

Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute of Information Technology, Pune-48
(An Autonomous Institute affiliated to Savitribai Phule Pune University)



Curriculum for F.Y. B.Tech (Pattern – 2023)

**Department of Computer Science and Engineering
(IoT, Cyber security including Blockchain Technology)**



F.Y. B. TECH CSE (IoTCSBT) , SEMESTER I (PATTERN 2023-NEP) AY 2023-24

Course Code	Course Title	Course Type	Teaching Scheme			Examination Scheme					Total	Credits
			L	T	P	C I E	IS E	SC E	ESE	Pr/O r/T W		
BS10232	CALCULUS AND ORDINARY DIFFERENTIAL EQUATIONS	TH	3	1	-	20	20	20	40	25	125	4
BS10233	ENVIRONMENTAL SCIENCE	TH	2	-	2	20	20	20	40	25	125	3
CI11235	DIGITAL ELECTRONICS AND LOGIC DESIGN	TH	2	0	2	20	20	20	40	25	125	3
CI11236	CRITICAL THINKING, PROBLEM SOLVING AND PROGRAMMING	TH	2	0	2	20	20	20	40	25	125	3
CI11237	HARDWARE AND NETWORK MAINTENANCE	CE	1	-	2	-	-	-	-	50	50	2
BS11238	INDIAN SCIENCE AND TECHNOLOGY	CE	1	1	-	-	-	-	-	50	50	2
BS11239	ENGLISH FOR TECHNICAL WRITING	CE	1	1	-			-	-	50	50	2
BS112310	YOGA AND SPORTS	CE	0	-	4	-	-	-	-	50	50	2
	Total		12	3	12	80	80	80	160	300	700	21

BOS Chairman

Dean Academics

Director



F.Y. B. TECH CSE (IoTCSBT) , SEMESTER I (PATTERN 2023-NEP) AY 2023-24

Course Code	Course Title	Course Type	Teaching Scheme			Examination Scheme					Total	Credits
			L	T	P	CIE	ISE	SC E	ESE	Pr/O r/T W		
BS10231	LINEAR ALGEBRA	TH	3	1	-	20	20	20	40	25	125	4
BS10234CS	PHYSICS	TH	2	-	2	20	20	20	40	25	125	3
CI12233	FUNDAMENTALS OF DATA STRUCTURES	TH	2	1/0	0/2	20	20	20	40	25	125	3
CI12234	BASICS OF IOT	TH	2	1/0	0/2	20	20	20	40	25	125	3
CI12235	SMART SENSORS	TH	2	-	2	20	20	20	40	25	125	3
CI12236	JAVA PROGRAMMING	CE	1	-	2	-	-	-	-	50	50	2
ME12237	MAKER'S LAB	CE	-	-	2			-	-	25	25	1
BS12238	COCURRICULAR ACTIVITY NSS/CLUB ACTIVITIES/CULTURAL ACTIVITIES/ PERFORMING ARTS	CE	-	-	4	-	-	-	-	50	50	2
	TOTAL		12	1/3	12/16	100	100	100	200	250	750	21

BOS Chairman

Dean Academics

Director

**BS10232 - CALCULUS AND ORDINARY DIFFERENTIAL EQUATIONS****Teaching Scheme****Credits:** 04**Lecture (L):** 03 hrs / week**Tutorial (T):** 01 hr / week**Examination Scheme**

CIE

ISE

SCE

ESE

TW

Total

20

20

20

40

25

125

Prerequisite: Basics of derivatives, integration, plane geometry and vector algebra**Course objectives:**

It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful.

Course Outcomes:

Upon completion of course, students will be able to

1. deal with derivative of functions of several variables that are essential in various branches of engineering.
2. apply the knowledge of partial derivatives to find extreme values of the function of several variables, to find gradient & directional derivative, Jacobian, approximate values and to estimate errors.
3. learn the Fourier series representation and harmonic analysis for design and analysis of periodic continuous and discrete systems.
4. learn advanced integration techniques such as Reduction formulae, Beta functions, Gamma functions needed in evaluating multiple integrals and their applications.
5. learn evaluation of multiple integrals and its application to find area bounded by curves, volume bounded by surfaces.
6. learn the effective mathematical tools for solutions of first order differential equations that model various physical processes.

Contents**Unit I – Partial Differentiation**

Partial Derivatives of first and higher orders, Euler's Theorem on Homogeneous functions, Partial derivative of Composite functions, Total derivative and Implicit differentiation

Unit II – Applications of Partial Differentiation

Maxima and minima of function of two variables, Lagrange's method of undetermined multipliers, Tangent Plane and Normal to a Surface, Gradient and Directional Derivative, Errors & Approximations, Jacobian.

Unit III – Fourier Series

Definition, Dirichlet's conditions, Full range Fourier series, Half range Fourier series, Harmonic analysis, Applications to problems in Engineering.

Unit IV – Integral Calculus & Curve Tracing

Reduction formulae, Beta & Gamma functions, Tracing of standard curves

Unit V – Multiple Integrals and Applications

Double Integration: Double integration in Cartesian & Polar coordinates, Change of order of integration, area bounded by curves

Triple Integration: Triple integral, volume bounded by surfaces

Unit VI – Differential Equations and Applications

Exact differential equation, Linear differential equation, Equations reducible to linear form, Bernoulli's differential equation, Applications of differential equations.

Textbooks:

1. Higher Engineering Mathematics by B.V.Ramana., Tata McGraw Hill Publisher
2. Higher Engineering Mathematics by B.S.Grewal, Khanna Publisher.
3. Higher Engineering Mathematics by H.K.Dass, S.Chand Publication
4. Advanced Engineering Mathematics by Erwin Kreyszig, John Wiley & Sons.

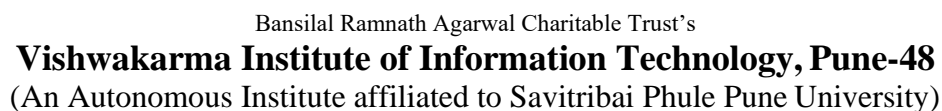


Reference books:

1. Advanced Engineering Mathematics by Peter O'Neil, Global Engineering, Publisher.
2. Textbook of Applied Mathematics (Volume I & II), by P.N.Wartikar & J.N. Wartikar Pune Vidhyarthi Griha Publisher.
3. Advanced Engineering Mathematics by C.Ray Wylie & L.Barrett, McGraw Hill Publications.
4. Advanced Engineering Mathematics by M.Greenberg, Wiley Publications.

List of Tutorials

1. Evaluation of partial derivatives, Euler's theorem on homogeneous functions
2. Partial derivative of Composite Function, Total Derivative.
3. Maxima and minima of functions of two variables, Lagrange's methods of undetermined multipliers
4. Gradient & Directional Derivative, Errors & Approximations, Jacobian.
5. Full range Fourier series
6. Half range Fourier series & Harmonic analysis
7. Reduction formulae, Gamma function, Beta function
8. Tracing of cartesian and polar curves
9. Double Integration and area
10. Triple Integration and volume
11. Home Assignment on solution of differential equations
12. Home Assignment on applications of differential equations



BS10233 - ENVIRONMENTAL SCIENCE							
Teaching Scheme	Examination Scheme						
Credits: 3 Lecture (L): 2 hrs./week Practical (P): 2 hrs./week	CIE	ISE	SCE	ESE	PR/OR	TW	Total
	20	20	20	40	-	25	125
Prerequisite course(s): 10 + 2 Syllabus							
Course Objective(s): To understand the different aspects of environmental science and management.							
Course Outcomes: Upon completion of the course, students will be able to: 1. Explain Conventional and Non-conventional Energy Resources, with respect to their advantages, disadvantages along with Principal, Construction, Working of different power plants. 2. Explain Air, Water, Land and Noise Pollution, suggest remedial measures and calculate particulates and gaseous pollutants in air. 3. Explain water and waste water management, and compute hardness, alkalinity, BOD, COD and total carbon contents. 4. Explain the Municipal and Industrial Wastes management along with its sustainability. 5. Use PBL/Seminars as a tool for reinforcing learning of concepts in Environmental Science.							
Unit I: Multidisciplinary Nature of Environmental Studies and Resources							
1) Environmental Studies: Definition, Scope, and Importance. 2) Conventional and Non-conventional Energy Resources: Conventional and Non-conventional Energy Resources, their Advantages, Disadvantages, and Impact on Environment. 3) Principal, Construction, Working of Thermal Power Plant, Hydroelectric Power Plant, Solar Power Plant, Wind Power Plant, Tidal Power Plant.							
Unit II: Environmental Pollution							
1) Air Pollution: Sources, Causes, Effects and Remedial Measures to control Air Pollution, Numerical on measurement of air pollutants for particulates and gaseous pollutants, Discussion on any one case study. 2) Water Pollution: Sources, Causes, Effects and Remedial Measures to control Water Pollution, Discussion on any one case study. 3) Land Pollution: Sources, Causes, Effects and Remedial Measures to control Land Pollution, Discussion on any one case study. 4) Noise Pollution: Sources, Causes, Effects and Remedial Measures to control Noise Pollution. Discussion on any one case study.							
Unit III: Water and Waste Water Management							
1) Introduction: Water Resources, Impurities in water, Disadvantages of impure water Analysis of water – physical, chemical (hardness, alkalinity and their numerical) and biological (BOD, COD, total carbon contents – Numerical), 2) Softening of Water: Zeolite process, Demineralization by ion exchangers, Numerical, Desalination methods - Reverse osmosis & Electro dialysis. 3) Municipal water treatment: Specifications for drinking water (IS 10500: 2012) 4) Wastewater: Sources, Necessity of treatment, Primary, Secondary, Tertiary Treatment of waste water							
Unit IV: Solid and Industrial Waste and Management and Sustainability							



- 1) Introduction:** Sources, Classification, Environmental impact
- 2) Municipal Waste Management:** collection and disposal
- 3) Industrial Waste Management:** Biomedical waste, E- waste and Management
- 4) Sustainability:** Introduction, Importance, Sustainability related to Environmental Parameters, Green computing and sustainable data centre, Importance of E- vehicle

Laboratory work:

A) List of experiments (Any 6 out of the following experiments)

1. (A)Preparation of chemical solutions and chemical safety and disposal
(B) Determination of error and error analysis
2. Proximate analysis of coal with determination of calorific value.
3. Estimation of temporary & permanent hardness of water sample by EDTA method.
4. Determination of alkalinity of water sample/To determine the acidity of the given sample of water.
5. To determine the quantity of iron present in the given sample of water by spectrophotometer / colorimeter.
6. Analysis of given soil sample with respect to pH and calcium carbonate content.
7. Field work - visit to a local area to document any one environmental issue and management system.
8. To determine physical parameters of water sample such as turbidity, pH, and conductance - virtual lab experiment
9. To determine chemical oxygen demand of water sample - virtual lab experiment
10. To determine pH and specific conductivity of soil sample - virtual lab experiment

B) PBL/Seminar:

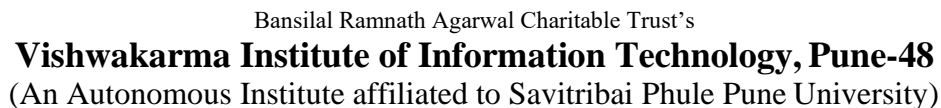
Students will select a relevant topic for seminar/project from Environmental Science and will be evaluated based on presentation

Textbooks:

1. Domkundwar & Arora, Power Plant Engineering, Dhanpat Rai & Sons, New Delhi
2. R.K. Rajput, Power Plant Engineering, Laxmi Publications New Delhi
3. S.K. Garg, Environmental Engineering (Vol. II), Sewage Disposal and Air Pollution, Khanna Publishers
4. Peavy, Rowe and Tchobanoglous, Environmental Engineering, Tata McGraw-Hill Book Company

Reference Books:

1. E.I. Wakil, Power Plant Engineering, McGraw Hill Publications, New Delhi
2. P.K. Nag, Power Plant Engineering, McGraw Hill Publications, New Delhi
3. Metcalf Eddy, Wastewater Engineering, Treatment and Reuse, McGraw Hill Education
4. Mahua Basu, Fundamentals of Environmental studies, Cambridge publication
5. S M Khopkar, Environmental pollution analysis, New age publication
6. C S Rao, Environmental pollution control Engineering, New age publication
7. J. Mendham, R. C. Denney, J. D. Barnes, M. J. K. Thomas, Vogel's Text book of Quantitative Chemical Analysis, Pearson Education Ltd.
8. Dr. G.Vijaya Pratap, Dr. Manasi Ghamande, Dr Prashant Pangrikar, De. Balaji Rupnar A Text Book of Environmental Pollution and Management ,R .K Publication
9. Dr .Surendrakumar Yadav, Dr. T. Arunkumar, Dr. Khushal Pathade ,Dr .Manasi Vyankatesh Ghamande A Text Book of Environmental Engineering and Sustainable Development, R.K. Publications
10. Dr. Maaz Allah Khan, Dr. Droupti Yadav, Dr. Pratima V. Damre, Dr .Manasi Vyankatesh Ghamande A Text Book of Water and Waste Water Engineering, R.K. Publications



CI11235 DIGITAL ELECTRONICS AND LOGIC DESIGN							
Teaching Scheme	Examination Scheme						
Credits: 3 Lecture (L): 2 hrs./week Practical (P): 2 hrs./week	CIE	ISE	SCE	ESE	PR/OR	TW	Total
	20	20	20	40	-	25	125
Prerequisite course(s):							
Course Objective(s): <ul style="list-style-type: none"> To understand the different simplification techniques of digital circuits. To understand and design combinational and sequential circuits. 							
Course Outcomes: Upon completion of the course, students will be able to: <ol style="list-style-type: none"> Understand number systems and minimization techniques. Apply minimization techniques to design combinational logic circuits. Understand and interpret fundamentals of sequential circuits. Design and analyse finite state machines and PLDs 							
Unit I: Number Systems and Minimization Techniques							
Introduction to number systems, conversion, binary arithmetic, digital codes, logic gates, Boolean algebra and logic simplification using Boolean rules and laws. Standard representations for logic functions, k map representation of logic functions (SOP & POS forms), minimization of logical functions for min-terms and max-terms (upto 4 variables), don't care conditions, Quine McCluskey method.							
Unit II: Combinational Logic Design							
Design Examples: Arithmetic Circuits, BCD - to - 7 segment decoder, Code converters. Adders and their use as subtractions, look ahead carry, ALU, Digital Comparator, Parity generators/checkers, Multiplexers and their use in combinational logic designs, multiplexer trees, De multiplexers and their use in combinational logic designs, Decoders, de multiplexer trees.							
Unit III: Sequential Logics							
Flip- flop: SR, JK, D, T; Preset & Clear, Master and Slave Flip Flops, Truth Tables and Excitation tables, Conversion from one type to another type of Flip Flop. Registers: Buffer register, shift register (SISO, SIPO, PISO & PIPO), Applications of shift registers. Counters: Asynchronous counter. Synchronous counter, ring counters, Johnson Counter, Modulus of the counter (IC 7490).							
Unit IV: FSM and PLD							
Synchronous Sequential Circuit Design: Models – Moore and Mealy, State diagram and State Tables, Design Procedure, Sequence generator and detector Concept of Programmable logic devices. Logic implementation using Programmable Devices.							
Laboratory work:							
A) List of experiments (Any 6 out of the following experiments)							



1. Realize Full Adder and Subtractor using a) Basic Gates and b) Universal Gates.
2. Number system conversion and 2's complement arithmetic.
3. Study of IC74LS85 as a magnitude comparator
4. Study of IC 74LS153 as a Multiplexer
5. Design and Implement MOD-N and MOD-NN using IC-74LS90 (Decade Counter)
6. Design and Implement MOD-N and MOD-NN using IC-74LS90 (Decade Counter)
7. Design and simulate the given combinational circuit using EDA tools.
8. Design and simulate the given sequential circuit using EDA tools.9.

Textbooks:

1. T. L. Floyd, "Digital Fundamentals", 9th edition, Pearson International Edition.
2. R. P. Jain, "Modern digital electronics", 4th edition, TMH Publication.

Reference Books:

1. Anand Kumar, "Fundamentals of digital circuits" 1st edition, PHI publication.
2. J F Wakerly, "Digital Design: Principles and Practices", 3rd edition, Pearson Education.

**CI1236 CRITICAL THINKING, PROBLEM SOLVING AND PROGRAMMING****Teaching Scheme**

Credits: 3

Lecture (L): 2 hrs./week

Practical (P): 2 hrs./week

Examination Scheme

CIE

ISE

SCE

ESE

PR/OR

TW

Total

20

20

20

40

-

25

125

Prerequisite course(s): Basic Computer Skills**Course Objective(s):**

- Cultivate skills to approach problems from multiple perspectives critically.
- Understand the stages of effective problem-solving: problem identification, analysis, solution generation, and evaluation.
- Learn to design and implement algorithms using C++.

Course Outcomes:

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

1. Develop the capacity to analyse and evaluate information critically.
2. Utilize problem-solving techniques to design algorithmic solutions for engineering challenges.
3. Acquire a solid foundation in C++ programming language syntax and semantics.

Unit I : Critical Thinking and Problem Solving

Definition of critical thinking and its significance, Elements of critical thinking, Steps of critical thinking, Skills for critical thinking, Developing and applying critical thinking in engineering problem-solving.

Exploring Your Personal Critical and Creative Thinking Skills.

Recognizing and defining engineering problems, Introduction to problem-solving process: define, analyze, generate solutions, evaluate solutions, implement, and monitor, Techniques for brainstorming and idea generation, Developing algorithmic thinking skills through exercises and case studies

Unit II: Introduction to C++

Fundamentals of OOPS, Introduction to Programming and C++, Variables, Data Types, and Operators, Control Structures, Loops and Iteration, Functions and Modular Programming, Class, Objects, Encapsulation, constructors, and destructors, Static, This, Inheritance, Polymorphism

Laboratory work:

A) List of experiments



1. The assessment is designed to test your critical reasoning skills. It is divided into 5 sections that will assess your ability to identify the key problems in complex scenarios, to pick out common errors in reasoning, to provide necessary assumptions for arguments, to recognize that problems can be solved in a variety of ways, and to distinguish valid/invalid and probable/improbable conclusions. Each section will consist of 3-4 questions and you will have to complete the assignment.
 - a) Identify Key Question, Problem, or Issue
 - b) Pick out the key, or primary, question.
 - c) Pick out the primary problem that creates further problems.
 - d) Pick out the issue, limit the scope.
2. Collect appropriate information and evidence
 - a) Interpreting claims and best evidence in a set.
 - b) Identifying bias.
 - c) Identifying the fallibility of experts.
3. Analyze the evidences and list the assumptions and Context
 - a) Pick out a valid assumption for the argument.
 - b) Provide the necessary assumption for the argument.
 - c) Picking out context. (In what way does the argument fail to recognize context?)
4. Identify the Perspectives and Plausible Solutions
 - a) Solve a problem with a set of solutions.
 - b) Pick out the best counter position.
 - c) Pick out a possible different perspective.
5. Write the Conclusions and Implications. Define a problem and Organizing the problem.
 - a) Analyze the problem and prepare Problem Analysis chart
 - b) Identify different modules and develop interactivity chart
 - c) Extent and organize the information in the problem analysis chart using Input-
 - d) Procession-Output (IPO Chart)
 - e) Write algorithms and draw flowchart for different modules
 - f) Test the solution.
6. Basics of C++
 - a) Write a C++ program to calculate the area of a rectangle given its length and width.
 - b) Develop a C++ program that converts temperature from Celsius to Fahrenheit using the formula: $Fahrenheit = (Celsius * 9/5) + 32$.
 - c) Create a program that takes a user's age as input and determines if they are eligible to vote or not.
 - d) Implement a C++ program that generates the Fibonacci sequence up to a given number 'n' using loops.
7. Functions and Modular Programming
 - a) Design a program that calculates the factorial of a given positive integer using a recursive function.
 - b) Develop a modular program that checks whether a given number is prime or not, utilizing a function for prime number testing.
8. Object-Oriented Programming (OOP)
 - a) Create a C++ class named Rectangle that has attributes for length and width. Implement methods to calculate the area and perimeter of the rectangle.
 - b) Design a program using OOP concepts to simulate a basic banking system. Implement classes for customers and accounts, allowing for deposits and withdrawals.
9. Inheritance and Polymorphism
 - a) Build a hierarchy of classes representing different shapes (e.g., Circle, Triangle, Rectangle) with a common base class. Implement a virtual function for calculating the area of each shape.
 - b) Extend the banking system to include different types of accounts (Savings, Checking) that inherit from a common Account class. Implement polymorphic behavior for interest calculations.



Textbooks:

1. Alec Fisher, "Critical Thinking: An Introduction", 2nd edition, ISBN: 978110740198
2. Tracy Bowell and Gary Kemp, "Critical Thinking: A Concise Guide", Taylor & Francis e-Library, 2005, ISBN 0-203-48288-3 Master e-book ISBN.
3. Dyer, Jeffrey H., Hal B. Gregersen, and Clayton M. Christensen. The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators. Boston, MA: Harvard Business Press, 2011.

Reference Books:

1. Richard Paul and Linda Elder, "Critical Thinking: Tools for Taking Charge of Your Learning & Your Life" - 4th Edition, Publisher: Rowman & Littlefield, Copyright: 2021, Softcover ISBN: 978-1-5381-3874-8, E-book ISBN: 978-1-5381-3875-5
2. Peter F. Drucker, "Innovation and Entrepreneurship"
3. https://www.tutorialspoint.com/critical_thinking/index.htm

**CI1237 HARDWARE AND NETWORK MAINTENANCE**

Teaching Scheme	Examination Scheme						
Credits: 2 Lecture's/Week(L): 1 Hrs/week Practical/Week(P): 2 Hrs/week Tutorial/Week(T): 0 Hrs/week	CIE	ISE	SCE	ESE	PR/OR	TW	TOTAL
	-	-	-	-	50	-	50

Prerequisites:

- Basic operating knowledge of wireless device like mobile phone, laptop etc

Course Objectives:

- To understand basic concept & structure of Computer Hardware & Networking Components.
- To Identify the existing configuration of the computers & peripherals.
- To identify and repair computer hardware, software and network related problems.
- To perform routine maintenance and upgrades.

Course Outcomes:

After studying this course, students will be able to:

- To recognize basic concept & structure of Computer Hardware & Networking Components.
- To identify the existing configuration of the computers & peripherals.
- To apply their knowledge about computer peripherals to identify/rectify problems.
- To integrate the PCs into Local Area Network & re-install OS & various shipboard applications.
- To perform routine maintenance, upgrades of virus definitions, set schedules etc.

Unit I : Fundamental of Computer and System

Computer Fundamentals History and Generations of Computer (Gen 1 to 10), Architecture of the Computer, Description of Different parts of a computer, Idea about System Software and Application Software. Operating system concept (Basic knowledge). Fundamentals of Electricity, About AC and DC, How AC is converted into DC in a Computer? SMPS Features, Functions, Types of SMPS, Types of UPS Offline, Line Interactive & Online, Working Principle of each type of UPS. What is information? Processing of Information, simulation on information/data processing.

Unit II: Basics Input, Output and Operating System

BIOS/CMOS Setup, POST(Power on Self-Test)(Date, Time, Enable/Disable Devices), Booting Sequence/Boot Order, Definition and types of Operating Systems. Functions & Features of OS, MS-DOS (Prelims), Windows 8.1, 10, 11, Red Hat 7 / Fedora Linux Server, Ubuntu, MAC OS, Android etc., Process of Booting the Operating System, Installation of Windows 8.1, 10, 11 What is Microprocessor? Types of Microprocessors, Instruction execution (Timing Diagrams), Advantages and Disadvantages of Sequential and Parallel Processors.

Unit III : PC Assembling And Troubleshooting



Primary and Secondary memory, RAM, ROM, Cache Memory, Buffer Memory, Virtual Memory. Speed, Timeline (EDO, NON-EDO, SD, RD, DDR, DDR2, DDR3, DDR4), Hybrid Memory.

Hard Disk, Cables (Serial, Parallel and USB), Secondary Storage, Computer Management, Disk Management, Defragmentation, Services and Applications, Local Users and Groups. Advanced System Settings, Device Manager, Task Manager, Windows Registry. Different Service management by Linux using **systemctl** command. Partitioning of Hard Drive/ SSD - Primary, Extended, Logical partitions using Partition Tools in windows and Linux

Unit IV : Fundamentals of Networks and Troubleshooting

What is Networking? Application of Network, Classification of Network, Network Devices, Types of Transmission Media, Topology, Network Operating System, Storage Devices, Introduction to cloud concept, Introduction to Network Security, Various Commands for Network troubleshooting, Case Study

List of Assignments

1. Demonstrate the different parts of a computer system and its working. Different Tools / equipment used for assembling/ disassembling a PC.
2. Demonstration of different types of configurations and effect of changes in an existing BIOS feature for a system.
3. Implementation of Dual Booting setup preferably in windows with Linux (Ubuntu).
4. Demonstration of different generation's RAM compatible with the system, showing speed, & other features.
Hand on practice to install RAM on the slot provided on the compatible main board.
Demonstration of different types of HDD/SSD, showing speed, characteristics & other features.
Hand on practice to install HDD / SSD or both in a System.
Hands on practice to make a HDD /SSD as Primary/ Secondary Master / Slave using IDE Jumper settings or cable select.
Fresh installation a HDD/SSD, Partition, Installation of OS, Application S/W.
5. Printers (Dot Matrix, Inkjet, Laser, Thermal, All-in-One Printers, etc.), Interface Cables, Ports & Connectors. Working Principles of each type, network Printer. Installing a Printer and Configuring Drivers. Possible Printer Problems and Troubleshooting Techniques. Types of Scanners (Handheld, Flatbed, Sheet fed, Portable Scanners). Interface Cables, Ports & Connectors. Working Principles of each type. Installation of Scanner, Device Driver Installation. Scanner Settings, Scanning Documents, Photos in different Formats like JPG, PDF etc.
6. Demonstration of different types of Network Implementation through Slides / Pictures.
Demonstration of Client, Server, Workstation, Hubs and their applications through Slides / Pictures.
Hand on Practice to identify Peer-to-Peer, Client-Server and Distributed network system.
Transmission media types Identification.
7. Crimping RJ45 Connectors, CAT V/ VI wired Colour Matching for Type A and Type B Connection.
Hand on practice for communication to windows networking. Data Sharing, Printer Sharing. Remote Desktop Connection using Windows RDC. Creating Shared Folders for each user, Assigning Access Rights and Changing Ownership for Shared Folders using File Server Wizard. Installing, Configuring Windows Server, DNS, ADS, DHCP Configuration.
8. Hand on practices on internet, mail and browser properties, security settings. Configuring mailbox with Outlook. Hands on practice to configure Router and or Modem through Admin. Hands on practice to configure Router and or Modem through Admin password. Create and configure SSID for secured Wireless connection through a router / modem. Practice on different advanced application on router / Wi-Fi modem to produce security filter / firewall in network access.

Textbooks:



1. Laptop Repair Complete Guide; Including Motherboard Component Level Repair! By [Garry Romaneo](#) · 2011
2. Essential Computer Hardware Second Edition The Illustrated Guide to Understanding Computer Hardware
By [Kevin Wilson](#) · 2019
3. E Book: Hardware and Networking Book

Reference Books:

1. <https://bharatskills.gov.in/Home/StudyMaterial>

**BS11238 – INDIAN SCIENCE AND TECHNOLOGY**

Teaching Scheme	Examination Scheme						
Credits:2 Lecture (L): --1 Tutorial (T): --1 1hr./week	CIE	ISE	SCE	ESE	PR	TW	Total
	-	-	-	-	-	50	50

Prerequisite:**Course objectives:**

- Development of a holistic perspective about Indian science and technology

Course Outcomes:

Upon completion of the course, students will be able to

- 1.Understand the modern technological trends through Indian scientific and technological philosophy
- 2.Understand the development of Mathematics and water management systems in India

Fundamentals

- An overview of Indian contributions to technology
- Technological Innovations

Mathematics

- An overview of the Development of Mathematics in India
 - Aryabhatta (discovery of zero)
 - Weaving Mathematics into Beautiful Poetry- *Bhaskaracarya*.
 - The Evolution of Sine Function in India
 - The Discovery of Calculus by Astronomers
- Concept of proof in Indian mathematics

Water Management

- Overview
- Harappan and Traditional Water Management System of Gujarat
- Historical Sites- Sringeverpur, South Indian Water Management System, WesternGhats Cave- Kanheri etc.
- Medieval Period
- Involvement of peoples in Water Management

List of Tutorial: (Any 7 tutorials can be taken)

1. Practice session to discuss-Contribution and innovation of Indian Science and Technology
- 2.Practice session to discuss - The Development of Mathematics in India
- 3.Practice session to discuss -The Evolution of Sine Function in India
- 4.Practice session to discuss - Harappan and Traditional Water Management System of Gujarat
- 5.Practice session to discuss-Historical Sites- Sringeverpur, South Indian Water Management System,WesternGhats Cave- Kanheri etc
- 6.Practice session to discuss – Basic concept of Ayurveda
- 7.Practice session to discuss- Forest Management and Urban Planning
- 8.Practice session to discuss - Ancient ecological and environmental aspects of Tank, Lakes,& Stepwells
- 9.Practice session to discuss- Development of Trading Techniques
- 10.Poster presentation on any one of the above topics

Text Books:

1. R.M. Pujari, Pradeep Kolhe, N. R. Kumar, 'Pride of India: A Glimpse into India'sScientific



Heritage', Samskrita Bharati Publication.

2. 'Indian Contribution to science', compiled by Vijnana Bharati.

3. 'Knowledge traditions and practices of India', Kapil Kapoor, Michel Danino, CBSE, India.

Reference Books:

1. Dr. Subhash Kak, Computation in Ancient India, Mount, Meru Publishing (2016)
2. Dharampal, Indian Science and Technology in the Eighteenth Century, Academy of Gandhian Studies, Hyderabad, 1971, republ. Other India Bookstore, Goa, 2000
3. Robert Kanigel, The Man Who Knew Infinity: A Life of the Genius Ramanujan, Abacus, London, 1999
4. Alok Kumar, Sciences of the Ancient Hindus: Unlocking Nature in the Pursuit of Salvation, CreateSpace Independent Publishing, 2014
5. B.V. Subbarayappa, Science in India: A Historical Perspective, Rupa, New Delhi, 2013
6. S. Balachandra Rao, Indian Mathematics and Astronomy: Some Landmarks, Jnana Deep Publications, Bangalore, 3rd edn, 2004
7. S. Balachandra Rao, Vedic Mathematics and Science In Vedas, Navakarnataka Publications, Bengaluru, 2019
8. Bibhutibhushan Datta, Ancient Hindu Geometry: The Science of the Śulba, 1932, repr. Cosmo Publications, New Delhi, 1993
9. Bibhutibhushan Datta & Avadhesh Narayan Singh, History of Hindu Mathematics, 1935, repr. Bharatiya Kala Prakashan, Delhi, 2004
10. George Gheverghese Joseph, The Crest of the Peacock, Penguin Books, London & New Delhi, 2000
11. J. McKim Malville & Lalit M. Gujral, Ancient Cities, Sacred Skies: Cosmic Geometries and City Planning in Ancient India, IGNCA & Aryan Books International, New Delhi, 2000).
12. Clemency Montelle, Chasing Shadows: Mathematics, Astronomy and the Early History of Eclipse Reckoning, Johns Hopkins University Press, 2011
13. Anisha Shekhar Mukherji, Jantar Mantar: Maharaja Sawai Jai Singh's Observatory in Delhi, AMBI Knowledge Resources, New Delhi, 2010
14. Thanu Padmanabhan, (ed.), Astronomy in India: A Historical Perspective, Indian National Science Academy, New Delhi & Springer (India), 2010
15. Acharya Prafulla Chandra Ray, A History of Hindu Chemistry, 1902, republ., Shaibya Prakashan Bibhag, centenary edition, Kolkata, 2002
16. R. Balasubramaniam, Delhi Iron Pillar: New Insights, Indian Institute of Advance Study, Shimla & Aryan Books International, New Delhi, 2002
17. R. Balasubramaniam, Marvels of Indian Iron through the Ages, Rupa & Infinity Foundation, New Delhi, 2008
18. Anil Agarwal & Sunita Narain, (eds), Dying Wisdom: Rise, Fall and Potential of India's Traditional Water-Harvesting Systems, Centre for Science and Environment, New Delhi, 1997
19. Fredrick W. Bunce: The Iconography of Water: Well and Tank Forms of the Indian Subcontinent, DK Printworld, New Delhi, 2013

**BS11239 – ENGLISH FOR TECHNICAL WRITING****Teaching Scheme****Examination Scheme****Credits:** 02**Lecture (L):** 01 hrs / week**Practical (P):** 01hrs / week

CIE	ISE	SCE	ESE	TW	Total
-	-	-	-	50	50

Course objectives:

1. Improve grasp of English grammar and punctuation rules
2. Learn to write precise and concise English text
3. Learn to write reader-friendly text, using rules of organizing a document
4. Apply techniques of writing skills in technical writing, through real life examples

Course Outcomes:

After completing this course learners will be able

1. Have clarity and coherence in English
2. Produce concise and precise English text
3. Write reader-friendly well organized text in English
4. Write effective reader-friendly technical documents in English of high-quality

Contents**Unit I – English Language Basics (6 hrs)**

English grammar essentials (Parts-of-speech, tense, active, passive, article), use of punctuation, confusing words-Homophones

Unit II – Precise and Concise Writing (6 hrs)

Logically organizing your thoughts, one idea per sentence/paragraph, avoiding repetition and being specific
 Using active voice, and strong verbs
 Using simple plain language, reducing adjectives and adverbs, avoiding unnecessary words
 Rewriting in smaller number of words/sentences
 Precise writing through meticulous editing, proofreading
 Writing abstracts and conclusions

Unit III – Organizing the Written Document (4 hrs)

Logical organization of text using headings, subheadings, and bullet points.
 Writing indexes, and table of content, chapters, paragraphs, references
 Structuring of formal and informal letters, technical reports and technical presentations

Unit IV– Technical Writing (8 hrs)

Introduction to technical writing, audience analysis and effectiveness, defining purpose of document
 Writing emails, minutes of meeting, user manuals/guides, FAQs , statement of purpose (SOP), reports, research papers and thesis

Tutorial:**Sample List of assignments**

1. Edit and proofread the provided technical document, identifying and correcting errors in grammar and punctuation.
2. Write and narrate an article of your choice (like - inventions or discoveries made by any scientist, etc). Note the mistakes you made in grammar, before the final version.
3. Rewrite the assignment in (2) with reduced number of sentences, words, but including all ideas written in the previous assignment. Note the percentage of reduction possible.
4. Write an abstract and conclusion for the given technical document.
5. Read a given unformatted document and organize it into chapters, paragraphs and sub topics. Give necessary heading where required.
6. Write an email to a faculty requesting to work under them as research interns, ensuring clarity, proper etiquette, and concise communication.
7. Prepare a User Manual for a select product. Make it easy to read and informative.



8. Write a precise and accurate technical description of an engineering component, system, or process, focusing on clarity and attention to detail.
9. Prepare a report that identifies and analyzes an engineering problem, proposes potential solutions, and recommends the best course of action

Text/Reference books:

1. English Grammar, Wren and Martin
2. Developing Communication Skills, Krishna Mohan, Meera Banerji, Second Edition, ISBN 10 : 0230-63843-0, ISBN 13: 978-0230-63843-3
3. Technical Communication for Engineers, Shalini Verma ISBN : 978-93259-9018-0
4. Effective Technical Communication, M Ashraf Rizvi, ISBN-13: 978-0-07-059952-9, ISBN-10: 0-07-059952-1

**BS112310 – YOGA AND SPORTS****Teaching Scheme****Examination Scheme****Credits:** 02**Practical (P):** 04 hrs / week

CIE

ISE

SCE

ESE

TW

Total

-

-

-

-

50

50

Course objectives:

1.) To motivate the students for higher education in Yogasana & Sports
2. To motivate the students for higher education in Yogasana / Pranayam and Kriya
3. Relate the fundamental principles of Yoga & sports to applications.
4. To developed Physical & mental fitness, remove stress, frustration and take some ethical knowledge about Yoga and Sports activities.
5. To motivate the students for higher education in Yogvidya & To acquire subject knowledge of Yogvidya
6. To developed skills of game and yogasana pranayama and kriya

Course Outcomes:

After completing this course learners will be able

1. Explain the Yoga & Sports ethics as an Indian culture.
2. Explain the basic concept of Physical, Mental fitness and Social awareness or responsibilities.
3. Explain the team work, Yogic Science, the effect on our Mind & Body. And the effect of our lifestyle.
4. Explain the practical of asana like back bending. Front bending, twisting, standing, balancing etc.
5. Explain and practice of Spiritual asana & physical fitness related asana, Pranayama, kriya etc.
6. Check Performance as per practice base Sports Games and yogasana, pranayama and kriya.
7. Well understanding of sports games, yoga ethics as a physical fitness, mental fitness, recreation and refresh of mind and body, as well as healthy lifestyle in daily routine.

Contents**Unit I – Introduction of Sports Games Yogasana (4 hrs)**

- 1) The Basic Exercises, game wise different Rhythmic Exercises, various sports events Introduction & playing methods. Rule regulation of overall events. Athletics events training introduction and practice.
- 2) Introduction of Yogashastra, Loosening Exercises, Suryanamaskar and its practice in same reputations. Practice of basic and simple healthy asanas.

Unit II – (4hrs)

- 1) Practice session for Outdoor Games, event wise practice and team game organized on the spot. Game wise practice as per student's interest.
- 2) Standing Asana Practice & method of practice as well as time, steps and other precautions'
- 3) Event wise Measurement and team selection process and practice for recreation and teamwork building.

Unit III – Various types of Asana, pranayama and sports practice cum Introduction (4 hrs)

- Selected simple types Sitting asana Practice, Pro down and laydown position practice, twisting asana and pranayama practice
- Selected basic indoor and outdoor sports events (team event individual events) measurement practice and game practice for physical fitness.

Unit IV– Yoga and sports Practice and matches for each other (4 hrs)

- 1) All the sports games practice as per the rule as well as yoga practice as per the previous learning based revision.
- 2) Finalize the best for revision and as per the importance of physical fitness awareness and selected yogic practice like asana pranayama and kriya for spiritual base, physical and mental wellness base as per capacity.

Textbooks:

1. Athletic Track and court marking Handbook of Games & Sports – Rajesh Agola.
2. Asana, Pranayama & Kriyas by Swami satyanand Swami.Munger.
3. Sports Game and its rule, regulation.

Reference books:



- 1)Yogic prakriyanche margdarshan – Dr.M.L.Gharote - (The Lonavala Yoga Research Institute,Lonavala)
- 2)Yogabhyas Ek Sukhi Jivan – Dr.Shripad Jarde (Chandrama Prakashan,Kolhapur)
- 3)Patanjal Yogsutra Ek Abhyas – Anand Rishi (Rajhans Prakashan,Pune)
- 4)Yog Ani Arogya – Dr.R.R.Waman (Tilak Maharashtra University,Pune)
- 5) Textbook of Yoga – Dr.Limbaji Pratale & Dr.Namdev Phatangare.