and develop Application using Pygame*
5. *Build software for real needs.*
6. *Ability to work on a real life Project, implementing R Analytics to create Business insights.*

LIST OF EXPERIMENTS:

1. Implement the following tasks
   a) Write a python program to check whether the number is positive or negative.
   b) Write a python program to find whether a given number is even or odd.
   c) Write a python program to find biggest number among three numbers.
2. Implement the following tasks
   a) Write a python program to displaying reversal of a number.
   b) Write a python program to print factorial of a number
   c) Write a python program to generate prime numbers series up to N
3. Implement following problems using python script
   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) Arithmetic operations (Addition, Subtraction, Multiplication, and Division) on integers. Input the two integer values and operator for performing arithmetic Operation through keyboard.
4. Implement the following tasks
   a) Implement the python program to generate the multiplication table.
   b) Implement Python program to find sum of natural numbers

c) 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.

5. Implement the following tasks
   a) 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 SIETK examination policy
   b) 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.
6. Implement the following tasks
   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.
7. Implement the following tasks:
   a) Write a Python script to read set of values from a Tuple to perform various operations.
   b) Write a Python script to perform basic dictionary operations like insert, delete and Display.
   c) Write a Python program to count the occurrence of each word in a given sentence.
8. Implement the following tasks
   a) 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.
   b) Implement Python script to display power of given numbers using function.
   c) Implement a Python program that takes a list of words and returns the length of the longest one using function.
9. Implement the following tasks
   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.
10. Implement the following tasks
    a) 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”
    b) Write a Python script to display file contents.
    c) Write a Python script to copy file contents from one file to another.

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

TEXT BOOKS

1. Reema Thareja, *Python Programming: Using Problem Solving Approach*, First Edition, Oxford University Press.
2. Vamsi Kurama, *Python Programming: A Modern Approach*, Pearson.

REFERENCES

1. Mark Lutz , *Learning Python*, O Reily, 4th Edition, 2009.
2. Mark Lutz , *Programming Python* , O Reily, 4th Edition, 2010.
3. Tim Hall and J-P Stacey , *Python 3 for Absolute Beginners*, 2009.
4. Magnus Lie Hetland , *Beginning Python: From Novice to Professional*, 2nd Edition, 2009.

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(20CS0546) VISUAL EFFECTS-VFX
(SKILL ORIENTED COURSE)

COURSE OBJECTIVES

The objectives of this course:

1. *Visual Effects Course (Vfx Course) is a career Program catering to the increasing demand of skilled and quality manpower for the thriving domestic and International VFX industry.*
2. *This course is aimed at equipping students with the basic and fundamental knowledge needed for creating high end industry standard Visual effects that cannot necessarily be captured in a Camera Shot.*
3. *The VFX Course is a course that would help Multimedia Students understand the basic concepts of Visual Effects and how to use Video Editing software to obtain seamless shots and create internationally standard projects*

COURSE OUTCOMES (COs)

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

1. *Effectively make use of the major video editing software such as Final Cut pro, Adobe premiere pro and Nuke*
2. *Create internationally standard Motion Graphics project for Television stations and Web Media*
3. *Effectively edit footages into several standard formats of Television, film, Documentary, Commercials or Music Videos*
4. *Use 3D objects with real life footages*
5. *Create stunning, crisp and realistic Visual effects*

CONTENTS:

1. Introduction to Photoshop, Installation of Adobe Photoshop 7.0 freeware
2. Photoshop Basic Operations
3. Using Layers, Masks and Paths
4. Fine Tuning your image, Prepping images for the web
5. Visual Effects: Set Up Your VFX Content Development Workstation
6. The Foundation of Raster for VFX: Pixels, Color, and Alpha
7. The Foundation of Motion for VFX: Frames and Codecs
8. The Foundation of Audio for VFX: MIDI, Wave, and Sample
9. The Foundation of 2D Vector for VFX: Point, Path, and SVG
10. The Foundation of 3D Vector for VFX: Models and OpenGL
11. Professional VFX Software: Blackmagic Design Fusion

TEXT BOOKS

1. Steve Bark, *"An Introduction to Adobe Photoshop"*, published by Ventus Publishing ApS, 2012.
2. Wallace Jaackson, "*VFX Fundamentals – Visula Special Effects using Fusion 8.0*", published by Apress, 2012.
3. Martin Watt And Erwin Coumans "*Visual Effects and Compositing*", Jon Gress.

REFERENCES

1. Karen E. Goulekas, "*Visual Effects In A Digital World*".
2. David B. Mattingly "*The Digital Matte Painting Handbook*".
3. Kelly, Murdock & Eric Allen "*Body Language Advanced 3d Character Rigging*".

WEB REFERENCE

1. http://www.luv2code.com/#_blank
2. http://www.wallacejackson.com/
3. http://chrisoatley.com/upcoming2015/
4. https://thewaltdisneycompany.com/employee-profile-spotlight-on-avisualdevelopment-artist-2/
5. http://www.artofvfx.com/escape-plan-chris-wells-vfx-supervisor-hydraulx/
6. http://conceptartworld.com/artists/interview-with-visual-development-artistlandis-fields/
7. https://vfxforfilm.wordpress.com/2013/01/03/mattepainting/
8. http://bct.me/tutorials/vfx-supervision-1/
9. https://www.pluralsight.com/blog/film-games/understanding-rotoscoping-process-every-vfx-artist-know
10. https://cmivfx.com/products/410-cinema-4d-advanced-lighting-and-rendering

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(20HS0836) DISCRETE MATHEMATICS

COURSE OBJECTIVES

The objectives of this course:

1. *To train the students thoroughly in Mathematical concepts of Mathematical logic, Relations, Algebraic structures, Recurrence Relation, Graph Theory.*
2. *To prepare students for lifelong learning and successful careers using Mathematical concepts of Mathematical logic, Relations, Algebraic structures, Recurrence Relation, Graph Theory.*
3. *To develop the skill pertinent to the practice of the Mathematical concepts including the students' abilities to formulate and modeling the problems, to think creatively and to synthesize information.*

COURSE OUTCOMES (COs)

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

1. *Demonstrate different traversal methods for trees and graphs.*
2. *Model problems in Computer Science using graphs and trees.*
3. *Write an argument using logical notation and determine if the argument is or is not valid.*
4. *Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described.*
5. *Understand the basic principles of sets and operations in sets.*
6. *Demonstrate an understanding of relations and functions and be able to determine their properties.*
7. *Determine when a function is 1-1 and "onto".*

UNIT-I

Graph Theory: Representation of Graphs, Sub graphs, Multi graphs, Graph Theory Applications: Basic Concepts Isomorphism. Euler circuits, planar Graphs, Hamiltonian graphs, Chromatic Numbers, Spanning Trees, DFS, BFS.

UNIT-II

Mathematical Logic: Statements and notations, Connectives, Truth tables, Well-formed formulae, tautology, equivalence implication, Normal forms.

Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of Contradiction, Quantifiers, Automatic Theorem Proving.

UNIT-III

Relations: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations.

Functions: Inverse Function, Composition of functions, recursive Functions.

Algebraic structures: Algebraic systems examples and general properties, Semi groups and Monoids, groups, Sub groups, Homomorphism, Isomorphism.

UNIT-IV

Elementary Combinatorics: Basis of counting, Enumerating Combination & Permutation with repetition, Constrained repetitions, Binomial & Multinomial theorems (without proof), Binomial Coefficients, The principle of Inclusion & Exclusion - Pigeon hole principle and its application.

UNIT-V

Recurrence Relation: Generating Functions & Sequences, Calculating Coefficient of generating function, Recurrence relations, Solving Recurrence relation by substitution and Characteristic roots, solution of inhomogeneous Recurrence Relation. Solving Recurrence relation by Generating function.

TEXT BOOKS

1. Thomas Koshy, *Discrete Mathematics with Applications*, Elsevier, 2004.
2. Chandra Sekharaiah D.S, *Mathematical Foundations of computer Science (Discrete Structures)*, Prism, 2012.

REFERENCES

1. Liu C.L & Mohapatra D.P, *Elements of Discrete Mathematics*- A Computer Oriented Approach, 3rd edition, McGraw Hill Education, 2012.
2. Mott J.L, Kandel A & Baker T.P, *Discrete Mathematics for Computer Scientists & Mathematicians*, 2nd edition, Prentice Hall of India , 2008.
3. Tremblay J.P and Manohar R, *Discrete Mathematical Structures with Application to Computer Science*, McGraw Hill Publication, 2017.
4. Satyanarayana Bh & Syam Prasad K, *Discrete Mathematics and Graph Theory*, Printice Hall of India, New Delhi, April 2014, ISBN: 978-81-203-4948-3.
5. Satyanarayana Bh, Venkata Pradeep Kumar T & Mohiddin Shaw S, *Mathematical Foundation of Computer Science*, BS Publications (A unit of BSP Books Pvt. Ltd.), Hyderabad, India, 2016, ISBN: 978-93-83635-81-8.

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(20CS1301) SENSORS AND INTERNET OF THINGS

COURSE OBJECTIVES

The objective of the course is to

1. *To provide knowledge on Sensor Principles.*
2. *To provide familiarity with different sensors and their application in real life.*
3. *To understand Basics of IoT, and enabling technologies.*
4. *To design IoT applications using Arduino and Raspberry pi.*

COURSE OUTCOMES

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

1. *Demonstrate knowledge on the characteristics of sensors and principles of IoT.*
2. *Select appropriate sensors for the given application development.*
3. *Understands the methodology to design IoT Applications*
4. *Design basic IoT Applications using Arduino.*
5. *Design IoT Applications using Raspberry Pi.*
6. *Perform Data Acquisition and analysis using Cloud and Tkinter*

UNIT - I

Introduction to Sensors: Sensors, Criteria to choose a Sensor, Generation of Sensors.

Optical Sources and Detectors: Electronic and Optical properties of semiconductor as sensors, LED, Semiconductor lasers, Fiber optic sensors, Thermal detectors, Photo multipliers, photoconductive detectors.

Strain, Force, Torque and Pressure sensors: Strain gages, strain gage beam force sensor, piezoelectric force sensor, load cell, torque sensor, Piezo-resistive and capacitive pressure sensor, optoelectronic pressure sensors, vacuum sensors.

UNIT - II

Types Of Sensors And Applications: Position, Direction, Displacement, Level sensors Velocity and Acceleration sensors.

Temperature sensors: thermoresistive, thermoelectric, semiconductor and optical. Piezoelectric temperature sensor.

Wearable Sensors: From fibers to textile sensors - Interlaced network -Textile sensors for physiological state monitoring - Biomechanical sensing –Non-invasive sweat monitoring by textile sensors and other applications. FBG sensor in Intelligent Clothing and Biomechanics

UNIT - III

Introduction to Internet of Things: Characteristics of IoT, Design principles of IoT, IoT Architecture and Protocols, Enabling Technologies for IoT, IoT levels and IoT vs M2M. IoT

Design Methodology: Design methodology, Challenges in IoT Design, IoT System Management, IoT Servers.

Basics of Arduino: Introduction to Arduino, Arduino IDE, Basic Commands for Arduino, Connecting LEDs with Arduino, Connecting LCD with Arduino.

UNIT - IV

Iot Application Development: Introduction to Raspberry pi, Installation of NOOBS on SD Card, Installation of Raspbian on SD Card, Terminal Commands, Installation of Libraries on Raspberry Pi, Getting the static IP address of Raspberry Pi, Run a Program on Raspberry Pi, Installing the Remote Desktop Server, Pi Camera, Face Recognition using Raspberry Pi, Installation of I2C driver on Raspberry Pi, SPI (serial peripheral interface) with Raspberry Pi, Programming a Raspberry Pi, Play with LED and Raspberry Pi, Reading the digital input, Reading an edge triggered input, Interfacing of Relay with Raspberry Pi, Interfacing of LCD with Raspberry Pi, Interfacing LCD with Raspberry Pi in I2C mode, Interfacing of DHT11 sensor with Raspberry Pi, Interfacing of ultrasonic sensor with Raspberry Pi, Interfacing of camera with Raspberry pi.

UNIT - V

Data Acquisition with Python and Tkinter: Basics-CSV file, Storing Arduino data with CSV file, Plotting random numbers using matplotlib, Plotting real-time from Arduino, Integrating the plots in the Tkinter window. Connecting to the Cloud: Smart IoT Systems, DHT11 Data Logger with ThingSpeak Server, Ultrasonic Sensor Data Logger with ThingSpeak Server, Air Quality Monitoring System and Data Logger with ThingSpeak Server, Landslide Detection and Disaster Management System, Smart Motion Detector and Upload Image to gmail.com.

TEXT BOOKS

1. J. Fraden, Handbook of Modern Sensors: Physical, Designs, and Applications, AIP Press, Springer, Fourth Edition, 2010.
2. Rajesh Singh, Anita Gehlot, Lovi Raj Gupta, Bhupendra Singh, Mahendra Swain, Internet of Things with Raspberry Pi and Arduino, CRC Press, 2019.

REFERENCES

1. D. Patranabis, Sensors and Transducers, PHI Publication, New Delhi,2003.
2. Jan Holler and Vlasios Tsiatsis, From Machine-to-Machine to the Internet of Things Introduction to a New Age of Intelligence, Elsevier Ltd., 2014.
3. David Hanes and Gonzalo Salgueiro, IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things, Cisco Press, 2017 Online Learning Resources: x https://www.guru99.com/iot-tutorial.html x https://developer.ibm.com/technologies/iot/tutorials/

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(20CS0506) OBJECT ORIENTED PROGRAMMING THROUGH JAVA

COURSE OBJECTIVES

The objectives of this course:

1. *Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc*
2. *Understand the basic object oriented programming concepts and apply them in problem solving.*
3. *Illustrate inheritance concepts for reusing the program.*
4. *Demonstrate on the multi-tasking by using multiple threads.*
5. *Understand the basics of java console and GUI based programming*

COURSE OUTCOMES (COs)

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

1. *Implement simple abstract data types and design implementations using abstraction functions.*
2. *Recognize features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity.*
3. *Implement Exception handling with synchronization.*
4. *Execute programs on Multithreading and String handling concepts.*
5. *Design applications with an event-driven graphical user interface.*
6. *Design and Implementation of Application Programming Interfaces.*

UNIT- I

The Java Language -Importance of Java -Programming Paradigms -The History and Evolution of Java -Java Byte Code -The Java Buzzwords.

Introduction of OOP-Abstraction, Encapsulation, Inheritance, Polymorphism-Understanding static -Varargs -Data Types -Type Casting -Java Tokens - Java Statements - Arrays -Command line arguments.

UNIT- II

Introducing Classes –Class Fundamentals -Declaring Objects -Introducing Methods Introduction to Constructors, Constructor Overloading- Garbage Collection -Introducing final -Inheritance -Using Super- Method Overloading, Method Overriding -abstract classes -Packages and Interfaces.

UNIT- III

Exception Handling - Exception Fundamentals - Exception Types -Uncaught Exceptions - Using try and catch - Nested try Statements -throw -throws –finally.

Multithreaded Programming - The Java Thread Model -Thread Priorities -The Thread Class and the Runnable Interface - Creating Multiple Threads -Using isAlive( ) and join( ) – Thread Priorities -Synchronization-String Handling.

UNIT- IV

Generics- A simple Generic Example-General form of Generic class-Generic Interfaces Collections overview, Collection class, Collection interfaces.

Introducing File Handling –File handling in java –Stream –Java File Method –File Operation in Java-Create file –Write to a file –Read from a file.

UNIT- V

Introducing the AWT -Using AWT Controls-Introducing Swing -Exploring Swing.

Introducing Java8 Features –Lambda Expression –Method references –forEach() method -Method and Constructor reference by double colon(::) operator - Stream API –Date & Time API.

TEXT BOOKS

1. Herbert Schildt, *The Complete Reference Java,* Eighth Edition,McGrawHill.
2. Cay S. Horstmann, *Java SE 8 for the Really Impatient,* Addison-Wesley 2014.

REFERENCES

1. P.J. Deitel and H.M. Deitel, *Java for Programmers,* Pearson Education.
2. Bruce Eckel, *Thinking in Java,* Pearson Education.

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(20CS0513) COMPUTER NETWORKS

COURSE OBJECTIVES

The objectives of this course:

1. *Build an understanding of the fundamental concepts of computer networking.*
2. *Understand how errors detected and corrected that occur in transmission*
3. *How collisions to be handled when many stations share a single channel*
4. *Know about routing mechanisms and different routing protocols*
5. *Understand transport layer functions*
6. *Know about different application layer protocols*

COURSE OUTCOMES (COs)

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

1. *Explain the terminology and concepts of OSI and TCP/IP Reference models and identify different physical media used for data transmission*
2. *Explain and implement the services of Data link layer*
3. *Describe the principles of network layer and implement routing algorithms used for data transmission*
4. *Explain the essential services of transport layer*
5. *Understand the functioning of various protocols of Application layer*
6. *Understand the principles of networking*

UNIT - I

Introduction: Networks, Network criteria, Physical structures - Reference Models: The OSI Reference Model, The TCP/IP Reference Model- Introduction to physical layer: Data and Signals, Data rate limits, Performance.

Transmission Media: Introduction,-Guided Media, -Unguided Media.

UNIT - II

Introduction to Data Link Layer: Introduction, Link layer addressing- Error detection and Correction: Cyclic codes, Checksum, Data link control: DLC Services- Data link layer protocols, HDLC, Point to Point Protocol- Media Access control:-Random Access - Controlled Access- Channelization

UNIT – III

The Network Layer: Network layer design issues- Routing algorithms - Congestion control algorithms - Quality of service- Internetworking- The network layer in the Internet: IPV4 - IPV6, Internet Control protocols- OSPF- BGP.

UNIT - IV

The Transport Layer: The Transport Service- Elements of Transport Protocols- Congestion Control- The internet transport protocols: UDP, TCP- Performance problems in computer networks

UNIT - V

Introduction to Application Layer: Introduction, WWW and HTTP – FTP - E-mail- TELNET - Secure Shell - Domain Name System - SNMP.

TEXT BOOKS

1. Behrouz A. Forouzan, *Data communications and networking*, 5th edition, 2012, TMH.
2. Andrew S. Tanenbaum, *Computer Networks*, 5th edition, 2010, Wetherall, Pearson.

REFERENCES

1. Bhushan Trivedi, *Data Communication and Networks*, Oxford
2. Douglas E. Comer, *Internetworking with TCP/IP – Principles, protocols, and architecture* Volume 1, 5th edition, PHI
3. Peterson, *Computer Networks*, 5E, Davie, Elsevier.
4. Chawan- Hwa Wu, Irwin, *Introduction to Computer Networks and Cyber Security*, CRC Publications.
5. Comer, *Computer Networks and Internets with Internet Applications*,

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(20HS0812) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

COURSE OBJECTIVES

The objectives of this course:

1. *To familiarize the students with the concepts of microeconomics and make them understand the concept of demand and supply analysis in business applications*
2. *To understand the pricing and output decisions under different market structures*
3. *To understand the basic financial statements and techniques of financial statement analysis*

COURSE OUTCOMES:

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

1. *Understand the nature of managerial economics and the role of it in business firms*
2. *Identify the determinants of demand and apply cost analysis under different market conditions*
3. *Integrate the concepts of price and output decisions of business firms*
4. *Appreciate the importance of market structures and implement appropriate price and output decisions*
5. *Assess the financial statements of a firm and the financial performance of the firm through the financial statements*
6. *Measure operating, investing and financial performance of a firm*

UNIT-I

Introduction To Managerial Economics - Managerial Economics - Definition, nature and scope – contemporary importance of Managerial Economics - Demand Analysis: Determinants- Law of Demand - Elasticity of Demand. Significance –Types – measurement of elasticity of demand - Demand forecasting- factors governing demand Forecasting-methods of demand forecasting –Relationship of Managerial Economics with Financial Accounting and Management.

UNIT-II

Theory Of Production and Cost Analysis -Production Function – Short-run and long- run production - Isoquants and Isocosts, MRTS, least cost Combination of inputs - Cobb-Douglas production function - laws of returns - Internal and External Economies of scale

Cost Analysis: Cost concepts - Break-Even Analysis (BEA) – Managerial Significance and limitations of BEA - Determination of Break Even Point (Simple Problems).

UNIT-III

Introduction to Markets and New Economic Environment - Market structures: Types of Markets - Perfect and Imperfect Competition - Features, Oligopoly -Monopolistic competition. Price-Output determination - Pricing Methods and Strategies - New Economic

Environment- Economic systems – Economic Liberalization – Privatization and Globalization

UNIT-IV

Capital and Capital Budgeting - Concept of Capital - Over and under capitalization – Remedial measures - Sources of Short term and Long term capital - Estimating Working Capital requirement – Capital budgeting – Features of Capital Budgeting proposals – Methods and Evaluation of Capital budgeting – Pay Back Method – Accounting Rate of Return (ARR) – Net Present Value (NPV) – Internal Rate Return (IRR) Method (simple problems)

UNIT-V

Introduction to Financial Accounting and Analysis - Financial Accounting – Concept - emerging need and importance - Double-Entry Book Keeping-Journal - Ledger – Trial Balance - Financial Statements - - Trading Account – Profit & Loss Account –Balance Sheet (with simple adjustments). Financial Analysis – Ratios – Techniques – Liquidity, Leverage, Profitability, and Activity Ratios (simple problems).

TEXT BOOKS

1. Aryasri, *Managerial Economics and Financial Analysis*, 4/e, TMH,2009.
2. Varshney&Maheswari, *Managerial Economics*, Sultan Chand,2009.

REFERENCES

1. PremchandBabu, Madan Mohan , *Financial Accounting and Analysis*, Himalaya, 2009
2. S.A. Siddiqui and A.S. Siddiqui , *Managerial Economics and Financial Analysis*, New Age International,.2009.
3. Joseph G. Nellis and David Parker, *Principles of Business Economics, Pearson*, 2/e, New Delhi.
4. Domnick Salvatore, *Managerial Economics in a Global Economy*, Cengage, 2009.
5. L.Ahuja, *Managerial Economics* H. S.Chand, 3/e,2009

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(20CS1302) SENSORS AND INTERNET OF THINGS LAB

COURSE OBJECTIVES

The objective of the course is to

1. *To provide basic skills on IoT sensor functionality.*
2. *To understand functionalities of Sensorswith micro controllers.*
3. *To demonstrate skills on IoT application development*

COURSE OUTCOMES

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

1. *Identify different types of Sensors and study their functionality in IoT*
2. *Demonstrate skills in connecting peripherals to Arduino/Raspberry Pi for data exchange.*
3. *Develop a Cloud platform to upload and analyze any sensor data*
4. *Demonstrate skills in connecting GSM, GPS, Gateways to micro controllers*
5. *Perform Data Management in IoT.*
6. *Build a complete working IoT system involving prototyping, programming and data analysis*

LIST OF EXPERIMENTS:

1. Introduction to Raspberry Pi platform and programming
2. Measuring Temperature, Pressure, and Humidity in real time using Sensors using Raspberry Pi.
3. Study the Light, Distance, Motion, Accelerometer, Position Data using Sensors using Raspberry Pi.
4. Log Data using Raspberry PI and upload to the cloud platform (using Tkinter)
5. Develop an IoT application using Raspberry Pi for fire alarm.
6. Develop an IoT application to measure soil moisture, air and water quality using Raspberry Pi.
7. Develop an IoT application using Raspberry Pi to monitor heartbeat, blood pressure, etc. of a person and to upload health information to cloud
8. Build Smart Parking application using IoT Platform
   a) Monitored Parameters: Vehicle detection
   b) Function1: Provide information to user about free space in parking slots
9. Build Smart Home system using IoT Platform
   a) Monitored Parameters: People presence, Outside ambient conditions, IAQ parameters
   b) Function1: Control Home appliances through manual application control
   c) Function2: Intelligently control appliances based on monitoring parameters

TEXT BOOKS

1. J. Fraden, Handbook of Modern Sensors: Physical, Designs, and Applications, AIP Press, Springer, Fourth Edition, 2010.
2. Rajesh Singh, Anita Gehlot, Lovi Raj Gupta, Bhupendra Singh, Mahendra Swain, Internet of Things with Raspberry Pi and Arduino, CRC Press, 2019.

REFERENCES

1. ArshdeepBahga and Vijay Madisetti, Internet of Things(A hands on approach),First Edition, VPI Publications,2014.
2. Adrian McEwen and Hakin Cassimally, Designing the Internet of Things, Wiley India.
3. Massimo Banzi and Michael Shiloh, Getting Started with Arduino, Third Edition, Maker Media
4. Matt Richardson and Shawn Wallace,Getting Started with Raspberry Pi, O'Reilly, 2014

SIDDARTHA INSTITUTE OF SCIECNE AND TECHNOLOGY: PUTTUR
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II B.Tech. – II Sem.

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(20CS0509) OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

COURSE OBJECTIVES

The objectives of this course:

1. *Illustrate software design, implementation, and testing using Java.*
2. *Introduce object-oriented design techniques and problem solving.*
3. *Emphasize development of secure, well-designed software projects that solve practical real-world problems.*
4. *Indentify the threads through multi thread programming*

COURSE OUTCOMES (COs)

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

1. *Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs*
2. *Read and make elementary modifications to Java programs that solve real-world problems*
3. *Validate input in a Java program*
4. *Identify and fix defects and common security issues in code.*
5. *Execute a Java program using Javadoc*
6. *Execute a Java program using Java Swings*

LIST OF PROGRAMS

1. Write a java program to read and write different types of data through keyboard and display them on console.
2. a) Write a java program to find Factorial of given number.
   b) Write a java program to find Fibonacci series of given number.
3. a) Write a java program to display prime number series up to N.
   b) Write a java program to find the maximum and minimum of N array elements.
4. a) Create a user defined package and import it into a java program.
   b) Write a java program to implement an interface using your own example.
5. Write a Java program that prints all real and imaginary solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula.
6. Write a java program to illustrate Constructor Overloading.
7. Write a Java program that creates three threads. First thread displays ―Good Morning, every one second, the second thread displays Hello, every two seconds and the third thread displays Welcome every three seconds.
8. Write a java program to accept a string from user and display number of vowels, consonants, digits and special characters present in each of the words of the given text.

9. Write a java program to create your own exception subclass and how to handle it.
10. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
11. Write a java program to show multiple type parameters in Java Generics.
12. Write a java program to use swings to create frame and buttons.

TEXT BOOKS

1. H.M.Dietel and P.J.Dietel, *Java How to Program*, Sixth Edition, Pearson Education/PHI.
2. Herbert Schildt, *Java-The Complete Reference*, TMH, 8th Edition.

REFERENCES

1. Y.Daniel Liang, *Introduction to Java programming*, Pearson Education, Sixth Edition.
2. Cay Horstmann,*Big Java*, Wiley Student Edition, Wiley India Private Limited, 2nd Edition.
3. J.Dean&R.Dean, *Introduction to Programming with Java*, McGraw Hill.

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(20CS0515) LINUX PROGRAMMMING LAB

COURSE OBJECTIVES

The objectives of this course:

1. *To demonstrate the basic knowledge of Linux commands and file handling utilities by using Linux shell environment.*
2. *To evaluate the concept of shell scripting programs.*
3. *To create the directory, how to change and remove the directory.*
4. *Use the following Bourne Shell constructs: test, if then, if then else, if then elif, for, while, until, and case.*
5. *Demonstrate how to use the following Bourne Shell commands: cat, grep, ls, more, ps, chmod etc.,*
6. *Make a Shell script executable.*

COURSE OUTCOMES

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

1. *Recognize, understand and make use of various LINUX commands*
2. *Students will be able to create file systems and directories and operate them*
3. *Gain hands on experience of LINUX commands and shell programs*
4. *To understand the inner workings of LINUX-like operating systems.*
5. *Write Regular expressions for pattern matching and apply them to various filters for a specific task*
6. *Analyze a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem*

LIST OF EXPERIMENTS:

1. Demonstrate the following commands
   i. Date Command
   ii. Calendar Command
   iii. Basic Calculator Commands
   iv. Print Command
   v. Script Command
   vi. Manual Command
2. i. Use the appropriate command to determine your login shell
   ii. Use the /etc/passwd file to verify the result of step i.
   iii. Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.
   iv. Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

3. Demonstrate the following Commands
   i. To create directory
   ii. To change directory permission
   iii. To create sub directory
   iv. To delete directory
   v. To list the files and directories
4. Demonstrate the following
   i. Use vi editor to create a file called myfile.txt
   ii. open the file created
   iii. Add some text
   iv. Change some text
   v. Delete some text
   vi. Apply Cursor move commands
   vii. Save the Changes
5. Demonstrate the following
   i. Use the cat command to create a file containing the following data. Call it student_data use tabs to separate the fields.

   101 Ravi 15.65
   102 Ramu 26.27
   103 Sita 36.15
   104 Raju 21.86

   ii. Use the cat command to display the file, student_data.
   iii. Use the vi command to correct any errors in the file, student_data
   iv. Use the sort command to sort the file student_data according to the first field. Call the sorted file my table
   v. Print the file student_data
   vi. Use the cut and paste commands to swap fields 2 and 3 of student_data. Call it my table (same name)
   vii. Print the new file, student_data.
6. i. Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.
   ii. Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.
7. i. Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.
   ii. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
8. i. Write a shell script that computes the gross salary of a employee according to the following rules:
   a) If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic.
   b) If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic
   The basic salary is entered interactively through the key board.
   ii. Write a shell script that accepts two integers as its arguments and computers the value of first number raised to the power of the second number.

TEXT BOOKS

1. N.Matthew,R.Stones, Wrox, *Beginning Linux Programming,* 4 th Edition, Wily India Edition.
2. N.B.Venkateswarlu, *Advanced Unix Programming*, BS Publications.

REFERENCES

1. M.G.Venkatesh Murthy, *Unix & Shell Programming*, Pearson Education
2. Ellie Quigley, *Unix shells by example,*4th Edition, Pearson Education.

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(20CS0547) ANIMATION DESIGN
(SKILL ORIENTED COURSE)

COURSE OBJECTIVES

The objectives of this course:

1. *To enable the students to be multimedia literates, which will prepare them to actively participate in various media related activities for strengthening their skills?*
2. *The Course will have scope for skill development in the field of Electronics and Print Media Production, which in turn make them employable in the media industry.*

COURSE OUTCOME (COs)

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

1. *Know fundamentals of animations and present a visual concept to a target audience.*
2. *Participate in the planning and implementation of animation projects.*
3. *Develop and execute believable animation sequences.*
4. *Create animation sequences that employ basic cinematography principles.*
5. *Apply performance theory to the creation of animation. Produce layouts and backgrounds with attention to composition, perspective and color.*
6. *Use computer skills and appropriate digital asset management techniques to function effectively within a production pipeline.*

CONTENTS

1. Introduction to Animation, Traditional Animation, Stop Motion Animation, 3D and 2D Animation
2. Installation of Blender Software
3. Blender Interface, Working with Viewports (windows), Creating and Editing Objects
4. Blender Render Engines, Materials and Textures, Setting Up a World, Lighting and Cameras, Render Settings
5. Ray-Tracing (mirror, transparency, shadows), Animation Basics, Adding 3D Text
6. NURBS and Meta Shape Basics, Modifiers, Particle Systems and Interactions
7. Child-Parent Relationships, Working With Constraints, Armatures (bones and skeletons) Relative Vertex Keys (shape keys), Object Physics
8. Creating Springs, Screws, Gears and other Add-On Shapes
9. Video Motion Tracking, Game Engine Basics (real-time animation), Video Sequence Editor
10. Production Pipeline, Pre-Production and Storyboarding

TEXT BOOK

1. James Chronister, *Blender Basics – Classroom Tutorial Book*, published by Blender Nation, 5th Edition, 2017.

REFERENCES

1. SteveRoberts, *Character Animation Fundamentals: Developing Skills for 2D and 3D Character*
2. KitLaybourne, *The Animation Book: A Complete Guide to Animated Filmmaking--from Flip-books to Sound Cartoons to 3-D Animation*

WEB REFERENCE

1. http://www.digitaltutors.com/subject/2d-animation-tutorials
2. http://webneel.com/2d-animation-best
3. http://www.lynda.com/Flash-Professional-tutorials/2D-Animation-rinciples/158769-2.html
4. http://en.wikipedia.org/wiki/Traditional_animation
5. http://animate-it.com/get-animating/how-to-create-a-hand-drawn-animated-movie/
6. http://en.wikipedia.org/wiki/Cinemagraph
7. http://www.tripwiremagazine.com/2011/07/cinemagraphs.html
8. http://giphy.com/search/cinemagraph
9. https://www.open-of-course.org/courses/course/view.php?id=84
10. http://www.cdschools.org/blenderbasics