

Department of CSE(Artificial Intelligence and Machine Learning)-CSM-SR22

I B. Tech., COURSE STRUCTURE-SR22(For batches admitted from 2023-2024) DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (Artificial Intelligence and Machine Learning)-CSM

I B.Tech., I-Sem.,										
Induction Program – UHV-I (Duration 15 Days)										
COURSE CODE	COURSE TITLE	COURSE AREA	HOURS/ WEEK			CREDIT	Internal Marks	External marks	Total Marks	
			L	T	P					
AS22-00BS05	Linear Algebra & Differential Equations (LADE)	BSC	3	1	0	4	40	60	100	
AS22-00BS01	Applied Chemistry	BSC	3	0	0	3	40	60	100	
AS22-05ES01	Programming For Critical Thinking	ESC	3	0	0	3	40	60	100	
AS22-04ES02	Semiconductor Devices & Circuits	ESC	3	0	0	3	40	60	100	
AS22-00HS01	English	HSMC	3	0	0	3	40	60	100	
PRACTICAL COURSES										
AS22-00BS03	Applied Chemistry Lab	BSC	0	0	3	1.5	40	60	100	
AS22-05ES04	Programming For Critical Thinking Lab	ESC	0	0	3	1.5	40	60	100	
AS22-00HS02	English Language and Communication Skills Lab	HSMC	0	0	2	1	40	60	100	
TOTAL CREDITS						20				
I B.Tech., II-Sem.,										
COURSE CODE	COURSE TITLE	COURSE AREA	HOURS/ WEEK			CREDIT	Internal Marks	External marks	Total Marks	
			L	T	P					
AS22-00BS07	Advanced Calculus & Vector Calculus (ACVC)	BSC	3	1	0	4	40	60	100	
AS22-00BS11	Applied Physics	BSC	3	0	0	3	40	60	100	
AS22-05ES07	Data Structures	ESC	3	0	0	3	40	60	100	
AS22-02ES01	Basic Electrical Engineering	ESC	3	0	0	3	40	60	100	
PRACTICAL COURSES										
AS22-00BS12	Applied Physics Lab	BSC	0	0	3	1.5	40	60	100	
AS22-05ES08	Data Structures Lab	ESC	0	0	3	1.5	40	60	100	
AS22-03ES01	Engineering Graphics Through Auto CAD Practice	ESC	0	0	4	2	40	60	100	
AS22-03ES03	Engineering Practices	ESC	0	0	4	2	40	60	100	
VALUE ADDED COURSE										
AS22-66PW11	Independent Project/MOOCs	PW				Three Week Duration				
TOTAL CREDITS						20				

II B. Tech I SEM									
COURSE CODE	COURSE TITLE	COURSE	HOURS/WEEK			CREDITS	Internal Marks	External marks	Total Marks
			L	T	P				
AS22-00BS09	Probability & Statistics	BSC	3	1	0	3	40	60	100
AS22-04ES07	Digital Electronics	ESC	3	1	0	3	40	60	100
AS22-05PC06	Computer Organization and Architecture	PCC	3	1	0	3	40	60	100
AS22-05PC07	Object Oriented Programming through Java	PCC	3	1	0	3	40	60	100
AS22-66ES01	Software Engineering	ESC	3	0	0	3	40	60	100
PRACTICAL COURSES									
AS22-04ES08	Digital Electronics Lab	ESC	0	0	3	1	40	60	100
AS22-05PC09	Oops through Java Programming	PCC	0	0	3	1.5	40	60	100
AS22-66ES02	Software Engineering Lab	ESC	0	0	3	1.5	40	60	100
MANDATORY COURSE									
AS22-00MC02	Gender Sensitization	M	0	0	2	0	0	100	100
VALUE ADDED COURSE									
AS22-66PW21	Skill Development Course – Data Analysis	PW	0	0	2	1	40	60	100
TOTAL									

II B. Tech II SEM									
COURSE CODE	COURSE TITLE	COURS	HOURS/WEEK			CREDITS	Internal Marks	External marks	Total Marks
			L	T	P				
AS22-66PC01	Introduction to Artificial Intelligence	PCC	3	0	0	3	40	60	100
AS22-66PC02	Formal Language and Automata Theory	PCC	3	0	0	3	40	60	100
AS22-05ES10	Fundamentals of Python Programming	ESC	3	0	0	3	40	60	100
AS22-05PC01	Database Management Systems	PCC	3	0	0	3	40	60	100
AS22-05PC02	Operating Systems	PCC	3	0	0	3	40	60	100
PRACTICAL COURSES									
AS22-05PC03	Database Management Systems	PCC	0	0	3	1.5	40	60	100
AS22-05PC04	Operating Systems Lab	PCC	0	0	3	1.5	40	60	100
AS22-05ES11	Fundamentals of Python Programming Lab	ESC	0	0	3	1	40	60	100
MANDATORY COURSE									
AS22-00MC01	Environmental sciences	MC	0	0	2	0	0	100	100
VALUE ADDED COURSE									
AS22-66PW22	Skill Development Course – Data Visualization	PW	0	0	2	1	40	60	100
TOTAL			20						

Course	BSC	ESC	HSMC	PCC	PE	OE	PW	MC	Credits
I-I	8.5	11.5							20
I-II	8.5	7.5	4						20
II-I	3	8.5		7.5			1		20
II-II		4		15			1		20
III-I			1.5	11.5	3	3	1		20
III-II			3	10	3	3	1		20
IV-I				9	6	3	2		20
IV-II					6	3	11		20
TOTAL Before II YEAR	19	28.5	12	52.5	18	12	18		160
AICTE	24	29	12	49	18	12	15		160
TOTAL After II YEAR	20	31.5	8.5	53	18	12	17	↓	160

**B. Tech.,
FIRST YEAR
FIRST SEMESTER
SYLLABUS**

**LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS
IB.Tech.,ISem., (Common to CSE, IT, CSM, AIDS & CSG)**

Course Title: Linear Algebra and Differential Equations	Course Code: AS22-00BS05
Teaching Scheme (L:T:P): 3:1:0	Credits: 4
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs + 16Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Intermediate Mathematics	

COURSEOBJECTIVES

- Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
- Concept of Eigen values and eigenvectors and to reduce the quadratic form to canonical form.
- Concept of nature of the series.
- Methods of solving the differential equations of first order.
- Methods of solving the differential equations of higher order.

COURSEOUTCOMES

CO#	Course Outcomes
C111.1	Convert the set of linear equations in to matrix notation and analyze its solution
C111.2	Apply the concept of orthogonal transformation and reduce quadratic form to canonical form
C111.3	Analyze the nature of quadratic forms.
C111.4	Analyze the nature of series.
C111.5	Determine whether the given differential equation of first order is exact or not.
C111.6	Apply the concept of higher order ODE to real world problems.

COURSECONTENT(SYLLABUS)

UNIT I: MATRICES

Rank of a matrix by Echelon form and Normal form, solving system of Homogeneous and Non-Homogeneous equations, Gauss Jacobi Iteration Method, Gauss Seidel Iteration Method.

UNIT-II: EIGEN VALUES AND EIGEN VECTORS

Eigen values and Eigenvectors and their properties; Cayley-Hamilton Theorem (without proof): finding inverse and power of a matrix by Cayley-Hamilton Theorem; Diagonalization; Quadratic forms and Nature, Index and Signature of the Quadratic Forms.

UNIT-III: INFINITE SERIES

Infinite Series: Convergent, Divergent and Oscillatory Series; Series of positive terms: Comparison test, p-test, D-Alembert's ratio test; Cauchy's nth root test, Raabe's test; Alternating series: Leibnitz test; Absolute and Conditionally Convergences.

UNIT IV: FIRST ORDER ODE

Exact equations; non-Exact equations; Linear equations; Bernoulli's equations; Newton's Law of Cooling; Law of Natural Growth and Decay.

UNIT V: HIGHER ORDER LDE

Higher Order Linear Differential Equations with Constant Coefficients; Solutions of Homogeneous and Non-Homogeneous Linear Differential Equations, Method of Variation of Parameters.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 43rd Edition, 2014.
2. R.K.Jain, S.R.K. Iyengar Advanced Engineering Mathematics, Narosa Publishing House Pvt.Ltd.,5thEdition,2016

References Books:

1. N.P. Bali and Manish Goyal, A Text book of Engineering Mathematics, Laxmi Publications, Reprint,

2008.

2. B.V.Ramana, Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11thReprint, 2010.

APPLIED CHEMISTRY
I B.Tech., I-Sem.,

Course Title: Applied Chemistry	Course Code: AS22-00BS01
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Intermediate Chemistry	

COURSE OVERVIEW

The primary objective of an Engineering Chemistry course is to introduce the students to the concepts and applications of chemistry in Engineering. It should cultivate in them an ability to identify chemistry in each piece of finely engineered products used in households and industry. This course aims to strengthen the fundamental concepts of chemistry and then builds an interface with their industrial applications. It deals with applied and industrially useful topics, such as Water Technology, Molecular Orbital Concepts, Electrode Potential, Electrodes, types of batteries and their industrial applications, Fuels, UV-VIS, IR and NMR concepts.

COURSE OBJECTIVES

- To bring adaptability to the concepts of chemistry and to acquire the required skills to become a perfect engineer.
- To know the modern technology and interpret different problems involved in industrial utilization of water.
- To acquire the skills pertaining to Polymers and Engineering Materials to apply them for various engineering fields etc.
- To acquire the knowledge of Electrochemistry and batteries which are essential for engineers in Industry.
- To acquire the knowledge of reaction mechanisms and drug synthesis
- To acquire the skills pertaining to spectroscopy and to apply them for medical and other fields.

COURSE OUTCOMES

CO#	Course Outcomes
C112.1	Acquire the Scientific Attitude by means of distinguishing, analyzing and solving various Engineering problems.
C112.2	Identify and interpret different problems involved in industrial utilization of water
C112.3	Interpret the knowledge of polymers and other materials and their applications to various engineering fields
C112.4	Summarize the principles and concepts of electrochemistry, corrosion to predict the behavior of a system under different variables.
C112.5	Define and distinguish the various reaction mechanisms as well as understands the concepts of drug synthesis.
C112.6	Apply the concepts on basic spectroscopy and application to medical and other fields.

COURSE CONTENT(SYLLABUS)

Unit – I

Water and its Treatment: Introduction to hardness of water – Estimation of hardness of water by complexometric method and related numerical problems. Potable water and its specifications - Steps involved in the treatment of potable water - Disinfection of potable water by chlorination and breakpoint chlorination. Defluoridation - Determination of F⁻ ion by ion-selective electrode method.
Boiler troubles: Sludges, Scales and Caustic embrittlement. Internal treatment of Boiler feed water - Calgon conditioning - Phosphate conditioning - Colloidal conditioning, External treatment methods - Softening of water by ion-exchange processes. Desalination of water – Reverse osmosis.

Unit – II: Polymeric materials:

Definition – Classification of polymers with examples – Types of polymerization –Addition (free radical addition) and condensation polymerization with examples – Nylon 6:6, Terylene

Plastics: Definition and characteristics- thermoplastic and thermosetting plastics, Preparation, Properties and engineering applications of PVC and Bakelite, Teflon, Fiber reinforced plastics (FRP).

Rubbers: Natural rubber and its vulcanization.

Elastomers: Characteristics –preparation – properties and applications of Buna-S, Butyl and Thiokol rubber.

Conducting polymers: Characteristics and Classification with examples-mechanism of conduction in trans-polyacetylene and applications of conducting polymers.

Biodegradable polymers: Concept and advantages - Polylactic acid and poly vinyl alcohol and their applications.

Unit – III:

Battery Chemistry & Corrosion

Introduction - Classification of batteries- primary, secondary and reserve batteries with examples. Basic requirements for commercial batteries. Construction, working and applications of: Zn-air and Lithium ion battery, Applications of Li-ion battery to electrical vehicles. Fuel Cells- Differences between battery and a fuel cell, Construction and applications of Methanol Oxygen fuel cell and Solid oxide fuel cell. Solar cells- Introduction and applications of Solar cells.

Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressed current methods.

Unit - IV

Energy Sources:

Introduction, Calorific value of fuel – HCV, LCV- Dulong's formula. Classification- solid fuels: coal – analysis of coal – proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining, cracking types – moving bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol - Fischer-Tropsch's process; Gaseous fuels – composition and uses of natural gas, LPG and CNG, Biodiesel – Transesterification, advantages.

Unit-V

Spectroscopic Techniques and applications: Introduction, Principles of Electronic Spectroscopy: Beer-Lambert's law, Types of electronic transitions, applications of UV-Visible spectroscopy.

IR Spectroscopy: Introduction, Principle, Modes of Molecular vibrations, selection rules, Force Constant, Wave number regions of Some common organic functional groups (C-H, NH₂, OH, -COOH, C=O, C≡N, C=C, C≡C, C-O-C), Applications of IR Spectroscopy.

¹H-NMR Spectroscopy, Principles of NMR spectroscopy, Chemical shift - Shielding and Deshielding effects, Chemical shifts of some organic protons, Applications of NMR, Introduction to Magnetic Resonance Imaging.

Text books:

1. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, 2010
2. Engineering Chemistry by Rama Devi, Venkata Ramana Reddy and Rath, Cengage learning, 2016
3. A text book of Engineering Chemistry by M.Thirumala Chary, E.Laxminarayana and K. Shashikala, Pearson Publications, 2021.
4. Textbook of Engineering Chemistry by Jaya Shree Anireddy, Wiley Publications.

Reference Books:

1. Engineering Chemistry by Shikha Agarwal, Cambridge University Press, Delhi (2015)
2. Engineering Chemistry by Shashi Chawla, Dhanpatrai and Company (P) Ltd. Delhi (2011)

PROGRAMMING FOR CRITICAL THINKING
IB.Tech.,I-Sem.,(Common to CSM&AIDS)

Course Title: Programming for Critical Thinking	Course Code: AS22-05ES01
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Mathematics knowledge, Analytical and Logical skills	

COURSE OVERVIEW:

This course introduces students to the field of computer science as a discipline for solving problems through computation and provides the foundation for more advanced courses on programming and software development.

COURSE OBJECTIVE

- To learn the fundamentals of computers.
- To understand the various steps in program development.
- To learn the syntax and semantics of C programming language.
- To learn the usage of structured programming approach in solving problems.

COURSE OUTCOMES(S)

CO#	Course Outcomes
C113.1	Designs algorithms and draws flowcharts for solving problems.
C113.2	Converts the algorithms/flowcharts to C programs.
C113.3	Develops the code and tests a given logic in C programming language.
C113.4	Dissects a problem into functions and develops modular reusable code.
C113.5	Demonstrates arrays, pointers, strings and structures in C.
C113.6	Demonstrates File Operations in C.

COURSE CONTENT (SYLLABUS)

UNIT - I

Introduction to Problem Solving: Overview of Computers, Block Diagram of a Computer, Characteristics of a Computer, Hardware vs Software, How to develop a Program? (Pseudo Code, Algorithms and Flowcharts), Software Development Life Cycle. Structured Programming, Types of Programming Languages.

Overview of C: Introduction to C, Basic structure of C program, Creating and Running a C Program The C Character Set, Identifiers and Keywords, Data Types, Constants, Variables and Arrays, Declarations, Expressions and Statements. (TB1).

UNIT – II

Operators and Expressions: Arithmetic Operators, Unary Operators, Relational and Logical Operators, Assignment Operators, Conditional Operator, Library Functions.

Input and Output statements: Single Character Input, Single Character Output, Entering Input Data – The scanf function, Writing Output Data – The printf function, The gets and puts functions, Interactive programming. (TB1)

UNIT – III

Control and Iterative Statements: Decision Statements, The if Statement, The if-else Statement,

Nested if-elses, Forms of if, Use of Logical Operators, The else if Clause, The ! Operator, Hierarchy of Operators, The Conditional Operators, The Iteration or Loop Control Statements, Loops, The while Loop, The for Loop, Nesting of loops, Multiple Initializations in For loop, The break statement, The continue statement, The do-while Loop, Decisions using switch, switch vs if-else ladder. (TB2)

Functions: Introduction, Definition of function, Declaration of Function and Function prototypes, The return Statement, Types of Functions, Function with Operators, Function and Decision Statements, Function and Loop Statements. Command Line Arguments, Storage Classes in C (TB3)

UNIT – IV

Arrays and Strings: Introduction to Arrays, Defining an array, Processing an Array, Passing arrays to functions, Multidimensional arrays, Overview of Strings, Defining a string, NULL character, Initialization of Strings, Reading and Writing a String, Processing a String, Character Arithmetic, Library Functions for strings.(TB1)

Pointers: Introduction to Pointers, Features of pointers, Pointer Declaration, Arithmetic Operations with Pointers, Pointers and Arrays, Pointers and Two Dimensional Arrays, Array of Pointers, Pointers to Pointers, Pointers to Strings, Void Pointers. Call by Value and Call by Reference. Macros in C (TB3)

UNIT – V

Structures and Unions: Introduction to Structures, Features of Structures, Declaration and Initialization of Structures, Structure within Structure, Array of Structures, Pointer to Structure, Structure and Functions, typedef, Bit Fields, Enumerated Data type, Union.(TB3)

Files: Data Organization, File Operations, Opening a File, Reading from a file, Trouble in opening a files, Counting Characters, Tabs, Space. A File-Copy Program, Writing to a File, File Opening Modes, String (line) I/O in Files, Record I/O in Files, Text Files vs Binary Files.(TB2)

Text Books:

1. Byron Gottfried, Programming with C, 4th Edition, McGrawHill Education
2. Yashwanth Kanethkar, Let Us C, BPB Publications(11th Edition)
3. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition).
4. Ashok N. Kamthane, Programming in C, 2/e, Pearson Education.
5. Programming with C, by K.R. Venugopal, Tata Mcgraw Hill Publishing Co Ltd

References Books:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
2. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression).
3. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education. 4.Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition.
4. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition.

Online Resources (SWAYAM/NPTEL/MOOCs/COURSERA):

1. <https://www.coursera.org/learn/computational-thinking-problem-solving>
2. nptel.ac.in/courses/106105085/4
3. nptel.ac.in/courses/106105085/2

Web Reference/E-Books:

1. https://onlinecourses.nptel.ac.in/noc18_cs33/preview
2. <http://www.thenewboston.com/>
3. <https://www.codesdope.com/>
4. <https://numericalmethodstutorials.readthedocs.io/en/latest/>

SEMICONDUCTOR DEVICES AND CIRCUITS

I B.Tech., I-Sem.,

Course Title: Semiconductor Devices and Circuits	Course Code: AS22-04ES02
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Basic knowledge of physics.	

COURSE OVERVIEW

The creation of electronic circuits requires knowledge of the physics and device technology for the emission and flow control of electrons in vacuum and matter. It uses active devices to control electron flow by amplification and rectification. Electronics has had a major effect on the development of modern society.

COURSE OBJECTIVES

- To introduce components such as diodes, BJTs and FETs.
- To know the applications of components.
- To know the switching characteristics of components
- To know the need of biasing in Transistors
- To understand of various types of transistor's with its principle of operation

COURSE OUTCOMES

CO#	Course Outcomes
C114.1	Understand and analyze the characteristics of various components of semiconductor devices and its applications
C114.2	Understand and remember the applications of semiconductor diodes with examples.
C114.3	Analyze different types of transistor configurations with its parameters
C114.4	Understand and analyze the relation between current amplification factors of the three configurations
C114.5	Analyze different biasing techniques of three terminal semiconductor Bipolar Semiconductor devices.
C114.6	Understand and remember the operation of different types of FETs with its characteristics.

COURSE CONTENT (SYLLABUS)

UNIT I

JUNCTION DIODE CHARACTERISTICS AND SOME SPECIAL DIODES

Qualitative Theory of P-N Junction, Diode and its characteristics, Static and Dynamic resistances, Diode current equation, Temperature dependence of VI characteristic, Transition and Diffusion capacitances, Zener diode and its characteristics, Breakdown Mechanisms in Semi-Conductor (Avalanche and Zener breakdown) Diodes, Varactor Diode, LED, LCD and photo diode characteristics.

UNIT II

DIODE APPLICATIONS

Half wave and Full wave rectifiers and its comparisons. Inductor filter, Capacitor filter, L- section filter, π - section filter and comparison of various filter circuits, Application of a zener diode as a voltage regulator.

UNIT III

BIPOLAR JUNCTION TRANSISTOR

Principle of Operation, Common Emitter, Common Base and Common Collector Configurations, Volt-ampere characteristics of CB, CE and CC. Transistor current components, Transistor as a switch, switching times, BJT acts as an amplifier, Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations, Relation between Alpha, Beta and Gamma, Analysis of CE Amplifier, Comparison of CE,CB,CC configurations.

UNIT IV

BIASING AND STABILISATION

Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Bias, Self-Bias, Bias Stability, Stabilization Factors, Stabilization against variations in V_{BE} , I_{CO} and β , Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability.

UNIT V

FIELD EFFECT TRANSISTORS

Types-The Junction Field Effect Transistor (construction, principle of operation, symbol)- pinch -off Voltage -Volt -Ampere characteristics, FET small signal model, MOSFET (construction, principle of operation, symbol) MOSFET characteristics in enhancement and depletion modes.

TEXT BOOKS

1. Electronic Devices and Circuits- Jacob Millman, McGraw Hill Education
2. Electronic Devices and Circuits theory– Robert L. Boylestead, Louis Nashelsky, 11th Edition, 2009, Pearson
3. Integrated Electronics, Jacob Millman, Christos C Halkias, McGraw Hill Education.

REFERENCE BOOKS

1. The Art of Electronics, Horowitz, 3rdEdition Cambridge University Press
2. Electronic Devices and Circuits, David A. Bell – 5 th Edition, Oxford.
3. Pulse, Digital and Switching Waveforms –J. Millman, H. Taub and Mothiki S. Prakash Rao, 2Ed., 2008, McGraw Hill.

ONLINE RESOURCES

1. <https://nptel.ac.in/courses/115/102/115102014/>
2. <https://nptel.ac.in/courses/117/101/117101106/>
3. <https://www.coursera.org/learn/electronics>
4. https://onlinecourses.nptel.ac.in/noc20_ee77/preview
5. <https://www.classcentral.com/course/swayam-semiconductor-devices-and-circuits-19997>
6. <https://sggs.ac.in/wp-content/uploads/2020/08/SWAYAM-NPTEL-Equivalence-Courses-w.e.f.2020-21-Electronics.pdf>

E-BOOKS

1. <https://www.pdfdrive.com/basic-electronics-for-scientists-and-engineers-e28939124.html>

APPLIED CHEMISTRY LAB
I B.Tech., I-Sem.,

Course Title: Applied Chemistry Lab	Course Code: AS20-00BS03
Teaching Scheme (L:T:P): 0:0:3	Credits: 1.5
Type of Course: Practical	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Applied Chemistry	

COURSE OBJECTIVES:

The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

- Estimation of hardness in water to check its suitability for drinking purpose.
- Quantitative analysis of acids and bases by conductometric, potentiometric, and pH metric titrations.
- To determine the rate constant of reactions from concentrations as a function of time.
- The measurement of physical properties like adsorption and viscosity.
- To synthesize the drug molecules and check the purity of organic molecules by thin layer chromatographic (TLC) technique.

COURSE OUTCOMES:

CO#	Course Outcomes
C116.1	Ability to perform experiments illustrating the principles of chemistry relevant to the study of science and engineering.
C116.2	record the amount of hardness and chloride content in water and interpret the significance of its presence in water.
C116.3	Understand the kinetics of a reaction from a change in concentration of reactants or products as a function of time.
C116.4	Predict the significance of properties like adsorption, conductance, viscosity, P^H and Surface tension.
C116.5	demonstrate the technique of thin Layer Chromatography (TLC) and synthesize drug molecules widely used in industry.
C116.6	Demonstrate the ability to perform qualitative and quantitative analysis of a given chemical compound.

LIST OF EXPERIMENTS

1. Determination of total hardness of water by Complexometric method using EDTA
2. Estimation of alkalinity of a given water sample
3. Estimation of an HCl by Conductometric titrations
4. Estimation of HCl by Potentiometric titrations
5. Estimation of Iron using Standard $KMnO_4$.
6. Estimation of acid value of coconut oil.
7. Determination of viscosity of castor oil and ground nut oil by using Ostwald's viscometer.
8. Determination of surface tension of a give liquid using Stalagmometer
9. Synthesis of Aspirin
10. Thin layer chromatography calculation of R_f values. eg ortho and para nitro phenols
11. Estimation saponification value of a lubricant oil.
12. Preparation Nylon -6

Reference Books:

1. Senior practical physical chemistry, B.D. Khosla, A. Gulati and V. Garg (R. Chand & Co., Delhi)
2. An introduction to practical chemistry, K.K. Sharma and D. S. Sharma (Vikas publishing, N. Delhi)
3. Vogel's text book of practical organic chemistry 5TH edition
4. Text book on Experiments and calculations in Engineering chemistry – S.S. Dara.

Online Resources (SWAYAM/NPTEL/MOOCs/COURSERA):

1. http://www.cdeep.iitb.ac.in/webpage_data/nptel/Core%20Science/Engineering%20Chemistry%201/Course_home_Lec38.html
2. <http://vlabs.iitb.ac.in/vlab/labscs.html>
3. <https://www.vlab.co.in/broad-area-chemical-engineering>

Web Reference/E-Books:

S.No	Advanced concepts in syllabus	Website Referred
1	Determination of total hardness of water by Complexometric method using EDTA	http://www.cdeep.iitb.ac.in/webpage_data/nptel/Core%20Science/Engineering%20Chemistry%201/Course_home_Lec38.html
2	Estimation of alkalinity of a given water sample	
3	Estimation of an HCl by Conductometric titrations	http://www.cdeep.iitb.ac.in/webpage_data/nptel/Core%20Science/Engineering%20Chemistry%201/Course_home_Lec38.html
4	Estimation of HCl by Potentiometric titrations	http://www.cdeep.iitb.ac.in/webpage_data/nptel/Core%20Science/Engineering%20Chemistry%201/Course_home_Lec38.html
5	Estimation of Iron using Standard KMnO ₄ .	
6	Determination of acid value of coconut oil	https://www.youtube.com/watch?v=b1PbQ7jjVVM
7	Determination of viscosity of castor oil and ground nut oil by using Ostwald's viscometer.	https://labmonk.com/determination-of-viscosity-of-liquid-using-ostwald-viscometer
8	Determination of surface tension of a give liquid using Stalagmometer	https://www.youtube.com/watch?v=qyUyVrUb8Fo
9	Synthesis of Aspirin	https://chem.libretexts.org/Bookshelves/Ancillary_Materials/Laboratory_Experiments/Wet_Lab_Experiments/Organic_Chemistry_Labs/Experiments/1%3A_Synthesis_of_Aspirin_(Experiment) https://www.researchgate.net/publication/262911382_Alternative_Synthesis_of_Paracetamol_and_Aspirin_Under_Non-conventional_Conditions
10	Thin layer chromatography calculation of R _f values. eg ortho and para nitro phenols	https://dukee2020.com/product/thin-layer-chromatography-tlc.html?gclid=Cj0KCQjwnqH7BRDdARIsACTSAdso_n-qYZJu3D2d_QsJYQEkIz0TEmIK_zoGcEs3LnHr2184kX-GYDoMaAvWdEALw_wcB

PROGRAMMING FOR CRITICAL THINKING LAB
I B.Tech., I-Sem., (Common to CSM& AIDS)

Course Title: Programming for Critical ThinkingLab	Course Code: AS22-05ES04
Teaching Scheme (L:T:P): 0:0:3	Credits: 1.5
Type of Course: Practical	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Mathematics knowledge, Analytical and Logical skills	

COURSE OVERVIEW:

This course provides the fundamental concepts of programming using C language, apply the control structures, iterations statements, arrays, functions, strings, pointers, structures, unions and files. This course also explains the concepts of searching and sorting techniques in C language.

COURSE OBJECTIVE

- To learn the fundamentals of computers.
- To understand the various steps in program development.
- To learn the syntax and semantics of C programming language.
- To learn the usage of structured programming approach in solving problems.

COURSE OUTCOMES(S)

CO#	CourseOutcomes
C117.1	Develops algorithms for simple problems.
C117.2	Translate given algorithms to a working and correct program.
C117.3	Identifies and correct syntax errors as reported by the compilers.
C117.4	Identifies and correct logical errors encountered during execution.
C117.5	Demonstrates data operations using arrays, strings, structuresand pointers of different types
C117.6	Creates, reads and writes to and from simple text and binary files

COURSE CONTENT

Practice Sessions:

Week 1:

- Work on Linux Environment to create a C Program
- Write a C Program to display “Hello World”
- Write a C Program to display Your name 5 times.

Week 2:

- Write a C Program to read two numbers add them and display their sum.
- Write a C Program to read the radius of a circle, calculate its area and display it.
- Write a C Program read p, n, r and calculate Simple Interest.
- For Advanced Learners: Write a C Program to calculate Compound Interest.

Week 3:

- Write a C program to check whether a number is even or odd
- Write a C program to check and print whether a user is eligible to vote or not.

Conditions:

- Minimum age required for voting is 18.
- You can use decision making statement.

- Write a C program to check whether an alphabet is Vowel or Consonant
- Conditions:
- Create a character type variable with name of alphabet and take the value from the user. Use Conditional Statements to solve.

Week 4:

- Write a C program to check whether number is positive, negative or zero
- Conditions:
- Create variable with name of number and the value will be taken by user from console
- Create this c program code using else if ladder statement.
- Write a C program to calculate Electricity bill.
Conditions:
For first 50 units – Rs. 3.50/unit
For next 100 units – Rs. 4.00/unit
For next 100 units – Rs. 5.20/unit
For units above 250 – Rs. 6.50/unit

Week 5:

- Write a C Program to display 1 to 10 Numbers using while loop.
- Write a C Program to display even numbers below 20 using do..while loop.
- Write a C Program to display sum of 20 natural numbers using for loop.

Week 6:

- Write a C program to find cube of any number using function.
- Write a C program to find diameter, circumference and area of circle using functions.
- Write a C program to find maximum and minimum between two numbers using functions.
- Write a C program to check whether a number is even or odd using functions.

Week 7:

- Write a C Program to find the factorial of a given number using recursive function.
- Write a C Program to print the first 10 Natural Numbers using recursive function.
- Write a C Program to solve Towers of Hanoi Problem using recursive function.

Week 8:

- Write a C Program to take 5 values from the user and store them in an array and display the elements in the array.
- Write a C Program to read 10 values in an array and display all even numbers in the array.
- Write a C Program to read 5 floating values in an array and display the sum and average of the elements in it.

Week 9:

- Write a C Program to read elements into a 2 dimensional array and display them.
- Write a C Program to read two matrices and display their sum.
- Write a C Program to read two matrices and display their product.(Matrix Multiplication).

Week 10:

- Write a C program to find length of a string.
- Write a C program to copy one string to another string.

- Write a C program to concatenate two strings.
- Write a C program to check whether a given string is palindrome or not.

Week 11:

- Write a C program to find total number of alphabets, digits or special character in a string.
- Write a C program to count total number of vowels and consonants in a string.
- Write a short C program that declares and initializes (to any value you like) a double, an int, and a string. Your program should then print the address of, and value stored in, each of the variables. Use the format string "%u" to print the addresses as unsigned (32-bit non-negative) integers.

Hint: Remember that you can use the & character to find addresses.

Reminder: 1 byte = 8 bits, and a 32-bit integer requires the space of 4 bytes.

Week 12:

- Write a C program to store and print the roll no., name, age and marks of a student using structures.
- Write a C program to store the roll no. (Starting from 1), name and age of 5 students and then print the details of the student with roll no. 2.
- Write a C program to add, subtract and multiply two complex numbers using structures to function.
- Write a C Program to swap two strings(Call by Reference)

Week 13:

- Write a C program to read a text file and display the number of lines, spaces and words in a text files.
- Write a C Program to write a structure into a binary file, read and display the structure from it

TEXT BOOKS:

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition).
3. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.

REFERENCES BOOKS:

1. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression).
2. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
3. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition.

Online Resources (SWAYAM/NPTEL/MOOCs/COURSERA):

1. <http://nptel.ac.in/courses/106105085/>
2. <http://nptel.ac.in/courses/106106127/>

Web Reference/E-Books:

1. www.leetcode.com
2. www.thenewboston.com
3. www.codesdope.com

**ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB
I B.Tech., I-Sem.,**

Course Title: English Language And Communication Skills Lab	Course Code: AS22-00HS02
Teaching Scheme (L:T:P): 0:0:2	Credits: 1
Type of Course: Practical	Total Contact Periods: 32Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Basic knowledge of English language, Grammar, speaking skills, able to communicate in English language, vocabulary in different of situations	

COURSE OVERVIEW

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire language skills, the syllabus of English Language Communication Skills Lab has been designed to develop linguistic, communicative and critical thinking competencies of Engineering students.

In ELCS Lab the focus should be on the skills development in the areas of vocabulary, grammar, reading and speaking. For this, the teachers should use the prescribed Lab manual for detailed study. The students should be encouraged in improving communication skills in the lab. The time should be utilized for activity-based learning. The focus in this syllabus is on skill development, fostering ideas and practice of language skills in various contexts and cultures.

COURSE OBJECTIVES

- To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning
- To sensitize students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
- To train students to use language appropriately for public speaking and interviews
- To improve the fluency of students in spoken English and neutralize their mother tongue influence

COURSE OUTCOMES

CO#	Course Outcomes
C118.1	Learn how to pronounce words using phonetic transcription
C118.2	Improves collaborative skills and maximizes speaking skills
C118.3	Develops Neutralization of accent for intelligibility
C118.4	Understand the nuances of English language through audio- visual experience and group activities
C118.5	Neutralize their accent for intelligibility
C118.6	Speak with clarity and confidence which intern enhances their employability skills

COURSE CONTENT (SYLLABUS)

Syllabus: English Language and Communication Skills Lab (ELCS) shall have two parts:

- Computer Assisted Language Learning (CALL) Lab**
- Interactive Communication Skills (ICS) Lab**

Listening Skills:

Objectives

1. To enable students develop their listening skills so that they may appreciate the role in the LSRWs skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening, so that they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds, to be able to mark stress and recognize and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:

Objectives

1. To involve students in speaking activities in various contexts
 2. To enable students to express themselves fluently and appropriately in social and professional contexts
- Oral practice
 - Describing objects/situations/people
 - Roleplay – Individual/Group activities
 - Just A Minute (JAM) Sessions

The following course content is prescribed for the **English Language and Communication Skills Lab.**

Exercise I

CALLLab:

Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers- Effective Listening. *Practice:* Introduction to Phonetics – Speech Sounds – Vowels and Consonants – Minimal Pairs- Consonant Clusters- Past Tense Marker and Plural Marker- *Testing Exercises*

ICSLab:

Understand: Spoken vs. Written language- Formal and Informal English. *Practice:* Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave – Introducing Oneself and Others.

Exercise II

CALLLab:

Understand: Structure of Syllables – Word Stress – Weak Forms and Strong Forms – Stress pattern in sentences – Intonation.

Practice: Basic Rules of Word Accent- Stress Shift- Weak Forms and Strong Forms- Stress pattern in sentences – Intonation - *Testing Exercises*

ICSLab:

Understand: Features of Good Conversation – Strategies for Effective Communication.

Practice: Situational Dialogues – Role Play- Expressions in Various Situations – Making Requests and Seeking Permissions- Telephone Etiquette.

Exercise III

CALLLab:

Understand: Errors in Pronunciation- Neutralising Mother Tongue Interference (MTI).

Practice: Common Indian Variants in Pronunciation –

Differences between British and American Pronunciation- *Testing Exercises*

ICSLab:

Understand: Descriptions- Narrations- Giving Directions and Guidelines – Blog Writing

Practice: Giving Instructions – Seeking Clarifications – Asking for and Giving Directions –

Thanking and Responding – Agreeing and Disagreeing – Seeking and Giving Advice – Making Suggestions.

Exercise IV CALL Lab:

Understand: Listening for General Details.

Practice: Listening Comprehension Tests - Testing Exercises

ICSLab:

Understand: Public Speaking – Exposure to Structured Talks - Non-verbal Communication - Presentation Skills.

Practice: Making a Short Speech – Extempore - Making a Presentation.

Exercise V CALL Lab:

Understand: Listening for Specific Details.

Practice: Listening Comprehension Tests - Testing Exercises

ICSLab:

Understand: Group Discussion

Practice: Group Discussion

TEXT BOOKS

A Textbook of English phonetics for Indian students by [T. Balasubramanian](#)

1. ELCS LAB Manual- A workbook for CALL and ICS Lab Activities, by Orient Black Swan
2. Group Discussion and Interview Skills by [Priyadarshi Patnaik](#)
3. Intonation in Context Student's Book: Intonation Practice for Upper- Intermediate and Advanced Learners of English by [Barbara Bradford](#) and [David Brazil](#) (Editor)

REFERENCE BOOKS

1. (2022). *English Language Communication Skills – Lab Manual cum Workbook*. Cengage Learning India Pvt. Ltd.
2. Shobha, KN & Rayen, J. Lourdes. (2019). *Communicative English – A workbook*. Cambridge University Press
3. Kumar, Sanjay & Lata, Pushp. (2019). *Communication Skills: A Workbook*. Oxford University Press
4. Board of Editors. (2016). *ELCS Lab Manual: A Workbook for CALL and ICS Lab Activities*. Orient Black Swan Pvt. Ltd.
5. Mishra, Veerendra et al. (2020). *English Language Skills: A Practical Approach*. Cambridge University Press.

ONLINE RESOURCES

Practice English Your Own- <https://www.immigratemanitoba.com/alt/practise-english-on-your-own.pdf>

E-BOOKS

1. <https://scholar.harvard.edu/files/adam/files/phonetics.ppt.pdf>
2. <https://gdpi.hitbullseye.com/MBA/free-ebooks.php>
3. <https://www.mbarendezvous.com/pdf/GroupDiscussionEbook.pdf>
4. https://www.ldsassoc.com/wp-content/uploads/2019/04/intonation_e-book.pdf
5. https://www.teachingenglish.org.uk/sites/teacheng/files/TeachingSpeaking_4_stressintonation_v01.pdf

**B. Tech.,
FIRST YEAR
SECOND SEMESTER
SYLLABUS**

**ADVANCED CALCULUS AND VECTOR CALCULUS
I B.Tech., II-Sem., (Common to CSE, IT, CSM, AIDS & CSG)**

Course Title: Advanced Calculus and Vector Calculus	Course Code: AS22-00BS07
Teaching Scheme (L:T:P): 4:0:0	Credits: 4
Type of Course: Lecture + Tutorial	Total Contact Periods: 64Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Knowledge on Derivatives, Integrations, Functions	

COURSEOBJECTIVES

- Geometrical approach to the mean value theorems.
- Partial differentiation, concept of total derivative. Finding maxima and minima of function of Several variables.
- Evaluation of multiple integrals and their applications.
- The physical quantities involved in engineering field related to vector valued functions.
- The basic properties of vector valued functions and their applications to line, surface and volume integrals.

COURSEOUTCOMES

CO#	Course Outcomes
C121.1	Describe the applications of the mean value theorems.
C121.2	Categorize the extreme values of functions of two variables with constraints and without constraints.
C121.3	Analyze and apply the concept of multiple integrals to find areas, volumes.
C121.4	Acquires various skills pertaining to differential and vector calculus and apply them in different fields of Engineering.
C121.5	Define Directional Derivative and Scalar Potential Function.
C121.6	Evaluate the line, surface and volume integrals and convert them from one to another.

COURSECONTENT(SYLLABUS)

UNIT-I: SINGLE VARIABLE CALCULUS

Mean value theorems (all the theorems without proof): Rolle's Theorem, Lagrange's Mean value theorem with their Geometrical Interpretation, Cauchy's Mean value Theorem. Taylor's Series and Maclaurin's Series.

UNIT-II: MULTI VARIABLE CALCULUS

Partial Differentiation; Euler's Theorem; Total derivative; Jacobian; Functional dependence & independence, Maxima and minima of functions of two variables with constraints, without constraints; method of Lagrange's Multipliers.

UNIT III: MULTIPLE INTEGRALS

Evaluation of Double Integrals (Cartesian and Polar); Change of Variables (Cartesian to Polar); Change of Order of Integration (Cartesian form); Areas and Volumes by Double Integrals. Triple Integrals (Cartesian form).

UNIT IV: VECTOR DIFFERENTIATION

Vector Point Function; Scalar Point function; Gradient of a scalar function; Divergent; Curl of a Vector point function; Solenoidal, Irrotational Vector point functions; Directional Derivative; Angle between two Surfaces; Scalar Potential Function.

UNIT V: VECTOR INTEGRATION

Line Integral; Surface Integral; Volume Integral; Green's Theorem; Gauss's Divergence Theorem; Stoke's Theorem (without proofs) and Applications.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 42nd Edition, 2010.
2. S.R.K. Iyengar and R.K.Jain, Advanced Engineering Mathematics, Narosa Publishing House, 5th Edition, 2016.

References Books:

1. Dr. M.D. Rai Singhania, Ordinary and Partial Differential Equations, S.Chand and Company Ltd., 18th Edition, 2008.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, John Wiley & Sons, 2011.
3. Murray R.Spiegel, Seymour Lipschutz, Dennis Spellman, Vector Analysis: Schaum's Outlines Series, Tata McGrawHill, 2nd Edition, 2009.

APPLIED PHYSICS
I B.Tech., II- Sem.,

Course Title: Applied Physics	Course Code: AS22-00BS11
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs +16Hrs
Continuous Internal Evaluation-30 Marks	Semester End Exams-70 Marks
Prerequisites: <ul style="list-style-type: none"> • The student must have basic knowledge of units and dimension of physical quantities, principles of mechanics and laws of optics. • The student must be aware of basics of waves and oscillations, fundamental principles of electromagnetic theory. • The student must have fundamental knowledge of mathematical concepts like vector algebra, integration and differentiation. 	

Course Overview:

This course deals with quantum principles and explore their applications in studying the behavior of fundamental entities of atom. It deals with semiconductor devices which are employed in designing electronic systems and in communication field. It deals with the fundamental properties of dielectric and magnetic materials and explore their application in all engineering streams. Also, it introduces to the concept of Quantum computing

Course Objective

1. Understand the basic principles of quantum physics and band theory of solids.
2. Understand the underlying mechanism involved in construction and working principles of various semiconductor devices.
3. Study the fundamental concepts related to the dielectric materials.
4. Study the fundamental concepts related to the magnetic and superconducting materials
5. Identify the importance of nanoscale, quantum confinement and various fabrications techniques.
6. Study the characteristics of lasers and optical fibres.

Course Outcomes(s)

CO#	Course Outcomes
C122.1	Understand physical world from fundamental point of view by the concepts of Quantum mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
C122.2	Identify the role of semiconductor devices in science and engineering Applications.
C122.3	Explore the fundamental properties of dielectrics and their applications.
C122.4	Explore the fundamental properties of magnetic, superconductivity materials and their applications.
C122.5	Appreciate the features and applications of Nanomaterials.
C122.6	Understand various aspects of Lasers and Optical fiber and their applications in diverse fields.

COURSE CONTENT (SYLLABUS)

UNIT-I:QUANTUMPHYSICSANDSOLIDS

Quantum Mechanics: Introduction to quantum physics, - photoelectric effect- deBroglie hypothesis - Davisson and Germer experiment – Heisenberg uncertainty principle- Born interpretation of the wavefunction – time independent Schrodinger wave equation – particle in one dimensional potential box.

Solids: Symmetry in solids, free electron theory (Drude & Lorentz, Sommerfeld)- Fermi-Dirac distribution - Bloch's theorem - Kronig-Penney model – E-K diagram- effective mass of electron- origin of energy bands- classification of solids.

UNIT-II:SEMICONDUCTORSANDDEVICES

Intrinsic and extrinsic semiconductors – Hall effect - direct and indirect band gap semiconductors -

construction, principle of operation and characteristics of P-N Junction diode, Zener diode and bipolar junction transistor (BJT) – LED, PIN diode, avalanche photodiode (APD) and solar cells, their structure, materials, working principle and characteristics.

UNIT-III: DIELECTRIC, MAGNETIC AND SUPERCONDUCTING MATERIALS

Dielectric Materials: Basic definitions - types of polarizations (qualitative) - ferroelectric, piezoelectric, and pyroelectric materials - applications - liquid crystal displays (LCD) and crystal oscillators.

Magnetic Materials: Hysteresis - soft and hard magnetic materials - magnetostriction, magnetoresistance - applications - bubble memory devices, magnetic field sensors and multiferroics Superconductors: Introduction, Meissner effect, type - I and type - II Superconductors, Applications of Superconductors

UNIT-IV: NANOTECHNOLOGY

Nanoscale, quantum confinement, surface to volume ratio, bottom-up fabrication: sol-gel, precipitation, combustion methods - top-down fabrication: ball milling - physical vapor deposition (PVD) - chemical vapor deposition (CVD) - characterization techniques - XRD, SEM & TEM - applications of nanomaterials.

UNIT-V: LASER AND FIBEROPTICS

Lasers: Laser beam characteristics - three quantum processes - Einstein coefficients and their relations - lasing action - pumping methods - ruby laser, He-Ne laser, CO₂ laser, Argon ion Laser, Nd:YAG laser - semiconductor laser - applications of laser.

Fiber Optics: Introduction to optical fiber - advantages of optical Fibers - total internal reflection - construction of optical fiber - acceptance angle - numerical aperture - classification of optical fibers - losses in optical fiber - optical fiber for communication system - applications.

TEXTBOOKS:

1. M.N. Avadhanulu, P.G. Kshirsagar & TVS Arun Murthy "A Textbook of Engineering Physics" - S.Chand Publications, 11th Edition 2019.
2. Engineering Physics by Shatendra Sharma and Jyotsna Sharma, Pearson Publication, 2019
3. Semiconductor Physics and Devices - Basic Principle - Donald A. Neamen, McGraw Hill, 4th Edition, 2021.
4. B.K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning, 2nd Edition, 2022.
5. Essentials of Nanoscience & Nanotechnology by Narasimha Reddy Katta, Typical Creatives NANODIGEST, 1st Edition, 2021.

REFERENCE BOOKS:

1. Quantum Physics, H.C. Verma, TBS Publication, 2nd Edition 2012.
2. Fundamentals of Physics - Halliday, Resnick and Walker, John Wiley & Sons, 11th Edition, 2018.
3. Introduction to Solid State Physics, Charles Kittel, Wiley Eastern, 2019.
4. Elementary Solid State Physics, S.L. Gupta and V. Kumar, Pragathi Prakashan, 2019.
5. A.K. Bhandhopadhyaya - Nano Materials, New Age International, 1st Edition, 2007.

Online Resources (SWAYAM/NPTEL/MOOCs/COURSERA):

1. https://onlinecourses.nptel.ac.in/noc20_ph24/preview
2. https://onlinecourses.nptel.ac.in/noc20_ph16/preview
3. <https://www.coursera.org/learn/semiconductor-physics>
4. https://onlinecourses.nptel.ac.in/noc21_cs103/preview
5. <https://www.coursera.org/lecture/leds-semiconductor-lasers/active-optical-devices-specialization-introduction-0jner>

Web Reference/E-Books:

1. <https://ocw.mit.edu/courses/physics/8-231-physics-of-solids-i-fall-2006/download-course-materials/>
2. <http://web.mit.edu/6.732/www/texts.html>
3. <https://nptel.ac.in/courses/115/105/115105099/>
4. <https://nptel.ac.in/courses/115/104/115104109/>

DATA STRUCTURES
I B.Tech., II-Sem.,

Course Title: Data Structures	Course Code: AS22-05ES07
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Programming for Problem Solving	

COURSE OVERVIEW

This course will deliver the knowledge in introducing the concepts of various data structures such as linked lists, stacks, queues, trees and graphs along with their applications.

COURSE OBJECTIVES

- To understand the basic concepts such as linear and non-Linear data structures.
- To understand the notations used to analyze the Performance of algorithms.
- To understand the behavior of data structures such as stacks, queues, trees, hash tables, search trees, Graphs and their representations.
- To choose an appropriate data structure for a specified application.
- To understand and analyze various searching and sorting algorithms.
- To learn how to implement lists, stacks, queues, trees, graphs, search trees in C to solve problems

COURSE OUTCOMES

CO#	Course Outcomes
C123.1	Explain basic concepts of algorithms and Asymptotic Notations
C123.2	Explain basic concepts of Data Types, Linear and Non-Linear Data structures.
C123.3	Explain Non-Linear Data structures like trees and graphs.
C123.4	Implements and know the application of algorithms for sorting.
C123.5	Understand and implement Searching and Sorting Techniques.
C123.6	Design programs using a variety of data structures, including Binary and general tree structures, search trees.

COURSECONTENT(SYLLABUS)

UNIT - I

Introduction to Data Structures: Data Structures Operations, What is an Algorithm, Importance of Time Complexity and Space Complexity, Mathematical Notations and Functions, Algorithmic **Notations:** Complexity of Algorithms, Omega Notation, Theta Notation, Little oh Notation, Explaining notations on Linear Search and Binary Search operations.

UNIT-II

Introduction to Linear Data Structures: Arrays, Representation of linear array in memory, Traversing Linear array, Inserting and Deleting elements in the array.

Sorting and Searching Techniques: Sorting Techniques – Selection Sort, Bubble Sort, Recursive Bubble Sort, Insertion Sort, Merge Sort, Quick Sort, , Searching(Linear Search, Binary Search),.

UNIT-III

Linked Lists: Introduction to Linked List, Representation of Linked List in memory. Traversing a Linked List, Searching a Linked list.

Operations on Linked Lists: Algorithms to insert nodes into a linked list, Inserting – at the beginning of a list, Inserting – after a given node, Inserting – Into a sorted Linked list, Algorithms to delete a node from a linked list, Deleting – a node following a given node, Deleting – a node with a given item of information,

Circular Linked List

UNIT-IV

Stacks: Introduction to Stacks, Array Representation of Stacks, Linked Representation of Stacks, Arithmetic Expression, Polish Notations, Evaluation of a Postfix expression, transforming infix expression into Postfix conversion of an expression, Importance of Stacks and Recursion, Solving Towers of Hanoi Problem.

Queues: Introduction to Queues, Representation of Queues, Linked Representation of Queues, DeQueues, Priority Queues, Circular Queues.

UNIT-V

Trees : Introduction to Binary Trees, Complete Binary Tree, Extended Binary Tree, Representing Binary Trees in memory. Linked Representation of Binary Tree. Sequential Representation of Binary Tree, Traversal Techniques. Binary Search Tree – operations (Insert, delete, search, traversal), AVL Trees – operations (Insert, delete, search, traversal).

Graphs : graph Representations, Graph Traversal techniques- BFS & DFS.

Text Books

1. Data structures, Seymour Lipschutz, Tata McGRAW Hill.
2. C and Data Structures, Ashok N. Kamthane, Pearson Education.

References Books:

1. Classic Data Structures, D. Samanta, 2nd edition, PHI.
2. C Programming and Data Structures, Balagurusamy, Tat McGRAW Hill.

OnlineResources(SWAYAM/NPTEL/MOOCs/COURSERA):

1. <https://www.coursera.org/learn/data-structures>
2. <https://www.coursera.org/specializations/data-structures-algorithms>
3. <http://nptel.ac.in/courses//data-structures>

WebReference/E-Books:

- <http://gvpcse.azurewebsites.net/pdf/data.pdf>
- <http://www.sncwgs.ac.in/wp-content/uploads/2015/11/Fundamental-Data-Structures.pdf>
- <http://www.learnerstv.com/Free-Computer-Science-Video-lectures-ltv247-Page1.htm>
- <http://nptel.ac.in/courses/106102064/1>

BASIC ELECTRICAL ENGINEERING
I B.Tech.,II-Sem.,

Course Title: Basic Electrical Engineering	Course Code: AS22-02ES01
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Basics of Physics and Mathematics	

COURSE OVERVIEW

Electrical engineering principles are taught in this course. Topics include circuit theory, alternating current theory, DC Machines, induction, motors, Synchronous Machine, cabling, batteries and Switches.

COURSE OBJECTIVES

- To introduce the concepts of electrical circuits and its components
- To understand DC circuits and AC single phase & three phase circuits
- To study and understand the different types of DC/AC machines and Transformers.
- To impart the knowledge of various electrical installations.

COURSE OUTCOMES

CO#	Course Outcomes
C124.1	Understand the basic concepts of Electrical Circuits.
C124.2	Study various concepts in AC circuits
C124.3	Discuss the concepts of DC Machines and BLDC Motor.
C124.4	Discuss the concepts of transformer, Induction motor and Synchronous machines
C124.5	Describe the operation of different types of cables, wires and batteries.
C124.6	understand the Performance of different protecting equipment 's like MCB, FUSE.

COURSECONTENT(SYLLABUS)

UNIT-I: D.C. CIRCUITS

Electrical circuit elements R, L and C, voltage and current sources, Kirchhoff's laws, analysis of simple circuits with DC excitation. Theorems-Superposition theorem, Thevenin 's theorem and Norton's Theorem, Maximum Power Transfer Theorem.

UNIT-II: A.C. CIRCUITS

Representation of sinusoidal waveform, phasor representation, peak and RMS values, power triangle, power factor, Analysis of single-phase AC circuits consisting of RLC combinations, Three-phase balanced circuits. Line and phase (V-I) relations in 3 phase balanced circuits. star and delta connections.

UNIT-III: DC MACHINES

DC Generators: Constructional details and working of DC Generator, Methods of excitation and Applications.

DC Motors: Principle of operation, speed control of shunt excited DC motor. Applications of various DC motors.

BLDC Motors: Principle of operation, Applications

UNIT-IV: TRANSFORMERS AND INDUCTION MOTORS

Transformers: construction and working Principle of transformer, losses and efficiency.

Induction motors: construction and working Principle of three phase induction motor and its applications

Synchronous Generator: Construction and working of synchronous generator and its applications.

UNIT-V: ELECTRICAL INSTALLATIONS

Components of LT Switchgear: Fuse-Need of Fuse, Fuse element materials. Circuit breaker, MCB, ELCB, MCCB. Types of Wires and Cables, Need of Earthing and its types.

Batteries: Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption and battery backup.

Text Books:

1. Basic Electrical Engineering, A. Chakrabarti, S. Debnath, Tata McGraw Hill, 2012.
2. Basic Electrical Engineering - D.P. Kothari and I.J. Nagrath, 3rd edition 2010, Tata McGraw Hill.

References Books:

1. L.S. Bobrow, Fundamentals of Electrical Engineering, Oxford University Press, 2011
2. Electrical and Electronics Technology, E. Hughes, 10th Edition, Pearson, 2010
3. Principle of Electrical Engineering, V.K Mehta, R. Mehta, S. Chand Limited, 2011.
4. Electrical Engineering Fundamentals, Vincent Deltoro, Second Edition, Prentice Hall India, 1989.

Online Resources (SWAYAM/NPTEL/MOOCs/COURSERA):

1. NPTEL Videos on Course —Basic Electrical Technology Co-ordinated by IISc Bangalore.
Link: <https://nptel.ac.in/courses/108/108/108108076/>
2. NPTEL Videos on Course —Basic Electrical Technology Co-ordinated by IIT Kharagpur.
Link: <https://nptel.ac.in/courses/108/105/108105053/>

Web Reference/E-Books:

1. Basic Electrical Engineering By U.A.Bakshi, V.U.Bakshi · 2009
Link: https://www.google.co.in/books/edition/Basic_Electrical_Engineering/Pp47n-yyVEYC?hl=en&gbpv=1&dq=basic+electrical+engineering+books&printsec=frontcover
2. Basic Electrical Engineering By Chakrabarti · 2009
https://www.google.co.in/books/edition/Basic_Electrical_Engineering/KuJ44LVAAK4C?hl=en&gbpv=1&dq=basic+electrical+engineering+books&printsec=frontcover
3. Basic Electrical Engineering By R. K. Rajput · 2009
https://www.google.co.in/books/edition/Basic_Electrical_Engineering/NamQz0aZMukC?hl=en&gbpv=1&dq=basic+electrical+engineering+books&printsec=frontcover

**APPLIED PHYSICS LAB
I B.Tech., II-Sem.,**

Course Title: Applied Physics Lab	Course Code: AS22-00BS12
Teaching Scheme (L:T:P): 0:0:3	Credits: 1.5
Type of Course: Practical	Total Contact Periods: 48Hrs
Continuous Internal Evaluation-30 Marks	Semester End Exams-70 Marks
Prerequisites: The student must know the usage of basic tools for measurement of physical quantities, knowledge of error analyses, types of errors, principles of optics, mechanics, waves and Oscillations	

Course Overview:

The course deals with experiments in various fields of physics such as Wave Optics, Wave mechanics, Electronics, Electricity and Magnetism.

Course Objective

1. To determine the work function of given material
2. To explore the characteristics of semiconductors and optoelectronic devices.
3. To classify the semiconductor materials into p-type or n-type semiconductor and study the V-I characteristics of Diode and BJT
4. To study the dielectric constant and B-H curve
5. To determine the properties of LASERs and optical fibers
6. To identify the method of least squares fitting

Course Outcomes(s)

CO#	Course Outcomes
C125.1	Evaluate work Function of a photo metal using photo electric effect.
C125.2	Analyze the V-I characteristics of Solar cell and LED.
C125.3	Identify the type of semiconductor using Hall Effect and study the V-I characteristics of Diodes and BJT
C125.4	Estimate the dielectric constant and plot the B-H curve
C125.5	Estimate the light gathering ability and beam divergence of the given LASER.
C125.6	Compute the least square fitting with torsional pendulum

COURSE CONTENT (SYLLABUS)

The students have to perform any eight of the following experiments

1. Photoelectric effect: To determine the work function of given material.
2. Solar Cell: To study V-I Characteristics of Solar Cell.
3. Energy Gap: To determine the energy gap of a given Semiconductor.
4. Hall Effect: To determine Hall voltage and Hall Coefficient of given semiconductor material.
5. V-I characteristics of a p-n junction diode and Zener diode
6. LED: To study the V-I characteristics of LED.
7. Input and output characteristics of BJT (CE, CB & CC configurations)
8. Determination of dielectric constant of a given material
9. Study B-H curve of a magnetic material.
10. LCR Circuit: To study the frequency response of LCR series and parallel resonance circuit.
- 11.A) Determination of the beam divergence of the given LASER beam
B) Determination of Acceptance Angle and Numerical Aperture of an optical fiber.
12. Understanding the method of least squares – torsional pendulum as an example

References Books:

1. S. Balasubramanian, M.N. Srinivasan “A Text book of Practical Physics”- S Chand Publishers,2017.
2. Practical physics by Dr. Aparna, V.G.S.publications.
3. Physics practical lab manual –SPEC

Online Resources

1. <https://nptel.ac.in/courses/115/105/115105120/>
2. <https://nptel.ac.in/courses/115/105/115105110/>
3. <https://nptel.ac.in/courses/115/105/115105121/>
4. <https://www.futurelearn.com/courses/teaching-practical-science-physics>

<https://www.vlab.co.in/broad-area-physical-sciences>

DATA STRUCTURES LAB
I B.Tech., II-Sem., (Common to CE, EEE, CSE, IT, CSM, CSG& AIDS)

Course Title: Data Structures Lab	Course Code: AS22-05ES08
Teaching Scheme (L:T:P): 0:0:3	Credits: 1.5
Type of Course: Practical	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Mathematics Knowledge, Analytical and Logical skills	

COURSE OVERVIEW

This course will deliver the knowledge in introducing the concepts of various data structures such as linked lists, stacks, queues, trees and graphs along with the applications.

COURSE OBJECTIVES

- Covers various concepts of C programming language
- Introduces searching and sorting algorithms
- Provides an understanding of data structures such as stacks and queues
- Implementing all data structures covered in the theory.

CO#	Course Outcomes
C126.1	Develop C programs for real time applications using basic elements like control statements, arrays, functions pointers and string.
C126.2	Understands the importance of Linear data structures like stacks and queues.
C126.3	Understands the importance of Non-Linear data structures like trees and graphs.
C126.4	understands the applications of algorithms for sorting.
C126.5	implements various search techniques.
C126.6	Implements the various data structures.

COURSE CONTENT (SYLLABUS)

1. Write a program that uses functions to perform the following operations on singly linked list.
 - i) Creation ii) Insertion iii) Deletion iv) Display
2. Write a program that uses functions to perform the following operations on doubly linked list.
 - i) Creation ii) Insertion iii) Deletion iv) Display
3. Write a program that uses functions to perform the following operations on circular linked list.
 - i) Creation ii) Insertion iii) Deletion iv) Display
4. Write a program that implement stack (its operations) using
 - i) Arrays ii) Pointers
5. Write a program that implement Queue (its operations) using
 - i) Arrays ii) Pointers
6. Write a program that implements the following sorting methods to sort a given list of integers in ascending order
 - i) Bubble sort ii) Selection sort iii) Insertion sort
7. Write a program that use both recursive and non-recursive functions to perform the following searching operations for a Key value in a given list of integers:
 - i) Linear search ii) Binary search (Recursive and Non-Recursive)
8. Write a C program to perform Binary Search Tree operations (Insertion, Deletion, Traversal)
9. Write a C program to perform AVL Tree operations
10. Write a C Program to perform Graph Traversal Techniques – BFS and DFS.

TEXTBOOKS:

1. Data Structures, Seymour Lipzchutz, Tata McGRAW Hill.
2. Fundamentals of Data Structures in C, 2nd Edition, E.Horowitz, S.Sahni and Susan Anderson Freed, Universities Press.
3. Data Structures using C–A.S.Tanenbaum, Y.Langsam, and M.J.Augenstein, PHI/Pearson Education.

REFERENCEBOOKS:

1. DataStructures:APseudocodeApproachwithC,2nd Edition,
2. R.F.GilbergandB.A.Forouzan,CengageLearning.

ENGINEERING GRAPHICS THROUGH AUTO CAD PRACTICE

I B.Tech., II-Sem.,

Course Title: Engineering Graphics Through Auto CAD Practice	Course Code: AS22-03ES01
Teaching Scheme (L:T:P): 0:0:4	Credits: 2
Type of Course: Practical	Total Contact Periods: 64Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Nil	

COURSE OVERVIEW

Engineering graphics & Design has a well-defined set of standards by which technical drawings are produced. This course teaches the language of engineering graphics from basic sketching through 3-D solid modeling using computer aided design (CAD) software AutoCAD.

COURSE OBJECTIVES

The objectives of this course are to

- To know the conventions used in Engineering Drawing and comprehend the tools to be used in AutoCAD software.
- To understand the importance of engineering curves.
- To learn to use the orthographic projections for points, lines, planes and solids in different positions.
- To make the students draw the projections of the sections of solids and development of surfaces.
- To understand the isometric projections.
- To create simple solid models of various domain applications.

COURSE OUTCOMES

CO#	Course Outcomes
C127.1	Apply the concepts of engineering curves in construction using AutoCAD.
C127.2	Solve the problem of projections of points and lines, in different positions using AutoCAD.
C127.3	Solve the problem of projections of planes and solids in different positions using AutoCAD.
C127.4	Solve the problems of Projections of sections of solids and development of surfaces and its positions using AutoCAD.
C127.5	Solve the problems on Conversion of Isometric Views to Orthographic Views Conventions using AutoCAD.
C127.6	Solve the problems on Orthographic Projections and its conversions using AutoCAD.

COURSECONTENT(SYLLABUS)

Introduction to AutoCAD Software: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line, The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

UNIT I:

Introduction to Engineering Drawing: Principles of Engineering drawing and their significance, Conventions, Drawing Instruments.

Engineering Curves: Construction of Ellipse, Parabola and Hyperbola – General and Special methods; Cycloidal curves- Epicycloids and Hypocycloids.

UNIT II:

Orthographic Projections, Projections of Points & Straight Lines: Principles of Orthographic Projections – Conventions; Projections of Points in all positions; Projections of lines inclined to both the planes.

Projections of Planes: Projections of Planes- Surface Inclined to both the Planes.

UNIT III:

Projections of Regular Solids: Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method.

UNIT IV:

Projection of Sections of Solids and Development of Surfaces: Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids, cylinders and cones.

UNIT V:

Isometric Projections and Transformations: Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and Compound Solids. Vice-versa, Conventions.

Text Books:

- 1.Engineering Drawing, N. D. Bhatt, 53rd Edition, Charotar Publishing House, 2016.
- 2.Textbook on Engineering Drawing, K. L. Narayana & P. Kannaiah, SciTech Publishers, 2010.
- 3.Engineering Drawing and Computer Graphics, M. B. Shah & B. C. Rana, Pearson Education, 2010.
- 4.Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education.
- 5.Engineering graphics and design, Pradeep Jain, A.P Gautam and Ankitha Maheshwari.

References Books:

- 1.Mastering AutoCAD 2019 and AutoCAD LT 2019, George Omura and Brian C. Benton (Auto CAD 2019), 1st Edition, John Wiley & Sons, Indianapolis, Indiana.
- 2.AutoCAD Software Theory and User Manuals.
- 3.Engineering Design, George E.Dieter,LindaC.Schmidt/third edition.
- 4.Engineering Drawing and design, CencellJonson,JayD.Helsel,DennisR.Short.

Online Resources (SWAYAM/NPTEL/MOOCs/COURSERA):

- 1.<https://nptel.ac.in/courses/112/103/112104019/>
- 2.<https://nptel.ac.in/courses/112/104/112104172/>

Web Reference/E-Books:

- 1.<http://nptel.ac.in/courses/112104019>
- 2.<http://www.me.umn.edu/courses/me2011/handouts/drawing/blanco-tutorial.html>
- 3.https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/env_health_science_students/engineeringdrawing.pdf

ENGINEERING PRACTICES

I B.Tech., II-Sem.,

Course Title: Engineering Practices	Course Code: AS22-03ES03
Teaching Scheme (L:T:P): 0:0:4	Credits: 2
Type of Course: Practical	Total Contact Periods: 64Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Nil	

COURSE OVERVIEW

Mechanical Engineering Practices is a place where students acquire knowledge on the operation of various processes involved in manufacturing and production. The Workshop Practice course makes students competent in handling practical work in engineering environment.

COURSE OBJECTIVES

The objectives of this course are to

- To Study of different hand operated power tools, uses and their demonstration.
- To gain a good basic working knowledge required for the production of various engineering products.
- To provide hands on experience about use of different engineering materials, tools, equipment's and processes those are common in the engineering field.
- To develop a right attitude, team working, precision and safety at work place.
- It explains the construction, function, use and application of different working tools, equipment and machines.
- To have practical exposure to various welding and joining processes.
- Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.

COURSE OUTCOMES

CO#	Course Outcomes
C128.1	Study and practice on machine tools and their operations.
C128.2	Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding.
C128.3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
C128.4	Apply basic electrical engineering knowledge for house wiring practice.
C128.5	Fabricate the given material to desired product in a particular pattern by tin smithy.
C128.6	Mould the component to desired pattern and shape by black smithy.

COURSE CONTENT(SYLLABUS)

At least two exercises from each trade:

1. TRADES FOR EXERCISES

Carpentry – (T-Lap Joint, Dovetail Joint, Mortise & Tenon Joint).

Fitting – (V-Fit, Dovetail Fit & Semi-circular fit).

Tin-Smithy – (Square Tin, Rectangular Tray & Conical Funnel).

Foundry – (Preparation of Green Sand Mould using Single Piece and Split Pattern).

Welding Practice – (Arc Welding & Gas Welding).

House-wiring – (Parallel & Series, Two-way Switch and Tube Light).

Black Smithy – (Round to Square, Fan Hook and S-Hook).

2. TRADES FOR DEMONSTRATION & EXPOSURE

Plumbing, Machine Shop, Metal Cutting (Water Plasma), Power tool in construction and Wood Working.

TEXT BOOKS

1. Workshop Practice /B. L. Juneja / Cengage
2. Workshop Manual / K. Venugopal / Anuradha.

REFERENCE BOOKS

1. Work shop Manual - P. Kannaiah/ K. L. Narayana/ SciTech
2. Workshop Manual / Venkat Reddy/ BSP.

ONLINE RESOURCES

1. <https://nptel.ac.in/courses/112/107/112107145/>
2. <https://nptel.ac.in/courses/112/107/112107144/>

E-BOOKS

1. https://books.google.co.in/books/about/MECHANICAL_WORKSHOP_PRACTICE.html?id=rHhJlb-ye4C
2. <https://www.youtube.com/watch?reload=9&v=4gpjof5ESKQ>

**B. Tech.,
SECOND YEAR
FIRST SEMESTER
SYLLABUS**

PROBABILITY AND STATISTICS
II B.Tech., I-Sem., (Common to CSE, IT, AIML)

Course Title: Probability and Statistics	Course Code: AS22-00BS09
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Probability in mathematics	

Course Objectives: To Learn

- The ideas of probability and random variables.
- The various discrete probability Distributions and continuous probability distributions their properties.
- Testing of hypothesis for large samples of few unknown statistical parameters.
- Testing of hypothesis for sample samples of few unknown statistical parameters
- Estimate the relation between the variables using correlation and regression

Course Outcomes

CO#	Course Outcomes
C211.1	Formulate and solve problems involving random variables.
C211.2	Apply Statistical methods for analysing experimental data by probability distributions
C211.3	Identify various discrete and continuous probability distributions and their properties.
C211.4	Examine the statistical hypothesis for large samples.
C211.5	Examine the statistical hypothesis for small samples.
C211.6	Evaluation of correlation and regression and Estimate relation between variables.

COURSE CONTENT (SYLLABUS)

UNIT - I: RANDOM VARIABLES

Random variables: Discrete Random Variable; Continuous Random variables.

Expectation of Random Variables: Variance of Random variables.

UNIT - II: PROBABILITY DISTRIBUTIONS

Discrete Probability Distributions:

Binomial Distributions, Poisson Distributions, Evaluation of statistical parameters for these distributions; Continuous Probability Distributions: Normal Distribution, Evaluation of statistical parameters of these Distributions

UNIT - III: TESTING OF HYPOTHESIS

Test of significance: Null Hypothesis, Alternative Hypothesis, Type-I Error, Type-II Error, Critical Region, One tailed Test, Two tailed test, Level of significance.

Large sample test for single proportion; Difference of proportions; Single mean: Difference of means

UNIT - IV: SMALL SAMPLE TESTS

Small Sample Tests: Student t-distribution, its properties; Test of significance difference between sample mean, population mean; Difference of Means F-Distribution and its properties. Test of Equality of two population variances. Chi-square distribution and It's properties, Chi-square test of goodness of fit.

UNIT - V: CORRELATION AND REGRESSION

Correlation and regression: coefficient of correlation, Rank correlation, Lines of Regression, Regression Coefficients.

TEXT BOOKS:

1. S C Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, Khanna Publications
2. S.R.K. Iyengar, R.K Jain Advanced engineering, Mathematics, Narosa publishing house, Fifth Edition 2016.

REFERENCES:

1. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Sheldon Ross,
2. A First Course in Probability, 9th Edition, Pearson Education India
3. K.B. Datta and M.S.Srinivasa, Mathematics for Engineers, cengage publications.

DIGITAL ELECTRONICS
II B.Tech., I-Sem., (Common to CSE, IT and CSM)

Course Title: Digital Electronics	Course Code:AS22-04ES07
Teaching Scheme(L:T:P):3:0:0	Credits:3
Type of Course: Lecture	Total Contact Periods:48Hrs+16Hrs
Continuous Internal Evaluation-40Marks	Semester EndExams-60Marks
Prerequisites: Analog Electronics	

Course Overview:

To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.

Course Objective

- To learn fundamental concepts of digital system design and common forms of number representations and their conversions.
- To implement and design logical operations using combinational logic circuits and sequential logic circuits.
- To understand the semiconductor memories and programmable logic devices.

Course Outcomes

CO#	Course Outcomes
C212.1	Understand the fundamentals of digital systems and working of logic gates.
C212.2	Understand the binary arithmetic operations using complements
C212.3	Minimization of logic functions using K-Maps
C212.4	Design and implement Combinational logic circuits.
C212.5	Design and implement Sequential logic circuits.
C212.6	Implement the given logical problems using programmable logic devices.

COURSE CONTENT (SYLLABUS)

UNIT-I:

Fundamentals of Digital Systems: Digital signals, Digital circuits, AND, OR, NOT, NAND, NOR and Exclusive-OR operations, Boolean algebra, Examples of IC gates, Number systems-binary, Signed binary, Octal hexadecimal number, Binary arithmetic, One's and Two's complements arithmetic.

UNIT-II:

Combinational Circuits-I: Standard representation for logic functions, K-map representation and simplification of logic functions using K- map, Minimization of logical functions, Don't care conditions, Multiplexer, De-Multiplexer.

UNIT-III:

Combinational Circuits-II: Adders, Sub tractors, Carry look ahead adder, Digital comparator, Parity checker/generator, Code converters, Priority encoders, Decoders/Drivers for display devices.

UNIT-IV:

Sequential Circuits: Introduction to flip-flops, SR, JK, T and D type's flip-flops, Shift registers, Conversion of flip-flops, Ring counter, Ripple (Asynchronous) counters, Synchronous counters.

UNIT-V:

Semiconductor Memories and Programmable Logic Devices: Memory organization and operation, expanding memory size, classification and characteristics of memories, sequential memory, read-only memory (ROM), ROM types, Read and write memory (RAM) types, Programmable logic array, Programmable array logic, Field Programmable Gate Array (FPGA).

TEXT BOOKS:

1. A. Kumar, "Fundamentals of Digital Circuits", Prentice Hall India, 2016.
2. M. M. Mano, "Digital logic and Computer design", Pearson Education India, 2016.

REFERENCE BOOKS:

1. R.S. Sedha, "A Textbook of Digital Electronics", S.Chand, 2005
2. R. P. Jain, "Modern Digital Electronics", McGraw Hill Education, 2009.

Online Resources(SWAYAM/NPTEL/MOOCs/COURSERA):

1. SWAYAM2. NPTEL

WebReference/E-Books:<https://doi.org/10.1515/9783110263787.73>

COMPUTER ORGANIZATION AND ARCHITECTURE
II B.Tech., I-Sem.,

Course Title: Computer Organization and Architecture	Course Code: AS22-05PC06
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Digital Logic Design	

Course Overview:

This course teaches the students to understand the design, structure and function of the computer systems.

Course Objectives

- The purpose of the course is to introduce principles of computer organization and the basic architectural concepts.
- It begins with basic organization, design, and programming of a simple digital computer and introduces simple register transfer language to specify various computer operations.
- Topics include computer arithmetic, instruction set design, micro programmed control unit, pipelining and vector processing, memory organization and I/O systems, and multiprocessors

Course Outcomes

CO#	Course Outcomes
C213.1	Understand the basics of instruction sets and their impact on processor design.
C213.2	Demonstrate an understanding of the design of the functional units of a digital computer system
C213.3	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
C213.4	Design a pipeline for consistent execution of instructions with minimum hazards.
C213.5	Recognize and manipulate representations of numbers stored in digital computers
C213.6	Demonstrate an understanding of the design of the basic computer and its instruction sets

COURSE CONTENT (SYLLABUS)

UNIT - I

DIGITAL COMPUTERS: Introduction, Block diagram of Digital Computer, Definition of Computer Organization, Computer Design and Computer Architecture.

Register Transfer Language and Micro operations: Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro operations, logic micro-operations, shift micro-operations, Arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, Computer Registers Computer instructions, Timing and Control, Instruction cycle, Memory Reference Instructions, Input – Output and Interrupt.

UNIT - II

MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, micro program example, design of control unit.

Central Processing Unit: General Register Organization, Instruction Formats, Addressing modes, Data Transfer and Manipulation, Program Control.

UNIT - III

DATA REPRESENTATION: Data types, Complements, Fixed Point Representation, Floating Point Representation.

Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic unit, Decimal Arithmetic operations.

UNIT - IV

INPUT-OUTPUT ORGANIZATION: Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt Direct memory Access.

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory.

UNIT – V

REDUCED INSTRUCTION SET COMPUTER: CISC Characteristics, RISC Characteristics.

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processor.

Multi Processors: Characteristics of Multiprocessors, Interconnection Structures, inter processor arbitration, Interprocessor communication and synchronization, Cache Coherence.

TEXT BOOK:

1. Computer System Architecture – M. Morris Mano, Third Edition, Pearson/PHI.

REFERENCE BOOKS:

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
3. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.

OBJECT ORIENTED PROGRAMMING THROUGH JAVA
II B.Tech., I-Sem., (Common to CSE, IT, CSM, AI&DS, CSD)

Course Title: Object Oriented Programming through Java	Course Code: AS22-05PC07
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Problem solving in C	

Course Overview:

The Course provides a comprehensive coverage of conceptual and practical Java language, describing its syntax, keywords, and fundamental programming principles to become a proficient Java Programmer. At the outset, the course ignites Object Oriented thinking and explores with the evolution of Java and its basics. It gives strong foundation on Inheritance, Packages and Interfaces and also discusses Exception Handling and Multithreaded mechanisms. The course examines java concepts such as Applets and Event handling.

Course Objective

- To understand object-oriented programming concepts, and apply them in solving problems.
- To introduce the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes.
- To introduce the implementation of packages and interfaces.
- To introduce the concepts of exception handling and multi-threading.
- To introduce the design of Graphical User Interface using applets and swing controls.

CO#	Course Outcomes
C214.1	Demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
C214.2	Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords
C214.3	Use multithreading concepts to develop inter process communication.
C214.4	Understand the process of graphical user interface design and implementation using AWT or swings.
C214.5	Develop applets that interact abundantly with the client environment and deploy on the server.
C214.6	Designs GUI based applications.

COURSE CONTENT (SYLLABUS)

UNIT - I

OBJECT ORIENTED THINKING AND JAVA BASICS- Need for oop paradigm, summary of oop concepts, coping with complexity, abstraction mechanisms. A way of viewing world – Agents, responsibility, messages, methods, History of Java, Java buzzwords, data types, variables, scope and lifetime of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, method binding, inheritance, overriding and exceptions, parameter passing, recursion, nested and inner classes, exploring string class.

UNIT - II

INHERITANCE, PACKAGES AND INTERFACES – Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding,

abstract classes, the Object class. Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces. Exploring java.io.

UNIT - III

EXCEPTION HANDLING AND MULTITHREADING-- Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception subclasses. String handling, Exploring java.util. Differences between multithreading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication, thread groups, daemon threads. Enumerations, autoboxing, annotations, generics.

UNIT - IV

EVENT HANDLING: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, checkbox groups, choices, lists panels – scroll pane, dialogs, menu bar, graphics, layout manager – layout manager types – border, grid, flow, card and grid bag.

UNIT - V

APPLETS – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets. Swing – Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

TEXT BOOKS:

1. Java the complete reference, 7th edition, Herbert schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson education.

REFERENCE BOOKS:

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John wiley& sons.
2. An Introduction to OOP, third edition, T. Budd, Pearson education.
3. Introduction to Java programming, Y. Daniel Liang, Pearson education.
4. An introduction to Java programming and object-oriented application development, R.A. Johnson- Thomson.
5. Core Java 2, Vol 1, Fundamentals, Cay.S. Horstmann and Gary Cornell, eighth Edition, Pearson Education.
6. Core Java 2, Vol 2, Advanced Features, Cay.S. Horstmann and Gary Cornell, eighth Edition, Pearson Education
7. Object Oriented Programming with Java, R.Buyya, S.T.Selvi, X.Chu, TMH.
8. Java and Object Orientation, an introduction, John Hunt, second edition, Springer.
9. Maurach's Beginning Java2 JDK 5, SPD.

SOFTWARE ENGINEERING
II B.Tech., I-Sem., (Common for CSE, IT, AI&DS, CSG)

Course Title: Software Engineering	Course Code: AS22-66ES01
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48 Hours
Continuous Internal Evaluation:40 Marks	Semester End Exams: 60 Marks
Prerequisites: Nil	

Course Overview:

A branch of engineering that deals with the development of software products. It operates within a set of principles, best practices, and methods that have been carefully honed throughout the years, changing as software and technology change.

Course Objective:

- The basic objective of Software Engineering is to develop methods and procedures for software development that can scale up for large systems and that can be used to consistently produce high-quality software at low cost and with a small cycle time.
- Software Engineering is the systematic approach to the development, operation, maintenance, and retirement of software.
- The course provides a thorough introduction to the fundamental's principles of software engineering.
- The organization broadly be based on the classical analysis-design-implementation framework.

Course Outcomes(s)

CO#	Course Outcomes
C221.1	Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
C221.2	Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
C221.3	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report.
C221.4	Enhance the testing tools for effective debugging.
C221.5	Analyze the metrics, risk and the quality issues for designing a process/ product.
C221.6	Test security levels of a software and mange security software's.

COURSECONTENT(SYLLABUS)

UNIT - I

Introduction to Software Engineering: The evolving role of software, changing nature of software, software myths. A Generic view of process: Software engineering- a layered technology, a process frame work, the capability maturity model integration (CMMI).

Process models: The waterfall model, Spiral model and Agile methodology

UNIT - II

Software Requirements: Functional and non-functional requirements, user requirements, system requirements, interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management.

UNIT - III

Design Engineering: Design process and design quality, design concepts, the design model.

Creating an architectural design: software architecture, data design, architectural styles and patterns, architectural design, conceptual model of UML, basic structural modeling, class diagrams, sequence diagrams, collaboration diagrams, use case diagrams, component diagrams.

UNIT - IV

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, black-box and white-box testing, validation testing, system testing, the art of debugging.

Metrics for Process and Products: Software measurement, metrics for software quality.

UNIT - V

Risk management: Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM.

Quality Management: Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability, the ISO 9000 quality standards.

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, McGraw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson Education.

REFERENCE BOOKS:

1. The unified modeling language user guide Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.
3. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.
4. Fundamentals of object-oriented design using UML Meiler page-Jones: Pearson Education.

Online Resources (SWAYAM/NPTEL/MOOCs/COURSERA):

1. https://onlinecourses.swayam2.ac.in/cec20_cs07/preview
2. <https://nptel.ac.in/courses/106/105/106105087/>
3. https://onlinecourses.nptel.ac.in/noc19_cs69/preview

Web Reference/E-Books:

1. https://www.javatpoint.com/software_engineering_tutorial
2. https://wrvrv.tutorialspoint.com/software_engineering/indcx.htm
3. https://rvwrv.geekslorgeeks.org/software_engineering/
4. https://u.wrvv.tutorialandexample.com/software_engineering_tutorial/

DIGITAL ELECTRONICS LAB
II B.Tech., I-Sem., (Common to CSE, IT & CSM)

Course Title: Digital Electronics Lab	Course Code:AS22-04ES08
Teaching Scheme (L:T:P):0:0:2	Credits:1
Type of Course: Practical	Total Contact Periods: 32Hrs
Continuous Internal Evaluation:40 Marks	Semester End Exam: 60 Marks
Prerequisites: Analog Electronics and Digital Electronics	

Course Overview:

To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.

Course Objective

- To learn basic techniques for the design of digital circuits and number conversion systems.
- To implement simple logical operations using combinational logic circuits.
- To design combinational logic circuits, sequential logic circuits.

Course Outcomes

CO#	Course Outcomes
C216.1	Understand the fundamentals of digital systems and working of logic gates.
C216.2	Understand the working of converters
C216.3	Minimization of logic functions using K-Maps
C216.4	Design and implement Combinational logic circuits.
C216.5	Design and implement Sequential logic circuits.
C216.6	Understand the working of logic families.

COURSE CONTENT(SYLLABUS)

LIST OF EXPERIMENTS

1. Realization of Boolean Expressions using Gates
2. Design and realization logic gates using universal gates
3. Generation of clock using NAND/NOR gates
4. Design a 4 – bit Adder / Subtractor
5. Design and realization a 4 – bit gray to Binary and Binary to Gray Converter
6. Design and realization of a 4-bit pseudo random sequence generator using logic gates.
7. Design and realization of an 8-bit parallel load and serial out shift register using flip-flops.
8. Design and realization Asynchronous and Synchronous counters using flip-flops
9. Design and realization 8x1 using 2x1 mux
10. Design and realization 2-bit comparator
11. Verification of truth tables and excitation tables
12. Realization of logic gates using DTL, TTL, ECL, etc.,

TEXT BOOKS:

1. A. Kumar, "Fundamentals of Digital Circuits", Prentice Hall India, 2016.
2. M. M. Mano, "Digital logic and Computer design", Pearson Education India, 2016.

REFERENCE BOOKS:

1. R.S. Sedha, "A Textbook of Digital Electronics", S.Chand, 2005
2. R. P. Jain, "Modern Digital Electronics", McGraw Hill Education, 2009.

Online Resources (SWAYAM/NPTEL/MOOCs/COURSERA):

1. SWAYAM
2. NPTEL

Web Reference/E-Books:

<https://doi.org/10.1515/9783110263787.73>

**OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB
II B.Tech., I-Sem.,**

Course Title: Object Oriented Programming Through Java Lab	Course Code: AS22-05PC09
Teaching Scheme(L: T: P):0:0:2	Credits:1
Type of Course: Laboratory	Total Contact Periods:32Hrs
Continuous Internal Evaluation-40Marks	Semester EndExams-60Marks
Prerequisites: C language	

Course Overview:

The hands-on course provides a comprehensive coverage of practical Java language, describing its syntax, keywords, and fundamental programming principles to become a proficient Java Programmer. The course stress on the strengths of Java to write efficient, maintainable, and portable code. The course focuses on a different aspect of core Java Environment suitable for advance learning, teaching, research, and commercial software development. At the outset it revise the control statements and then explores with the concepts of Inheritance and Interfaces. Exception Handling, Multithreaded mechanisms and File I/O is also been practiced. The concepts such as AWT Controls, Event handling, Applets and Swings are deeply Practiced to build GUI based applications.

Course Objectives:

- To write programs using abstract classes.
- To write programs for solving real world problems using the java collection framework.
- To write multithreaded programs.
- To write GUI programs using swing controls in Java.
- To introduce java compiler and eclipse platform.
- To impart hands-on experience with java programming.

CO#	Course Outcomes
C217.1	Able to write programs for solving real world problems using the java collection framework.
C217.2	Able to write programs using abstract classes.
C217.3	Able to write multithreaded programs.
C217.4	Able to write GUI programs using swing controls in Java.
C217.5	Design a java program which implements events
C217.6	Design a java program which implements AWT components

Note:

1. Use LINUX and MySQL for the Lab Experiments. Though not mandatory, encourage the use of the Eclipse platform.
2. The list suggests the minimum program set. Hence, the concerned staff is requested to add more problems to the list as needed.

List of Experiments:

1. Use Eclipse or Net bean platform and acquaint yourself with the various menus. Create a test project, add a test class, and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods, and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop.
2. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result. Handle any possible exceptions like divided by zero.

3. A) Develop an applet in Java that displays a simple message.
B) Develop an applet in Java that receives an integer in one textfield, and computes its factorial Value and returns it in another text field, when the button named “Compute” is clicked.
4. Write a Java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num 2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, 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.
5. Write a Java program that implements a multi-thread application that has three threads. First thread generates a random integer every 1 second and if the value is even, the second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of the cube of the number.
6. Write a Java program for the following:
Create a doubly linked list of elements.
Delete a given element from the above list.
Display the contents of the list after deletion.
7. Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with “Stop” or “Ready” or “Go” should appear above the buttons in the selected color. Initially, there is no message shown.
8. Write a Java program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle, and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.
9. Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas.
10. Write a java program to display the table using Labels in Grid Layout.
11. Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired (Use Adapter classes).
12. Write a Java program that loads names and phone numbers from a text file where the data is organized as one line per record and each field in a record are separated by a tab (\t). It takes a name or phone number as input and prints the corresponding other value from the hash table (hint: use hash tables).
13. Write a Java program that correctly implements the producer – consumer Problem using the concept of inter thread communication.
14. Write a Java program to list all the files in a directory including the files present in all its subdirectories.

REFERENCE BOOKS:

1. Java for Programmers, P. J. Deitel and H. M. Deitel, 10th Edition Pearson education.
2. Thinking in Java, Bruce Eckel, Pearson Education.
3. Java Programming, D. S. Malik and P. S. Nair, Cengage Learning.
4. Core Java, Volume 1, 9th edition, Cay S. Horstmann and G Cornell, Pearson.

**SOFTWARE ENGINEERING LAB
II B.Tech., I-Sem.,**

Course Title: Software Engineering Lab	Course Code: AS20-66ES02
Teaching Scheme (L:T:P): 0 : 0 : 2	Credits: 1
Type of Course: Practical Work	Total Contact Periods :48 hours
Continuous Internal Evaluation -40 marks	Semester End Exams- 60 Marks
Prerequisites: Interfaces to other applications; specific technologies, tools, and databases to be used	

Course Overview:

To impart knowledge about Computer Programming, Web Development, Data Structures, Project Management, etc. Students are equipped with practical knowledge about designing, developing, and testing software.

Course Objective:

- To have hands on experience in developing a software project by using various software engineering principles and methods in each of the phases of software development.

Course Outcomes:

CO#	Course Outcomes
C218.1	Ability to translate end-user requirements into system and software requirements
C218.2	Ability to generate a high-level design of the system from the software requirements
C218.3	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
C218.4	Understand and develop various structure and behavior UML diagrams.
C218.5	Ability to develop, maintain, efficient, reliable and cost-effective software solutions
C218.6	Understanding on quality control and how to ensure good quality software.

**COURSE CONTENT (SYLLABUS)
LIST OF EXPERIMENTS**

Do the following seven exercises for any two projects given in the list of sample projects or any other Projects:

1. Development of problem statements.
2. Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
3. Preparation of Software Configuration Management and Risk Management related documents.
4. Study and usage of any Design phase CASE tool
5. Performing the Design by using any Design phase CASE tools.
6. Develop test cases for unit testing and integration testing
7. Develop test cases for various white box and black box testing techniques.

SAMPLE PROJECTS:

1. Retail Management
2. Passport automation System
3. Book Bank
4. Online Exam Registration

5. Stock Maintenance System
6. Online course reservation system
7. E-ticketing
8. Software Personnel Management System
9. Credit Card Processing
10. E-book management System.
11. Recruitment system

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, McGraw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson Education.
3. The unified modeling language user guide Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.

REFERENCE BOOKS:

1. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.
2. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill

Online Resources (SWAYAM/NPTEL/MOOCs/COURSERA):

1. <https://nptel.ac.in/courses/106105182>
2. https://onlinecourses.nptel.ac.in/noc20_cs68/preview

Web Reference/E-Books:

1. https://www.google.co.in/books/edition/Software_Engineering_Body_of_Knowledge/1YMPjwEACAAJ?hl=en

**GENDER SENSATIZATION
II B.Tech.,I-Sem.,
MANDATORY COURSE**

Course Title: GENDER SENSATIZATION	Course Code: AS22-00MC02
Teaching Scheme (L:T:P):0:0:2	Credits: 0
Type of Course: Lecture	Total Contact Periods:32Hrs
Continuous Internal Evaluation-0	Semester End Exams-100 Marks
Prerequisites: Gender vs Sex, Gender in contemporary India, Gender discrimination works in our society, Men and women live together as equals, Build up a sense of appreciation of women	

Course Overview:

This course is designed to understand the issues related to Gender and how Gender discrimination impacts in our society and how to encounter them. Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

Course Objective

- To develop students' sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Course Outcomes(s)

CO#	Course Outcomes
C219.1	Develop a better understanding of important issues related to gender in contemporary India.
C219.2	Sensitize to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
C219.3	Attain a finer grasp of how gender discrimination works in our society and how to counter it.
C219.4	Acquire insight into the gendered division of labor and its relation to politics and economics.
C219.5	Men and women students and professionals will be better equipped to work and live together as equals.
C219.6	Build up a sense of appreciation of women in all walks of life.

COURSE CONTENT

Unit-I: UNDERSTANDING GENDER

Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes towards Gender-Construction of Gender-Socialization: Making Women, Making Men - Preparing for Womanhood. Growing up Male. First lessons in Caste.

Unit – II: GENDER ROLES AND RELATIONS

Two or Many? -Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles-Gender Roles and Relationships Matrix-Missing Women-Sex Selection and Its Consequences-Declining Sex Ratio. Demographic Consequences-Gender Spectrum: Beyond the Binary

Unit – III: GENDER AND LABOUR

Division and Valuation of Labour-Housework: The Invisible Labor- “My Mother doesn’t Work.” “Share the Load.”-Work: Its Politics and Economics -Fact and Fiction. Unrecognized and Unaccounted work. -Gender Development Issues-Gender, Governance and Sustainable Development-Gender and Human Rights-Gender and Mainstreaming

Unit – IV: GENDER - BASED VIOLENCE

The Concept of Violence- Types of Gender-based Violence-Gender-based Violence from a Human Rights Perspective-Sexual Harassment: Say No!-Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: “Chupulu”.

Domestic Violence: Speaking OutIs Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Thinking about Sexual Violence Blaming the Victim-“I Fought for my Life....”

Unit – V: GENDER AND CULTURE

Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development Issues-Gender Issues-Gender Sensitive Language-Gender and Popular Literature - Just Relationships: Being Together as Equals Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa Parks- The Brave Heart.

TEXTBOOK:

1. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu “**Towards a World of Equals: A Bilingual Textbook on Gender**” published by Telugu Akademi, Hyderabad, Telangana State, 2015.

REFERENCE BOOKS:

1. Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012
2. Abdul ali Sohaila. “I Fought For My Life...and Won.” Available online at:
3. <http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdul/>

ONLINE RESOURCES (SWAYAM/NPTEL/MOOCs/COURSERA):

1. <https://nptel.ac.in/courses/110/105/110105080/>
2. <https://nptel.ac.in/courses/109/103/109103122/>

WEB REFERENCE/E-BOOKS:

1. <http://www.mchrtdi.gov.in/adr%202016/presentations/Gender%20Sensitisation%20For%20FCs.pdf>
2. <https://mangaloreuniversity.ac.in/sites/default/files/2019/Course%20-%206%20Gender%20School%20&%20Society%20-%20English%20Version.pdf>
3. <http://ncw.nic.in/notice/gender-sensitization-module-gender-sensitization-and-legal-awareness-programme-collaboration>

**B. Tech.,
SECOND YEAR
SECOND SEMESTER
SYLLABUS**

INTRODUCTION TO ARTIFICIAL INTELLIGENCE

II B.Tech., II-Sem.,

Course Title: Introduction to Artificial Intelligence	Course Code: AS22-66PC01
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48
Continuous Internal Evaluation: 40 Marks	Semester End Exams: 60 Marks
Prerequisites: Knowledge on Data Structures	

Course Overview:

It is a constellation of many different technologies working together to enable machines to sense, comprehend, act, and learn with human-like levels of intelligence.

Course Objectives:

- To learn the distinction between optimal reasoning Vs. human like reasoning.
- To understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
- To learn different knowledge representation techniques.
- To understand the applications of AI, namely game playing, theorem proving, and machine learning.

Course Outcomes(s)

CO#	Course Outcomes
C221.1	Learn the distinction between optimal reasoning Vs human like reasoning and formulate an efficient problem space for a problem expressed in natural language. Also select a search algorithm for a problem and estimate its time and space complexities.
C221.2	Apply AI techniques to solve problems of game playing, theorem proving, and machine learning.
C221.3	Learn different knowledge representation techniques.
C221.4	Understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
C221.5	Comprehend the applications of Probabilistic Reasoning and Bayesian Networks.
C221.6	Analyze Supervised Learning Vs. Learning Decision Trees.

COURSE CONTENT (SYLLABUS)

UNIT - I

INTRODUCTION TO AI - Intelligent Agents, Problem-Solving Agents,

SEARCHING FOR SOLUTIONS - Breadth-first search, Depth-first search, Hill-climbing search, Simulated annealing search, Local Search in Continuous Spaces.

UNIT-II

GAMES - Optimal Decisions in Games, Alpha-Beta Pruning, Defining Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search for CSPs, Knowledge-Based Agents, Logic Propositional Logic

PROPOSITIONAL THEOREM PROVING: Inference and proofs, Proof by resolution, Horn clauses and definite clauses.

UNIT-III

FIRST-ORDER LOGIC - Syntax and Semantics of First-Order Logic, Using First Order Logic, Knowledge Engineering in First-Order Logic. Inference in First-Order Logic: Propositional vs. First-Order Inference, Unification, Forward Chaining, Backward Chaining, Resolution.

KNOWLEDGE REPRESENTATION: ONTOLOGICAL ENGINEERING, CATEGORIES AND OBJECTS, EVENTS.

UNIT-IV

PLANNING - Definition of Classical Planning, Algorithms for Planning with State Space Search, Planning Graphs, other Classical Planning Approaches, Analysis of Planning approaches. Hierarchical Planning.

UNIT-V

PROBABILISTIC REASONING: Acting under Uncertainty, Basic Probability Notation Bayes' Rule and Its Use, Probabilistic Reasoning, Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks, Efficient Representation of Conditional Distributions, Approximate Inference in Bayesian Networks, Relational and First- Order Probability.

TEXT BOOKS:

1. Artificial Intelligence: A Modern Approach, Third Edition, Stuart Russell and Peter Norvig, Pearson Education.
2. Artificial Intelligence and Expert systems – Patterson, Pearson Education.

REFERENCES BOOKS:

1. Artificial Intelligence, 3rd Edn., E. Rich and K. Knight (TMH)
2. Artificial Intelligence, 3rd Edn., Patrick Henny Winston, Pearson Education.
3. Artificial Intelligence, Shivani Goel, Pearson Education.

Online Resources (SWAYAM/NPTEL/MOOCs/COURSERA):

1. https://onlinecourses.nptel.ac.in/noc22_cs56/preview
2. <https://www.classcentral.com/course/swayam-artificial-intelligence-17520>
3. <https://www.quora.com/What-are-your-reviews-on-the-NPTEL-vs-Coursera-online-course-for-computer-science-students>

Web Reference/E-Books:

1. https://eplibrary.libguides.com/EPOL/SR/Applications_of_AI/e-books
2. <https://dlabs.ai/blog/free-ebooks-on-artificial-intelligence-to-read/>
3. <https://www.fita.in/artificial-intelligence-books/>

AUTOMATA THEORY AND COMPILER DESIGN
II B.Tech., II-Sem.,

Course Title: Automata Theory and Compiler Design	Course Code: AS22-66PC02
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48 Hours
Continuous Internal Evaluation:40 Marks	Semester End Exams: 60 Marks
Prerequisites: Nil	

Course Overview:

Finite automata is a state machine that takes a string of symbols as input and changes its state accordingly. Finite automata is a recognizer for regular expressions. When a regular expression string is fed into finite automata, it changes its state for each literal.

Course Objectives:

- To introduce the fundamental concepts of formal languages, grammars and automata theory.
- To understand deterministic and non-deterministic machines and the differences between decidability and undecidability.
- Introduce the major concepts of language translation and compiler design and impart the knowledge of practical skills necessary for constructing a compiler.
- Topics include phases of compiler, parsing, syntax directed translation, type checking use of symbol tables, intermediate code generation.

Course Outcomes(s)

CO#	Course Outcomes
C222.1	Able to employ finite state machines for modeling and solving computing problems.
C222.2	Able to design context free grammars for formal languages.
C222.3	Able to distinguish between decidability and undecidability.
C222.4	Demonstrate the knowledge of patterns, tokens & regular expressions for lexical analysis.
C222.5	Acquire skills in using lex tool and design LR parsers.
C222.6	Design algorithms to generate machine code.

COURSE CONTENT (SYLLABUS)

UNIT - I

INTRODUCTION TO FINITE AUTOMATA: Structural Representations, Automata and Complexity, the Central Concepts of Automata Theory – Alphabets, Strings, Languages, Problems.

NONDETERMINISTIC FINITE AUTOMATA: Formal Definition, an application, Text Search, Finite Automata with Epsilon-Transitions.

DETERMINISTIC FINITE AUTOMATA: Definition of DFA, How A DFA Process Strings, The language of DFA, Conversion of NFA with ϵ -transitions to NFA without ϵ -transitions. Conversion of NFA to DFA.

UNIT - II

REGULAR EXPRESSIONS: Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expressions, Conversion of Finite Automata to Regular Expressions.

PUMPING LEMMA FOR REGULAR LANGUAGES: Statement of the pumping lemma, Applications of the Pumping Lemma.

CONTEXT-FREE GRAMMARS: Definition of Context-Free Grammars, Derivations Using a Grammar, Leftmost and Rightmost Derivations, the Language of a Grammar, Parse Trees, Ambiguity in Grammars and Languages.

UNIT - III

PUSH DOWN AUTOMATA: Definition of the Pushdown Automaton, the Languages of a PDA,

Equivalence of PDA and CFG's, Acceptance by final state

TURING MACHINES: Introduction to Turing Machine, Formal Description, Instantaneous description, The language of a Turing machine

UNDECIDABILITY: Undecidability, A Language that is Not Recursively Enumerable, An Undecidable Problem That is RE, Undecidable Problems about Turing Machines

UNIT - IV

INTRODUCTION: The structure of a compiler, Lexical Analysis: The Role of the Lexical Analyzer, Input Buffering, Recognition of Tokens, The Lexical- Analyzer Generator Lex,

SYNTAX ANALYSIS: Introduction, Context-Free Grammars, Writing a Grammar, Top-Down Parsing, Bottom- Up Parsing.

INTRODUCTION TO LR PARSING: Simple LR, More Powerful LR Parsers

UNIT - V

SYNTAX-DIRECTED TRANSLATION: Syntax-Directed Definitions, Evaluation Orders for SDD's, SyntaxDirected Translation Schemes, Implementing L-Attributed SDD's.

INTERMEDIATE-CODE GENERATION: Variants of Syntax Trees, Three-Address Code

RUN-TIME ENVIRONMENTS: Stack Allocation of Space, Access to Nonlocal Data on the Stack, Heap Management.

TEXT BOOKS:

1. Introduction to Automata Theory, Languages, and Computation, 3rd Edition, John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Pearson Education.
2. Theory of Computer Science – Automata languages and computation, Mishra and Chandrashekar, 2nd Edition, PHI.

REFERENCES BOOKS:

1. Compilers: Principles, Techniques and Tools, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, 2nd Edition, Pearson.
2. Introduction to Formal languages Automata Theory and Computation, Kamala Krithivasan, Rama R, Pearson.
3. Introduction to Languages and The Theory of Computation, John C Martin, TMH.
4. lex & yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly Compiler Construction, Kenneth C. Loudon, Thomson. Course Technology.

ONLINE RESOURCES (SWAYAM/NPTEL/MOOCs/COURSERA):

1. https://onlinecourses.nptel.ac.in/noc20_cs13/preview
2. <https://nptel.ac.in/courses/106105190>

WEB REFERENCE/E-BOOKS:

1. <https://math.stackexchange.com/questions/450849/best-book-for-automata-theory-and-compiler-design>
2. https://onlinecourses.nptel.ac.in/noc23_cs57/preview

**FUNDAMENTALS OF PYTHON PROGRAMMING
II B.Tech., II-Sem., (Common to CSE, IT, CSM, AIDS & CSG)**

Course Title: Fundamentals of Python Programming	Course Code: AS22-05ES11
Teaching Scheme (L:T:P): 3:1:0	Credits: 4
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs +16Hrs.
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Basic Programming Skills	

COURSE OBJECTIVES

- Learn syntax and semantics along with the basic data structures of Python
- Handle modules, files and exceptions in Python.
- Understand regular expressions and multithreaded programming in Python.
- Implement Object Oriented Programming concepts in Python.
- Build GUI programming and web programming in Python

COURSE OUTCOMES

CO#	Course Outcomes
C223.1	Learn syntax and semantics along with the basic data structures of Python
C223.2	Apply different operation on Files by using modules and implement exceptions in Python
C223.3	Identify the use of regular expressions and multithreaded programming in Python
C223.4	Implement Object Oriented Programming concepts to build programs in Python
C223.5	Identify different GUI components to design web applications in Python.

COURSE CONTENT (SYLLABUS)

UNIT I: BASICS

Python Basics, Getting started, Python Objects, Numbers, Sequences: Strings, Lists, Tuples, Set and Dictionary. Conditionals and Loop Structures

UNIT-II: MODULES, FILES, EXCEPTIONS

Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules

Files: File Objects, File Built-in Function, File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules.

Exceptions: Exceptions in Python, Detecting and Handling Exceptions, Context Management, Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, Creating Exceptions, Why Exceptions, Why Exceptions at All? Exceptions and the sys Module.

UNIT-III: REGULAR EXPRESSION, MULTITHREADED PROGRAMMING

Regular Expression (RE): Introduction, Special Symbols and Characters, REs and Python.

Multithreaded Programming: Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules.

UNIT IV: CLASSES AND OBJECT-ORIENTED PROGRAMMING

Classes and Object-Oriented Programming (OOP): OOP, Classes, Class Attributes, Instances, Instance Attributes, Binding and Method Invocation, Composition, Subclassing and Derivation, Inheritance, Built-in Functions for Classes, Instances, and Other Objects, Types vs. Classes/Instances, Customizing Classes with Special Methods, Privacy, Delegation and Wrapping

UNIT V: GUI PROGRAMMING, WEB PROGRAMMING

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs.

Web Programming: Introduction, Web Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application Advanced CGI, Web (HTTP) Servers

Text Books:

3. Wesley J. Chun, Core Python Programming, Second Edition, Prentice Hall, 2007.
4. Kenneth A. Lambert, Fundamentals of Python: First Programs, Cengage Learning, 2011.

References Books:

5. Allen B. Downey, "Think Python, How to think like a Computer Scientist", First Edition, O'reilly Publishing, 2018.
6. Vamsi Kurama, "Python Programming: A Modern Approach", Pearson India, 2017.
7. Mark Lutz, "Learning Python", Fifth Edition, O'rielly Publishers, 2013.

DATABASE MANAGEMENT SYSTEMS
II B.Tech., II-Sem., (Common for CSE, IT, AI&DS, CSD)

Course Title: DATABASE MANAGEMENT SYSTEMS	Course Code: AS22-05PC02
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: A course on “Data Structures”	

Course overview:

This course enables the students to understand various data representation techniques in the real world and develop skills to design and analyze simple linear and non linear data.

Course Objectives:

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.

CO#	Course Outcomes
C224.1	Gain knowledge of fundamentals of DBMS, database design and normal forms
C224.2	To draw Entity-Relationship diagrams to represent simple database application scenarios.
C224.3	Master the basics of SQL for retrieval and management of data.
C224.4	Be acquainted with the basics of transaction processing and concurrency control.
C224.5	Familiarity with database storage structures and access techniques
C224.6	Understand the transaction processing and concurrency control concepts.

COURSE CONTENT

UNIT - I

DATABASE SYSTEM APPLICATIONS: A Historical Perspective, File Systems versus a DBMS, the Data Model, Levels of Abstraction in a DBMS, Data Independence, Structure of a DBMS

INTRODUCTION TO DATABASE DESIGN: Database Design and ER Diagrams, Entities, Attributes, and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design With the ER Model

UNIT - II

INTRODUCTION TO THE RELATIONAL MODEL: Integrity constraint over relations, enforcing integrity constraints, querying relational data, logical database design, introduction to views, destroying/altering tables and views.

Relational Algebra, Tuple relational Calculus, Domain relational calculus.

UNIT - III

SQL: QUERIES, CONSTRAINTS, TRIGGERS: form of basic SQL query, UNION, INTERSECT, and EXCEPT, Nested Queries, aggregation operators, NULL values, complex integrity constraints in SQL, triggers and active databases.

Schema Refinement: Problems caused by redundancy, decompositions, problems related to

decomposition, reasoning about functional dependencies, First, Second, Third normal forms, BCNF, lossless join decomposition, multivalued dependencies, Fourth normal form, Fifth normal form.

UNIT - IV

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, Lock Based Protocols, Timestamp Based Protocols, Validation- Based Protocols, Multiple Granularity, Recovery and Atomicity, Log–Based Recovery, Recovery with Concurrent Transactions.

UNIT - V

Data on External Storage, File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes, Index data Structures, Hash Based Indexing, Tree based Indexing, Comparison of File Organizations, Indexes- Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic Index Structure.

TEXT BOOKS:

1. Database System Concepts, Silberschatz, Korth, McGraw hill, V edition.3rd Edition
2. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill

REFERENCE BOOKS:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, ElmasriNavrate, Pearson Education
3. Introduction to Database Systems, C. J. Date, Pearson Education
4. Oracle for Professionals, The X Team, S.Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.

OPERATING SYSTEMS
II B.Tech., II- Sem.,

Course Title: OPERATING SYSTEMS	Course Code: AS22-05PC03
Teaching Scheme (L:T:P): 3:0:0	Credits: 3
Type of Course: Lecture + Tutorial	Total Contact Periods: 48Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Computer Programming and Data Structures	

Course overview:

This course enables students to learn the fundamental concepts of database analysis and design, roles of transaction processing and concurrency and control.

Course Objectives:

- Introduce operating system concepts (i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection)
- Introduce the issues to be considered in the design and development of operating system
- Introduce basic Unix commands, system call interface for process management, inter process communication and I/O in Unix

CO#	Course Outcomes
C225.1	Demonstrate the knowledge of the components of computers and their respective roles in computing.
C225.2	Ability to recognize and resolve user problems with standard operating environments.
C225.3	Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
C225.4	Experiment an algorithm to detect and avoid dead lock.
C225.5	Apply the various methods in memory allocation and page replacement algorithm.
C225.6	Demonstrate the various operations of file system.

COURSE CONTENT (SYLLABUS)

UNIT - I

OPERATING SYSTEM - INTRODUCTION, Structures - Simple Batch, Multi programmed, Time-shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, System components, Operating System services, System Calls

Process - Process concepts and scheduling, Operations on processes, Cooperating Processes, Threads

UNIT - II

CPU SCHEDULING - Scheduling Criteria, Scheduling Algorithms, Multiple -Processor Scheduling. System call interface for process management-fork, exit, wait, wait pid, exec

Deadlocks - System Model, Deadlocks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock

UNIT - III

PROCESS MANAGEMENT AND SYNCHRONIZATION - The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors **Inter process Communication Mechanisms:** IPC between processes on a single computer

system, IPC between processes on different systems, using pipes, FIFOs, message queues, shared memory.

UNIT - IV

MEMORY MANAGEMENT AND VIRTUAL MEMORY - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging, Demand Paging, Page Replacement, Page Replacement Algorithms.

UNIT - V

FILE SYSTEM INTERFACE AND OPERATIONS -Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management. Usage of open, create, read, write, close, seek, stat, ioctl system calls.

TEXT BOOKS:

1. Operating System Principles- Abraham Silber chatz, Peter B. Galvin, Greg Gagne 9th Edition, John Wiley.
2. Advanced programming in the UNIX environment, W.R. Stevens, Pearson education.

REFERENCE BOOKS:

1. Operating Systems- Internals and Design Principles, William Stallings, Fifth Edition–2005, Pearson Education/PHI
2. Operating System A Design Approach- Crowley, TMH.
3. Modern Operating Systems, Andrew S. Tanenbaum 2nd edition, Pearson/PHI
4. UNIX programming environment, Kernighan and Pike, PHI/ Pearson Education
5. UNIX Internals -The New Frontiers, U. Vahalia, Pearson Education.

**DATABASE MANAGEMENT SYSTEMS LAB
II B.Tech., II-Sem.,**

Course Title: Database Management Systems Lab	Course Code: AS22-05PC03
Teaching Scheme (L:T:P): 0 : 0 : 3	Credits: 1.5
Type of Course: Practical Work	Total Contact Periods :48 hours
Continuous Internal Evaluation -40 marks	Semester End Exams- 60 Marks
Prerequisites:Database Management Systems	

Course overview:

This course helps students to understand various queries execution such as relational constraints, joins, set operations, aggregate functions, trigger, views and embedded SQL.

Course Objectives:

Introduce ER data model, database design and normalization Learn SQL basics for data definition and data manipulation

CO#	Course Outcomes
C226.1	Designs and implements a database schema for given problem.
C226.2	Acquire skills in using SQL commands for data definition and data manipulation
C226.3	Applies the normalization techniques for development of application software to realistic problems.
C226.4	Formulates queries using SQL DML/DDL/DCL commands.
C226.5	Develop solutions for database applications using procedures, cursors and triggers.
C226.6	Declare and enforce integrity constraints on a database using RDBMS.

**COURSECONTENT(SYLLABUS)
LIST OF EXPERIMENTS**

1. Concept design with E-R Model
2. Relational Model
3. Normalization
4. Practicing DDL commands
5. Practicing DML commands
6. Querying (using ANY, ALL, UNION, INTERSECT, JOIN, Constraints etc.) B. Nested, Correlated sub queries
7. Queries using Aggregate functions, GROUP BY, HAVING and Creation and dropping of Views.
8. Triggers (Creation of insert trigger, delete trigger, update trigger)
9. Procedures.
10. Usage of Cursors

TEXT BOOKS:

1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill, 3rd Edition
2. Database System Concepts, Silberschatz, Korth, McGraw Hill, V edition.

REFERENCE BOOKS:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, ElmasriNavrate, Pearson Education
3. Introduction to Database Systems, C.J. Date, Pearson Education
4. Oracle for Professionals, The X Team, S. Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.

ONLINERESOURCES(SWAYAM/NPTEL/MOOCs/COURSERA):

1. <https://www.coursera.org/python>
2. <https://www.edx.org/python>

WEBREFERENCE/E-BOOKS:

1. <http://www.learnpython.org/>
2. <https://docs.python.org/2/tutorial/index.html>
3. http://en.wikibooks.org/wiki/Non-Programmer%27s_Tutorial_for_Python_3/Intr
4. <https://developers.google.com/edu/python/introduction>
5. <https://www.datacamp.com/courses/intro-to-python-for-data-science>

**OPERATING SYSTEMS LAB
II B.Tech., II-Sem.,**

Course Title: OPERATING SYSTEMS LAB	Course Code: AS22-05PC04
Teaching Scheme (L: T: P):0:0:2	Credits:1
Type of Course: Laboratory	Total Contact Periods:32Hrs
Continuous Internal Evaluation-40Marks	Semester End Exams-60Marks
Prerequisites: A course on “Programming for Problem Solving”, A course on “Computer Organization and Architecture”.	

Course Overview:

This Laboratory covers the major methods of inter process communications (IPC), which is the basis of all client / server applications under UNIX, Linux utilities. There will be extensive Programming exercises in shell scripts. It also emphasizes various programming concepts in IPC, multithreaded programming and socket programming.

Course Objectives:

- To provide an understanding of the design aspects of operating system concepts through simulation
- Introduce basic Unix commands, system call interface for process management, inter process communication and I/O in Unix

Course Outcomes

CO#	Course Outcomes
C227.1	Simulate and implement operating system concepts such as scheduling, deadlock management, file management
C227.2	Able to implement C programs using Unix system calls
C227.3	Implements semaphores for producer-consumer problem
C227.4	Illustrates the IPC mechanisms
C227.5	Constructs the memory management techniques
C227.6	Developing a Page replacement policies using C programming

COURSE CONTENT (SYLLABUS)

List of Experiments:

1. Write C programs to simulate the following CPU Scheduling algorithms a) FCFS b) SJF c) Round Robin d) Priority
2. Write programs using the I/O system calls of UNIX/LINUX operating system (open, read, write, close, fcntl, seek, stat, opendir, readdir)
3. Write a C program to simulate Bankers Algorithm for Deadlock Avoidance and Prevention.
4. Write a C program to implement the Producer – Consumer problem using semaphores using UNIX/LINUX system calls.
5. Write C programs to illustrate the following IPC mechanisms a) Pipes b) FIFOs c) Message Queues d) Shared Memory
6. Write C programs to simulate the following memory management techniques a) Paging b) Segmentation
7. Write C programs to simulate Page replacement policies a) FCFS b) LRU c) Optimal

TEXT BOOKS:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 9th Edition, John Wiley
2. Advanced programming in the Unix environment, W.R.Stevens, Pearson education.

REFERENCE BOOKS:

1. Operating Systems – Internals and Design Principles, William Stallings, Fifth Edition–2005, Pearson Education/PHI
2. Operating System - A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum, 2nd edition, Pearson/PHI
4. UNIX Programming Environment, Kernighan and Pike, PHI/Pearson Education
5. UNIX Internals: The New Frontiers, U. Vahalia, Pearson Education

**FUNDAMENTALS OF PYTHON PROGRAMMING LAB
II B.Tech., II Sem.,**

Course Title: Fundamentals of Python Programming Lab	Course Code: AS22-05ES11
Teaching Scheme (L:T:P): 0:0:2	Credits: 1
Type of Course: Practical	Total Contact Periods: 32Hrs
Continuous Internal Evaluation: 40 Marks	Semester End Exam: 60 Marks
Prerequisites: Programming for critical thinking	

COURSE OBJECTIVES:

- To be able to introduce core programming basics and program design with functions using python programming language.
- To understand a range of Object-Oriented Programming, as well as in-depth data and information processing techniques.
- To understand the high-performance programs designed to strengthen the practical expertise.

COURSE OUTCOMES

CO#	Course Outcomes
C228.1	Study the basic concepts scripting and the contributions of scripting language.
C228.2	Demonstrate proficiency in handling Strings and File Systems.
C228.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
C228.4	Explore python especially the object-oriented concepts, and the built in objects of Python.
C228.5	Create practical and contemporary applications such as TCP/IP network programming.
C228.6	Identify Database Connectivity Concepts and Object Relational Managers in Modules.

COURSE CONTENT (SYLLABUS)

List of Experiments:

Week -1:

1. Read name, roll number, address, email and phone number of a person through keyboard and print the details.
2. Write a program to calculate compound interest when principal, rate and number of periods are given
3. Write a python to perform various operations by using operators.

Week -2:

1. Write a program to demonstrate working with lists in python
2. Write a program to demonstrate working with tuples in python
3. Write a program to demonstrate working with dictionary in python.

Week -3:

1. Write a program to check whether the given input is digit or lowercase character or uppercase character or a special character (use 'if-else-if' ladder).
2. Python Program to Print the Fibonacci sequence using while loop.
3. Python program to print all prime numbers in a given interval (use break).
4. Print the below triangle using for loop.

```

5
4 4
3 3 3
2 2 2 2
1 1 1 1 1
    
```

Week -4:

1. Write a python program to convert an decimal to a binary conversion.
2. Write a python program to create, concatenate and print a string and accessing sub-string from a given string.
3. Write a python program to perform the various string operation a given string.
4. Write a python program to find largest of three numbers.
5. Write a function called gcd that takes parameters a and b and returns their greatest common divisor.

Week -5:

1. Write a python program to find factorial of a number using recursion.
2. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.
3. Write a python program to define a module to find Fibonacci numbers and import the module to another program.
4. Write a function called palindrome that takes a string argument and returns True if it is a palindrome and False otherwise.

Week -6:

1. Write a python class to convert integer to roman numeral.
2. Write a Python class to reverse a string word by word.
3. Write a Python class to implement pow(x, n).
4. Write a python program to perform the single inheritance.

Week -7:

1. Write a python program to handle the exception for division of two numbers.
2. Write a python program to handle the IO exception for reading the file.
3. Write a python program to create and handle the user defined exception.

Week -8:

1. Write a Python code to merge two given file contents into a third file.
2. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.
3. Write a Python code to Read text from a text file, find the word with most number of occurrences
4. Write a function that reads a file file1 and displays the number of words, number of vowels, blank spaces, lower case letters and uppercase letters.

Week -9:

1. Write a python program to check whether the string is PAN number format or not.
2. Write a python program to check whether the string is E-mail format or not.
3. Write a program to implement Digital Logic Gates – AND, OR, NOT, EX-OR
4. Write a program to implement Half Adder, Full Adder, and Parallel Adder
5. Write a GUI program to create a window wizard having two text labels, two text fields and two buttons as Submit and Reset.
6. Write a GUI program to create a student registration window wizard using Tkinter.

Text Books:

1. Learning Python: Powerful Object-Oriented Programming: Shroff; Fifth edition
2. Guidovan Rossum and FredL.DrakeJr, An Introduction to Python–Revised and updated for Python3.2, Network Theory Ltd., 2011.
3. Introduction to programming using python3, Y. Daniel Liang, Prentice Hall(2020).

References Books:

1. Python Essential Reference. Addison-Wesley Professional; 4TH edition (July19, 2009)byDavidM. Baezly.
2. Cook book O Reilly Media;3 Edition (June1,2013)by David M.Baezly.

CONSTITUTION OF INDIA
II B.Tech., II-Sem.,

Course Title: CONSTITUTION OF INDIA	Course Code: AS22-00MC03
Teaching Scheme (L:T:P) : 0: 0 : 2	Credits: 0
Type of Course: Lecture	Total Contact Periods: 24 hours
Continuous Internal Evaluation -0 marks	Semester End Exams- 100 Marks
Prerequisites: Nil	

Course Overview:

Identify and explore the basic features and modalities about Indian constitution. Differentiate and relate the functioning of Indian parliamentary system at the center and state level. Differentiate different aspects of Indian Legal System and its related bodies.

Course Objectives: Students will be able to:

- To Enable the student to understand the importance of constitution
- To understand the structure of executive, legislature and judiciary
- To understand philosophy of fundamental rights and duties.
- To know about the Administration, Concept and Development of Human Rights,
- To understand the autonomous nature of constitutional bodies like Supreme Court and high court, controller and auditor general of India and election commission of India. C115.5
- To understand the central and state relation, financial and administrative

Course Outcomes: Students will be able to:

CO#	Course Outcomes
C229.1	To understand the sources, features and principles of Indian Constitution.
C229.2	To analyze about Union Government, State government and its administration.
C229.3	To remember to get acquainted with Local administration and Pachayati Raj.
C229.4	To understand Be aware of basic concepts and developments of Human Rights.
C229.5	To apply Gain knowledge on roles and functioning of Election Commission.
C229.6	To understand the election commission for sustaining democracy, application.

COURSECONTENT (SYLLABUS)

UNIT I

Constitution: Introduction to constitution of India, Meaning and importance of Constitution, Making of Indian Constitution, Sources, Salient features of Indian Constitution, and constitutional history, Features, itizenship, Preamble,

Fundamental Rights and Directive Principles: Fundamental Rights, Fundamental Duties, Directive Principles of State Policy.

UNIT II

Government of Indian Union : President of India – Election and Powers , Prime Minister and Council of Ministers Lok Sabha , Cabinet and Central Secretariat – Composition and Powers, Rajya Sabha – Composition and Powers, Federalism, Centre- State relationship, Lok Sabha, Rajya Sabha,

Government of Indian State: State Government and its Administration Governor - Powers, Chief Minister and Council of Ministers, Legislative Assembly – Composition and powers, Legislative Council – Composition and powers State Secretariat: Organization, Structure and Functions,

UNIT III

The Judiciary: Features of judicial system in India, Supreme Court –Structure, functions and jurisdiction, High Court – Structure , function and jurisdiction,

Local Administration District’s Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation, B: Pachayati raj: Introduction, PRI: Zila Pachayat, Elected officials and their roles, CEO Zila Pachayat: Position and role, Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy

UNIT IV

Concept and Development of Human Rights: Meaning Scope and Development of Human Rights, United Nations and Human Rights – UNHCR, UDHR 1948, ICCPR 1996 and ICESCR 1966,

Human Rights in India: Protection of Human Rights Act, 1993 (NHRC and SHRC), First, Second and Third Generation Human Rights, Judicial Activism and Human Rights. Citizen oriented measures – RTI and PIL – Provisions and significance

UNIT V

Federalism in India – Features , Election Commission: Election Commission- Role and Functioning, Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning.

Institute and Bodies for the welfare of SC/ST/OBC and women 117

Reference:

1. Durga Das Basu, Introduction to the Constitution of India, Gurgaon; LexisNexis, 2018 (23rd edn.)
2. M.V. Pylee, India’s Constitution, New Delhi; S. Chand Pub., 2017 (16th edn.)
3. . J.A. Siwach, Dynamics of Indian Government & Politics
4. M.V. Pylee, Indian Constitution Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd. New Delhi
5. Durga Das Basu, BharatadaSamvidhanaParichaya, Gurgaon; LexisNexis Butterworths Wadhwa, 2015
6. M.V. Pylee, Indian Constitution Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd. New Delhi
7. J.N. Pandey, The Constitutional Law of India, Allahabad; Central Law Agency, 2018 (55th edn.)

E-Resources:

1. nptel.ac.in/courses/109104074/8
2. nptel.ac.in/courses/109104045/
3. nptel.ac.in/courses/101104065/
4. www.hss.iitb.ac.in/en/lecture-details
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indian-constitution