SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

(Approved by AICTE |Accredited by NAAC with 'A' Grade

Accredited by NBA| Permanently Affiliated to JNTUA)

Karakambadi Road, Tirupati-517507

B.Tech

Course Structure& Syllabus under

R20 Regulations

SRI VENKATESWARA COLLEGE OF ENGINEERING

(Autonomous)
Karakambadi Road, TIRUPATI – 517507

Semester-0
Induction Program
(Common for all branches)

S.No	Course Name	Category	L-T-P-C
1	Physical Activities - Sports, Yoga and Meditation, Plantation	MC	0-0-6-0
2	Career Counseling	MC	2-0-2-0
3	Orientation to all branches -career options, tools, etc.	MC	3-0-0-0
4	Orientation on admitted Branch - corresponding labs, tools and platforms	EC	2-0-3-0
5	Proficiency Modules & Productivity Tools	ES	2-1-2-0
6	Assessment on basic aptitude and mathematical skills	MC	2-0-3-0
7	Remedial Training in Foundation Courses	MC	2-1-2-0
8	Human Values & Professional Ethics	MC	3-0-0-0
9	Communication Skills - focus on Listening, Speaking, Reading, Writing skills	BS	2-1-2-0
10	Concepts of Programming	ES	2-0-2-0

SRI VENKATESWARA COLLEGE OF ENGINEERING

(Autonomous)
Karakambadi Road, TIRUPATI – 517507

Computer Science & Engineering (Cyber Security)

B.Tech I Semester(Theory -4, Lab-5,MC-1)

S.No	Course No	Course Name	Category	L-T-P	Credits
1.	MA20ABS101	Linear Algebra and Calculus	BS	3-0-0	3
2.	PH20ABS103	Applied Physics	BS	3-0-0	3
3.	CS20AES101	Problem Solving using C	ES	3-0-0	3
4.	EG20AHS101	Communicative English	HS	3-0-0	3
5.	ME20AES101	Engineering Workshop	ES	0-0-3	1.5
6.	CS20AES103	IT Workshop	ES	0-0-3	1.5
7.	EG20AHS102	Communicative English Lab	HS	0-0-3	1.5
8.	PH20ABS104	Applied Physics Lab	BS	0-0-3	1.5
9.	CS20AES102	Problem Solving using C Lab	ES	0-0-3	1.5
10.	MA20AMC101	Logical Skills for Professionals-I	MC	2-0-0	0
				Total	**19.5**

B.Tech II Semester(Theory -5 Lab-5,MC-1)

S.No	Course No	Course Name	Category	L-T-P/D	Credits
1.	MA20ABS201	Differential Equations and Vector Calculus	BS	3-0-0	3
2.	CH20ABS103	Chemistry	BS	3-0-0	3
3.	EE20AES101	Basic Electrical & Electronics Engineering	ES	3-0-0	3
4.	CS20AES201	Data Structures	ES	3-0-0	3
5.	ME20AES102	Engineering Drawing	ES	1-0-0/2	2
6.	ME20AES103	Engineering Graphics Lab	ES	0-0-2	1
7.	CH20ABS104	Chemistry Lab	BS	0-0-3	1.5
8.	EE20AES102	Basic Electrical & Electronics Engineering Lab	ES	0-0-2	1.5
9.	CS20AES202	Data Structures Lab	ES	0-0-3	1.5
10.	BA20AHS201	Universal Human Values	HS	3-0-0	3
11.	EG20AMC101	Speech & Oral Communication	MC	2-0-0	0
				Total	**22.5**

SRI VENKATESWARA COLLEGE OF ENGINEERING

(Autonomous)
KarakambadiRoad, TIRUPATI–517507

Computer Science and Engineering (CYBER SECURITY)

B. Tech III Semester(Theory -6 Lab-3,SOC-1,MC-2)

S. No	Course No	Course Name	Category	L-T-P	Credits
1	MA20ABS303	Discrete Mathematics & Graph Theory	BS	3-0-0	3
2	EC20AES301	Digital Electronics & Microprocessors	ES	3-0-0	3
3	CY20APC301	Computer organization	PC	3-0-0	3
4	AM20APC301	Design and Analysis of Algorithms	PC	3-0-0	3
5	IT20APC301	Python Programming	PC	3-0-0	3
6	EC20AES302	Digital Electronics & Microprocessors Lab	ES	0-0-3	1.5
7	AM20APC302	Algorithms Lab	PC	0-0-3	1.5
8	IT20APC302	Python Programming Lab	PC	0-0-3	1.5
9	AM20ASC301	**Skill oriented course-I** Linux Administration	SC	1-0-2	2
10	CH20AMC201	**Mandatory non-credit course-II** Environmental Science	MC	2-0-0	0
11	EG20AMC302	Enhancing English Language Skills**(Lateral Entry Students only)**	MC	2-0-0	0
12	BA20AHS201	Universal Human Values**(Lateral Entry Students only)**	HS	3-0-0	*3
				Total	**21.5**

*UHV is Considered as Credit Based Course from 2021 Batch.

SRI VENKATESWARA COLLEGE OF ENGINEERING

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Computer Science and Engineering (CYBER SECURITY)

B. Tech IV Semester(Theory -5 Lab-3,SOC-1,MC-3)

S. No	Course No	Course Name	Category	L-T-P	Credits
1	MA20ABS402	Number Theory	BS	3-0-0	3
2	CS20APC401	Object Oriented Programming Through Java	PC	3-0-0	3
3	CY20APC401	Computer Networks	PC	3-0-0	3
4	IT20APC401	Operating Systems	PC	3-0-0	3
5	BA20AHS301	**Humanities Elective-I** Managerial Economics and Financial Analysis	HS	3-0-0	3
	BA20AHS302	Business Environment			
	BA20AHS303	Organizational Behavior			
6	CS20APC402	Object Oriented Programming Through Java Lab	PC	0-0-3	1.5
7	CY20APC402	Computer Networks lab	PC	0-0-3	1.5
8	IT20APC402	Operating systems Lab	PC	0-0-3	1.5
9	IT20ASC401	**Skill Oriented Course-II** Exploratory Data Analysis With R	SC	1-0-2	2
10	CS20AMC401	**Mandatory non-credit course-III** Design Thinking for Innovation	MC	2-1-0	0
11	SH20AAC401	NSS/YOGA/Cultural Activities/Sports	AC	0-0-2	0
12.	MA20AMC401	Engineering Mathematics (Lateral Entry Students only)	MC	2-0-0	0.0
13	MA20AMC301	Logical Skills for Professionals-II	MC	2-0-0	0
				Total	**21.5**
		Internship 1 Month (Mandatory) during summer vacation			
		Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)		0-0-2	0

SRI VENKATESWARA COLLEGE OF ENGINEERING

(Autonomous)

B.Tech-I Sem

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3 0 0 3

(MA20ABS101) LINEAR ALGEBRA & CALCULUS
(Common to All Branches)

Course Objectives:

* This course will illuminate the students in the concepts of calculus and linear algebra.
* 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.

Unit -1:

Matrices

Rank of a matrix by echelon form, normal form. Solving 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, Diagonalisation of a matrix.

Learning Outcomes:

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

* Solve systems of linear equations, using technology to facilitate row reduction determine the rank, eigen values and eigen vectors. (L3)
* Identify special properties of a matrix, such as positive definite, etc., and use this information to facilitate the calculation of matrix characteristics. (L3)

Unit -2:

Mean Value Theorems

Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, Taylor's and Maclaurin theorems with remainders (without proof) related problems.

Learning Outcomes:

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

* Translate the given function as series of Taylor's and Maclaurin's with remainders. (L3)
* Analyze the behavior of functions by using mean value theorems. (L3)

Unit -3:

Multivariable Calculus

Partial derivatives, total derivatives, chain rule, change of variables, Jacobian, maxima and minima of functions of two variables, method of Lagrange multipliers.

Learning Outcomes:

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

- Find partial derivatives numerically and symbolically and use them to analyze and interpret the way a function varies. (L3)
- Acquire the Knowledge maxima and minima of functions of several variables. (L1)

Utilize Jacobian of a coordinate transformation to deal with the problems in change of variables. (L3)

Unit -4:

Multiple Integrals

Double integrals, change of order of integration, change of variables. Evaluation of triple integrals, change of variables between Cartesian, Cylindrical and Spherical polar co-ordinates.

Learning Outcomes:

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

- Evaluate double integrals of functions of several variables in two dimensions using Cartesian and polar coordinates. (L5)
- Apply double integration techniques in evaluating areas bounded by region. (L4)
- Evaluate multiple integrals in Cartesian, cylindrical and spherical geometries. (L5)

Unit -5:

Beta and Gamma functions

Beta and Gamma functions and their properties, relation between beta and gamma functions,

Evaluation of definite integrals using beta and gamma functions. Evaluation of double and triple integrals using Beta and Gamma functions.

Learning Outcomes:

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

- Understand Beta and Gamma functions and its relations. (L2)
- Conclude the use of Special function in evaluating definite integrals. (L4)

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers, 2017.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.

Reference Books:

1. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 3/e, Alpha Science International Ltd., 2002.
2. George B. Thomas, Maurice D. Weir and Joel Hass, Thomas Calculus, 13/e, Pearson Publishers, 2013.
3. Glyn James, Advanced Modern Engineering Mathematics, 4/e, Pearson publishers, 2011.
4. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education.
5. H. k Das, Er. RajnishVerma, Higher Engineering Mathematics, S. Chand.
6. N. Bali, M. Goyal, C. Watkins, Advanced Engineering Mathematics, Infinity Science Press.

Course Outcomes:

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

- Develop the use of matrix algebra techniques that is needed by engineers for practical applications. (L6)
- Utilize mean value theorems to real life problems. (L3)
- Familiarize with functions of several variables which are useful in optimization. (L3)
- Apply multiple integrals to find the area and volumes for different functions. (L3)
- Analyze the concepts of Beta and Gamma special function for different functions. (L4)

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech I Sem

L T P C
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(PH20ABS103) APPLIED PHYSICS

(ECE, EEE, CSE, CSE (AI & ML), IT, CSE(Cyber Security),CSE(Data Science))

Course Objectives:

- To identify the importance of the optical phenomenon i.e., interference, diffraction and polarization related to its engineering applications.

- To understand the mechanisms of emission of light, the use of lasers as light sources for low and high energy applications, study of propagation of light wave through optical fibers along with engineering applications.

- To explain the significant concepts of dielectric and magnetic materials that leads to potential applications in the emerging microdevices.

- To enlighten the concepts of Quantum Mechanics and to provide fundamentals of de 'Broglie waves, quantum mechanical wave equation and its applications, the importance of free electron theory and band theory of solids.

- Evolution of band theory to distinguish materials, basic concepts and transport phenomenon of charge carriers in semiconductors. To give an impetus on the subtle mechanism of superconductors using the concept of BCS theory and their fascinating applications.

Unit-1:

Wave Optics

Interference- Principle of superposition – Interference of light – Interference by division of wavefront and amplitude -Interference in thin films (Reflection Geometry) – Colors in thin films – Newton's Rings – Determination of wavelength and refractive index–Applications.

Diffraction- Introduction – Fresnel and Fraunhofer diffraction – Fraunhofer diffraction due to single slit, double slit and N-slits (qualitative) – Grating spectrum–Applications.

Polarization- Introduction – Types of polarization – Polarization by reflection, refraction and double refraction - Nicol's Prism - Half wave and Quarter wave plates–Applications.

Learning Outcomes:

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

- Explaintheneedofcoherentsourcesandtheconditionsforsustainedinterference. (L2)

- Identify engineering applications of interference. (L3)

- Analyze the differences between interference and diffraction with applications. (L4)

- Illustrate the concept of polarization of light and its applications. (L2)

- Classify ordinary polarized light and extraordinary polarized light. (L2)

Unit-2:

Lasers and Fiber optics

Lasers- Introduction – Characteristics of laser – Spontaneous and Stimulated emission of radiation – Einstein's coefficients – Population inversion – Lasing action – Pumping mechanisms – Nd-YAG laser–He-Ne laser– GaAs Laser – Applications of lasers.

Fiber optics- Introduction – Principle of optical fiber – Acceptance Angle – Numerical Aperture – Classification of optical fibers based on refractive index profile and modes – Propagation of electromagnetic wave through optical fibers – Attenuation – Optical fiber communication system – Applications.

Learning Outcomes:

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

- Demonstrate the basic concepts of LASER light Sources. (L2)

- Apply the concepts to learn the types of lasers. (L3)

- Identifies the Engineering applications of lasers. (L3)

- Explain the working principle of optical fibers. (L2)

- Classify optical fibers based on refractive index profile and mode of propagation. (L2)

- Identify the applications of optical fibers in various fields. (L3)

Unit-3:

Dielectric and Magnetic Materials

Dielectric Materials- Introduction – Dielectric polarization – Dielectric polarizability, Susceptibility and Dielectric constant – Types of polarizations: Electronic, Ionic and Orientational polarizations (Qualitative) – Lorentz internal field – Clausius-Mossottiequation-Ferro electricity- Dielectric Loss-Applications.

Magnetic Materials- Introduction – Magnetic dipole moment – Magnetization – Magnetic susceptibility and Permeability – Origin of permanent magnetic moment – Classification of magnetic materials: (Dia, Para, Ferro Ferri, &Antiferro) - Domain theory of Ferromagnetism (Qualitative), – Hysteresis – Soft and Hard magnetic materials-Applications.

Learning Outcomes:

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

- Explain the concept of dielectric constant and polarization in dielectric materials. (L2)

- Summarize various types of polarization of dielectrics. (L2)

- Interpret Lorentz field and Clausius-Mossottirelation in dielectrics. (L2)

- Classify the magnetic materials based on susceptibility and their temperature dependence. (L2)

- Explain the applications of dielectric and magnetic materials. (L2)

- Apply the concept of magnetism to magnetic devices. (L3)

Unit-4:

Quantum Mechanics, Free Electron Theory and Band theory of Solids

Quantum Mechanics- Dual nature of matter – de-Broglie hypothesis- Heisenberg uncertainty principle(Qualitative) – Significance of wave function- Schrodinger's time independent and dependent wave equation – Particle in a one-dimensional infinite potential well.

Free Electron Theory- Classical free electron theory (Merits and demerits) – Quantum free electron theory – Equation for electrical conductivity based on quantum free electron theory – Density of States–Fermi- Dirac distribution.

Band theory of Solids- Origin of energy bands- Classification of solids – Bloch's Theorem (Qualitative) – Kronig- Penney model (Qualitative) – E vs k diagram.

Learning Outcomes:

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

- Explain the concept of dual nature of matter. (L2)

- Explain the significance of wave function. (L2)

- Interpret the concepts of classical and quantum free electron theories. (L2)

- Explain the importance of K-Pmodel. (L2)

- Classify the materials based on band theory. (L2)

Unit-5:

Semiconductors and Superconductors

Semiconductors- Introduction – Intrinsic semiconductors – Density of charge carriers – Electrical conductivity – Fermi level – Extrinsic semiconductors – Density of charge carriers – Dependence of Fermi energy on carrier concentration and temperature – Drift and diffusion currents – Einstein's equation – Direct and indirect band gap semiconductors – Hall effect – Hall coefficient – Applications ofHall effect.

Superconductors- Introduction – Concept & Properties of superconductors – Meissner effect – Type I and Type II superconductors – BCS theory – Josephson effects (AC and DC) – High T_c superconductors – Applications of superconductors.

Learning Outcomes:

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

- Interpret the direct and indirect band gap semiconductors. (L2)

- Identify the type of semiconductor using Hall effect. (L2)

- Identify applications of semiconductors in electronic devices. (L2)

- Explain how electrical resistivity of solids changes with temperature. (L2)

- Classify superconductors based on Meissner's effect. (L2)

Text books:

1. A text book of Engineering Physics – Dr. M.N. Avadhanulu& Dr. P.G. Kshirsagar, S. Chand and Company, 11 Edition, 2019

2.Engineering Physics – B.K. Pandey and S. Chaturvedi, Cengage Learning, 2013

Reference Books:

1. Engineering Physics – Shatendra Sharma, Jyotsna Sharma, Pearson Education,2018

2. Engineering Physics – K. Thyagarajan, McGraw HillPublishers, 2019

3. Engineering Physics - Sanjay D. Jain, D. Sahasrambudheand Girish, UniversityPress,2010

4. Semiconductor physics and devices- Basic principle - Donald A,Neamen,McGraw Hill,2011

5. Solid State Physics, A.J. Dekker, Macmillan Education UK,1969

6. Kittel's Introduction to Solid State Physics,Charles Kittel ,Wiley India Edition Paperback, 2019

Course Outcomes:
- Apply the different realms of physics and their applications in both scientific and technological systems through physical optics.(L3)

- understand the mechanisms of emission of light, the use of lasers as light sources for low and high energy applications. (L2)

- Understands the response of dielectric and magnetic materials to the applied electric and magnetic fields.(L2)

- Apply the quantum mechanical picture of subatomic world along with the discrepancies between the classical estimates and laboratory observations of electron transportation phenomena by free electron theory and band theory.(L3)

- Elaborate the physical properties exhibited by materials through the understanding of properties of semiconductors and superconductors.(L5)

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech-I Sem	**3**	**0**	**0**	**3**

(CS20AES101) PROBLEM SOLVING USING C
(Common to All Branches of Engineering**)**

Course Objectives:

- To learn how to solve a given problem.
- To illustrate the basic concepts of C programming language.
- To discuss the concepts of Functions, Arrays, Pointers and Structures.
- To familiar with Dynamic memory allocation concepts.
- To apply concepts of structures and files to solve real word problems.

UNIT-1:

Introduction to Problem Solving: Problem Solving Aspect, Problem Identification, Problem Understanding, Algorithm Development, Solution Planning, Flowcharts, flowgorithm.

Overview of C: History Of C, C Language Elements, Basic Structure of C Program,C Tokens-Variables and Data Types, Operators,Expressionsand Type Conversions.

Learning Outcomes:

The students will be able to

- Develop solution through problem understanding and decomposition (L6).
- Develop basic flowcharts for performing input and output and computations (L3).
- Solve Numerical Problems using Flowgorithm (L3).
- Use C basic concepts to write simple C programs (L3).

UNIT-2:

Control Statements: Selection Statements- if and switch statements.

Iterative Statements:for, while and do-while statements.

Jump Statements:break and continue statements.

Learning Outcomes:

The students will be able to

- Implement C program using Conditional statements (L2).
- Implement C program using Iterative statements (L2).

UNIT-3:

Arrays: Declaration, accessing array elements, Storing values, Operations on arrays, Multi-dimensional arrays.

Functions: Introduction, Using Functions, Function declaration, Function definition and Function call, Parameter passing, Passing arrays to functions, Recursion, Storage classes.

Learning Outcomes: The students will be able to
- Writing Structured programs using Functions (L5).
- Apply arrays concepts on real time applications (L6).

UNIT-4:

Pointers: Declaration and Initialization of pointer variables, Pointer arithmetic, Pointers and arrays, Pointer to pointer, Array of pointers, Pointers and functions, Dynamic Memory Allocation.

Strings: Introduction to Strings, String handling functions, Preprocessor Directives.

Learning Outcomes: The students will be able to
- Use pointers to write c Programs (L3).
- Understand the concepts of preprocessors (L2).
- Apply Dynamic Memory Allocation concepts on real time applications (L6).

UNIT-5:

Structures: Introduction, Nested Structures, Array of Structures, Structures and Functions, Unions.

Files in C: Using Files in C, Read data from Files, Writing data to Files, Random access to files, Command-line Arguments

Learning Outcomes:

The students will be able to
- Use the concepts of Structures and Unions to write C programs (L3).
- Apply various operations on Files (L6).

Text Books:

1. Reema Thareja, Programming in C, Oxford University Press, AICTE Edition, 2018.

2. R.G. Dromey, "How to Solve it by Computer". 2014, Pearson.

Reference Books:

1. Jeri R. Hanly, Ellot B. Koffman, Problem Solving and Program Design in C, 5/e, Pearson

2. B. A. Forouzan and R. F. Gilberg, Computer Science: A Structured Programming Approach Using C, 3/e, Cengage Learning, 2007.

3. Brian W Kernighan and Dennis M Ritchie, The C Programming Language, Second Edition, Prentice Hall Publication.

4. Paul Deitel, Harvey Deitel -C How to Program with an introduction to C++, Eighth Edition

Course Outcomes:

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

- Solve computational problems (L3).
- Select the features of C language appropriate for solving a problem (L4)
- Design computer programs for real world problems (L6)
- Organize the data which is more appropriated for solving a problem (L6).

SRI VENKATESWARA COLLEGE OF ENGINEERING
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B.Tech I Sem

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3	0	0	3

(EG20AHS101) COMMUNICATIVE ENGLISH
(Common to all Branches)

Course Objectives:

- To give inputs to students regarding effective listening skills for better comprehension of academic lectures and English spoken by native speakers.
- To make students aware of reading strategies for comprehension of various academic texts and authentic materials.
- To improve speaking skills through participation in activities such as role plays, discussions and structured talks/oral presentations.
- To impart effective strategies for good writing and demonstrate the same in summarizing, writing well-organized essays, record and report useful information.
- To offer relevant inputs regarding grammatical structures and vocabulary and encourage their appropriate use in speech and writing.

Unit-1:

Lesson: On the Conduct of Life: William Hazlitt

Listening: Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions.

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. **Reading for Writing:** Beginnings and endings of paragraphs - introducing the topic, summarizing the main idea and/or providing a transition to the next paragraph.

Grammar and Vocabulary: Parts of Speech, Prepositions, Word formation-I: Introduction to Word formation, Clauses and Sentences.

Learning Outcomes:

At the end of the module, the learners will be able to

- Understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information

- Ask and answer general questions on familiar topics and introduce oneself/others
- Employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information
- Recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs
- Form sentences using proper grammatical structures and correct word forms

Unit-2:

Lesson: The Brook: Alfred Tennyson

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: Paragraph writing (specific topics) using suitable cohesive devices; mechanics of writing - punctuation, capital letters.

Grammar and Vocabulary: Articles, Word formation-II: Root words from other languages, Punctuation.

Learning Outcomes:

At the end of the module, the learners will be able to

- Comprehend short talks on general topics.
- Participate in informal discussions and speak clearly on a specific topic using suitable discourse markers.
- Understand the use of cohesive devices for better reading comprehension.
- Write well-structured paragraphs on specific topics.
- Identify basic errors of grammar/ usage and make necessary corrections in short texts.

Unit-3:

Lesson: The Death Trap: Saki

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, Paragraph Writing.

Grammar and Vocabulary: Noun-pronoun agreement, Subject-verb agreement,

Word formation-III: Prefixes & suffixes from other languages. Principles of Good writing.

Learning Outcomes:

At the end of the module, the learners will be able to

- Comprehend short talks and summarize the content with clarity and precision.

- Participate in informal discussions and report what is discussed.

- Infer meanings of unfamiliar words using contextual clues.

- Write summaries based on global comprehension of reading/listening texts

- Use correct tense forms, appropriate structures and a range of reporting verbs in speech and writing.

Unit -4:

Lesson: Muhammad Yunus

Listening: Making predictions while listening to conversations/ transactional dialogues without video; listening with video.

Speaking: Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/directions.

Reading: Studying use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communication processe or display complicated data.

Writing: Letterwriting, Essaywriting.

Grammar and Vocabulary: Misplaced Modifiers, Synonyms and Antonyms, Essaywriting.

Learning Outcomes:

At the end of the module, the learners will be able to

- Infer and predict content of spoken discourse.
- Understand verbal and non-verbal features of communication and hold formal/informal conversations.
- Interpret graphic elements used in academic texts.
- Produce a coherent paragraph interpreting a figure/graph/chart/table.
- Use appropriatelanguage for description and interpretation of graphical elements.

Unit-5:

Lesson: Politics and the English Language: George Orwell

Listening: Identifying key terms, understanding concepts and answering a series of relevant questions.

Speaking: Formal oral presentations on topics from academic contexts - without the use of PPT slides.

Reading: Reading for comprehension.

Writing: Summarywriting, Notemaking.

Grammar and Vocabulary: Clichés, Redundancies, Common Abbreviations, Writing a summary.

Learning Outcomes:

At the end of the module, the learners will be able to

- Take notes while listening to a talk/lecture and make use of them to answer questions.
- Make formal oral presentations using effective strategies.
- Comprehend, discuss and respond to academic texts orally and in writing.
- Produce a well-organized essay with adequate support and detail.
- Edit short texts by correcting Common Errors.

Web links

1. www.englishclub.com

2. www.easyworldofenglish.com

3. www.languageguide.org/english

4. www.bbc.co.uk/learningenglish

5. www.eslpod.com/index.html

6. www.myenglishpages.com

Text Books:

1. Language and Life: A Skills Approach- I Edition 2019, Orient Black-Swan.

Reference Books:

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. Raymond Murphy's English Grammar in Use, Fourth Edition (2012)E-book.

4. Hewings, Martin. Cambridge Academic English (B2). CUP, 2012.

5. Oxford Learners Dictionary, 12th Edition, 2011.

6. Norman Lewis Word Power Made Easy- The Complete Handbook for Building a Superior Vocabulary Goyal Reprint edition 2011.

7. Speed Reading with the Right Brain: Learn to Read Ideas Instead of Just Words by David Butler; 2nd edition 2014.

Course Outcomes:
- Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English. (L2)
- Apply grammatical structures to formulate sentences and correct word forms. (L3)
- Analyze discourse markers to speak clearly on a specific topic in informal discussions. (L4)
- Evaluate reading/listening texts and to write summaries based on global comprehension of these texts. (L5)
- Create a coherent paragraph interpreting a figure/graph/chart/table. (L6)

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B.Tech I Sem   **L T P C**
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(ME20AES101) ENGINEERING WORKSHOP
(Common to all Branches)

Course Description:

This course will provide students with a hands-on experience on various basic engineering practices. This course will also provide an opportunity to the students to experience the various steps involved in the industrial product fabrication.

Course Objectives:

- To familiarize students with basic engineering applications in day-to-day life.

Wood Working: (Any 2)

To familiarize with different types of wood and tools used in wood working and make following joints;

1. Planning and Sawing of Wood

2. Half – Lap Joint

3. Mortise and Tenon Joint

4. Dovetail Joint or Bridle Joint

Sheet Metal Working: (Any 2)

To familiarize with different types of tools used in sheet metal working, developments of following sheet metal job from GI sheets;

   1) Rectangular tray   2) Conical funnel   3) Open scoop

Fitting: (Any 1)

To familiarize with different types of tools used in fitting and do the following fitting exercises;

1) V-fit   2) Square fit   3) Dovetail fit

Electrical Wiring: (Any 2)

To familiarize with different types of basic electrical circuits and make the following connections;

1) Parallel and series 2) Two-way switch3) Godown lighting 4) Soldering of wires.

Foundry Practice: (Any 1)

To familiarize with different types of tools used in Foundry and do the following exercises;

1. Preparation of a green sand mould using single piece pattern

2. Preparation of a green sand mould using split piece pattern with core and demonstration of casting.

Welding Practice: (Any 1)

To familiarize with different types of tools used in Welding and do the following exercises;

1. Lap joint, butt joint and T joint using arc welding.

2. Lap joint using resistance spot welding

3. Lap and butt joints using gas welding

Assembling/Disassembling Practice: (Any 1)

To familiarize with different types of tools used in Assembling/Disassembling and do the following exercises;

1. Bicycle

2. Clutch and carburetor

3. Two-wheeler engine parts

Manufacture of a Plastic Component (Any 1)

To familiarize with different types of tools used in Manufacture of a Plastic Componentand do the following exercises;

1. Use of injection moulding machine

2. FRP composite preparation using hand layup method

3. Joining of plastic components

Reference Books/Laboratory Manuals:

1. P. Kannaiah and K. L. Narayana, Workshop Manual, SciTech Publishers, 2009.

2. K. Venkata Reddy, Workshop Practice Manual, BS Publications, 2008.

3. V. Ramesh Babu, Engineering Workshop Practice, V R B Publishers Private Limited, 2009.

Additional Learning Resources:

1. R. K. Jain, Production Technology, Khanna Publishers, 17th edition, 2012.

2. Kalpakjain, Serope, Manufacturing Engineering and Technology, Pearson Education, 7th edition, 2014.

Course Outcomes:

After completion of this lab the student will be able to

1. Identify tools, work material, measuring instruments useful for domestic applications (L3).

2. Apply wood working skills in real world applications. (L3)

3. Build different parts with metal sheets in real world applications. (L3)

4. Apply fitting operations in various applications for good strength. (L3)

5. Analyze different types of basic electric circuit connections. (L4)

6. Demonstrate soldering and brazing in joining circuits. (L2)

7. Make moulds for sand casting using standard equipment. (L3)

8. Develop different weld joints for various metals. (L3)

9. Inspect various parts of machine components. (L4)

10. Make plastic components using proper raw material. (L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)

B.Tech I Sem

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(CS20AES103) IT Workshop
(Common to All Branches of Engineering)

Course Objectives:

- To make the students to know about the internal parts of computer, Generation of Computers
- To make the students to know how to assemble and disassemble a computer from its parts
- To make the students to install Operating system for a computer.
- To provide technical training to the students on productivity tool like Word Processor, Spread Sheets, Presentations and LaTeX
- To learn about networking of computers and use Internet facility for browsing and searching

Task 1:

Learn about Computer Hardware -1: Identifying the internal parts of computer with its peripherals, Block diagram of Computer, Generations of Computers. Write specifications for each part of a computer including peripherals and specifications of a system. Submit it in the form of report.

Task 2:

Learn about Computer Hardware-2: Assemble and disassemble the Personal Computer, Internal and external connections of the computer, Troubleshoot the computer by identifying working and non-working parts. Submit a report about the working and non-working parts in a computer.

Task 3:

Installation of Operating System: Linux, Windows 7/8/10 Installation, install both the operating system in a computer and make the system as Dual boot. Student should record the entire installation process.

Task 4:

Installation of Device drivers: install supported device drivers for the system-printer drivers, audio and video drivers, Graphic card drivers, USB drivers, install new application software and record the process of installations.

Task 5:

Networking: Connecting computers directly using a cable or wireless connectivity and share information, connecting computers using switch/hub or Local Area Network connection and share information, Wide Area Network Connection, crimpling activity, logical configuration. The entire process has to be documented.

Task 6:

Introduction to Web Design: Introduction to Web Design, Introduction to HTML tags, Cascading Style sheets and Applications using HTML and CSS.

Task 7:

Introduction to Virus and Antivirus: Types of Virus, virus engine, Antivirus-download freely available Anti-virus software, install it and use it to check for the threats to the computer being used. Student should submit information about the features of the installation process and antivirus used.

Task 8:

Introduction to Microsoft Office-1: Microsoft word, Operations on text data in word- inserting, deleting, Aligning, header, footer, font style, font type, bulleting and numbering, hyperlinking, inserting images, page setup, inserting images, writing equations, formatting Paragraphs, spell checking etc. Student should submit a user manual of the word processor

Task 9:

Introduction to Microsoft Office-2: Microsoft Excel, Operation on data in Excel-creating, opening, saving the document as per the requirement, inserting, deleting the cell data, format the cell, creation of pivot table, applying the formulas and functions, preparing charts, converting .xls to csv, etc., Student should submit a user manual of the Spreadsheet.

Task 10:

Introduction to Microsoft Office-3: Microsoft PowerPoint Presentation, creating, opening, saving the presentations, inserting and deleting the slides, styles for slides, formatting the slides with different fonts, colours, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyper linking, running the slideshow, Setting the timing for slide show. Student should submit a user manual of the PowerPoint presentation.

Task 11:

Introduction to LaTeX: LaTeX and its installation and different IDEs, Creating the document using Latex, content into sections using article and book class of Latex.

Styling Pages: Reviewing and customizing different paper sizes and formats. Formatting text, creating basic table, adding simple and dashed border, merging rows and columns, referencing and indexing. Student should submit a user manual of the LaTeX.

References:

1. Introduction to Computers, Peter Norton, McGraw Hill
2. PC Hardware, Maintenance & Troubleshooting In-Depth, Reddy N.S.
3. MOS study guide for Word, Excel, PowerPoint & Outlook Exams, Joan Lambert, Joyce Cox, PHI
4. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
5. Networking your computers and devices, Rusen, PHI
6. Lamport L. LaTeX: a document preparation system: user's guide and reference manual. Addison-Wesley: 1994

Course Outcomes:

- Identify the Internal parts of computers and Generation of Computers. (L1)
- Assemble and disassemble a computer from its parts and prepare the computer ready to use.(L3)
- Installation process of different types Operating system for a computer by their own.(L3)
- Interconnect two or more computers for information sharing.(L4)
- Access the Internet and browse it for required information.(L1)
- Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX.(L3)
- Prepare slide presentation using the presentation tool.(L4)

SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)

B.Tech I Sem

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(EG20AHS102) COMMUNICATIVE ENGLISH LAB
(Common to all Branches)

Course Objectives:

- To expose students to a variety of self-instructional, learner-friendly modes of language learning.

- To give inputs on better pronunciation through stress, intonation and rhythm.

- To make students aware of the impact of mother tongue on their use of English.

- To make students aware of the skills of using effective language in Interviews, Group Discussions and Public speaking.

- To equip students with knowledge of the use of computers in resume preparation, reportwriting, and formatmaking etc.

Unit-1:

1. Phonetics (sounds symbols, transcription and Received Pronunciation (R.P), stress and intonation).
2. Describing objects/places/persons.

Unit-2:

1. Role Play/ Conversational Practice.
2. JAM.

Unit-3:

1. **Group Discussion**:Types, process, language and body language.
2. **Debate**: Arguing in favor of and against a topic- logical questioning.

Unit-4:

1. **Oral/ Poster Presentations:** Structure, preparation, visual aids and delivery.
2. **ResumeWriting:**Definition, formats and practice.

Unit-5:

1. **Interview Skills**: Basics of interviews -kinds of interviews- preparation – and performance.
2. **Film/book review:**Structure, language and practice.

Suggested Software

Orel, Walden InfoTech, Young India Films.

Reference Books

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. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Macmillan Educational. 2016**.**

4. Hewings, Martin. Cambridge Academic English (B2). Cambridge University Press, 2012.

5. T.Balasubramaniyan, A Textbook of English Phonetics for Indian Students, 3rdedition; Laxmi publications 2017.

Web Links

1. www.esllab.com
2. www.englishmedialab.com
3. www.englishinteractive.net

Course Outcomes:

After completing the course, the students will be:

1. Develop to handle and excel in a variety of self-instructional, learner-friendly modes of language learning. (L6)

2. Develop to employ better stress and intonation patterns and utter English sounds correctly. (L6)

3. Develop to avoid the impact of mother tongue in English and neutralize their accent. (L6)

4. Develop to participate with skill and confidence in Group Discussions, Interviews and Public Speaking. (L6)

5. Utilize the technical skills to prepare resume, report-writing, and format-making etc. (L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING
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B.Tech I/II Sem

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(PH20ABS104) APPLIED PHYSICS LAB
(ECE, EEE, CSE, CSE (AI & ML), IT, CSE(Cyber Security),CSE(Data Science))

Course Objectives:
- Understands the concepts of interference, diffraction and their applications.

- Understand the role of optical fiber parameters in communication.

- Recognize the importance of energy gap in the study of conductivity and Hall Effect in a semiconductor.

- Illustrates the magnetic and dielectric materials applications.

- Apply the principles of semiconductors in various electronic devices.

Note: In the following list, out of 12 experiments, any 10 experiments must be performed in a semester.

List of Applied Physics Experiments:
1. Determine the thickness of the wire using wedge shape method.

2. Determination of the radius of curvature of the lens by Newton's ring method.

3. Determination of wavelength by plane diffraction grating method.

4. Determination of dispersive power of prism.

5. Determination of wavelength of LASER light using diffraction grating.

6. Determination of particle size using LASER.

7. To determine the numerical aperture of a given optical fiber its acceptance angle.

8. Determination of dielectric constant by charging and discharging method.

9. Magnetic fieldalongtheaxisofacircularcoilcarryingcurrent–StewartGee'smethod.

10. Study the variation of B versus H by magnetizing the magnetic material (B-Hcurve).

11. To determine the energy gap of a semiconductor by temperature by Four-Probe Method.

12. Determination of thermistor negative temperature coefficient of resistance.

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.

Course Outcomes:

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

- Utilize optical instruments like microscope and spectrometer. (L3)

- Determine thickness of a hair/paper with the concept of interference. (L5)

  - Estimate the wavelength of different colors using diffraction grating and resolving power. (L5)

  - Organize the intensity of the magnetic field of circular coil carrying current with distance. (L3)

- Evaluate the acceptance angle of an optical fiber and numerical aperture. (L5)

  - Determine the resistivity of the given semiconductor using four probe method. (L5)

- Identify the type of semiconductor i.e., n-type or p-type using hall effect. (L3)

- Determine the band gap of a given semiconductor. (L5)

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(Autonomous)

B.Tech I Sem

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(CS20AES102) PROBLEM SOLVING USING C LAB
(Common to All Branches of Engineering**)**

Course Objectives:

- To learn how to solve a given problem.
- To illustrate the basic concepts of C programming language.
- To discuss the concepts of Functions, Arrays, Pointers and Dynamic Memory Allocation.
- To understand and implement Structures and Unions.
- To familiarize with Files and File Operations.

Week-1: Draw flowcharts for fundamental algorithms.

Week-2: C Programs to demonstrate C-tokens.

Week-3: C Programs on usage of operators.

Week-4: C Programs to demonstrate Decision making and branching (Selection).

Week-5: C Programs to demonstrate different loops.

Week-6: C Programs to demonstrate 1-D arrays.

Week-7: C Programs to demonstrate multi-dimensional arrays.

Week-8: C Programs to demonstrate functions.

Week-9: C Programs on pointers.

Week-10: C Programs to perform operations on Strings with String handling functions and without String handling functions.

Week-11: C Programs on Structures and Unions.

Week-12: C Programs to demonstrate Files.

Text Books:

1. R.G. Dromey, How to Solve it by Computer, 1/e, Pearson Education, 2006.
2. Reema Thareja, Programming in C, Oxford University Press, AICTE Edition, 2018.

Reference Books:

1. B. A. Forouzan and R. F. Gilberg, Computer Science: A Structured Programming Approach Using C, 3/e, Cengage Learning, 2007.
2. Pradip Dey, Manas Ghosh, Programming in C, Oxford University Press, AICTE Edition,
3. B. Gottfried, Programming with C, 3/e, Schaum's outlines, McGraw Hill (India), 2017.
4. Jeri R. Hanly, Ellot B. Koffman, Problem Solving and Program Design in C, 5/e, Pearson.

Course Outcomes:

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

- Build algorithm and flowchart for simple problems.
- Use suitable control structures to solve problems.
- Use suitable iterative statements, arrays and modular programming to solve the problems.
- Implement Programs using pointers and String handling Functions.
- Develop code for complex applications using structures, unions and file handling features.

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B.Tech I Sem

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(MA20AMC101) LOGICAL SKILLS FOR PROFESSIONALS-I
(Mandatory Course)

Course Objectives:

- To learn the basic methods to find averages, percentages, Time and Distance and Time and Work concepts extended to problems on trains, Boats and Streams and different shortcut techniques to find the solution in a stipulated time.

- To understand the logic behind the series, coding- decoding, Directions, Problems on ages, Analogy concepts.

Unit-1:

Averages:

- Find the averages on some quantities.

- Find the averages on speed and distance.

Ratio and Proportions:

- Ratio between quantities of the same kind.

- Comparison of two ratios and convert into equal fractions.

- Find the 4th, 3rd terms of proportions and mean proportions.

Profit and Loss:

- Find the Profit or Loss on Selling price, cost price and market price.

Unit-2:

Partnership:

- Ratio of division of gains.

- Working and sleeping partners.

Simple Interest and Compound Interest:

- Find the Principal, Rate of interest and time.

- Find the amount of compound interest when the compound interest is Annually or half-year or quarterly or daily.

- Find the difference between the simple and compound interests

Time and Distance:
- Find the time, speed and distance by using direct formula.

- Find the time, speed and distance by using ratios and averages.

Unit-3:

Time and Work:
- The relation between days taken by individuals to complete a given work independently and to complete while working simultaneously or alternately.

- Teams of men, women, children and time taken by the teams to complete work independently or while working simultaneously.

Problems on Trains:
- Time Taken by Train to Cross any stationary Body or Platform.

- Time Taken by 2 trains to cross each other.

- Distance covered when two trains are moving in the same/opposite directions.

Boats and streams:
- Find the speed of boat in upstream and downstream.

- Find the speed of boat in still water and **averagespeed of boat.**

Unit-4:

Series:
- Alphabet series

- Number series

- Alpha-Numeric series

Coding and Decoding:
- Letter coding

- Number/symbol coding

- Substitution coding

Blood relation:
- Based dialogue or conversation

- Based on puzzles

Unit-5:

Directions:

- The right and left directional movement

- The directional reference point

- The directions of sun rays and shadow

Problems on ages:

- Find the ages at present

- Find the ages in future

- Find the ages in post

Analogy:

- Alphabet analogy

- Number analogy

Text Books:

1. Quantitative Aptitude, 2012, Dr. R.S. Agarwal, S. Chand and Company Ltd, New Delhi.

2. A Modern Approach to Verbal and Non-Verbal Reasoning, 2012, Dr. R.S. Aggarwal, S. Chand and Company Ltd, New Delhi.

Reference Books:

1. Quantitative Aptitude for Competitive Examinations, 14/e, 2010, Abhijit Guha, Tata McGraw Hill Publishers, New Delhi.

2. Course in Mental Ability & Quantitative Aptitude, 3/e, 2012, Edgar Thorpe, Tata McGraw Hill Publishers, New Delhi.

3. Fast Track Objective Arithmetic, 2012, Rajesh Verma, Arihant Publications, Meerut.

4. Reasoning and Aptitude, 2013, Nem Singh, Made Easy Publications, New Delhi

Course Outcomes:

- Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Averages - Percentages - Ratio. (L2)
- Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Partnership - Simple Interest and Compound Interest and time and distance. (L2)
- Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of time ad work, problems on trains and Boats and streams. (L2)
- Analyze the techniques in series, coding and decoding and blood relations. (L3)
- Analyze the techniques in directions, problems on ages and analogy.(L3)

(MA20ABS201) DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS
(Common to All Branches)

Course Objectives:

- To enlighten the learners in the concept of differential equations and multivariable calculus.
- To furnish the learners with basic concepts and techniques at plus two level to lead them into advanced level by handling various real world applications.

Unit -1:

Differential equations

Exact, Non-Exact Linear and Bernoulli equations. Applications to Newton's law of cooling and law of natural growth and decay.

Learning Outcomes:

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

- Identify the essential characteristics of linear differential equations with constant coefficients. (L3)
- Solve the linear differential equations with constant coefficients by appropriate method. (L3)
- Classify and interpret the solutions of linear differential equations. (L3)

Unit -2:

Linear differential equations of higher order

Definitions, homogenous and non-homogenous, complimentary function, general solution, particular integral, method of variation of parameters, Cauchy's and Legendre's linear equations. Applications to L-C-R Circuit.

Learning Outcomes:

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

- Solve the linear differential equations with variable coefficients by appropriate method. (L3)
- Classify and interpret the solutions of linear differential equations of higher order. (L3)
- Formulate and solve the higher order differential equation by analyzing physical situations. (L3)

Unit 3:

Partial differential equations

Formation of a PDE, Linear partial differential equations of first order, non-linear PDEs of first order (standard forms). Solutions to homogenous linear partial differential equations with constant coefficients, rules for finding the complementary function and the particular integral.

Learning Outcomes:

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

- Apply a range of techniques to find solutions of standard PDEs. (L3)
- Outline the basic properties of standard PDEs. (L2)

Unit-4:

Vector differentiation

Scalar and vector point functions, vector operator del, del applies to scalar point functions-Gradient, del applied to vector point functions-Divergence, Curl and their related properties.

Learning Outcomes:

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

- Apply del to Scalar and vector point functions. (L3)
- Illustrate the physical interpretation of Gradient, Divergence and Curl. (L3)

Unit -5:

Vector integration

Line integral-circulation-work done by force, surface integral-flux, Green's theorem in the plane (without proof), Stoke's theorem (without proof), volume integral, Divergence theorem (without proof).

Learning Outcomes:

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

- Find the work done in moving a particle along the path over a force field. (L4)
- Evaluate the rates of fluid flow along and across curves. (L4)
- Apply Green's, Stokes and Divergence theorem in evaluation of double and triple integrals. (L3)

Text Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.
2. B.S. Grewal, Higher Engineering Mathematics, 44/e, Khanna publishers, 2017.

Reference Books:

1. Dennis G. Zill and Warren S. Wright, Advanced Engineering Mathematics, Jones and Bartlett,2011.
2. Michael Greenberg, Advanced Engineering Mathematics, 2/e, Pearson, 2018
3. George B.Thomas, Maurice D. Weir and Joel Hass, Thomas Calculus, 13/e, Pearson Publishers, 2013.
4. R.K.Jain and S.R.K.Iyengar, Advanced Engineering Mathematics, 3/e, Alpha Science International Ltd., 2002.
5. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education.
6. H. k Das, Er. RajnishVerma, Higher Engineering Mathematics, S. Chand.
7. N. Bali, M.Goyal, C. Watkins, Advanced Engineering Mathematics, Infinity Science Press.

Course Outcomes:

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

- Solve the differential equations related to various engineering fields. (L6)
- Solve the linear differential equations of higher order related to various engineering fields. (L6)
- Identify solution methods for partial differential equations that model physical processes. (L3)
- Interpret the physical meaning of different operators such as gradient, curl and divergence. (L5)
- Estimate the work done against a field, circulation and flux using vector calculus.(L5)

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B.Tech II Sem

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(CH20ABS103) CHEMISTRY
(ECE, EEE, CSE, CSE (AI & ML), IT,CSE (Cyber Security), CSE (Data Science))

Course Objectives:

- To impart the concept of soft and hard waters, softening methods of hard water.

- To familiarize engineering chemistry and its applications.

- To train the students on the principles and applications of electrochemistry.

- To determine the polymer molecular weights and various applications of polymers.

- To introduce instrumental methods.

Unit 1: Water Technology

Introduction –Soft Water and hardness of water, Estimation of hardness of water by EDTA Method, Estimation of Dissolved Oxygen by Winkler's method -Boiler troubles–Priming, foaming, scale and sludge, Caustic embrittlement, Domestic treatment of water, specifications for drinking water, Bureau of Indian Standards (BIS) and World Health Organization (WHO) standards, Industrial water treatment, ion-exchange processes - desalination of brackish water, reverse osmosis.

Learning Outcomes:

At the end of this unit, the students will be able to

- List the differences between temporary and permanent hardness of water. (L1)

- Explain the principles of reverse osmosis and electrodialysis. (L2)

- Compare quality of drinking water with BIS and WHO standards. (L2)

- Illustrate problems associated with hard water - scale and sludge. (L2)

- Explain the working principles of different Industrial water treatment processes. (L2)

Unit 2: Modern Engineering materials

Understanding of materials: Crystal field theory – salient features – splitting in octahedral and tetrahedral geometry. Properties of coordination compounds- Oxidation state, coordination, magnetic and colour.

Semiconductor materials, super conductors- basic concept, band diagrams for conductors, semiconductors and insulators, Effect of doping on band structures. Super capacitors: Introduction, Basic Concept-Classification – Applications.

Nano chemistry: Introduction, classification of nanomaterials, properties and applications of Fullerenes, carbon nano tubes and Graphene's nanoparticles.

Learning Outcomes:

At the end of this unit, the students will be able to

- Explain splitting in octahedral and tetrahedral geometry of complexes. (L2)

- Discuss the magnetic behavior and colour of coordination compounds. (L3)

- Explain the band theory of solids for conductors, semiconductors and insulators. (L2)

- Demonstrate the application of Fullerenes, carbon nano tubes and Graphines nanoparticles. (L2)

Unit 3: Electrochemistry and Applications

Introduction to Electrochemistry: Electrodes – concepts, reference electrodes (Calomel electrode, Ag/AgCl electrode and glass electrode); Electrochemical cell, Nernst equation, cell potential calculations and numerical problems,

P^Hmetry,Potentiometry- potentiometric titrations (redox titrations), concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations).

Electrochemical sensors – potentiometric sensors with examples,amperometric sensors with examples.

Primary cells – Zinc-air battery, Secondary cells – Nickel-Cadmium (NiCad), and lithium ion batteries- working of the batteries including cell reactions; Principles and applications of Fuel cells: hydrogen-oxygen, methanol fuel cells

Learning Outcomes:

At the end of this unit, the students will be able to

- Apply Nernst equation for calculating electrode and cell potentials. (L3)

- Differentiate between P^{h}metry, potentiometric and conductometric titrations. (L2)

- Explain the theory of construction of battery and fuel cells. (L2)

- Solve problems based on cell potential. (L3)

Unit 4: Polymer Chemistry

Introduction to polymers, functionality of monomers, types of polymerization, chain growth and step growth polymerization, coordination polymerization, copolymerization (stereospecific polymerization) with specific examples and mechanisms of polymer formation. Calculation of weight average molecular mass of polymers, polydispersity index (PDI).

Plastics - Thermoplastics and Thermosettings, Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres.

Elastomers–Buna-S, Buna-N–preparation, properties and applications.

Conducting polymers–polyacetylene, polyaniline, polypyrroles–mechanism of conduction and applications.

Learning Outcomes:

At the end of this unit, the students will be able to

- Explain the different types of polymers and their applications. (L2)

- Explain the preparation, properties and applications of Bakelite, Nylon-6,6, and carbon fibres. (L2)

- Describe the mechanism of conduction in conducting polymers. (L2)

- Discuss Buna-S and Buna-N elastomers and their applications. (L2)

Unit 5: Instrumental Methods and Applications

Electromagnetic spectrum. Absorption of radiation: Beer-Lambert's law. Principle, instrumentation and applications of UV-Visible, IR Spectroscopies.

Learning outcomes:

After completion of Unit IV, students will be able to:

- Explain the different types of spectral series in electromagnetic spectrum. (L2)

- Understand the principles of different analytical instruments. (L2)

- Explain the different applications of analytical instruments. (L2)

Text Books:

1. Jain and Jain, Engineering Chemistry, 16/e, DhanpatRai, 2013.

2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference Books:

1. G.V.Subba Reddy, K.N.Jayaveera and C. Ramachandraiah, Engineering Chemistry, Mc Graw Hill, 2020.

2. D.Lee, Concise Inorganic Chemistry, 5/e, Oxford University Press, 2008.

3. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.

Course Outcomes:

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

- Estimate the amount of hardness and DO present in water. (L2)

- Compare the materials of construction for battery and electrochemical sensors. (L2)

- Explain the preparation, properties, and applications of thermoplastics &thermosetting, elastomers & conducting polymers. (L2)

- Explain the principles of spectrometry. (L2)

- Apply the principle of Band diagrams in application of conductors and semiconductors. (L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING
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B.Tech-II Sem   **3   0   0   3**

(EE20AES101) BASIC ELECTRICAL & ELECTRONICS ENGINEERING
Part A: BASIC ELECTRICAL ENGINEERING
(Civil, Mechanical, CSE, CSE (AI&ML) and IT, CSE (Cyber Security), CSE (Data Science))

Course Objectives:

- To introduce basics of electric circuits.
- To teach DC and AC electrical circuit analysis.
- To explain working principles of transformers and electrical machines.
- To impart knowledge on low voltage electrical installations

Unit-1: DC & AC Circuits

Electrical circuit elements (R - L and C) - Kirchhoff laws - Series and parallel connection of resistances with DC excitation. Nodal and Mesh analysis. Superposition Theorem - Representation of sinusoidal waveforms –average and rms values - phasor representation - real power - reactive power - apparent power - power factor - Analysis of single-phase ac circuits consisting of RL - RC - RLC series circuits.

Learning Outcomes:

The student will be able to

- Recall Kirchoff laws (L2)
- Analyze simple electric circuits with DC excitation (L4)
- Apply network theorems to simple circuits (L3)
- Analyze single phase AC circuits consisting of series RL - RC - RLC combinations (L4)

Unit-2: DC & AC Machines

Construction and working Principle of DC Generator - EMF equations - OCC characteristics of DC generator – principle and operation of DC Motor – Performance Characteristics of DC Motor - Speed control of DC Motor – Construction and working Principle of Single Phase Transformer - OC and SC test on transformer - principle and operation of Induction Motor and Synchronous Generator.

Learning Outcomes:

The student will be able to

- Explain principle and operation of DC Generator & Motor.
- Perform speed control of DC Motor (L2)
- Explain operation of transformer and induction motor. (L2)
- Explain construction & working of induction motor - DC motor

Unit-3: Basics of Power Systems

Layout & operation of Hydro, Thermal, Nuclear Stations - Solar & wind generating stations –Typical AC Power Supply scheme – Elements of Transmission line – Types of Distribution Systems: Primary & Secondary distribution systems.

Learning Outcomes:

The student will be able to

- Understand working operation of various generating stations (L1)
- Explain the types of Distribution systems (L2)

Text Books:

1. D. P. Kothari and I. J. Nagrath - "Basic Electrical Engineering" - Tata McGraw Hill -2010.
2. V.K. Mehta & Rohit Mehta, "Principles of Power System" – S.Chand – 2018.

References:

1. L. S. Bobrow - "Fundamentals of Electrical Engineering" - Oxford University Press -2011.
2. E. Hughes - "Electrical and Electronics Technology" - Pearson - 2010.
3. C.L. Wadhwa – "Generation Distribution and Utilization of Electrical Energy", 3rd Edition, New Age International Publications.

Course Outcomes:

- Apply concepts of KVL/KCL in solving DC circuits (L3)
- Choose correct rating of a transformer for a specific application (L5)
- Illustrate working principles of induction motor - DC Motor (L3)
- dentify type of electrical machine based on their operation. (L1)
- Describe working principles of protection devices used in electrical circuits. (L2)

Part 'B'- ELECTRONICS ENGINEERING

Course Objectives:

- Understand principles and terminology of electronics.

- Familiar with the construction, and operation and applications of electronic devices.

- Learn about biasing of BJTs and FETs.

- Understand the concept of logic gates.

Unit-1:

Diodes and Applications: Construction, Operation and VI characteristics of PN Junction diode, Diode as a Switch & Rectifier, Construction and Operation of Half Wave and Full Wave Rectifiers with and without Filters; Operation and VI characteristics of zener diode, zener as voltage regulator; Wave shaping circuits – clippers and clampers, peak detector, voltage doubler, LED, Photo Diode, Varactor diode.

Learning Outcomes:

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

- Remember and understand the basic characteristics of semiconductor diode. (L1)

- Understand principle of operation of Zener diode and other special semiconductor diodes. (L1)

- Analyze the operation of diode circuits in different applications such as rectifier, wave shaping circuits, etc.

Unit-2:

Transistor Characteristics: Bipolar Junction Transistor (BJT) – Construction, different modes of Operation, Input and Output characteristics of BJT in Common Base, Common Emitter and Common Collector Configurations, Field Effect Transistor (FET) – Classification, Construction, Symbols, Characteristics of JFET, MOSFET,

Applications: Transistor as an amplifier, switch.

Digital Electronics: Number Systems, Logic Gates, Adders- Half Adder, Full Adder; Flip Flops.

Learning Outcomes:

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

- Understand principle of operation of BJT in different configurations. (L2)

- Understand principle of operation of JFET, MOSFET. (L2)

- Understand the different applications of transistors. (L2)

- Explain the functionality of logic gates. (L2)

Unit-3:

Operational Amplifiers and Applications: Introduction to Op-Amp, Differential Amplifier Configurations, Characteristics of Ideal Op-Amp, Concept of Virtual Ground; Op-Amp Applications - Inverting, Non- Inverting, Summing and Difference Amplifiers, Voltage Follower, Comparator, Differentiator, Integrator.

Communication Systems: Introduction, Elements of communications systems, EM spectrum, Examples of communication systems: Satellite, Fibre Optic, Mobile communication (block diagram approach).

Learning Outcomes:

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

- Describe operation of Op-Amp based linear application circuits, converters, amplifiers and non-linear circuits. (L2)

- Analyze Op-Amp based comparator, differentiator and integrator circuits. (L3)

- Understand the basic principles of different communication systems. (L2)

Text Books:

1. D.P. Kothari, I.J. Nagrath, Basic Electrical and Electronics Engineering, McGraw Hill Education (India) Private Limited, 2014.

2. S.K. Bhattacharya, Basic Electrical and Electronics Engineering,2nd Edition, Pearson India Private Limited.

3. R.L.Boylestad&LouisNashlesky, Electronic Devices&Circuit Theory, PearsonEducation,2007.

Reference Books:

1. Ramakanth A. Gayakwad, Op-Amps & Linear ICs, 4thEdition, Pearson, 2017.
2. R. P. Jain, Modern Digital Electronics, 3rd Edition, Tata McGraw Hill,2003.

Course Outcomes:

1. Explain the theory, construction, and operation of electronic devices. (L2)
2. Apply the concept of science and mathematics to explain the working of diodes and its applications, working of transistor and to solve the simple problems based on the applications. (L2)
3. Analyze small signal amplifier circuits to find the amplifier parameters(L5)
4. Design small signal amplifiers using proper biasing circuits to fix up proper Q point. (L5)
5. Distinguish features of different active devices including Microprocessors. (L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING

(Autonomous)

B.Tech II Sem

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(CS20AES201) DATA STRUCTURES
(CSE, CSE (AI&ML), ITCSE(Cyber Security) & CSE(Data Science))

Course Objectives:

- To familiarize with basic techniques of algorithm analysis.

- To familiarize Stacks, Queues using Arrays and Linked List.

- To Understand Searching and Sorting techniques.

- To learn the concepts of different types of trees and its operations.

- To familiarize with graph algorithms.

Unit-1:

Data Structures: Introduction to Data Structures, Abstract Data Types, analysis and efficiency of algorithms, Time and Space Complexity.
Stack, Stack operations, Implementation using arrays, Applications of stack, Queue, Queue operations, Implementation using arrays, various Queue Structures, Applications of queue.

Learning Outcomes:

Student should be able to

- Analyze the given algorithm to find the time and space complexities.(L4)

- Develop the applications of stack and queue using arrays. (L3)

Unit-2:

Linked lists: Single linked list, Double linked list, Circular linked list, operations on linked lists, Applications of Linked List.
Implementation of Stack using Pointers, Implementation of Queue using Pointers.

Learning outcomes:

Student should be able to

- Implement Stack and Queues using Pointers. (L3)

- Construct the linked lists for various applications. (L4)

Unit-3:

Searching Techniques: Linear Search, Binary Search and Fibonacci Search.

Sorting Techniques: Selection Sort, Insertion sort, Merge Sort, Quick Sort, Heap sort.

Hash Tables: Hash Functions, Collision Handling Schemes, Applications.

Learning outcomes:

Student should be able to

- Select sorting technique for a given sorting.(L3)

- Construct Heap and its implementation. (L4)

Unit-4:

Trees: Vocabulary and Definitions, Binary Tree, Implementation, Binary Tree Traversal, Binary Search Tree, Implementation, Balanced Search Trees: AVL Trees, Implementation, Splay Trees, Red-Black Trees.

Learning outcomes:

Student should be able to

- Explain the concept of a tree. (L2)

- Compare different tree structures. (L4)

- Apply Trees for indexing. (L3)

Unit-5:

Graph Theory: Graphs Terminology, Graph ADT, Data Structures for Graphs-Adjacency Matrix Structure, Graph Traversals, Shortest Paths, Minimum Spanning Trees- Prims' Algorithm, Kruskal's Algorithm.

Learning outcomes:

Student should be able to

- Recognize the importance of Graphs in solving real world problems. (L2)

- Apply various graph traversal methods to applications. (L3)

- Design a minimum cost solution for a problem using spanning trees. (L4)

Text Books:

1. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, Second Edition, 2002, Pearson.

2. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronald L.Rivest, Clifford Stein, Third Edition, 2010, PHI.

3. Data Structures and Algorithms Made Easy by Narasimha Karumanchi, 2020, CareerMonk Publications.

Reference Books:
1. Fundamental of Data Structures in C, Horowitz, Sahani, Anderson-Freed, Second Edition, 2008, Universities Press.

2. Classic Data Structures, Debasis Samantha, Second Edition, 2009, PHI

Course Outcomes:
- Analyze the problems using asymptotic notations. (L4)

- Apply Stack, Queues and linked list to solve different applications.(L3)

- Demonstrate suitable sorting techniques for the real world problem. (L4)

  - Implement tree structures in different patterns of representation of data.(L3)

- Analyze the given problem using graph traversal techniques.(L4)

SRI VENKATESWARA COLLEGE OF ENGINEERING
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B.Tech II Sem

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1	0	2	2

(ME20AES102) ENGINEERING DRAWING
(Common to all Branches of Engineering)

Engineering drawing being the principal method of communication for engineers

Course Objectives:

To introduce and make the students

- To use drawing instruments and to draw polygons, engineering curves.
- To draw orthographic projections of points, lines & planes.
- To draw the projections of the various types of solids in different positions inclined to one and both the planes.
- To draw the projections of sectional views of various types of right regular solids.
- To draw the development of regular solids.

Unit-1:

Introduction to Engineering Drawing:

Principles of Engineering Drawing and its Significance-Conventions in drawing-lettering – BIS conventions.

a) Conic sections (General Method only) including Rectangular Hyperbola.

b) Cycloid, Epicycloid and Hypocycloid.

c) Involutes.

Learning Outcomes:

At the end of this unit the student will be able to

- Understand the significance of engineering drawing. (L2)
- Identify and draw curves obtained in different conic sections. (L3)
- Draw different curves such as cycloids and involutes. (L3)

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Unit-2:

Projection of Points, Lines and Planes: Projection of Points in any quadrant, lines inclined to one or both planes, finding true lengths, angle made by line. Projections of regular plane surfaces inclined to one or both the planes.

Learning Outcomes:

At the end of this unit the student will be able to

- Understand the meaning of projection and draw the projections of points &lines. (L2)
- Differentiate between projected length and true length and find the true length of the lines. (L2)
- Draw the projection of regular plane surfaces. (L3)

Unit-3:

Projections of solids: Projections of regular solids inclined to one or both planes by rotational or auxiliary view method.

Learning Outcomes: At the end of this unit the student will be able to

- Understand the procedure to draw projection of solids. (L2)
- Draw the projection of solids inclined to one plane. (L3)
- Draw the projection of solids inclined to both the planes. (L3)

Unit-4:

Sections of solids: Section planes and sectional view of right regular solids- prism, cylinder, pyramid and cone. True shapes of the sections.

Learning Outcomes: At the end of this unit the student will be able to

- Understand different sectional views of regular solids. (L2)
- Obtain the true shapes of the sections of prism, cylinder, pyramid and cone. (L4)
- Draw the sectional views of prism, cylinder, pyramid and cone.(L3)

Unit-5:

Development of surfaces: Development of surfaces of right regular solids-prism, cylinder, pyramid, cone and their sectional parts.

Learning Outcomes:

At the end of this unit the student will be able to

- Understand the meaning of development of surfaces. (L2)
- Draw the development of regular solids such as prism, cylinder, pyramid and cone.(L3)

- Obtain the development of sectional parts of regular shapes. (L4)

Text Books:

1. K.L. Narayana & P. Kannaiah, Engineering Drawing, 3/e, SciTech Publishers, Chennai, 2012.

2. N.D. Bhatt, Engineering Drawing, 53/e, Charotar Publishers, 2016.

Reference Books:

1. Dr K. Prahlada Rao, Dr. S. Krishnaiah, Prof. A.V.S. Prasad, Engineering Graphics, Amaravati publications.

2. Dhanajay A Jolhe, Engineering Drawing, Tata McGraw-Hill, Copy Right, 2009.

3. Venugopal, Engineering Drawing and Graphics, 3/e, New Age Publishers, 2000.

4. Shah and Rana, Engineering Drawing, 2/e, Pearson Education, 2009.

5. K.C. John, Engineering Graphics, 2/e, PHI, 2013.

6. Basant Agarwal & C.M. Agarwal, Engineering Drawing, Tata McGraw-Hill, Copy Right, 2008.

Course Outcomes:

After completing the course, the student will be able to

- **Draw** basic geometrical constructions, curves used in engineering practices. (L1)
- **Understand** the concept of projection and acquire visualization skills, projection of points, Lines and Planes. (L2)
- **Illustrate** the projections of solids graphically. (L3)
- **Draw** and explore the sectional views of right regular solids.(L3)
  Draw the development of surfaces of solids. (L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech II Sem

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0	0	2	1

(ME20AES103) ENGINEERING GRAPHICS LAB
(Common to all Branches of Engineering)

Course Objectives:

- Instruct the utility of drafting & modelling packages in orthographic and isometric drawings.
- Train the usage of 2D and 3D modelling.
- Develop the graphical skills for communication of concepts, ideas and design of engineering products through technical drawings

Introduction to AutoCAD: Basic drawing and editing commands: line, circle, rectangle, erase, view, undo, redo, snap, object editing, moving, copying, rotating, scaling, mirroring, layers, templates, polylines, trimming, extending, fillets, arrays, dimensions.

Exercises:

1. Practice exercise using basic drawing commands (4 No's).

2. Practice exercise using editing commands (4 No's).

Orthographic and Isometric Projections

Orthographic Projections: Systems of projections, conventions and application to orthographic projections.

Isometric Projections: Principles of isometric projection- Isometric scale; Isometric views: lines, planes, simple solids.

Exercises:

1. Practice exercises on Orthographic Projections (4 No's).

2. Practice exercises on Isometric Projections (4 No's).

Text Books:

1. K. Venugopal, V. Prabhu Raja, Engineering Drawing + Auto Cad, New Age International Publishers.

2. Engineering Drawing, ND Bhatt, Charotar Publishing House.

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3. Engineering Drawing, K.L Narayana, SciTech Publishers.

4. D. M. Kulkarni, A. P. Rastogi, A. K. Sarkar, Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi, Revised edition, 2010.

Course Outcomes:

After completing the course using CAD package, the student will be able to

- **Draw** the basic views related to projections of Lines, Planes. (L1)
- **Draw** the basic views related to projections of Planes. (L1)
- **Illustrate** orthographic views of simple objects. (L3)
- **Illustrate** isometric projections of simple solids. (L3)
- **Interpret** and comprehend with drafting packages for engineering practice. (L2)

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.TechII Sem

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0	0	3	1.5

(CH20ABS104) CHEMISTRY LAB
(ECE, EEE, CSE, CSE (AI & ML), IT, CSE(Cyber Security),CSE(Data Science))

Course Objectives:

- Verify the fundamental concepts with experiments

Note: In the following list, out of 12 experiments, any 10 experiments must be performed in a semester

List of Chemistry Experiments:

1. Determination of Hardness of a groundwater sample.

2. Estimation of Dissolved Oxygen by Winkler's method.

3. Conductometric titrationof(i) strong acid vs. strong base, (ii) weak acid vs. strong base.

4. Determination of cell constant and conductance of solutions.

5. Potentiometry - determination of redox potentials and emfs.

6. Determination of Strength of an acid in Pb-Acid battery.

7. Preparation of Bakelite

8. Verify Lambert-Beer's law.

9. Thin layer chromatography.

10. Identification of simple organic compounds byIR.

11. Preparation of nano material's by precipitation.

12. Estimation of Ferrous Iron by Dichrometry.

13. P^H metric titration of (i) strong acid vs. strong base, (ii) weak acid vs. strong base

Reference Books:

1. Vogel's Text book of Quantitative Chemical Analysis, Sixth Edition – Mendham J et al, Pearson Education, 2012.

2. Chemistry Practical– Lab Manual, First edition, Chandra Sekhar KB, Subba Reddy GV and Jayaveera KN, SM Enterprises, Hyderabad, 2014.

3. Chemistry Laboratory Manual, Sri Krishna Hitech Publishing Company Pvt.Ltd,2ndEdition, A Ravi Krishanan, B Tirumalarao, 2020-2021.

Course Outcomes:

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

- Determine the cell constant and conductance of solutions.(L3)

- Prepare advanced polymer- Bakelite. (L2)

- Measure the strength of an acid present in secondary batteries.(L3)

- Analyse the IR of some organic compounds.(L3)

- Estimate the amount of dissolved oxygen in water.(L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING
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B.Tech II Sem

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0	0	3	1.5

(EE20AES102) BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB
(Civil, Mechanical, CSE, CSE (AI&ML) and IT, CSE(Cyber Security),CSE(Data Science))

Part A: Electrical Engineering Lab

Course Objectives:
- To Verify Kirchoff's laws.
- To verify Superposition theorem.
- To learn performance characteristics of DC Machines.
- To perform open circuit & Short Circuit test on 1- Phase Transformer.
- To Study the I – V Characteristics of Solar PV Cell.

List of experiments: -
1. Verification of Kirchhoff laws.
2. Verification of Superposition Theorem.
3. Open circuit characteristics of a DC Shunt Generator.
4. Speed control of DC Shunt Motor.
5. OC & SC test of 1 – Phase Transformer.
6. Brake test on 1 - Phase Induction Motor.
7. I – V Characteristics of Solar PV cell
8. Brake test on DC Shunt Motor.

Course Outcomes:
Student will be able to.
- Verify Kirchoff's Laws & Superposition theorem. (L3)
- Perform testing on AC and DC Machines. (L5)
- Study I – V Characteristics of PV Cell. (L2)

Part B: Electronics Engineering Lab

Course Objectives:
- To verify the theoretical concepts practically from all the experiments.
- To analyze the characteristics of Diodes, BJT.
- To analyze the frequency response of amplifier circuits.
- Exposed to linear and digital integrated circuits.

List of Experiments:

1. PN Junction diode characteristics A) Forward bias B) Reverse bias.
2. Zener diode characteristics and Zener as voltage Regulator.
3. Full Wave Rectifier with & without filter.
4. Wave Shaping Circuits. (Clippers & Clampers)
5. Input & Output characteristics of Transistor in CB / CE configuration.
6. Frequency response of CE amplifier.
7. Inverting and Non-inverting amplifiers using Op-AMPs.
8. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.
9. Verification of Truth Tables of S-R, J-K& D flip flops using respective ICs.

Tools / Equipment Required:

DC Power supplies, Multi meters, DC Ammeters, DC Voltmeters, ACVoltmeters, CROs, all the required active devices.

Course outcomes:

- Learn the characteristics of basic electronic devices like PN junction diode, Zener diode &
  BJT.
- Construct the given circuit in the lab.
- Analyze the application of diode as rectifiers, clippers and clampers and other circuits.
- Design simple electronic circuits and verify its functioning.

Note: Minimum Six Experiments to be performed in each section.

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B.Tech II Sem

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(CS20AES202) DATA STRUCTURES LAB

(CSE, CSE (AI&ML) and IT, CSE(Cyber Security),CSE(Data Science))

Course Objectives:

- To strengthen the ability to identify and apply the suitable data structure for the given real-world problem.

Tasks:

1. Demonstrate recursive algorithms with examples.

2. Develop a program to perform operations of a Stack and Queue using arrays.

3. Implement and perform different operations on Single, Double and Circular Linked Lists.

4. Develop a program to perform operations of Stack and Queue using Linked Lists.

5. Develop a program to implement Stack applications.

6. Implement Circular Queues.

7. Implement various Searching techniques.

8. Develop programs for different Sorting techniques.

9. Develop a program to represent a Tree Data Structure.

10. Develop a program to demonstrate operations on Binary Search Tree.

11. Demonstrate Graph Traversal Techniques.

12. Develop a program to find Minimum Cost Spanning tree.

Text Books:

1. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, Second Edition, 2002,   Pearson.

2. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest,   Clifford Stein, Third Edition, 2010, PHI.

3. Data Structures and Algorithms Made Easy by Narasimha Karumanchi, 2020, CareerMonk Publications.

Course Outcomes:

- Demonstrate the concept of Recursion for solving a problem. (L4)

- Choose and implement linear data structure to solve problems. (L3)

- Develop programs for searching and sorting algorithms. (L3)

- Select and implement suitable nonlinear data structure for solving a problem. (L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING
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B.Tech II Sem

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(BA20AHS201) UNIVERSAL HUMAN VALUES(Mandatory Course)
(ME, CSE, IT, AI&ML, CSE(Cyber Security),CSE(Data Science))

Course Objectives:

The objective of the course is fourfold:

- Development of a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
- Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence.
- Strengthening of self-reflection.
- Development of commitment and courage to act.

Unit -1:

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

- Purpose and motivation for the course, recapitulation from Universal Human Values-I.
- Self-Exploration–what is it? Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration.
- Continuous Happiness and Prosperity- A look at basic Human Aspirations.
- Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority.
- Understanding Happiness and Prosperity correctly-A critical appraisal of the current scenario.
- Methods to fulfil the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking.

Unit -2:

Understanding Harmony in the Human Being - Harmony in Myself!

- Understanding human being as a co-existence of the sentient 'I' and the material 'Body'.
- Understanding the needs of Self ('I') and 'Body' - happiness and physical facility.
- Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer).
- Understanding the characteristics and activities of 'I' and harmony in 'I'.
- Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail.
- Programs to ensure Sanyam and Health.

Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

Unit -3:

Understanding Harmony in the Family and Society- Harmony in Human-HumanRelationship

- Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship.
- Understanding the meaning of Trust; Difference between intention and competence.
- Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship.
- Understanding the harmony in the society (society being an extension of family):
- Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals.
- Visualizing a universal harmonious order in society- Undivided Society, Universal Order-   from family to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios,elicit examples from students' lives.

Unit-4:

Understanding Harmony in the Nature and Existence -Whole existence as Co-existence

- Understanding the harmony in the Nature.
- Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in nature.
- Understanding Existence as Co-existence of mutually interacting units in all pervasiveSpace.
- Holistic perception of harmony at all levels of existence.Include practice sessions to discuss human being as cause of imbalance in nature (film"Home" can be used), pollution, depletion of resources and role of technology etc.

Unit-5:

Implications of the above Holistic Understanding of Harmony on Professional Ethics

- Natural acceptance of human values.
- Definitiveness of Ethical Human Conduct.
- Basis for Humanistic Education, Humanistic Constitution and Humanistic universal order
- Competence in professional ethics: *a.* Ability to utilize the professional competence for augmenting universal human order *b*. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, *c*. Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- Strategy for transition from the present state to Universal Human Order:
a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers*.*
b. At the level of society: as mutually enriching institutions and organizations
- Sum up: Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions.
    E.g., To discuss the conduct as an engineer or scientist etc.

Text Books:

1. R R Gaur, R Asthana, G P Bagaria, "A Foundation Course in Human Values and Professional Ethics", 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1.
2. R R Gaur, R Asthana, G P Bagaria, "Teachers' Manual for A Foundation Course in Human Values and Professional Ethics", 2nd Revised Edition, Excel Books, New Delhi,2019. ISBN 978-93-87034-53-2.

Reference Books:

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar kantak, 1999.
2. A. N. Tripathi, "Human Values", New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. Mohandas Karamchand Gandhi "The Story of My Experiments with Truth"
5. E. FSchumacher. "Small is Beautiful".
6. Slow is Beautiful –Cecile Andrews.
7. J C Kumarappa "Economy of Permanence".
8. Pandit Sunderlal "Bharat Mein Angreji Raj".
9. Dharampal, "Rediscovering India".
10. Mohandas K. Gandhi, "Hind Swaraj or Indian Home Rule".
11. India Wins Freedom - Maulana Abdul Kalam Azad.
12. Vivekananda - Romain Rolland (English).
13. Gandhi - Romain Rolland (English).

Course Outcomes:

By the end of the course,

- Understanding the value of education to become more aware of themselves, and their surroundings (family, society, nature). (L2)
- Utilize the concepts of human being-harmony in myself become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.(L3)
- Understanding the concepts of society-harmony in human for better critical ability.(L2)
- Understanding the human values, human relationship and human society to become sensitive to their commitment. (L2)
- Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction. (L3)

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B.Tech II Sem

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(EG20AMC103) SPEECH AND ORAL COMMUNICATION(Mandatory Course)
(Common to All Branches**)**

Course Objectives:
- To improve the language proficiency of the students in English by practicing with his/her peers.
- To impart creative skills for professional development.
- To develop the communication skills of the students in both formal and informal situations.
- To develop extensive speaking skills and comprehension for career growth.

Detailed Syllabus:

Unit-1:

Story Telling (Narrate a story)

1. Biography description (Describe a freedom fighter/politician/athlete/celebrity etc.)
2. Speech sounds
3. Formal Conversation (Enact official Telephone conversation/Telephone interview etc.)
   Verb forms, Subject -Verb agreement, Vocabulary).

Unit-2:

1. Stress in Speech
2. English Puzzle solving (Finding cross words from table)
3. Fun with English (Speech through grammar-changing tense, voice of the sentences)
4. Open Talk with CM (Funny interview with class mates) Voice, Speech.

Unit-3:

1. Intonation
2. If I'm a..... What would I do? (Students enact as… and describe their choices what they would do?)
3. LanguageTranslation (Dialogues/jokes/proverbs/quotations-Regional language to English)

4. Mock Assembly (Students enact as speaker, MLA, CM and opposition leaders in Assembly) Wh- Questions, Question tags.

Unit-4:
1. Tongue twisters / pronounce it…..
2. Humorous Play (Playing jokes/Telling funny dialogues in English)
3. Celebrity Interview (Enact Play), Spotting Errors, Etiquettes

Unit-5:

News Reader (Prepare funny news and read on Dias)
1. Film Review (A critique on regional language films by students)
2. Movie Script Narration (Subject -Verb agreement, Tenses)

Reference books:
1. K.R Lakshmi Narayanan, A Course book on English, SCITECH publications Pvt. Ltd,Hyd, 2009.
2. Sanjay Kumar &Pushp Lata, Communication skills, Oxford university press, New Delhi, 2019.
3. M Ashraf Rizvi, Effective Technical Communication, Tata McGraw- Hill, New Delhi, 2017.

Additional Learning Resources:
1. https://www.bbc.co.uk/skillswise/english
2. https://www.nonstopenglish.com
3. https://www.grammarly.com/blog/

Course Outcomes:
- Improve the neutral accent and be free from mother tongue influence. (L6)
- Hypothesizing small talks on general topics and learn critiquing skills by participating in Conversations. (L6)
- Applying Vocabulary and using it in their day-to-day life. (L4)
- Understanding and mastering in verbal and non-verbal communication. (L2)

SRI VENKATESWARA COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech III Sem   **L T P C**

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(MA20ABS303) DISCRETE MATHEMATICS AND GRAPH THEORY
(CSE, AI&ML, IT& CSC)

Course Objectives:

- To describe logical sentences in terms of predicates, quantifiers, and logical connectives in theory of inference for the statement calculus. (L2)
- To demonstrate the application of basic methods of discrete mathematics in Computer Science problem solving. (L3)
- To explain about the Graph theory and Recurrence relations. (L5)
- To reveal the concepts of graph theory which is applied in addressing the problems
- related to computer science. (L3)
- To introduce the mathematical concepts which will be useful to study advanced courses such as Design and Analysis of Algorithms, Theory of Computation, Cryptography and Software Engineering etc. (L4)

UNIT – 1: Mathematical logic:

Statements and Notation, Connectives- Negation, Conjunction, Disjunction, Conditional and Bi-conditional, Statement formulas and Truth Tables. Well-formed formulas, Tautologies, Equivalence of Formulas,Duality Law, Tautological Implications.

Normal Forms: Disjunctive Normal Forms, Conjunctive Normal Forms, Principal Disjunctive Normal Forms (PDNF), Principal Conjunctive Normal Forms (PCNF).

The Theory of Inference for the Statement Calculus:Rules of Inference, Consistency of Premises and Indirect Method of Proof.

The predicate Calculus, and Inference theory of the Predicate Calculus: Predicates, the statement function, variables and quantifiers, predicate formulas, free and bound variables, the universe of discourse, valid formulas and equivalences, some valid formulas over finite universe, special valid formulas involving quantifiers, theory of inference for the predicate calculus.

Learning Outcomes:

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

- Describe logical sentences in terms of predicates, quantifiers, and logical connectives. (L2)
- Evaluate basic logic statements using truth tables and the properties of logic. (L5)
- Apply rules of inference to test the consistency of premises and validity of arguments and verify the equivalence of two formulas and their dual. (L3)
- Find the Principal Conjunctive and Principal Disjunctive Normal Forms of a statement formula. (L1)

UNIT – II: Set Theory:

Basic concepts of Set theory: Notation, inclusion and equality of sets, the power set, some operation on sets, Venn diagrams, some basic set identities, Cartesian products.

Relations and Ordering: Relations, properties of binary relations in a set, relation matrix and the graph of a relation, partition and covering of a set, equivalence relations, compatibility relations, composition of binary relations, and partial ordering, Hasse Diagram.

Functions: Definition and introduction, composition of functions, inverse functions, binary and n-ray operations, characteristic function of a set.

Learning Outcomes:

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

- Describe the basic concepts of set theory. (L2)
- Describe equivalence, partial order and compatible relations.(L2)
- Describe functions and composition of functions. (L2)
- Describe binary and n-ray operations. (L2)

UNIT – III: Algebraic Structures

Algebraic Systems: Examples and General Properties.

Semi Groups and Monoids: Definitions and examples, homomorphism of semi groups and Monoids, Sub semigroups and Sub Monoids.

Groups: Definition and examples, subgroups and homomorphisms, cosets and Lagrange's theorem, normal subgroups, algebraic systems with two binary operations.

Learning Outcomes:

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

- Describes the properties of Semi groups.(L2)
- Describes the properties of Monoids.(L2)
- Describes the properties of Groups.(L2)

UNIT – IV: Recurrence Relations:

Recurrence Relations: Generating Functions of Sequences, Calculating Coefficients of Generating Functions, Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, The method of Characteristic Roots, Solution of In-homogeneous Recurrence Relations.

Learning Outcomes:

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

- Find the generating functions for a sequence.(L1)
- Solve recurrence relations by using the method of Characteristic roots and Generating functions.(L3)

UNIT – V: Graph Theory:

Graphs: Basic Concepts, Isomorphism and Sub graphs, Planar Graphs, Euler's Formula, Multi graphs and Euler Circuits, Hamiltonian Graphs.

Graph coloring: Chromatic Number, The Four-Color Problem.

Trees and their Properties, Spanning Trees, Directed Trees, Binary Trees.

Algorithms to find a spanning tree in connected graph: Minimum spanning tree, Depth first search (DFS) algorithm, Breadth first search (BFS) algorithm and Kruskal's algorithm.

Learning Outcomes:

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

- Investigate if a given graph is simple or a multigraph, directed or undirected, cyclic or acyclic.(L6)
- Apply the concepts of functions to identify the Isomorphic Graphs and Identify Euler Graphs, Hamilton Graph.(L3)
- Describes Graph coloring and chromatic number of a graph.(L2)
- Apply depth-first and breadth-first search algorithmto find a minimum spanning tree.(L3)
- Apply Kruskal's algorithms to find a minimum spanning tree.(L3)

Text Books:

- J P Trembly and R Manohar, "Discrete Mathematical Structures with Applications to Computer Science", 1st Edition, McGraw Hill, 2017(For Unit I&II).

- Joe L. Mott. Abraham Kandel and Theodore P. Baker, "Discrete Mathematics for Computer Scientists & Mathematicians", 2nd Edition, Pearson, 2008. (for Units III to V).

Reference Books:

- Kenneth H Rosen, "Discrete Mathematics and Its Applications (SIE)",7th Edition, Mc Graw-Hill.
- Ralph P. Grimaldi and B.V. Ramana, "Discrete and Combinatorial Mathematics, an Applied
- Introduction", 5th Edition, Pearson, 2016.
- Narsingh Deo, "Graph Theory with Applications to Engineering", Prentice Hall, 1979.
- S. Malik and M.K. Sen, "Discrete Mathematics theory and Applications", Ist Edition, Cenegage
- Learning, 2012.
- L Liu and D P Mohapatra, "Elements of Discrete Mathematics, A computer Oriented approach", 4th edition, Mc Graw-Hill, 2018.
- Dr. D.S. Chandrasekharaiah, "Mathematical foundations of computer science", 3rd edition Prism books Pvt. Ltd.

Course Outcomes:

At the end of this Course the student will be able to

- Apply mathematical concepts and logical reasoning to solve problems in different fields of Computer science and information technology (L3).
- Apply the properties of Set theory to find Equivalence and Partial Ordering relations and Hasse   Diagrams for different functions (L3).
- Analyse the properties of Algebraic Structures to find the given sets are Semi group, Monoids and Groups (L4).
- Analyse the concepts of Generating and Recurrence relations for solving Homogeneous and In-Homogeneous equations (L4).
- Investigate the graphs are Isomorphic Graphs, Euler and Hamilton Graphs (L6).

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B.TechIIISEM

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(EC20AES301) DIGITAL ELECTRONICS & MICROPROCESSORS

(CSE,CSM,IT&CSC)

CourseObjectives:

- To understand allthe concepts of Logic Gates and Boolean Functions.
- To understand about Combinational Logic and SequentialLogic Circuits
- To Create Combinationallogic circuits using Programmable Logic Devices.
- To understand the concepts of 8085, 8086 Microprocessor and 8051 Microcontroller.
- To Analyze Assembly Language Programming of 8086 & 8051.

UnitI

Number systems and Boolean Algebra: Digital Systems, Introduction to number systems and conversion, Binary codes, Complements, signed and unsigned Binary numbers, Boolean Algebra and its properties, SimplificationofBooleanfunctions,SOPandPOSmethods–

SimplificationofBooleanfunctions using K-maps and realization using Universal Gates.

Learning Outcomes:

- Explain number systems and convert number systems. (L2)
- Explains the simplification of logical statements with using boolean rules and de-morgan theorems(L2)
- Understand the simplification of logical statements with karnaugh maps (L2)

UnitII

CombinationalLogicCircuits : Adders &Subtractors, 4- bit binary adder and Subtractor , Decoders, Encoders ,Multiplexers, Demultiplexers, Programmable Logic devices-PROM,PAL,PLA, Design of combinational circuits using PLD's.

LearningOutcomes:

- Analyze combinational logic circuits (L4)

- Understand and Analyze the working principle of encoders ,decoders(L2)
- Design combinational circuits using PLD's.(L6)

UnitIII

Sequential Logic Circuits : Sequential Circuits, Latches ,Flipflops: RS ,D,JK, MasterSlaveJK, TFlip-Flops, Shift Registers, Types of Shift Registers, Universal Shift registers ,Counters, Synchronous Counters, Asynchronous Counters, Up-Down Counter

Learning Outcomes:
- Analyze sequential circuits(L4)
- Understand and Analyze the counters (L2)

UnitIV

Introduction to 8085 & 8086 Microprocessor: 8085 microprocessor Review(brief details only),8086 Architecture –Block Diagram, register organization 8086, Flag register of8086 and its functions, Pin diagram of 8086, Minimum mode& Maximum mode operation of8086, Interrupts in 8086, Addressing modes of8086.

Learning Outcomes:
- To understand the concepts of 8085, 8086 Microprocessor (L2).
- To understand the addressing modes of 8086 Microprocessor (L2).

UnitV

Instruction Set of 8086 Microprocessor: Instruction set of 8086,Assembler directives, Procedures and Macros, Simple programs involving arithmetic, logical, branch instructions, Ascending, Descending and Block move programs, String Manipulation Instructions.

Introduction to 8051 Microcontrollers: Overview of 8051 microcontroller, Architecture, Register set of 8051, Memory organization, Addressing modes & instruction set of 8051, Simple programs.

Learning Outcomes:
- Distinguish and analyze between Microprocessor and Microcontrollers.(L4)
- Understand the concepts of 8051 microcontroller.(L2)
- Apply knowledge and demonstrate programming proficiency using various addressing modes and instruction sets of 8086 & 8051 (L3)

Text Books:

1. M.Morris Mano, MichaelD. Ciletti, Digital Design, Pearson Education,5thEdition, 2013

2. Advanced microprocessors and peripherals- A.KRayandK.M. Bhurchandani,TMH, 2nd edition, 2006

References:

1. Switching Theory and Logic Design –A. Anand Kumar,PHI learning Pvt.Ltd.2013.

2. N.Senthil Kumar, M .Saravanan ,S.Jeevanathan ,Microprocessor and Microcontrollers, Oxford Publishers,2010.

Course Outcomes:

After the completion of the course ,students will able to

CO1: To understand the concept of Logic circuits and analyze various Boolean algebra functions.

CO2: To understand the concept of CombinationalLogicand SequentialLogic Circuits.

CO3: To create combinational circuits using PLD's.

CO4: To understand and Analyze the counters,

CO5: To understand the concepts of 8085, 8086 Microprocessor and 8051 Microcontroller.

CO6: Apply knowledge and demonstrate programming proficiency using various addressing modes and instruction sets of 8086 & 8051

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech III Sem.   **L   T   P   C**

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(CY20APC301) COMPUTER ORGANIZATION
(CSC)

Course Objectives:

- To learn the fundamentals of computer organization and its relevance to classical and modern problems of computer design
- To understand the structure and behavior of various functional modules of a computer.
- To learn the techniques that computers use to communicate with I/O devices
- To acquire the concept of pipelining and exploitation of processing speed.
- To learn the basic characteristics of multiprocessors

UNIT -I

Digital Computers: Introduction, Block diagram of Digital Computer, Definition of Computer Organization

Basic Structure of Computer: Computer Types, Functional Units, Basic operational Concepts, Bus Structure, Software, Performance, Multiprocessors and Multicomputer.

Machine Instructions and Programs: Numbers, Arithmetic Operations and Programs, Instructions and Instruction Sequencing, Addressing Modes, Basic Input/output Operations, Stacks and Queues, Subroutines, Additional Instructions.

Learning Outcomes:

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

- Understand the various blocks& the definition of Computer Organization (L1)
- Identify the basic functional units and different ways of interconnecting to form a computer system (L1)
- Illustrate various addressing modes for accessing register and memory operands (L2)
- Describe the instruction sequencing and various types of instructions (L3)

UNIT-II

Arithmetic: Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed-operand Multiplication, Fast Multiplication, IntegerDivision, Floating-Point Numbers and Operations.

Basic Processing Unit: Fundamental Concepts, Execution of a Complete Instruction, Multiple- Bus Organization, Hardwired Control and Multi programmed Control.

Learning Outcomes:

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

- Outline the arithmetic operations on signed numbers (L1)
- Describe the operations performed on floating point numbers (L1)
- Distinguish between hardwired and micro programmed control units. (L2)

UNIT III

The Memory System: Basic Concepts, Semiconductor RAM Memories, Read-Only Memories, Speed, Size and Cost, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements, Secondary Storage.

Learning Outcomes:

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

- Recognize the various types of memories (L2)
- Analyze the performance of cache memory (L4)
- Apply effective memory management strategies (L3)

UNIT IV

Input/output Organization: Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, Modes of Transfer, Buses, Interface Circuits, Standard I/O Interfaces.

Learning Outcomes:

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

- Examine the basics of I/O data transfer synchronization (L5)
- Analyze the interrupt handling mechanisms of various processors (L4)
- Describe various techniques for I/O data transfer methods (L1)

UNIT - V

Pipelining: Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction Sets.

Large Computer Systems: Forms of Parallel Processing, Array Processors,

the Structure of General-Purpose multiprocessors, Interconnection Networks.

Learning Outcomes:

> At the end of this unit, the student will be able to

- Investigate the use of pipelining and multiple functional units in the design of high-Performance processors (L4)
- Design and analyze a high-performance processor (L4)
- Describe the interconnection networks for multiprocessors (L1)

TEXT BOOKS:

1. M.Morris Mano, "Computer System Architecture", 3rd Edition, Pearson Education
2. Carl Hamacher, ZvonkoVranesic, SafwatZaky, "Computer Organization", 5th Edition, McGraw Hill Education, 2013.

REFERENCE BOOKS:

1. Themes and Variations, Alan Clements, "Computer Organization and Architecture", CENGAGE Learning.
2. Smruti Ranjan Sarangi, "Computer Organization and Architecture", McGraw Hill

   Education.
3. John P.Hayes, "Computer Architecture and Organization", McGraw HillEducation

Course Outcomes:

> **At end of the course the student will be able to**

- Understand the computer organization concepts related to design of modern processors, memories and I/Os (L2)
- Identify the hardware requirements for cache memory and virtual memory (L2)
- Understand the importance and tradeoffs of different types of memories (L2)
- Design algorithms to exploit pipelining and multiprocessors (L4)
- Identify pipeline hazards and possible solutions to those hazards (L2)

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech III Sem.   **L T P C**
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(AM20APC301) DESIGN AND ANALYSIS OF ALGORITHMS

(CSE,CSM, IT& CSC)

Course Objectives:

- Demonstrate the importance of the complexity of a given algorithm.
- Illustrate various algorithm design techniques.
- Make use of data structures and/or algorithmic design techniques in solving new problems.
- Explain the advanced algorithm design and analysis techniques.
- Identify and understand basic computability concepts and the complexity classes P, NP, and NP-Complete.

UNIT I

Introduction: What is an Algorithm, Algorithm specification, Performance analysis.

Divide and Conquer: General method, Binary Search, Finding the maximum andminimum, Merge sort, Quick Sort, Selection sort, Strassen's matrix multiplication.

Learning Outcomes:

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

- Analyze the complexity of Algorithms. (L4)
- Identify with mathematical formulation, complexity analysis and methodologies to solve recurrence relations for algorithms. (L3)
- Analyze different scenarios for running time of algorithms using asymptotic notations and Design using Recursion. (L4)
- Apply divide and conquer strategy for design of various algorithms. (L3)
- Compare complexities of Merge sort, Quick sort and Selection sorttechniques. (L2)

UNIT II

Greedy Method: General method, Knapsack problem, Job Scheduling with Deadlines,Minimum cost Spanning Trees, Optimal storage on tapes, Single-source shortest paths. **Dynamic programming:** General Method, Multistage graphs, All-pairs shortest paths,Optimal binary search trees, 0/1 knapsack, The traveling sales person problem.

Learning Outcomes:

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

- Decide and apply algorithmic strategies to solve given problem. (L5)

- Develop algorithms for well known problems using greedy methods. (L3)
- Define Principle of optimality withexamples. (L1)
- Contrast Greedy and Dynamic programmingparadigms. (L2)
- Apply dynamic-programming approach for designing graph and matrix based algorithms. (L3)

UNIT III

Basic Traversal and Search Techniques: Techniques for binary trees, Techniques forGraphs,

Connected components and Spanning trees, Bi-connected components and DFS

Back tracking: General Method, 8–queens' problem, Sum of subsets problem, Graphcoloring and Hamiltonian cycles, Knapsack Problem.

Learning Outcomes:

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

- Define solution spacetree. (L1)
- Illustrate graph search strategies: BFS, DFS and D-Search. (L2)
- Demonstrate the recursive and iterative backtrackingalgorithms. (L2)
- Apply backtracking strategy to solve N – queens' problem, Sum of subsets problem and Knapsackproblem. (L3)

UNIT IV

Branch and Bound: The method, Travelling salesperson, 0/1 Knapsack problem,Efficiency Considerations.

String Matching: The naive string-matching algorithm, The Rabin-Karp algorithm, String matching with finite automata, The Knuth-Morris-Pratt algorithm.

Learning Outcomes:

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

- Find optimal solution by applying various methods. (L1)
- Analyze the advantage of bounding functions in Branch and Bound technique to solve the Travelling Salespersonproblem.(L4)
- Apply the knowledge to find patterns in the given text.(L3)

UNIT V

NP – Hard and NP – Complete Problems: NP Hardness, NP Completeness,Consequences of being in P, Cook's Theorem, Reduction Source Problems, Reductions: Reductions for some known problems

Learning Outcomes:

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

- Define P, NP, NP –hard and NP-complete classes ofproblems.(L1)
- Prove that a certain problem is NP-Complete.(L5)

- Apply algorithm design principles to derive solutions for real life problems and comment on complexity of solution.(L3)

Text Books:

1. Fundamentals of Computer Algorithms‖, Ellis Horowitz, S. SatrajSahani and Rajasekhran, 2nd edition, University Press.2014,
2. Introduction to Algorithms, Third Edition, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein.

Reference Books:

1. Introduction to Algorithms‖, second edition, T.H.Cormen, C.E.Leiserson, R.L.Rivest and C.Stein, PHI Pvt. Ltd./ Pearson Education.
2. Introduction to Design and Analysis of Algorithms A strategic approach‖, R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, Mc Graw Hill.
3. Data structures and Algorithm Analysis in C++‖, Allen Weiss, Second edition.

Course Outcomes:

- Analyze the complexity of the algorithms
- Make use of various design techniques like divide and conquer, greedy, dynamic programming, backtracking, branch and bound to solve the problems.
- Identify and analyze criteria and specifications appropriate to new problems, and choose the appropriate algorithmic design technique for their solution.
- Able to prove that a certain problem is NP-Complete.

SRI VENKATESWARA COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech III Sem.

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(IT20APC301) PYTHON PROGRAMMING
(CSE, CSM, IT& CSC)

Course Objectives:

1. To learn the fundamentals of Python

2. To elucidate problem-solving using a Python programming language

3. To introduce a function-oriented programming paradigm through python

4. To get training in the development of solutions using modular concepts

5. To introduce the programming constructs of python.

Unit – I

Introduction to Python Programming: Overview of Programming Languages, History of Python, Installing Python, Executing Python Programs, Commenting in Python, Internal Working of Python.

Basics of Python Programming: Python Character Set, Token, Python Core Data Type, I/O functions, Assigning Value to a Variable, Multiple Assignments, Writing Simple Programs in Python, Formatting Number and Strings, Python In-built Functions.

Operators and Expressions: Operators and Expressions, Arithmetic Operators, Operator Precedence and Associativity, Changing Precedence and Associativity of Arithmetic Operators, Translating Mathematical Formulae into Equivalent Python Expressions, Bitwise Operator, The Compound Assignment Operator.

Learning Outcomes:

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

- List the basic constructs of Python (L1).
- Understand operators and expressions. (L2).

Unit – II

Decision Statements: Boolean Type, Boolean Operators, Using Numbers with Boolean Operators, Using String with Boolean Operators, Boolean Expressions and Relational Operators, Decision Making Statements, Conditional Expressions.

Loop Control Statements: The while Loop, The range() Function, The for Loop, Nested Loops, The break Statement, The continue Statement.

Functions: Syntax and Basics of a Function, Use of a Function, Parameters and Arguments in a Function, The Local and Global Scope of a Variable, The return Statement, Recursive Functions, The Lambda Function.

Learning Outcomes:

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

- Apply the conditional execution of the program (L3).
- Apply the principle of recursion to solve the problems (L3).

Unit - III

Strings: The str class, Basic Inbuilt Python Functions for String, The index[] Operator, Traversing String with for and while Loop, Immutable Strings, The String Operators, String Operations.

Lists: Creating Lists, Accessing the Elements of a List, Negative List Indices, List Slicing [Start: end], List Slicing with Step Size, Python Inbuilt Functions for Lists, The List Operator, List Comprehensions, List Methods, List and Strings, Splitting a String in List, Passing List to a Function, Returning List from a Function.

Tuples, Sets and Dictionaries: Introduction to Tuples, Sets, Dictionaries.

Learning Outcomes:

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

- Design programs for manipulating strings (L6).
- Apply lists, Tuples, Sets and Dictionaries (L3).

Unit – IV

Exceptions: When Something Goes Wrong, Classes of Exceptions, A Final Note on Pythonic Exception Handling.

File Handling: Need of File Handling, Text Input and Output, The seek() Function, Binary Files, Accessing and Manipulating Files and Directories on a Disk.

Modules: Reusing Code with Modules and Packages, Understanding Python Modules, Everyday Module Usage, Advanced Module Behavior, Combining Modules into Packages

Learning Outcomes:

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

- Understand Exceptions and Modules (L2).
- Organize data in the form of files (L4).

Unit – V

Object-Oriented Programming: Class, Objects and Inheritance: Defining Classes, The Self parameter and Adding Methods to a Class, Display Class Attributes and Methods, Special Class Attributes, Accessibility, The __init__ Method (Constructor), Passing an Object as Parameter to a Method, __del__() (Destructor Method), Class Membership Tests, Method Overloading, Operator Overloading, Inheritance, The Object Class.

Case study: The turtle module, Simple Repetition, Encapsulation, Generalization, Interface design, Refactoring, docstring.

Learning Outcomes:

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

- Plan programs using object orientation approach (L4).
- Design graphics using turtle module (L4).

Text books:

1. Programming and problem solving with Python by Ashok NamdevKamthane, Amit Ashok Kamthane (2018): McGraw Hill Education (India) Private Limited.
2. Allen B. Downey, "Think Python", 2nd edition, SPD/O'Reilly, 2016.
3. Python 3 for Absolute Beginners, Tim Hall and J-P Stacey, Apress.

Reference Books:

- R. Nageswara Rao, "Core Python Programming", 2nd edition, Dreamtech Press, 2019.
- Python Pocket Reference 5ed: Python in Your Pocket, Mark Lutz, 2014.

e-Resources:

- https://www.tutorialspoint.com/python3/python_tutorial.pdf

Course Outcomes:

- Apply the features of Python language in various real applications (L3).
- Select appropriate core data structure of Python for solving a problem (L5).
- Design object-oriented programs using Python for solving real-world problems (L4).
- Apply modularity to programs (L3).
- Design graphics using turtle module (L4).

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

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(EC20AES302)DIGITAL ELECTRONICS & MICROPROCESSORSLAB
(CSE,CSM, IT& CSC)

CourseObjectives:

- To understand and analyze the concepts ofLogic Gatesand Boolean functions.
- To understand and analyze CombinationalLogicand SequentialLogic Circuits .
- To understand and analyze the logic circuits using Programmable Logic Devices.
- Apply knowledge and demonstrate programming proficiency using various addressing modes and instruction sets of 8086 & 8051.

ListofExperiments:

Note: Minimum of12 experiments shallbe conducted fromboththe sections:

Hardware: DIGITAL ELECTRONICS (Any 6 Experiments):

1. Realization of NOT, AND, OR, EX-OR gates with only Universal gates.

2. Karnaugh map Reductionand Logic CircuitImplementation.

3. Verificationof DeMorgan's Laws.

4. Implementation ofHalf-Adder and Half-Subtractor.

5. Implementation ofFull-Adder and Full-Subtractor.

6. Four Bit Binary Adder

7. Implementation of 4*1 Multiplexer and 8*1 Multiplexer.

8. Verification of state tables of D flip-flop , JK flip-flop,T flip-flop.

Software: MICROPROCESSORS & MICROCONTROLLERS (Any 6 Experiments)

1 .Programs using arithmetic and logical operations

2. Programs for code conversions.

3. ASCII Arithmetic Addition and Subtraction.

4. Searching for an element in an Array.

5. Sortingin Ascendingand DescendingOrders.

6. Finding Largest and Smallest elements from an array.

7. Reversing a string.

8. String Comparison

9. Block Move**.**

10. Arithmetic and logical operations using 8051,

11. Sortingin Ascendingand DescendingOrders using 8051,

Equipment Required:

1. Hardware kits.

2. TASM

3. 8051 kits.

4. Personal computer with necessary peripherals

Course Outcomes:

After Completion of this course ,the student will be able to:

- Analyze the concepts of Logic Gates and Boolean functions.

- Analyze Combinational Logic and Sequential Logic Circuits.

- Analyze the logic circuits using Programmable Logic Devices.

- Apply knowledge and demonstrate programming proficiency using various addressing modes and instruction sets of 8086 & 8051.

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech III Sem   **L T P C**

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(AM20APC302) ALGORITHMS LAB

(CSE, CSM, IT& CSC)

Course objectives

- Analyze a problem and design the solution for theproblem.
- Illustrate the method of finding the complexity of algorithms
- Infer the advanced algorithm design and analysistechniques.
- Identify and apply the suitable algorithm for the given real worldproblem.

Week-l   QUICK SORT

Sort a given set of elements using the quick sort method and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the 1st to be sorted and plot a graph of the time taken versus n. The elements can be read from a file or can be generated using the random numbergenerator.

Week-2   MERGESORT

Implement merge sort algorithm to sort a given set of elements and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n. The elements can be read from a file or can be generated using the random numbergenerator.
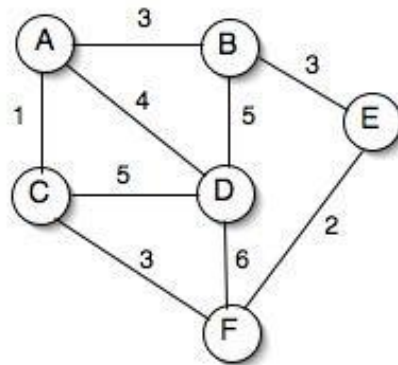
Week-3   KNAPSACK PROBLEM

Implement 0/1 Knapsack problem using Dynamic Programming.

Week-4   SHORTEST PATHSALGORITHM

From a given vertex in a weighted connected graph, find shortest paths from 0 to other vertices using Dijkstra's algorithm.
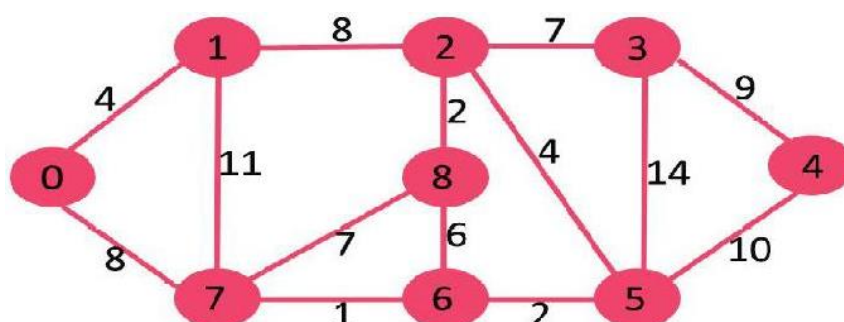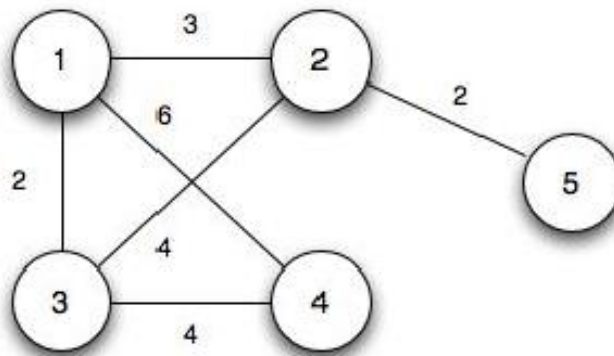
Week-5   MINIMUM COST SPANNINGTREE

Find Minimum Cost Spanning Tree of a given undirected graph using Kruskal's algorithm.
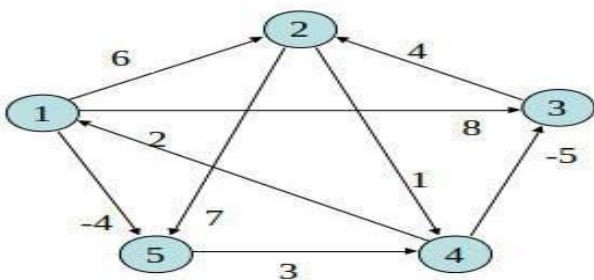
Week-6   MINIMUM COST SPANNINGTREE

Find Minimum Cost Spanning Tree of a given undirected graph using Prim's algorithm.
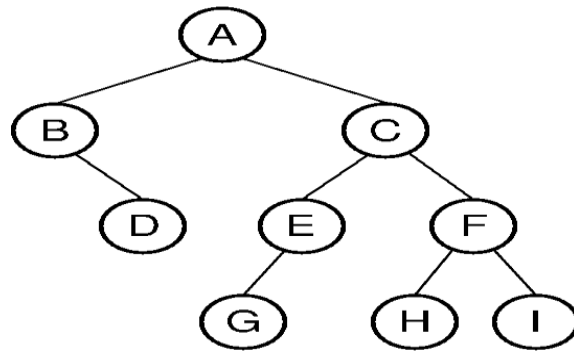

Week-7   ALL PAIRS SHORTESTPATHS

Implement All-Pairs Shortest Paths Problem using Floyd's algorithm.

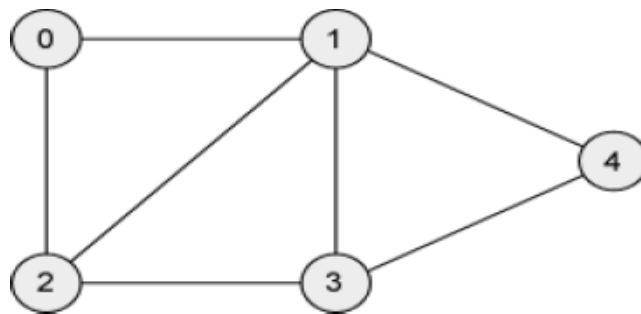|	1	2	3	4	5
1	0	6	8	∞	-4
2	∞	0	∞	1	7
3	∞	4	0	∞	∞
4	2	∞	-5	0	∞
5	∞	∞	∞	3	0

Week-8   TREETRAVERSALS
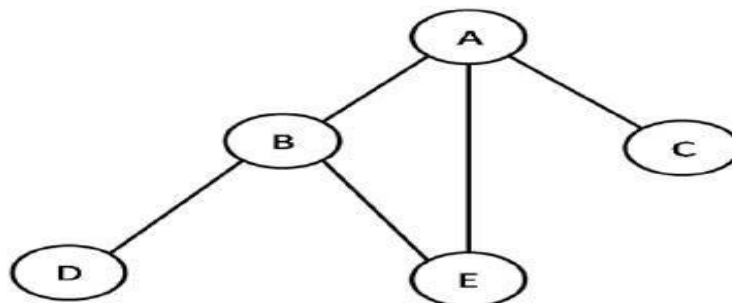
Perform various tree traversal for a given tree

Week-9 GRAPHTRAVERSALS

a. Print all the nodes reachable from a given starting node in a digraph using BFS method.

b. Check whether a given graph is connected or not using DFSmethod.

Week-10 SUM OF SUB SETSPROBLEM

Find a subset of a given set S = {sl, s2,....., sn} of n positive integers whose sum is equal to a given positive integer d. For example, if S= {1, 2, 5, 6, 8} and d = 9 there are two solutions {1, 2, 6} and {1,8}.A suitable message is to be displayed if the given problem instance doesn't have a solution.

Week-11 TRAVELLING SALES PERSONPROBLEM

Implement any scheme to find the optimal solution for the Traveling Sales Person problem and then solve the same problem instance using any approximation algorithm and determine the error in the approximation.

Week-12 N QUEENSPROBLEM

Implement N Queen's problem using Back Tracking.

Week-13 STRING MATCHING

a. Implement naïve string matching algorithm.
   b. Implement Rabin-karp string matching algorithm.
   c. Implement knuth-Morris-Pratt algorithm.
   d. Implement finite automata string matching algorithm.

ReferenceBooks:

- Levitin A —Introduction to the Design and Analysis of Algorithms, Pearson Education, 2008.
- Goodrich, M.T. R Tomassia—Algorithm Design foundations Analysis andInternet Examples, John Wiley and Sons, 2006.

Course outcomes

- Apply the Divide andConquer strategy to solve searching, sorting problems.
- Analyze the efficiency of Greedy and Dynamic Programming design techniques to solve the optimizationproblems.
- Relate Backtracking technique for solving constraint satisfaction problems.

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech III Sem   **L T P C**

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(IT20APC302) PYTHON PROGRAMMING LAB

(CSE,CSM, IT& CSC)

Course Objectives:

- To train the students in solving computational problems
- To elucidate solving mathematical problems using Python programming language
- To understand the fundamentals of Python programming concepts and its applications.
- To understand the object-oriented concepts using Python in problem solving.

Laboratory Experiments

1. Install Python Interpreter and use it to perform different Mathematical
Computations. Try to do all the operations present in a Scientific Calculator

2. Write a function that draws a grid like the following:

```
+ - - - - + - - - +
| | |
 | | |
 | | |
 | | |
+ - - - - + - - - +
| | |
| | |
| | |
| | |
+ - - - - + - - - - +
```

3. Write a function that draws a Pyramid with # symbols

```
#
 # # #
 # # # # #
 # # # # # # #
```

.Up to 15 hashes at the bottom

4. Using turtles concept draw a wheel of your choice

5. Write a program that draws Archimedean Spiral

6. The letters of the alphabet can be constructed from a moderate number of basic

elements, like vertical and horizontal lines and a few curves. Design an alphabet that can be drawn with a minimal number of basic elements and then write functions that draw the letters. The alphabet can belong to any Natural language excluding English. You should consider at least Ten letters of the alphabet.

7. The time module provides a function, also named time that returns the current Greenwich Mean Time in "the epoch", which is an arbitrary time used as a reference point. On UNIX systems, the epoch is 1 January 1970.

>>> import time

>>>time.time()

1437746094.5735958

Write a script that reads the current time and converts it to a time of day in hours, minutes, and seconds, plus the number of days since the epoch.

8. Given $n+r+1 <= 2^r$. n is the input and r is to be determined. Write a program which computes minimum value of r that satisfies the above.

9. Write a program that evaluates Ackermann function

10. The mathematician Srinivasa Ramanujan found an infinite series that can be used to generate a numerical approximation of 1/ π:

Write a function called estimate_pi that uses this formula to compute and return an estimate of π.

$$\frac{1}{\pi} = \frac{2\sqrt{2}}{9801} \sum_{k=0}^{\infty} \frac{(4k)!(1103 + 26390k)}{(k!)^4 396^{4k}}$$

It should use a while loop to compute terms of the summation until the last term is smaller than 1e-15 (which is Python notation for 10^{-15}). You can check the result by comparing it to math.pi.

11. Choose any five built-in string functions of C language. Implement them on your own in Python. You should not use string related Python built-in functions.

12. Given a text of characters, Write a program which counts number of vowels, consonants and special characters.

13. Given a word which is a string of characters. Given an integer say 'n', Rotate each character by 'n' positions and print it. Note that 'n' can be positive or negative.

14. Given rows of text, write it in the form of columns.

15. Given a page of text. Count the number of occurrences of each latter (Assume case insensitivity and don't consider special characters). Draw a histogram to represent the same

16. Write program which performs the following operations on list's. Don't use built-in functions

a) Updating elements of a list

b) Concatenation of list's

c) Check for member in the list

d) Insert into the list

e) Sum the elements of the list

f) Push and pop element of list

g) Sorting of list

h) Finding biggest and smallest elements in the list

i) Finding common elements in the list

18. Write a program that reads a file, breaks each line into words, strips whitespace and punctuation from the words, and converts them to lowercase.

19. Go to Project Gutenberg (http://gutenberg.org) and download your favorite out-of-copyright book in plain text format. Read the book you downloaded, skip over the header information at the beginning of the file, and process the rest of the words as before. Then modify the program to count the total number of words in the book, and the number of times each word is used. Print the number of different words used in the book.

Compare different books by different authors, written in different eras.

20. Go to Project Gutenberg (http://gutenberg.org) and download your favorite out-of-copyright book in plain text format. Write a program that allows you to replace words, insert words and delete words from the file.

21. Consider all the files on your PC. Write a program which checks for duplicate files in your PC and displays their location. Hint: If two files have the same checksum, they probably have the same contents.

22. Consider turtle object. Write functions to draw triangle, rectangle, polygon, circle and sphere. Use object oriented approach.

23. Write a program illustrating the object oriented features supported by Python.

24. Design a Python script using the Turtle graphics library to construct a turtle bar chart representing the grades obtained by N students read from a file categorising them into distinction, first class, second class, third class and failed.

25. Design a Python script to determine the difference in date for given two dates in YYYY:MM:DD format(0 <= YYYY <= 9999, 1 <= MM <= 12, 1 <= DD <= 31) following the leap year rules.

26. Design a Python Script to determine the time difference between two given times in HH:MM:SS format.(0 <= HH <= 23, 0 <= MM <= 59, 0 <= SS <= 59)

Reference Books:

1. Peter Wentworth, Jeffrey Elkner, Allen B. Downey and Chris Meyers, "How to Think Like a Computer Scientist: Learning with Python 3", 3rd edition, Available at http://www.ict.ru.ac.za/Resources/cspw/thinkcspy3/thinkcspy3.pdf

2. Paul Barry, "Head First Python a Brain Friendly Guide" 2nd Edition, O'Reilly, 2016

3. DainelY.Chen "Pandas for Everyone Python Data Analysis" Pearson Education, 2019

Course outcomes:

Student should be able to

• Design solutions to mathematical problems (L6).

• Organize the data for solving the problem (L4).

• Develop Python programs for numerical and text-based problems (L6).

• Select appropriate programming construct for solving the problem (L5).

• Illustrate object-oriented concepts (L3).

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech III Sem   **L T P C**

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(AM20ASC301) LINUX ADMINISTRATION (Skill Oriented Course)

(CSE,CSM, IT& CSC)

Course Objectives:

- To familiarize basic concepts of shell programming
- To learn shell programming.
- To practice basic administration skills.
- To demonstrate use of system calls
- To demonstrate Inter process communication.

1. Practice session: practice use of some basic Linux commands. Document the syntax and semantics of the commands like man, passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who.

2. Study and Practice on various commands like cat, tail, head , sort, nl, uniq, grep, egrep,fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

3. Write a shell script that accepts a name from user and displays whether it is a file, directory or   something else.

4. Write a shell script that creates users

5. Write a shell script that searches for a given string in a file

6. Write a shell script that compiles all C files in your home directory and creates executable files

7. Write a shell script that given a filename as argument, deletes all even lines in a file

8. Implement the grep command in C language

9. Write a shell script that removes duplicate lines from a file

10. Write a shell script that enhances find command by adding error messages that explain why the   command failed.

11. Write a shell script to backup files in a specified directory

12. Write a shell script that finds all links to a file

13. Write an awk script to count the number of lines in a file that do not contain vowels.

14. Write an awk script to find the number of characters, words and lines in a file.

15. Write C programs that illustrate communication between two unrelated processes using named pipe (FIFO).

16. Write a C program in which a parent writes a message to a pipe and the child reads

the message.

17. Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.

18. Write a C program (receiver.c) that receives the messages (from the above message queue) and displays them.

19. Configure mail server and file server.

20. Write Client and Server programs in C for connection oriented communication between Server and Client processes using Unix Domain sockets to perform the following: Client process sends a message to the Server Process. The Server receives the message, reverses it and sends it back to the Client. The Client will then display the message to the standard output device.

References:

1. "Unix and Shell programming", B.A.Forouzan and R.F.Gilberg, Cengage Learning.
2. "Beginning Linux Programming", 4th Edition, N.Matthew, R.Stones,Wrox, Wiley
3. "Advanced Unix Programming", N.B.Venkateswarulu, BS Publications.
4. "Unix and Shell Programming", M.G. Venkatesh Murthy, Pearson Education.
5. "Unix Shells by Example", 4th Edition, Elllie Quigley, Pearson Education.
6. "Sed and Awk", O.Dougherty&A.Robbins,2nd edition,SPD.
7. "Unix shell Programming", S.G.Kochan and P.Wood,3rd edition, Pearson Education.

Course Outcomes:

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

- Understand shell script to create files and handle text documents. (L2)
- Analyze various methodologies in Linux administration. (L3)
- Implementation of IPC through shell programming in the Linux environment.(L5)
- Create child processes and background processes. (L5)

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B. Tech III Sem   **L   T   P   C**

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(CH20AMC201) ENVIRONMENTAL SCIENCE
(Common to All Branches)

Course Objectives:

- To make the students to get awareness on environment.
- To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day-to-day activities of human life.
- To save earth from the inventions by the engineers.

UNIT – I

Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.

Natural Resources:

Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer- pesticide problems, water logging, salinity, case studies. Energy Resources.

Learning outcomes:

At the end of this unit, the students will be able to

- Understanding the importance of public awareness. (L2)
- Understanding about the various resources. (L2)

UNIT – II

Ecosystems:

Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession.

Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:

a.   Forest ecosystem.

b.   Grassland ecosystem.

c.   Desert ecosystem.

d.   Aquatic ecosystems. (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and Its Conservation:

Introduction: Definition, genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels. India as a mega-diversity nation – Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Learning outcomes:

At the end of this unit, the students will be able to

- Understanding about various ecosystems and their characteristics. (L2)
- Understanding the biodiversity and its conservation. (L2)

UNIT – III

Environmental Pollution: Definition, Causes, effects and control measures of

a.   Air Pollution

b.   Water pollution

c.   Soil pollution

d.   Marine pollution

e.   Noise pollution

f.   Thermal pollution

g.   Nuclear hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes –Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

Learning outcomes:

At the end of this unit, the students will be able to

- Understanding about the various sources of pollution. (L2)
- Understanding about the various sources of solid waste and preventive measures. (L2)
- Understanding about the different types of disasters and their managerial measures. (L2)

UNIT – IV

Social Issues and the Environment:

From Unsustainable to Sustainable development – Urban problems related to energy. Water conservation, rain water harvesting, watershed management –Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wasteland reclamation. – Consumerism and waste products Environment Protection Act. – Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act –Issues involved in enforcement of environmental legislation – Public awareness.

Learning outcomes:

At the end of this unit, the students will be able to

• Understanding about the social issues related to environment and their protection acts. (L2)

• Understanding about the various sources of conservation of natural resources. (L2)

• Understanding about the wild life protection and forest conservation acts. (L2).

UNIT – V

Human Population and The Environment:

Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health – Case studies.

Field Work: Visit to a local area to document environmental assets River/forest/grass/hill/mountain–Visit to a local polluted site- Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes.

Learning outcomes:

At the end of this unit, the students will be able to

• Understanding about the population explosion and family welfare programmes. (L2)

• To identify the natural assets and related case studies. (L3)

Text Books:

• Text book of Environmental Studies for Undergraduate Courses ErachBharucha for University Grants Commission, Universities Press.

• Palaniswamy, "Environmental Studies", Pearson education.

- S.AzeemUnnisa, "Environmental Studies" Academic Publishing Company.
- K.Raghavan Nambiar, "Text book of Environmental Studies for Undergraduate Courses as per UGC model syllabus", Scitech Publications (India), Pvt. Ltd.

References:
- Deeksha Dave and E.Sai Baba Reddy, "Textbook of Environmental Science", Cengage Publications.
- M.Anji Reddy, "Text book of Environmental Sciences and Technology", BS Publication.
- J.P.Sharma, Comprehensive Environmental studies, Laxmi publications.
- J. Glynn Henry and Gary W. Heinke, "Environmental Sciences and Engineering", Prentice hall of India Private limited.
- G.R.Chatwal, "A Text Book of Environmental Studies" Himalaya Publishing House.
- Gilbert M. Masters and Wendell P. Ela, "Introduction to Environmental Engineering and Science, Prentice hall of India Private limited.

Course Outcomes:

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

- Understanding multidisciplinary nature of environmental studies and various renewable and nonrenewable resources. (L2)
- Understand flow and bio-geo- chemical cycles and ecological pyramids. (L2)
- Understand various causes of pollution and solid waste management and related preventive measures. (L2)
- Apply the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation. (L3)
- Apply the concepts of population explosion, value education and welfare programmes in society. (L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech III Sem   **L T P C**

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(EG20AMC302) ENHANCING ENGLISH LANGUAGE SKILLS

(Common to All Branches of LE Students)

COURSE OBJECTIVES

- To enhance communication skills through listening, speaking, reading, and writing.
- To improve language proficiency of the students for career development.
- To train students to use language appropriately for interview skills, group discussion and public speaking.
- To develop confidence in the students to use English in everyday situations.
- To provide training and opportunities to participate in formal and informal communication.

UNIT- I

1. Greetings-Introducing oneself and others
2. Just A Minute (JAM) & Role play
3. Prepositions, Word formation

Learning Outcomes

At the end of the module, the learners will be able to

➢ Respond general questions on familiar topics by introducing oneselfand

others

➢ Comprehend short talks on general topics.

➢ Use grammatical structures effectively and meaningfully.

UNIT – II

1. Oral Presentations – Technical presentations
2. Letter Writing- Formal and Informal, Email Writing
3. Articles, Punctuation.

Learning Outcomes

At the end of the module, the learners will be able to

> ➢ Make formal oral presentations using effective strategies

> ➢ Write formal letters and e-mail writing appropriately in formal contexts

>   without any mistakes

> ➢ Use articles and use punctuation contextually.

UNIT – III

1. Communication – Verbal and Non- verbal communication
2. Telephone Etiquettes
3. Tenses,Subject-verb agreement, Prefixes & suffixes

Learning Outcomes

At the end of the module, the learners will be able to

> ➢ **U**nderstand non-verbal features of communication and holdFormal& informal conversations

> ➢ **U**se correct tense forms and structures in speech and writing

> ➢ Use grammatical structures aptly.

UNIT – IV

1. Resume Writing and Technical Report writing
2. Book/Film review
3. Synonyms and Antonyms, Vocabulary building

Learning Outcomes

At the end of the module, the learners will be able to

> ➢ Write Resume appropriately and ready for an interview.

> ➢ Review a book/film

> ➢ Edit short texts by correcting errors

UNIT – V

1. Group Discussions
2. Debate
3. Interview Skills

Learning Outcomes

At the end of the module, the learners will be able to

> ➢   Participate in formal & informal discussions and speak clearly on a specific topic

> ➢   Understand how to face interviews effectively.

> ➢ Comprehend, discuss and respond to academic texts orally and in writing

REFERENCE BOOKS:

1. Krishna Mohan & NP Singh, Speaking English Effectively, 2nd Edition,2011.
2. MAshrafRizvi,EffectiveTechnicalCommunication,TataMcGraw-Hill,NewDelhi,2017.
3. Francis Soundararaj,Basics of Communication in English: Soft Skills for Listening, Speaking, Reading and Writing, New Delhi: Macmillan-2012.
4. ChaseR. Tarver&Kristin L. Johannsen, Pathways: Listening, Speaking and Critical Thinking. Heinley ELT; 2nd Edition, 2018.
5. Meenakshi Raman, Technical Communication, Oxford University Press,2008
6. Raymond Murphy, English Grammar in Use, Cambridge University Press,4th Edition,2012.

COURSE OUTCOMES

- Use English language, both written and spoken, competently and correctly.
- Improve comprehension and fluency of speech.
- Hone the communication skills to meet the challenges of their careers successfully.
- Gain confidence in using English in verbal situations.
- Strengthen communication skills in different contexts like formal and informal.

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech IV Sem   **L T P C**

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(MA20ABS402) NUMBER THEORY
(CSC)

Course Objective:

This course enables the students to learn the concepts of number theory and its applications to information security.

Unit-I

Integers, Greatest common divisors and prime Factorization The well-ordering property-Divisibility-Representation of integers-Computer operations with integers-Prime numbers-Greatest common divisors.

Learning Outcomes: Students will be able to

1. Understand basics of number theory concepts.

2. Solve problems on prime numbers.

Unit-II

The Euclidean algorithm-The fundamental theorem of arithmetic-Factorization of integers and the Fermat numbers-Linear Diophantine equations.

Learning Outcomes: Students will be able to

1. Understand Euclidean algorithm and its applications.

2. Understand Fermat numbers-Linear Diophantine equations.

Unit-III

Congruences Introduction to congruences -Linear congruences-The Chinese remainder theorem-Systems of linear congruences.

Learning Outcomes: Students will be able to

1. Understand Congruences and its basic properties.

2. Understand Chinese remainder theorem and its applications.

Unit-IV

Applications of Congruences Divisibility tests. Wilson's theorem and Fermat's little theorem- Pseudo primes- Euler's theorem- Euler's p hi-function- The sum and number of divisors- Perfect numbers and Mersenne primes.

Learning Outcomes: Students will be able to

1. Understand divisibility tests.

2. Apply the concept of congruences to various applications.

Unit-V

Cryptology Basic terminology-complexity theorem-Character ciphers-Block ciphers-Exponentiation ciphers- Public-key cryptography-Discrete logarithm-Knapsack ciphers-RSA algorithm.

Learning Outcomes:

Students will be able to

1. Understand the terminology of Cryptology.

2. Understand different encryption mechanisms.

TEXTBOOKS

1. Joseph Silverman- A Friendly Introduction to Number Theory -Fourth Edition.

2. Kenneth H. Rosen - Elementary Number Theory and its Application-Addison - Wesley Publishing Company

REFERENCE BOOKS

1G.A. Jones & J.M. Jones, Elementary Number Theory, Springer, UTM, 2007.

2. Neal Koblitz, A Course in Number Theory and Cryptography, Springer, Verlag - New york Inc., May 2001.

Course Outcomes: After the completion of course, student will be able to □

1. Understand number theory and its properties.

2. Understand principles on congruences

3. Develop the knowledge of Congruences to apply various applications □

4. Develop various encryption methods and its applications

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech IV Sem   **L T P C**

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(CS20APC401) OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(CSE,CSM, IT& CSC)

Course Objectives:
- To understand object-oriented concepts and problem-solving techniques
- To obtain knowledge about the principles of inheritance and polymorphism
- To implement the concept of packages, interfaces, exception handling and concurrency mechanism.
- To design the GUIs using applets and swing controls.

UNIT - I
Introduction to OOP: OOP principles, Java Buzzwords, Implementing Java program, JVM, Data Types, Variables, Type conversions and Casting, Operators, Control statements, Arrays. Classes, Objects, Methods, Constructors, this keyword, static keyword, Overloading Methods and Constructors, Argument passing, Exploring String class.

Learning Outcomes:

At the end of this unit, the student will be able to
- Understand the syntax, semantics and features of Java Programming Language (L1).
- Learn object-oriented features and understanding type conversion and casting (L2).
- Understand different types of string handling functions and its usage (L1).

UNIT – II
Inheritance: Basics, Using Super, Creating Multilevel hierarchy, Method overriding, Dynamic Method Dispatch, Using Abstract classes, Using final with inheritance

Interfaces: Definition, Implementing Interfaces, Extending Interfaces, Nested Interfaces, Applying Interfaces, Variables in Interfaces.

Packages: Basics, finding packages and CLASSPATH, Access Protection, Importing packages.

Learning Outcomes:

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

- Implement types of Inheritance and developing new classes based on existing classes(L3)
- Demonstrate features of interfaces to implement multiple inheritances (L2).
- Distinguish between system packages and user defined packages (L2).

UNIT – III

Exception handling - Fundamentals, Exception types, uncaught exceptions, using try and catch, Multiple catch clauses, nested try statements, throw, throws and finally, built- in exceptions, creating own exception sub classes.

I/O and Other Topics: – I/O basics, Reading Console input, Writing console Output, The PrintWriter class, Reading and writing files, Automatically closing a file, enumerations, type wrappers.

Learning Outcomes:

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

- Learn what exceptions are and how they are handled (L1).
- Learn when to use exception handling and how to create user defined exceptions(L3)
- Learn the difference between various files and streams (L1).

UNIT - IV

Multithreading: The Java thread model, Creating threads, Thread priorities, Synchronizing threads, Inter thread communication.

The Collections Framework (java.util): Collections overview, Collection Interfaces, The Collection classes- Array List, Linked List, Hash Set, Hash table, Properties, Stack, Vector, String Tokenizer, Date, Calendar, Random, Scanner.

Applets- Definition, Life Cycle and Execution.

Learning Outcomes:

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

- Understand concurrency, parallelism and multithreading(L1).
- Learn the importance of collections and use prebuilt generic data structures from Framework (L1).
- Develop applets for web applications(L5)

UNIT – V

Event Handling-Delegation Event Model, Event Sources, Event Classes, Event Listener Interfaces, Handling Mouse and Keyboard Events, Adapter classes.

AWT AND Swings: AWT: AWT Hierarchy, AWT controls, Layout Managers: FlowLayout, BorderLayout, GridLayout, CardLayout, and Limitations of AWT. SWINGS: JFrame, JPanel, JComponent- JLabel and ImageIcon, JTextField,JTabbedPane , Swing Buttons, JScrollPane, JComboBox, JTable.

Learning Outcomes:

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

- Understand the GUI programming (L1).

Text Books:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill Education (India) Pvt. Ltd.

2. Java How to Program, 10th Edition, Paul Dietel, Harvey Dietel, Pearson Education.

Reference Books:

1. T. Budd "Understanding Object-Oriented Programming with Java", updated edition, Pearson Education.

2. Cay S. Horstmann "Core Java Volume – 1 Fundamentals",Pearson Education.

3. Sagayaraj, Dennis, Karthik and Gajalakshmi "Java Programming for core and advanced learners, University Press.

4. Y. Daniel Liang, "Introduction to Java programming", Pearson Education.

5. P. Radha Krishna "Object Oriented Programming through Java", University Press.

6. S. Malhotra, S. Chudhary, "Programming in Java", 2nd edition, Oxford Univ. Press.

7. R.A. Johnson, "Java Programming and Object-oriented Application Development", Cengage Learning.

Course Outcomes:

After completion of the course the student will be able

- To solve real world problems using OOP techniques (L3).
- To apply code reusability through inheritance, packages and interfaces(L3)
- To solve problems using java collection framework and I/O classes (L3).
- To develop applications by using parallel streams for better performance (L4).
- To build GUIs and handle events generated by user interactions (L4).

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

BTech IV Sem　　　　　　　　　　　　　　　　　　　　　**L T P C**
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(CY20APC401)COMPUTER NETWORKS
(CSC)

Course Objectives:

- Understand the basic concepts of Computer Networks.

- Introduce the layered approach for design of computer networks

- Familiarize with the applications of Internet

- Explore the network protocols used in Internet environment

- Explain the format of headers of IP, TCP and UDP

- Elucidate the design issues for a computer network

Unit I: Computer Networks and the Internet

What is the Internet ?, The Network Edge, The Network Core, Delay, Loss, and Throughput in Packet- Switched Networks, Protocol Layers and their Service Models, Networks under attack, History of Computer Networking and the Internet.

Learning Outcomes:

At the end of the unit, students will be able to:

- Enumerate the hardware components of a computer network (L1)

- List the layers of a Computer Network (L1)

- Identify the performance metrics of a computer network (L3)

Unit II: Application Layer

Principles of Network Applications, The web and HTTP, File transfer: FTP, Electronic mail in the internet, DNS-The Internet's Directory Service, Peer-to-Peer Applications

Learning outcomes:

At the end of the unit, students will be able to:

- Design new applications of a computer network (L6)

- Analyze the application protocols (L4)

- Extend the existing applications (L2)

Unit III : Transport Layer

Introduction and Transport-Layer Services, Multiplexing and De-multiplexing, Connectionless Transport: UDP, Principles of Reliable Data transfer, Connection-Oriented Transport: TCP, Principles of Congestion Control, TCP Congestion Control.

Learning outcomes:

At the end of the unit, students will be able to:

- Design Congestion control algorithms (L6)
- Select the appropriate transport protocol for an application (L3)
- Identify the transport layer services (L3)

Unit IV :The Network Layer

Introduction, Virtual Circuit and Datagram Networks, The Internet Protocol(IP): Forwarding and Addressing in the Internet, Routing Algorithms, Routing in the Internet, Broadcast and Multicast Routing.

Learning outcomes:

At the end of the unit, students will be able to:

- Compare routing algorithms (L4)
- Design routing algorithms (L6)
- Extend the existing routing protocols (L2)

Unit V :The Layer: Links, Access Networks, and LANs

Introduction to the Link Layer, Error-Detection and Correction Techniques, Multiple Access Links and Protocols, Switched Local Area Networks, Link Virtualization: A Network as a Link Layer, Data Center Networking, Retrospective: A Day in the Life of a Web Page Request.

Learning outcomes:

At the end of the unit, students will be able to:

- Compare medium access protocols (L4)
- Classify the computer networks (L2)
- Design a Data Centre for an organization (L6)

Text Books:

1. James F. Kurose, Keith W. Ross, "Computer Networking: A Top-Down Approach", 6th edition, Pearson, 2019.

References:

1. Forouzan, "Datacommunications and Networking", 5th Edition, McGraw Hill Publication.

2. Andrew S.Tanenbaum, David j.wetherall, "Computer Networks", 5th Edition, PEARSON.

3. Youlu Zheng, Shakil Akthar, "Networks for Computer Scientists and Engineers", Oxford Publishers, 2016.

Course Outcomes:

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

1. Identify the software and hardware components of a Computer network (L3)

2. Develop new routing, and congestion control algorithms (L3)

3. Assess critically the existing routing protocols (L5)

4. Explain the functionality of each layer of a computer network (L2)

5. Choose the appropriate transport protocol based on the application requirements(L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech IV Sem   **L T P C**

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(IT20APC401)OPERATING SYSTEMS

(CSE,CSM, IT& CSC)

Course Objectives:

- Understand basic concepts and functions of operating systems.
- Understand the processes, threads and scheduling algorithms.
- Provide good insight on various memory management techniques.
- Expose the students with different techniques of handling deadlocks.
- Explore the concept of file-system and its implementation issues.
- Implement various schemes for achieving system protection and security.
- Familiarize with the basics of Windows and Linux operating systems.

UNIT I

Operating Systems Overview: Operating system functions, Operating system structure, operating systems Operations, protection and security, Kernel data Structures, Computing Environments, Open-Source Operating Systems.

Operating System Structure: Operating System Services, User and Operating-System Interface, system calls, Types of System Calls, system programs, operating system structure, operating system debugging, System Boot.

Processes: Process concept, process Scheduling, Operations on processes, Inter process Communication, Examples of IPC systems.

Learning Outcomes:

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

- Identify major components of operating systems and understand the types of computing environments.(L1)
- Explore several open source operating systems.(L2)
- Recognize operating system services to users, processes and other systems.(L2)
- Understand the importance, features of a process and methods of communication between processes.(L2)

UNIT II

Multithreaded Programming: Overview, Multi-core Programming, Multithreading Models, Thread Libraries, Implicit threading, Threading Issues, Examples.

CPU Scheduling: Basic concepts, Scheduling-Criteria, Scheduling Algorithms, Thread Scheduling, Multiple-Processor Scheduling, Real-Time CPU Scheduling, Algorithm Evaluation.

Inter-process Communication: Race conditions, Critical Regions, Mutual exclusion with busy waiting, Sleep and wakeup, Semaphores, Mutexes, Monitors, Message passing, Barriers, Classical IPC Problems - Dining philosopher's problem, Readers and writers problem.

Learning Outcomes:

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

- Improving CPU utilization through multi programming and multithreaded programming. (L3)
- Examine several classical synchronization problems.(L2)
- Understand various process scheduling algorithms.(L2)
- Understand the importance, features of a process and methods of communication between processes.(L2)

UNIT III

Memory Management: Swapping, contiguous memory allocation, segmentation, paging, structure of the page table.

Virtual memory: demand paging, page-replacement, Allocation of frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory, Examples.

Learning Outcomes:

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

- Examine the various techniques of allocating memory to processes. (L2)
- Summarize how segmentation and paging works in contemporary computer systems. (L2)
- Understanding the benefits of virtual memory systems. (L2)

UNIT IV

Deadlocks: System Model, deadlock characterization, Ostrich algorithm, Methods of handling Deadlocks, Deadlock prevention, Detection and Avoidance, Recovery from deadlock.

File Systems: Files, Directories, File system implementation, management and optimization, Directory Implementation, Allocation Methods, Free-Space management.

Secondary-Storage Structure: Overview of disk structure, and attachment, Disk scheduling,RAID structure, Stable storage implementation.

Learning Outcomes:

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

- Investigate methods for preventing/avoiding deadlocks.(L3)
- Examine file systems and its interface in various operating systems.(L2)
- Analyze different disk scheduling algorithms.(L4)
- Understand the Stable-storage implementation and Free-Space management.(L2)

UNIT V

Protection: Goals of Protection, Principles of Protection, Domain of protection, Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection

Security: The Security problem, Program threats, System and Network threats, Cryptography as a security tool, User authentication, Implementing security defenses, Firewalling to protect systems and networks, Computer–security classifications.

Case Studies: Linux, Microsoft Windows.

Learning Outcomes:

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

- Identify various schemes available for achieving system protection.(L2)
- Acquiring knowledge about various countermeasures to security attacks.(L2)
- Outline protection and security in Linux and Microsoft Windows. (L2)

Text Books:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Ninth Edition,2012, Wiley.
2. Modern Operating Systems, Andrew S Tanenbaum, Third Edition, Pearson Education, 2008

Reference Books:

1. Operating systems by A K Sharma, Universities Press.
2. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition, 2009, Pearson Education.
3. Operating Systems, S. Haldar, A.A. Aravind, Pearson Education.
4. Operating Systems, A.S. Godbole, Second Edition, TMH.

Online Learning Resources:

- https://nptel.ac.in/courses/106/106/106106144/
- http://peterindia.net/OperatingSystems.html/

Course Outcomes:

- Understand theOS design structures, its services and basics of a Process. (L2)

- Analyze various scheduling algorithms and examine concurrency mechanisms in Operating Systems. (L4)
- Apply memory management techniques in the design of operating systems. (L3)

- Compare and contrast various structures and organization of the file system and secondary storage structure. (L4)
- Apply different concepts of Protection and Security services in OS. (L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech IV Sem   **L T P C**

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(BA20AHS301) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Objectives:

The objective of this course is to equip the student with the basic inputs of Managerial Economics and Economic Environment of business and to impart analytical skills in helping them take sound financial decisions for achieving higher organizational productivity.

UNIT I
INTRODUCTION TO MANAGERIAL ECONOMICS

Managerial Economics – Definition- Nature- Scope - Contemporary importance of Managerial Economics - Relationship of Managerial Economics with Financial Accounting and Management. Demand Analysis: Concept of Demand-Demand Function - Law of Demand - Elasticity of Demand- Significance - Types of Elasticity - Measurement of elasticity of demand - Demand Forecasting- factors governing demand forecasting- methods of demand forecasting.

UNIT II
THEORY OF PRODUCTION AND COST ANALYSIS

Production Function- Least cost combination- Short-run and Long- run production function- Isoquants and Isocosts, MRTS - Cobb-Douglas production function - Laws of returns - Internal and External economies of scale - Cost Analysis: Cost concepts and cost behavior- Break-Even Analysis (BEA) - Determination of Break Even Point (Simple Problems)-Managerial significance and limitations of Break- Even Point.

UNIT III
INTRODUCTION TO MARKETS AND NEW ECONOMIC ENVIRONMENT

Market structures: Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition- Monopoly-Monopolistic Competition-Oligopoly-Price-Output

Determination - Pricing Methods and Strategies-Forms of Business Organizations- Sole Proprietorship- Partnership – Joint Stock Companies - Public Sector Enterprises – New Economic Environment- Economic Liberalization – Privatization - Globalization. GST and Demonetization.

UNIT IV
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 – Liquidity, Leverage, Profitability, and Activity Ratios (simple problems).

UNIT V
CAPITAL AND CAPITAL BUDGETING

Concept of Capital - Over and Undercapitalization – Remedial Measures - Sources of Shot term and Long term Capital - Estimating Working Capital Requirements – Capital Budgeting – Features of Capital Budgeting Proposals – Methods and Evaluation of Capital Budgeting Projects – Pay Back Method – Accounting Rate of Return (ARR) – Net Present Value (NPV) – Internal Rate Return (IRR) Method (simple problems)

TEXT BOOKS:

1. Managerial Economics 3/e, Ahuja H.L, S.Chand, 2013.

2. Financial Management, I.M.Pandey, Vikas Publications, 2013.

REFERENCES

1. Managerial Economics and Financial Analysis, 1/e, Aryasri, TMH, 2013.

2. Managerial Economics and Financial Analysis, S.A. Siddiqui and A.S. Siddiqui, New Age International, 2013.

3. Accounting and Financial Mangement, T.S.Reddy& Y. Hariprasad Reddy, Margham

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B. Tech IV Sem   **L T P C**

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(BA20AHS302) BUSINESS ENVIRONMENT

Course Objective: To provide the student with a background of various environment factors that have major repercussions on business and sharpen their mind to watch and update the changes that occur constantly in this sphere.

UNIT-I

An Overview of Business Environment:-

Type of Environment- internal, external, micro and macro environment- Competitive structure of industries, environmental analysis and strategic management- Managing diversity- Scope of business, characteristics of business- Objectives and the uses of study- Process and limitations of environmental analysis.

UNIT-II

Economic Environment:

Nature of Economic Environment- Economic factors-growth strategy, basic economic system, economic planning, Economic policies- new industrial policy, FEMA, onetary and fiscal policies- Consumer Protection Act and Competition Law. Liberalization, Privatization and Globalization of Indian Economy,- Trends and Issues.

UNIT-III

Socio-Cultural Environment:-

 Nature and impact of culture on business, culture and globalization, social responsibilities of usiness, social audit, business ethics and corporate governance, Demographic environment population size, migration and ethnic aspects, birth rate, death rate and age structure

UNIT-IV

Political Environment:-

Functions of state- economic roles of government- government and legal environment- The constitutional environment, rationale and extent of state intervention.

UNIT-V

Natural and Technological Environment:

Innovation, technological leadership and followership, sources of technological dynamics, impact of technology on globalization, transfer of technology, time lags in technology introduction, Status of technology in India; Management of technology; Features and Impact of technology.

Textbooks:

- K.Aswathappa (2017), Essentials of Business Environment, 13ᵗʰ Edition, Himalaya publishers.
- N.D.Kapoor (2019), Elements of Mercantile Law, 38ᵗʰ Edition, Sultan Chand & Sons.

References:

- Indian Economy, Dutt and Sundaram, S. Chand, New Delhi.
- Business Environment – Text and Cases, Justin Paul, TMH.
- Indian Economy- Misra and Puri, Himalaya.
- Business Environment, Suresh Bedi, Excel.
- Rangarajan, C.A.; Perspective in Economics, S.Chand& Sons, New Delhi
- Cherunilam, Francis; Business Environment - Text and Cases, Himalaya Publishing House.
- Aswathappa, K.; Essentials of Business Environment, Himalaya Publishing House, New Delhi.

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B. Tech IV Sem   **L T P C**

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<div align="center">(BA20AHS303) ORGANIZATIONAL BEHAVIOUR</div>

Course Objective: To provide the student with a background of various environment factors that have major repercussions on business and sharpen their mind to watch and update the changes that occur constantly in this sphere.

UNIT-I

Introduction to Organization Behaviour:-

Introduction to organization, organization and managers, manager' roles and skills, behaviour at work, introduction to organization behaviour, major behavioral science disciplines contributing to OB, challenges and opportunities managers have in applying OB concepts, OB model (including motivation models) and levels of OB model

UNIT-II

Individual behaviour:

Introduction to individual behaviour, values, attitudes, job satisfaction, personality, perception and individual decision making, learning, motivation at work, managing emotions and stress (Meaning-Definition Stress and job performance relationship Approaches to stress management (Coping with stress)

UNIT-III

Interpersonal behaviour:-

 Interpersonal Behaviour, Johari Window, Transactional Analysis– ego states, types of transactions, life positions, applications of T.A., managerial interpersonal styles..

UNIT-IV

Group behaviour:-

Introduction to group behaviour, foundations of group behaviour, concept of group and group dynamics, types of groups, formal and informal groups, theories of group formation, group norms, group cohesiveness, group decision making, inter group behaviour, concept of team vs. group, types of teams, building and managing effective teams, leadership theories and styles, power and politics, conflict and negotiation.

UNIT-V

Organisationalbehaviour:

Foundations of organization structure, organization design, organization culture, organizationchange, managing across cultures, human resource management policies and practices, diversity at work.

Textbooks:

- Pardeshi, P. C., Organizational Behaviour& Principles & Practice Of Management, Nirali publication

References:

- Robbins, S. P/ Judge, T. A/ Sanghi, S., Organizational Behavior, Pearson Publication
- Aswathappa, K., OrganisationalBehaviour– Text and Problem, Himalaya Publication

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech IVSem   **L T P C**

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(CS20APC402) OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

(CSE,CSM, IT& CSC)

Course Objectives:

- To introduce the concepts of Java.
- To Practice object-oriented programs and build java applications.
- To implement java programs for establishing interfaces.
- To implement sample programs for developing reusable software components.
- To establish database connectivity in java and implement GUI applications.

List of Experiments

Week 1:

- Read the marks of a student in 4 subjects and find grade.
- Program to check a number is Amstrong or n ot.
- Program to display prime numbers from m to n.

Week 2:

- Define a class Rectangle with data member's length and width. Write methods to find perimeter and area of a rectangle. (class and object)
- Create a class Account with data members name, accno and balance. Use appropriate methods to perform various operations like deposit, withdraw, balance Check.
- Create a class Student with appropriate data and methods using constructor.

Week 3:

- Create overloaded methods to find volume of Sphere, Cylinder & Cone.
- To sort given list of elements in ascending order.
- Read two matrices of size m*n , p*q , perform the multiplication of matrices.

Week 4:

- Check a string is palindrome or not.
- Given a string and an int n, return a string made of n repetitions of the last n characters of the string.
- You may assume that n is between 0 and the length of the string, inclusive. Write a Java program.

repeatEnd("Hello",3)→"llollollo
repeatEnd("Hello",2)→"lolo"
repeatEnd("Hello", 1) → "o"

- Read array of City names and Sort in dictionary order.(Ascending order).

Week 5:

- Write Java program on use of inheritance, preventing inheritance using final, abstract classes.

- Write Java program on dynamic binding, differentiating method overloading and overriding

Week 6:

- Write a Java program to implement user defined exception handling.

- Write java program that inputs 5 numbers, each between 10 and 100 inclusive. As each number is read display it only if it's not a duplicate of any number already read. Display the complete set of unique values input after the user enters each new value.

- Write a Java program that creates a user interface to perform integer division. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 and Num2 were not integers, the program would throw a Number Format Exception. If Num2 were zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

Week 7:

- Implement the concept of producer consumer problem using thread synchronization.

- 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.

Week 8:

- Use an Array List to manage Employee objects for insertion, display and remove.

- Use HashSet methods to perform operations on collection of data.

Week 9:

- Implement Mouse Listener and Mouse Motion Listener to handle various mouse events.

- Implement Key Listener to handle key events.

- Create a Simple login window to validate a user with name and password.

Week 10:

- Create a JTable to display various fields of Student data like RollNo, Name, Branch ,Year, Percentage etc.
- Write a java program to Create and Read data using JDBC

Text Books:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill Education (India) Pvt. Ltd. 2. Java How to Program, 10th Edition, Paul Dietel, Harvey Dietel, Pearson Education.

Reference Books:

1. T. Budd "Understanding Object-Oriented Programming with Java", updated edition, Pearson Education.
2. Cay S. Horstmann "Core Java Volume – 1 Fundamentals",Pearson Education. 3. Sagayaraj, Dennis, Karthik and Gajalakshmi "Java Programming for core and advanced learners, University Press.
3. Y. Daniel Liang, "Introduction to Java programming", Pearson Education.
4. P. Radha Krishna "Object Oriented Programming through Java", University Press. 6. S. Malhotra, S. Chudhary, "Programming in Java", 2nd edition, Oxford Univ. Press. 7. R.A. Johnson, "Java Programming and Object-oriented Application Development", Cengage Learning.

Course Outcomes:

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

- Recognize the Java programming environment (L3).
- Select appropriate programming construct to solve a problem (L2).
- Develop efficient programs using multithreading (L5).
- Design reliable programs using Java exception handling features (L3).
- Extend the programming functionality supported by Java (L4).

SRI VENKATESWARA COLLEGE OF ENGINEERING

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BTech IV Sem   **L T P C**
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(CY20APC402)COMPUTER NETWORKS LABORATORY

(CSC)

Course Objectives:

- Understand the different types of networks

- Discuss the software and hardware components of a network

- Enlighten the working of networking commands supported by operating system

- ImpartknowledgeofNetworksimulator2/3

- Familiarize the use of networking functionality supported by JAVA

- Familiarize with computer networking tools.

ListofExperiments

1. Study different types of Network cables (CopperandFiber) and prepare cables (Straight and Cross) to connect Two or more systems. Use crimping tool to connect jacks. Use LAN tester to connect the cables. Install and configure Network Devices: HUB, Switch and Routers .Consider both manageable and non-manageable switches. Do the logical configuration of the system. Set the bandwidth of different ports. Install and Configure Wired and Wireless NIC and transfer files between systems in Wired LAN and Wireless LAN .Consider both adhoc and infrastructure mode of operation.

2. WorkwiththecommandsPing,Tracert,Ipconfig,pathping,telnet,ftp,getmac,ARP ,Hostname,Nbtstat,netdiag,and Nslookup

3. Use Sniffers for monitoring network communication(Ethereal)

4. Find all the IP addresses on your network. Unicast, Multicast, and Broad cast on your network.

5. Use Packet tracer software to build network topology and configure using Distance vector routing protocol.

6. Use Packet tracer software to build network topology and configure using Link State routing protocol.

7. Using JAVARMI Write a program to implement Basic Calculator

8. Implement a Chatting application using JAVA TCP and UDP sockets.

9. Hello command is used to know whether the machine at the other end is working or not .Echo command is used to measure the round trip time to the neighbour. Implement Hello and Echo commands using JAVA.

10. Use Ether ealtool to capture the information about packets.

11. Install Network Simulator2/3. Create a wired network using dumb bell topology. Attach agents, generate both FTP and CBR traffic, and transmit the traffic. Vary the data rates and evaluate the performance using metric throughput, delay, jitter and packet loss.

12. Create a static wireless network. Attach agents, generate both FTP and CBR traffic, and transmit the traffic. Vary the data rates and evaluate the performance using metric throughput, delay, jitter and packet loss.

13. Create a mobile wireless network. Attach agents, generate both FTP and CBR traffic, and transmit the traffic. Vary the data rates and evaluate the performance using metric throughput, delay, jitter and packet loss.

Reference Books:

1. Shivendra S.Panwar , ShiwenMao,JeongdongRyoo,andYihanLi,"TCP/IPEssentialsALab-BasedApproach",CambridgeUniversity Press,2004.

2. Cisco Networking Academy ,"CCNA1 and CCNA 2 CompanionGuide",CiscoNetworkingAcademyProgram,3rdedition, 2003.

3. Elloitte Rusty Harold,"JavaNetworkProgramming",3rdedition,O'REILLY,2011.

Course outcomes:

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

- Design scripts for Wired network simulation(L6)

- Design scripts of static and mobile wireless networks simulation (L6)

- Analyze the data traffic using tools (L4)

- Design JAVA programs for client-server communication(L6)

- Construct a wired and wireless networks using the real hardware(L3)

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech IV Sem   **L T P C**

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(IT20APC402) OPERATING SYSTEMS LAB

(CSE,CSM,IT& CSC)

Course Objectives:

- To familiarize students with the architecture of OS.
- To provide necessary skills for developing and debugging CPU Scheduling algorithms.
- To explore the process management and scheduling and memory management.
- To explain the working of an OS as a resource manager, file system manager, process manager, memory manager, and page replacement tool.
- To provide insights into system calls, file systems and deadlock handling.

List of Experiments

1. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority
2. Implement dynamic priority scheduling algorithm.
3. Assume that there are five jobs with different weights ranging from 1 to 5. Implement round robin algorithm with time slice equivalent to weight.
4. Implement priority scheduling algorithm. While executing, no process should wait for more than 10 seconds. If waiting time is more than 10 seconds that process has to be executed for at least 1 second before waiting again.
5. Control the number of ports opened by the operating system with
   a) Semaphore b) Monitors.
6. Simulate how parent and child processes use shared memory and address space.
7. Simulate sleeping barber problem.
8. Simulate dining philosopher's problem.
9. Simulate producer and consumer problem using threads.
10. Implement the following memory allocation methods for fixed partition a) First fit b) Worst fit c) Best fit
11. Simulate the following page replacement algorithms
    a) FIFO b) LRU c) LFU etc.,

12. Simulate Paging Technique of memory management

13. Simulate Bankers Algorithm for Dead Lock avoidance and prevention.

14. Simulate following file allocation strategies

   a) Sequential b) Indexed c) Linked

15. Simulate all File Organization Techniques

   a) Single level directory b) Two level c) Hierarchical d) DAG

Reference Books:

1. Peter B. Galvin, Greg Gagne "Operating System Concepts", Abraham Silberchatz, Eighth Edition, John Wiley.

2. Stallings "Operating Systems: Internals and Design Principles", Sixth Edition–2009, Pearson Education

3. Andrew S Tanenbaum, "Modern Operating Systems", Second Edition, PHI. 4. S.Haldar, A.A.Aravind, "Operating Systems", Pearson Education.

4. B.L.Stuart, "Principles of Operating Systems", Cengage learning, India Edition.2013-2014 6. A.S.Godbole, "Operating Systems", Second Edition, TMH.

Online Learning Resources/Virtual Labs:

- https://www.cse.iitb.ac.in/~mythili/os/
- http://peterindia.net/OperatingSystems.htm

Course Outcomes:

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

- Trace different CPU Scheduling algorithm. (L2)
- Implement Bankers Algorithms to Avoid and prevent the Dead Lock. (L3)
- Evaluate Page replacement algorithms. (L5)
- Illustrate the file organization techniques. (L4)
- Illustrate shared memory process. (L4)
- Design new scheduling algorithms. (L6)

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech IV Sem   **L T P C**

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(IT20ASC401) EXPLORATORY DATA ANALYSIS WITH R

(CSE,CSM, IT& CSC) (Skill Oriented Course)

Course Objectives:

- Understand the R Programming Language.
- Exposure on solving of data science problems.
- Understand The Regression Model

List of Experiments:

1: INTRODUCTION TO COMPUTING

    a. Installation of R

    b. The basics of R syntax, workspace

    c. Matrices and lists

    d. Subsetting

    e. System-defined functions; the help system

    f. Errors and warnings; coherence of the workspace

2: GETTING USED TO R: DESCRIBING DATA

    a. Viewing and manipulating Data

    b. Plotting data

    c. Reading the data from console, file (.csv) local disk and web

    d. Working with larger datasets

3: SHAPE OF DATA AND DESCRIBING RELATIONSHIPS

    a. Tables, charts and plots.

    b. Univariate data, measures of central tendency, frequency distributions, variation, and Shape.

    c. Multivariate data, relationships between a categorical and a continuous variable,

    d. Relationship between two continuous variables – covariance, correlation coefficients, comparing multiple correlations.

    e. Visualization methods – categorical and continuous variables, two categorical variables, two continuous variables.

4: PROBABILITY DISTRIBUTIONS

    a. Sampling from distributions – Binomial distribution, normal distribution

    b. tTest, zTest, Chi Square test

c. Density functions

d. Data Visualization using ggplot – Box plot, histograms, scatter plotter, line chart, bar chart, heat maps.

5: EXPLORATORY DATA ANALYSIS

a. Demonstrate the range, summary, mean, variance, median, standard deviation, histogram, box plot, scatter plot using population dataset.

6: TESTING HYPOTHESES

a. Null hypothesis significance testing

b. Testing the mean of one sample

c. Testing two means

7: PREDICTING CONTINUOUS VARIABLES

a. Linear models

b. Simple linear regression

c. Multiple regression

d. Bias-variance trade-off – cross-validation

8: CORRELATION

a. How to calculate the correlation between two variables.

b. How to make scatter plots.

c. Use the scatter plot to investigate the relationship between two variables

9: TESTS OF HYPOTHESES

a. Perform tests of hypotheses about the mean when the variance is known.

b. Compute the p-value.

c. Explore the connection between the critical region, the test statistic, and the p-value

10: ESTIMATING A LINEAR RELATIONSHIP

Demonstration on a Statistical Model for a Linear Relationship

a. Least Squares Estimates

b. The R Function lm

c. Scrutinizing the Residuals

Reference Books:

1. SandipRakshit, "Statistics with R Programming", McGraw Hill Education, 2018.

2. Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani, "AN Introduction to Statistical

Learning: with Applications in R", Springer Texts in Statistics, 2017.

3. Joseph Schmuller, "Statistical Analysis with R for Dummies", Wiley, 2017.

4. K G Srinivasa, G M Siddesh, ChetanShetty, Sowmya B J, "Statistical Programming

in R", Oxford

Higher Education, 2017

Web References:

- http://www.r-bloggers.com/how-to-perform-a-logistic-regression-in-r/
- http://www.ats.ucla.edu/stat/r/dae/rreg.htm
- http://www.coastal.edu/kingw/statistics/R-tutorials/logistic.html
- http://www.ats.ucla.edu/stat/r/data/binary.csv

SOFTWARE REQUIREMENTS:

SOFTWARE: R Software , R Studio Software

Course Outcomes:

- Install and use R for simple programming tasks (L3).
- Extract data from files and other sources and perform various data manipulation tasks on

  them (L3).
- Explore statistical functions in R (L4).
- Use R Graphics and Tables to visualize results of various statistical operations on data (L3).
- Apply the knowledge of R gained to data Analytics for real-life applications (L3).

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech IV Sem   **L T P C**

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(CS20AMC401)DESIGN THINKING FOR INNOVATION (Mandatory Course)

(CSE,CSM, IT& CSC)

Course Objectives:

- To familiarize product design process
- To introduce the basics of design thinking
- To bring awareness on idea generation
- To familiarize the role of design thinking in services design

Unit -I

Introduction to design, product development process, product planning, Innovation in product development, characteristics of successful product development.

Design Thinking: Introduction, Defining design thinking, Principles, the process.

Learning Outcomes:

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

- Understand design and development process. (L2)
- Understand Design thinking concept and its uses. (L2)
- Learn Principles of design thinking.(L3)

Unit –II

Stages in design thinking, Benefits of Design thinking, design thinking and innovation, case studies.

Immersion: Preliminary immersion, In Depth immersion.

Learning Outcomes:

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

- Familiarize with design thinking stages.(L2)
- Differentiate design thinking and innovation.(L3)
- Identify the problems in the immersion stage (L4)

Unit-III

Analysis and Synthesis: Insight, Affinity diagram, Conceptual Map, Guiding criteria, Empathy map.

Idea generation: Introduction, techniques, Conventional methods, Brainstorming, Gallery method, Delphi method, Synectics, etc, Select ideas from ideation methods, case studies.

Learning Outcomes:

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

- Analyze possibilities of the problem through analysis and synthesis process.(L4)
- Understand different analysis and synthesis techniques.(L2)
- Apply different ideation techniques for designing solutions. (L3)

Unit-IV

Prototyping: Paper prototyping, volumetric model, Staging, Storyboard, Service prototyping. Design Thinking in Information Technology, Design thinking in Business process model, Design thinking for agile software development, TILES toolkit, Cloud implementation.

Learning Outcomes:

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

- Understand different prototyping techniques.(L2)
- Know the role of design thinking in information technology field.(L2)
- To distinguish traditional software development model and agile model.(L3)

Unit V

- **Design thinking for service design:** How to design a service, Principles of service design, Benefits of service design, Service blueprint, Design strategy, organization, principles for information design, principles of technology for service design.

Learning Outcomes:

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

- Understand different prototyping techniques.(L2)
- Know the role of design thinking in information technology field.(L2)
- To distinguish traditional software development model and agile model.(L3)

Reference Books:

- Christoph Meinel and Larry Leifer, "Design Thinking", Springer, 2011
- AdersRiiseMaehlum, "Extending the TILES Toolkit" from Ideation to Prototyping
- Maurício Vianna, Ysmar Vianna, Brenda Lucena and Beatriz Russo," Design thinking : Business innovation", MJV Technologies and innovation press, 2011.
- Tim Brown, "Change by Design: Design Thinking Transforms organizations and inspires innovations", Harper Collins publication, 2009
- http://www.algarytm.com/it-executives-guide-to-design-thinking:e-book.
- Marc stickdorn and Jacob Schneider, "This is Service Design Thinking", Wiely, 2011

- Pahl and Vietz, "Engineering Design", Springer, 2007

Course Outcomes:

Student will be able to

- Generate and develop different design ideas.(L4)
- Appreciate the innovation and benefits of design thinking.(L3)
- Experience the design thinking process in IT and agile software development.(L2)
- Understand design techniques related to variety of software services.(L2)

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B. Tech IV Sem   **L T P C**

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(MA20AMC401) ENGINEERING MATHEMATICS

(Common to All Branches of LE Students)

Course Objectives:

- This course will illuminate the students in the concepts of calculus and linear algebra.
- 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 realworld problems and their applications.

UNIT -1

Matrices

Solving system of homogeneous and non homogeneous linear equations. Eigen values and Eigenvectors and their properties, Cayley-Hamilton theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton theorem,

Learning Outcomes:

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

- Solving systems of linear equations, using technology to facilitate row reduction determine the rank, eigen values and eigenvectors (L3).
- Identify special properties of a matrix, such as positive definite, etc., and use this information to facilitate the calculation of matrix characteristics (L3).

UNIT -2

Mean Value Theorems

Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, Taylor's andMaclaurin theorems with remainders (without proof) related problems.

Learning Outcomes:

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

- Translate the given function as series of Taylor's and Maclaurin's with remainders (L3)

Analyze the behaviour of functions by using mean value theorems (L3)

UNIT 3

Linear differential equations of higher order

Definitions, complete solution, operator D, rules for finding complimentary function, inverse operator, rules for finding particular integral, method of variation of parameters, Applications to L-C-R Circuit problems.

Learning Outcomes:

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

- Identify the essential characteristics of linear differential equations with constant coefficients (L3)
- Solve the linear differential equations with constant coefficients by appropriate method (L3)

UNIT 4

Multivariable Calculus

Partial derivatives, total derivatives, chain rule, change of variables, Jacobian, maxima and minima of functions of two variables, method of Lagrange multipliers.

Learning Outcomes:

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

- Find partial derivatives numerically and symbolically and use them to analyze and interpret the way a function varies. (L3)
- Acquire the Knowledge maxima and minima of functions of several variable (L1)
- Utilize Jacobian of a coordinate transformation to deal with the problems in change of variables (L3)

UNIT -5

Vector Calculus

Vector differentiation

Scalar and vector point functions, vector operator del, del applies to scalar point functions-Gradient, del applied to vector point functions-Divergence, Curl and their related properties.

Vector integration

Line integral-circulation-work done, surface integral-flux, Green's theorem in the plane (without proof), Stoke's theorem (without proof), volume integral, Divergence theorem (without proof) and applications of these theorems.

Learning Outcomes:

 At the end of this unit, the student will be able to □

- Find the work done in moving a particle along the path over a force field (L4)
- Evaluate the rates of fluid flow along and across curves (L4) □
- Apply Green's, Stokes and Divergence theorem in evaluation of double and triple integrals (L3)

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers, 2017.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.

Reference Books:

1. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 3/e, Alpha

Science

International Ltd., 2002.

2. George B. Thomas, Maurice D. Weir and Joel Hass, Thomas Calculus, 13/e, Pearson Publishers, 2013.

3. Glyn James, Advanced Modern Engineering Mathematics, 4/e, Pearson publishers, 2011.

4. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education

5. H. k Das, Er. RajnishVerma, Higher Engineering Mathematics, S. Chand.

6. N. Bali, M. Goyal, C. Watkins, Advanced Engineering Mathematics, Infinity Science Press.

Course Outcomes:

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

- Develop the use of matrix algebra techniques that is needed by engineers for practical

  applications (L6)
- Utilize mean value theorems to real life problems (L3)
- Solve the differential equations related to various engineering fields (L6) □
- Apply multiple integrals to find the area and volumes for different functions. (L3)
- Estimate the work done against a field, circulation and flux using vector calculus (L6)

SRI VENKATESWARA COLLEGE OF ENGINEERING
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B. Tech IV Sem   **L T P C**
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(MA20AMC301) Logical Skills for Professionals-II
(Mandatory Course)

Course Objectives:
- To learn the basic methods to find HCF, LCM Factors, Simplification, Pipes, Alligation or Mixture, Table, Bar Graphs and Pie Chart concepts.
- To understand the logic behind the Syllogism, Calender, Clocks and Number Series Analogy concepts.

UNIT –I
HCF, LCM Factors:
- Find the HCF and LCM of the given numbers by using Factorization method.
- Find the HCF and LCM of the given numbers by using Division method.

Simplification:
- Using BODAMS rule to find out the value of a given expression.
- Using Vernacular rule to find out the value of a given expression.

UNIT – II
Pipes
- Find the how much time taken to fill the tank by opening one pipe, two pipe and one after another.

Alligation or Mixture
- Using Ratio and proportion to solve the mixture problems.
- To find quickly calculate the price of a mixture, given that it is a mix of twoelements having different prices.

UNIT – III
Table, Bar Graphs
- Find the Average sales of all branches for the respective years.
- Find the ratio of the total sales of respective branches.

Pie Charts
- Study the Pie chart and the table answer the questions based on them.
- Find the central angle of the components.

UNIT –IV

Syllogism

- Type-I: Different types of Venn diagrams with their implications.
- Type-II: Analyse the figure carefully and then answer certain questions regarding the given data.

UNIT – V

Calendars

- Find the day of the week on a given date
- Find the ordinary year and Leap year

Clocks

- Find the angle between the hour hand and minute hand of a clock.
- When the hands are at right angles.

Number Series Analogy

- Choosing a similarly related pair as the given number pair on the basis of the relation between the numbers in each pair.
- Choosing a number similar to a group of numbers on the basis of certain common properties that they possess..

Textbooks:

1. Quantitative Aptitude, 2012, Dr. R.S. Aggarwal, S. Chand and Company Ltd, New Delhi.
2. A Modern Approach to Verbal and Non-Verbal Reasoning, 2012, Dr. R.S. Aggarwal, S. Chand and Company Ltd, New Delhi.

Reference Books:

1. Quantitative Aptitude for Competitive Examinations, 14/e, 2010, AbhijitGuha, Tata McGraw Hill Publishers, New Delhi.
2. Course in Mental Ability & Quantitative Aptitude, 3/e, 2012, Edgar Thorpe, Tata McGraw Hill Publishers, New Delhi.
3. Fast Track Objective Arithmetic, 2012, Rajesh Verma, Arihant Publications, Meerut.
4. Reasoning and Aptitude, 2013, Nem Singh, Made Easy Publications, New Delhi.

Course Outcomes (CO):

- Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of HCF, LCM Factors and Simplification.
- Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Pipes, Alligation or Mixture.

- Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Table, Bar Graphs and Pie Chart.
- Analyze the techniques in Syllogism.
- Analyze the techniques in Calendar, Clocks and Number Series Analogy concepts.

SRI VENKATESWARA COLLEGE OF ENGINEERING

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Computer Science and Engineering(Cyber Security)

Honours Degree in CSE

S.No.	Course Name
	Sem-IV
1.	Vulnerability Assessment & Penetration Testing
2.	Malware Analysis
	Sem-V
3.	Securing Programming
4.	Cyber Crime Investigations and Digital Forensics

Minor Degree in CSE(Cyber Security)

S.No.	Course Name
1.	Computer Networks
2.	Cloud Security
3.	Social Media Security
4.	Digital Forensics