DOMBIVLI SHIKSHAN PRASARAK MANDAL'S,

K.V. PENDHARKAR COLLEGE OF ARTS, SCIENCE AND COMMERCE, (AUTONOMOUS) DOMBIVLI (EAST), DIST. THANE

(Affiliated to University of Mumbai)

Faculty of Science

DEPARTMENT OF INFORMATION TECHNOLOGY

(Programme: Bachelor of Science: B.Sc. I.T.)

SYLLABUS FOR

F. Y. B.Sc. I.T. – Information Technology (Semester I and II)

Choice Based Credit System (CBCS)

(as per NEP-2020)

(with effect from the Academic Year: 2023-2024)

SEM I

Course Code	Course Title	Category	Marks	Credits
IT23101MM	Imperative Programming	Major Mandatory	100	2
IT23102MM	Discrete Mathematics	Major Mandatory	100	2
IT23103MM	Imperative Programming Practical	Major Mandatory	50	2
IT23104MN	Digital Electronics	Minor	100	2
IT23105OE	Communication Skills Practical	Open Elective	50	2
AF23105OE	Direct Tax-I	Open Elective	50	2
IT23107VS	Discrete Mathematics Practical	Vocational Skill Course	50	2
IT23108SE	Digital Electronics Practical	Skill Enhancement Course	50	2
IT23109AE	Communication SKills	Ability Enhancement Course	50	2
IT23110VE	Green Computing	Value Education Course	50	2
IT23111IK	IPR & Cyber Law	Indian Knowledge System	50	2
			Total Credits: 22	

SEM II

Course Code	Course Title	Category	Marks	Credits
IT23201MM	Object Oriented Programming	Major Mandatory	100	**2**
IT23202MM	Web Programming	Major Mandatory	100	**2**
IT23203MM	Object Oriented Programming Practical	Major Mandatory	50	**2**
IT23204MN	Microprocessor Architecture	Minor	100	**2**
IT23205OE	Operating System	Open Elective	50	**2**
AF23205OE	Direct Tax-II	Open Elective	50	**2**
IT23207VS	Microprocessor Architecture Practical	Vocational Skill Course	50	**2**
IT23208SE	Web Programming Practical	Skill Enhancement Course	50	**2**
IT23209AE	Numerical & Statistical Methods Practical	Ability Enhancement Course	50	**2**
IT23210VE	Numerical & Statistical Methods	Value Education Course	50	**2**
IT2311CC	Co-Curricular Course	Co-Curricular Course	50	**2**
			Total Credits: 22	

F. Y. BSc. I.T.

SEMESTER- I

B. Sc (Information Technology)		Semester – I	
Course Name: Imperative Programming		Course Code: IT23101MM	
Periods per week		**3**	
Credits		**2**	
		Hours	**Marks**
Evaluation System	**Theory Examination**		
	Internal		

Learning Outcomes:

1. Students will get to know the basic idea about the logic and development of programs.

2. Students will get familiar with operators and I/O library functions available in C.

3. Students will be able to use conditional statements and loops to solve various complex programs and using functions in the program.

4. Students will get familiar with preprocessor directives and arrays.

5. Students will get to know the concept of pointers and structures in c programming.

Unit	Details	No. of Lectures
I	**Introduction:** Types of Programming languages, History, features and application. Simple program logic, program development cycle, pseudocode statements and Algorithm, flowchart symbols, sentinel value to end a program, programming and user environments, evolution of programming models., desirable program characteristics. Structure of Program with its	

	sections **Fundamentals:** Compilation and Execution of a program, Character/Token, Symbolic Constants, Type of Operators, Library Functions, Type of Data Input and Output Functions, String functions. **Conditional Statements and Loops:** Decision Making Within A Program, Conditions, Relational Operators, Logical Connectives, If Statement, If-Else Statement. Loops: While Loop, Do While, For Loop. Nested Loops, Infinite Loops, Switch Statement, use of break, continue, go to statement.	
II	**Functions:** Overview, defining a function, accessing a function, passing arguments to a function, specifying argument data types, function prototypes, recursion, modular programming and functions, standard library of c functions, prototype of a function: parameter list, return type, function call, block structure, passing arguments to a function: call by reference, call by value. Inline Function **Program structure:** Storage classes, automatic variables, external variables, static variables, multi file programs, more library functions **Preprocessor:** Features, #define and #include, Directives and Macros	
III	**Arrays:** n, processing, passing arrays to functions, Array Operations multidimensional arrays, arrays and string and its functions. **Pointers:** Fundamentals, declarations, Pointers Address Operators, Pointer Type Declaration, Pointer Assignment, Pointer Initialization, pointer, Pointer with function. **Structures and Unions:** Structure Variables, Initialization, Structure Assignment, Nested Structure, Structures and Functions, Structures and Arrays: Arrays of Structures,	

| | Structures Containing Arrays, Unions. | |

References:

Books and References:					
Sr. No.	**Title**	**Author/s**	**Publisher**	**Edition**	**Year**
1.	Programming with C	Byron Gottfried	Tata McGRAW - Hill	2nd	1996
2.	Programming Logic and Design	Joyce Farell	Cengage Learning	8th	2014
3.	"C" Programming"	Brian W. Kernighan and Denis M. Ritchie.	PHI	2nd	
4.	Let us C	Yashwant P. Kanetkar,	BPB publication		
5.	C for beginners	Madhusudan Mothe	X-Team Series	1st	2008
6.	21st Century C	Ben Klemens	OReilly	1st	2012

B. Sc. (Information Technology)		**Semester – I**
Course Name: Discrete Mathematics		**Course Code: IT23102MM**
Periods per week		**3**
Credits		**2**
		Marks
Evaluation System	**Theory Examination**	
	Internal	

Learning Outcomes:

After successful completion of this course students will be able to

1. Simplify and evaluate basic logic statements.

2. Develops reasoning and problem-solving abilities, with an emphasis on proof.

3. Apply rules of inference, tests for validity, and methods of proof including direct and indirect proof forms, proof by contradiction, proof by cases, and mathematical induction and write proofs using symbolic logic and Boolean Algebra

4. Demonstrate the ability to use iterative and recursive processes to prove properties of integers.

5. Demonstrate the ability to use a problem-solving approach in applying counting techniques in order to determine probabilities.

Unit	Details	No. of Lectures
I	**Introduction**: Introduction to Discrete mathematics and its applications, Variables, The Language of Sets, The Language of Relations and Function **Set Theory**: Definitions and the Element Method of Proof, Properties of Sets, Disproofs, Algebraic Proofs, Boolean Algebras **The Logic of Compound Statements**: Logical Form and Logical Equivalence, Converse, inverse and contrapositive of statement Conditional Statements, Valid and Invalid Arguments **Relations**: Relations on Sets, Reflexivity, Symmetry, and Transitivity, Equivalence Relations, Partial Order Relations **Functions**: Functions Defined on General Sets, One-to-One and Onto, Inverse Functions, Composition of Functions, Cardinality	**(10)**

	Counting: Introduction, Possibility Trees and the Multiplication Rule, Possibility Trees and the Multiplication Rule, Counting Elements of Disjoint Sets: The Addition Rule, The Pigeonhole Principle, Counting Subsets of a Set: Combinations, r- Combinations with Repetition Allowed **Probability:** Introduction to random experiment, Sample space Events and types of events, Axioms and Expected Value, Conditional Probability, Bayes' Formula, and Independent Events	
II	**Elementary Number Theory and Methods of Proof**: Introduction to Direct Proofs, Rational Numbers, Divisibility, Division into Cases and the Quotient-Remainder Theorem, Floor and Ceiling. **Sequences, Mathematical Induction**: Sequences, Mathematical Induction, Strong Mathematical Induction and the Well- Ordering Principle for the Integers, Correctness of algorithms. **Recursio**n: Defining sequences recursively, solving recurrence relations by iteration, Second order linear homogeneous recurrence relations with constant coefficients. general recursive definitions and structural induction.	**(10)**
III	**Graphs**: Definitions and Basic Properties, Trails, Paths, and Circuits, Matrix Representations of Graphs, Isomorphism of Graphs, Eulerian graph, Planar graph, Graph Colouring **Trees**: Rooted Trees, spanning trees and shortest paths, Minimum spanning tree by using Prim's Algorithm, Kruskal's Algorithm and Djkstra's Algorithm	**(10)**

Books and References:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Discrete Mathematics with Applications	Sussana S. Epp	Cengage Learning	4th	2010
2.	Discrete Mathematics, Schaum's Outlines Series	Seymour Lipschutz, Marc Lipson	Tata MCGraw Hill		2007
3.	Discrete Mathematics and its Applications	Kenneth H. Rosen	Tata MCGraw Hill		
4.	Discrete mathematical Structures	B Kolman RC Busby, S Ross	PHI		
5.	Discrete structures	Liu	Tata MCGraw Hill		

B. Sc (Information Technology)	Semester – I	
Course Name: Digital Electronics	Course Code: IT23104MN	
Periods per week	3	
Credits	2	
	Marks	
Evaluation System	Theory Examination	
	Internal	

Learning Outcomes:

After successful completion of this course students will be able to

1. Get information about the Number system and their arithmetic operations.

2. Get in detail study of Boolean algebra as well as K-maps technique.

3. Study in detail about combinational circuits.

4. Get to know about Encoder, decoder and different types of Flip-flop Circuits.

5. Understand in detail about the Counter and Shift register.

Unit	Details	No. of Lectures
I	**Number System:** Analog System, digital system, numbering system, binary number system, octal number system, hexadecimal number system, conversion from one number system to another, floating point numbers, weighted codes binary coded decimal, non-weighted codes Excess – 3 code, Gray code, **Binary Arithmetic:** Binary addition, Binary subtraction, Negative number representation, Subtraction using 1's complement and 2's complement, Binary multiplication and division **Boolean Algebra and Logic Gates:** Introduction, Logic (AND OR NOT), Boolean theorems, Boolean Laws, De Morgan's Theorem, Perfect Induction, Reduction of Logic expression using Boolean Algebra, Deriving Boolean expression from given circuit, exclusive OR and Exclusive NOR gates, Universal Logic gates, Implementation of other gates using universal gates.	(12)
II	**Minterm, Maxterm and Karnaugh Maps:** Introduction, minterms and sum of minterm form, maxterm and Product of maxterm form, Reduction technique using Karnaugh maps – 2/3/4/5/6 variable K-maps, Grouping of variables in K-maps, K-maps for product of sum form, minimize Boolean expression using K-map and obtain K-map from Boolean expression,Quine McClusky method.	(12)

	Combinational Logic Circuits:	
	Introduction, Multi-input, multi-output Combinational circuits, Code converters design	
	Multiplexer, Demultiplexer, ALU, Encoder and Decoder:	
	Introduction, Multiplexer, Demultiplexer, Implementation of Mux and Demux , Decoder, Encoders.	
III		**(12)**
	Sequential Circuits: Flip-Flop:	
	Introduction, Terminologies used, S-R flip-flop, clocked S-R flip-flop,D flip-fop, JK flip- flop, Race-around condition, Master – slave JK flip-flop, T flip-flop, conversion from one type of flip-flop to another, Application of flip-flops.	
	Counters:	
	Introduction, Asynchronous counter, IC 7493 (4-bit binary counter), Synchronous counter, Type JK Design, Synchronous counter ICs, Analysis of counter circuits,	
	Shift Register:	
	Introduction, parallel and shift registers, serial shifting, serial–in serial–out, serial–in parallel–out , parallel–in parallel–out, Ring counter, Applications of shift registers, sequence generator, Seven Segment displays,	

Books and References:					
Sr. No.	**Title**	**Author/s**	**Publisher**	**Edition**	**Year**
1.	Digital Electronics and Logic Design	N. G. Palan	Technova		

2.	Make Electronics	Charles Platt	O'Reilly	1st	2010
3.	Modern Digital Electronics	R. P. Jain	Tata McGraw Hill	3rd	
4.	Digital Principles and Applications	Malvino and Leach	Tata McGraw Hill		
5.	Digital Electronics: Principles, Devices and Applications,	Anil K. Maini	Wiley		2007

Open Elective:

B. Sc (Information Technology)		Semester – I	
Course Name: Direct Tax I		**Course Code:AF23105OE**	
Periods per week		**3**	
Credits		**2**	
			Marks
Evaluation System	**Theory Examination**		
	Internal		

Units	Topics	No of Hours
Unit I	**Introduction to Income tax and Basis of Charge**	**06**
	Definitions u/s – 2: Assessee, Assessment Year, Assessment, Annual value, Business, Capital asset, Income, Person, Previous Year, Transfer Basis of Charge: Section 3 – 9 – Previous Year, Residential Status, Scope Of Total Income, Deemed Income	
Unit II	**Heads of Income & Deductions - I**	**12**

	Salary Income: Section 15 – 17, Including Section 10 relating to House Rent Allowance, Travel Concession, Special Allowance, Gratuity, Pension – Commutation, Leave Encashment, Compensation, Voluntary Retirement, Payment from Provident Fund **Income From House Property**: Section 22 – 27, Including Section 2 – Annual Value **Profits & Gains From Business & Profession** : Vocation Section 28-32, 36, 37, 40, 40A, 43B, 44AD, 44ADA & 44AE including.: Section 2 – Business	
Unit III	**Heads of Income & Deductions - II**	**12**
	Capital Gains : Section 45, 48, 49, 50, 54 and 55 **Income from Other Sources**: Section 56 – 59 **Deductions** 80 A 80 C 80CCC 80CCD 80D 80 DD 80DDB 80E 80EE 80G 80 TTA 80TTB 80U **Clubbing of Income** Section 60 to 65 **Set Off & Carry Forward of Losses** Sec: 70 Sec: 71 Sec: 71B Sec: 72 Sec: 73 Sec: 74	

B. Sc (Information Technology)	**Semester – I**
Course Name: Communication Skills	**Course Code: IT23109AE**
Periods per week	**3**
Credits	**2**
	Mark
Evaluation System	**Theory Examination**	
	Internal	

Learning Outcomes:

After successful completion of this course students will be able to

1. Understands the process of communication and its effects on giving and receiving messages.

2. Create a resume, a cover on professional level along with the interviewing process.

3. Chiseling of students communication skills to help manage the communication style required in the organization.

4. Understand the need of enhancing internal and external communication.

5. Hone their presentation making and giving skills and make them able to cope with corporate presentation skills.

Unit	Details	No. of Lectures
I	**The Seven Cs of Effective Communication:** Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness **Understanding Business Communication:** Nature and Scope of Communication, Non-verbal Communication, Cross-cultural communication, Technology-enabled Business Communication **Writing Business Messages and Documents:** Business writing, Business Correspondence, Instructions Business Reports and Proposals, Career building and Resume writing.	(10)
II	**Developing Oral Communication Skills for Business:** Effective Listening, Business Presentations and Public Speaking, Conversations, Interviews Creative Writing: Business Emails Meetings and Conferences, Group Discussions and Team Presentations, Team Briefing	(10)
III	**Understanding Specific Communication Needs:** Communication across Functional Areas Corporate Communication, Persuasive Strategies in Business Communication, Ethics in Business Communication, Business Communication Aids **Presentation Process:** Planning the presentations, executing the presentations, Impressing the audience by performing, Planning stage:	(10)

	Brainstorming, mind maps / concept maps, executing stage: chunking theory, creating outlines, Use of templates. Adding graphics to your presentation: Visual communication, Impress stage: use of font, colour, layout, Importance of practice and performance.	

Books and References:					
Sr. No.	Title	Author /s	Publisher	Edition	Year
1.	Business Communication	Edited by Meenakshi Raman and Prakash Singh	Oxford University Press	Second	
2.	Professional Communication	Aruna Koneru	Tata McGraw Hill		
3.	Strategies for improving your business communication	Prof. M. S. Rao	Shroff publishers and distributors		2016

B. Sc. (Information Technology)		Semester – II
Course Name: Green Computing		**Course Code: IT23110VE**
Periods per week		3
Credits		2
		Marks
Evaluation System	**Theory Examination**	60
	Internal	40

Learning outcomes:

1. Students will get an overview of green computing and they will also get to know various initiatives and standards followed by various countries.

2. Students will get to know various ways to reduce power consumption.

3. They will know how to change their behavior in day-to-day life. They will also get familiar with the advantages of going paperless.

4. Students will learn about the benefits of Recycling and selecting a proper hardware for use.

5. Students will know about green information systems and different ways of keeping the organization green.

Unit	Details	No. of Lectures
I	**Overview and Issues:** Problems: Toxins, Power Consumption, Equipment Disposal, Company's Carbon Footprint: Measuring, Details, reasons to bother, Plan for the Future, Cost Savings: Hardware, Power. **Initiatives and Standards:** Global Initiatives: United Nations, Basel Action Network, Basel Convention, North America: The United States, Canada, Australia,	(10)

	Europe, WEEE Directive, RoHS, National Adoption **Minimizing Power Usage:** Power Problems, Monitoring Power Usage, Servers, Low-Cost Options, Reducing Power Use, Data Deduplication, Virtualization, Management, Bigger Drives, Involving the Utility Company, Low- Power Computers, PCs, Linux, Components, Servers, Computer Settings, Storage, Monitors, Power Supplies, Wireless Devices, Software.	
II	**Cooling:** Cooling Costs, Power Cost, Causes of Cost, Calculating Cooling Needs, Reducing Cooling Costs, Economizers, On-Demand Cooling, HP's Solution, Optimizing Airflow, Hot Aisle/Cold Aisle, Raised Floors, Cable Management, Vapour Seal, Prevent Recirculation of Equipment Exhaust, Supply Air Directly to Heat Sources, Fans, Humidity, Adding Cooling, Fluid Considerations, System Design, Data Centre Design, Centralized Control, Design for Your Needs, Put Everything Together. **Changing the Way of Work:** Old Behaviours, starting at the Top, Process Reengineering with Green in Mind, Analysing the Global Impact of Local Actions, Steps: Water, Recycling, Energy, Pollutants, Teleworkers and Outsourcing, Telecommuting, Outsourcing, how to Outsource. **Going Paperless:** Paper Problems, The Environment, Costs: Paper and Office, Practicality, Storage, Destruction, Going Paperless, Organizational Realities, Changing Over, Paperless Billing, Handheld Computers vs. the Clipboard, Unified Communications, Intranets, What to Include, Building an Intranet, Microsoft Office SharePoint Server 2007, Electronic Data Interchange (EDI), Nuts and Bolts, Value Added Networks, Advantages, Obstacles.	**(10)**
III	**Recycling:** Problems, China, Africa, Materials, Means of Disposal, Recycling, Refurbishing, Make the Decision, Life Cycle, from beginning to end, Life,	**(10)**

Cost, Green Design, Recycling Companies, Finding the Best One, Checklist, Certifications, Hard Drive Recycling, Consequences, cleaning a Hard Drive, Pros and cons of each method, CDs and DVDs, good and bad about CD and DVDs disposal, Change the mind-set, David vs. America Online **Hardware Considerations:**

Certification Programs, EPEAT, RoHS, Energy Star, Computers, Monitors, Printers, Scanners, All-in-Ones, Thin Clients, Servers, Blade Servers, Consolidation , Products, Hardware Considerations, Planned Obsolescence, Packaging, Toxins, Other Factors, Remote Desktop, Using Remote Desktop, Establishing a Connection

Greening Your Information Systems:

Initial Improvement Calculations, Selecting Metrics, Tracking Progress, Change Business Processes, Customer Interaction, Paper Reduction, Green Supply Chain, Improve Technology Infrastructure, Reduce PCs and Servers, Shared Services, Hardware Costs, Cooling. Staying Green: Organizational Check-ups, Chief Green Officer, Evolution, Sell the CEO, SMART Goals, Equipment Check-ups, Gather Data, Tracking the data, Baseline Data, Benchmarking, Analyze Data, Conduct Audits, Certifications, Benefits, Realities

B. Sc. (Information Technology)	Semester – I
Course Name: IPR & Cyber Law	**Course Code: IT23111IK**
Periods per week	3
Credits	2
	Marks
Evaluation System	**Theory Examination**	
	Internal	

Learning Outcomes:

After successful completion of this course students will be able to

    1. Make Learner Conversant With The Social And Intellectual Property Issues Emerging From 'Cyberspace.

    2. Explore The Legal And Policy Developments In Various Countries To Regulate Cyberspace;

    3. Develop The Understanding Of Relationship Between Commerce And Cyberspace;   4. Give Learners In Depth Knowledge Of Information Technology Act And Legal Frame Work Of Right To Privacy, Data Security And Data Protection.

    5. Make Study On Various Case Studies On Real Time Crimes.

Unit	Details	No. of Lectures
I	**INTRODUCTION TO IPR**: Meaning of property, Meaning of Intellectual Property Rights Kinds of Intellectual property rights—Copy Right, Patent, Trade Mark, Trade Secret and trade dress, Design, Layout Design, Geographical Indication, Plant Varieties and Traditional Knowledge. Indian IT act: Information Technology Act, 2000(Complete including digital signature, certifying authorities and E governance). Protection of cyber consumers in India	(10)

	PATENT RIGHTS AND COPY RIGHTS—Meaning of Patent, Types, Inventions which are not patentable, Registration Procedure, Rights and Duties of Patentee, Assignment and licence , Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties	
II	**COPY RIGHT**—Definition &Types of Copy Right, Registration procedure, Assignment & licence , Terms of Copy Right, Piracy, Infringement, Remedies, Copy rights with special reference to software **Introduction to cyber crimes**: Definition, cybercrime and information security, classes of cybercrime and categories, cyber offences, cybercrimes with mobile and wireless devices.	**(10)**
III	Hacking, Ethical Hacking. Need and Importance of Cyber law, areas of cyber law Cyber law Provision in India – cyber crimes under IT Act 2000 , IPC & Special Laws, Cyber law and Information Technology Act 2000. Cyber crime Complaints. National cyber security policy – Objectives and Strategies. **Introduction to Cyber crimes and cyber forensics** ; Kinds of cyber crimes – Fraud and identity theft, cyber stalking; cyber pornography; Cyber terrorism; cyber defamation, Phishing, Hacking etc.; Issues relating to Investigation, Jurisdiction, Evidence	**(10)**

Open Elective offered by IT Department

B. Sc (Information Technology)		Semester – II		
Course Name: Introduction to Web Designing		**Course Code:**		
Periods per week		**3**		
Credits		**2**		
				Marks
Evaluation System	**Theory Examination**			30
	Internal		--	20

Learning outcome:

1. Acquire the knowledge about the Internet & its functionality, protocols, different types of web browsers & its working.
2. Develop HTML Scripting language webpage**.**
3. Create their own scripts.
4. Explain different HTML tags.
5. Demonstrate event handling in javascript.

Unit	Details	No. of Lectures
I	**Internet and the World Wide Web:** What is the Internet? Introduction to the internet and its applications, E-mail, telnet, FTP, e-commerce, video conferencing, e-business. Internet service providers, domain name server, internet address, World Wide Web (WWW): World Wide Web and its evolution, uniform resource locator (URL), browsers – internet explorer, Netscape navigator, opera, Firefox, chrome, Mozilla. search engine, web saver – apache, IIS, proxy server, HTTP protocol. **HTML5:** Introduction, Why HTML5? Formatting text by using tags, using lists and backgrounds, Creating hyperlinks and anchors.	

	CSS: Style sheets, CSS formatting text using style sheets, formatting paragraphs using style Sheets.	
II	**HTML5 Page layout and navigation:** Creating navigational aids: planning site organisation, creating text based navigation bar, creating graphics based navigation bar, creating graphical navigation bar, creating image map, redirecting to another URL, creating division based layouts: HTML5 semantic tags, creating divisions, creating HTML5 semantic layout, positioning and formatting divisions. **HTML5 Tables, Forms and Media:** Creating tables: creating simple table, specifying the size of the table, specifying the width of the column, merging table cells, using tables for page layout, formatting tables: applying table borders, applying background and foreground fills, changing cell padding, spacing and alignment, creating user forms: creating basic form, using check boxes and option buttons, creating lists, additional input types in HTML5, Incorporating sound and video: audio and video in HTML5, HTML multimedia basics, embedding video clips, incorporating audio on web page.	
III	**Core JavaScript (Properties and Methods of Each) :** Array, Boolean, Date, Function, Math, Number, Object, String, regExp. **Documents and its associated objects**: document, link area, Anchor, Image, Applet, layer. **Events and Event Handlers :** General Information about Events, Defining Event Handlers, event, onAbort, onBlur, onChange, onClick, onDblClick, onDragDrop, onError, onFocus, onKeyDown, onKeyPress, onKeyUp, onLoad, onMouseDown, onMouseMove, onMouseOut, onMouseOver, onMouseUp, onMove, onReset, onResize, onSelect, onSubmit, onUnload.	

PRACTICALS:

B. Sc (Information Technology)			Semester – I	
Course Name: Imperative Programming Practical			**Course Code: IT23103MM**	
Periods per week			**3**	
Credits			**2**	
				Marks
Evaluation System		Practical Examination		50

	List of Practical: (Can be done in any imperative language)
1.	**Basic Programs:**
a.	Write a program to display the message HELLO WORLD.
b.	Write a program to declare some variables of type int, float and double. Assign some values to these variables and display these values.
c.	Write a program to find the addition, subtraction, multiplication and division of two numbers.
2.	**Programs on variables:**
a.	Write a program to swap two numbers without using a third variable.
b.	Write a program to find the area of rectangle, square and circle.
c.	Write a program to find the volume of a cube, sphere, and cylinder.
3.	**Conditional statements and loops(basic)**
a.	Write a program to enter a number from the user and display the month name. If number >13 then display invalid input using the switch case.
b.	Write a program to check whether the number is even or odd.
c.	Write a program to check whether the number is positive, negative or zero.
d.	Write a program to find the factorial of a number.
e.	Write a program to check whether the entered number is prime or not.

f.	Write a program to find the largest of three numbers.
4.	**Conditional statements and loops(advanced)**
a.	Write a program to find the sum of squares of digits of a number.
b.	Write a program to reverse the digits of an integer.
c.	Write a program to find the sum of numbers from 1 to 100.
d.	Write a program to print the Fibonacci series.
e.	Write a program to find the reverse of a number.
f.	Write a program to find whether a given number is palindrome or not.
g.	Write a program that solve the quadratic equation. $$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
h.	Write a program to check whether the entered number is Armstrong or not.
i.	Write a program to count the digit in a number.
5.	**Programs on patterns:**
a.	Programs on different patterns.
6.	**Functions:**
a.	Programs on Functions.
7.	**Recursive functions**
a.	Write a program to find the factorial of a number using a recursive function.
b.	Write a program to find the sum of natural numbers using a recursive function.
8.	**Arrays**
a.	Write a program to find the largest value that is stored in the array.
b.	Write a program using pointers to compute the sum of all elements stored in an array.
c.	Write a program to arrange the 'n' numbers stored in the array in ascending and descending order.

d.	Write a program that performs addition and subtraction of matrices.
e.	Write a program that performs multiplication of matrices.
9.	**Pointers**
a.	Write a program to demonstrate the use of pointers.
b.	Write a program to perform addition and subtraction of two pointer variables.
10.	**Structures and Unions**
a.	Programs on structures.
b.	Programs on unions.

B. Sc (Information Technology)			Semester – I	
Course Name: Digital Electronics Practical			**Course Code: IT23108SE**	
Periods per week			**3**	
Credits			**2**	
			Hours	**Marks**
Evaluation System		**Practical Examination**	**2½**	**50**
List of Practical				
1.	**Study of Logic gates and their ICs and universal gates:**			
a.	Study of AND, OR, NOT, XOR, XNOR, NAND and NOR gates			
b.	IC 7400, 7402, 7404, 7408, 7432, 7486, 74266			
c.	Implement AND, OR, NOT, XOR, XNOR using NAND gates.			
d.	Implement AND, OR, NOT, XOR, XNOR using NOR gates.			
2.	**Implement the given Boolean expressions using minimum number of gates.**			
a.	Verifying De Morgan's laws.			
b.	Implement other given expressions using minimum number of gates.			
c.	Implement other given expressions using minimum number of ICs.			

3.	**Implement combinational circuits.**
a.	Design and implement combinational circuit based on the problem given and minimizing using K-maps.
4.	**Implement code converters.**
a.	Design and implement Binary – to – Gray code converter.
b.	Design and implement Gray – to – Binary code converter.
c.	Design and implement Binary – to – BCD code converter
d.	Design and implement Binary – to – XS-3 code converter
5.	**Implement Adder and Subtractor Arithmetic circuits.**
a.	Design and implement Half adder and Full adder.
b.	Design and implement BCD adder.
c.	Design and implement XS – 3 adder.
d.	Design and implement binary subtractor.
e.	Design and implement BCD subtractor.
f.	Design and implement XS – 3 subtractor.
6.	**Implement Arithmetic circuits.**
a.	Design and implement a 2-bit by 2-bit multiplier.
b.	Design and implement a 2-bit comparator.
7.	**Implement Encode and Decoder and Multiplexer and Demultiplexers.**
a.	Design and implement 8:3 encoder.
b.	Design and implement 3:8 decoder.
c.	Design and implement 4:1 multiplexer. Study of IC 74153, 74157
d.	Design and implement 1:4 demultiplexer. Study of IC 74139
e.	Implement the given expression using IC 74151 8:1 multiplexer.
f.	Implement the given expression using IC 74138 3:8 decoder.
8.	**Study of flip-flops and counters.**
a.	Study of IC 7473.
b.	Study of IC 7474.
c.	Study of IC 7476.

d.	Conversion of Flip-flops.
e.	Design of 3-bit synchronous counter using 7473 and required gates.
f.	Design of 3-bit ripple counter using IC 7473.
9.	**Study of counter ICs and designing Mod-N counters.**
a.	Study of IC 7490, 7492, 7493 and designing mod-n counters using these.
b.	Designing mod-n counters using IC 7473 and 7400 (NAND gates)
10.	**Design of shift registers and shift register counters.**
a.	Design serial – in serial – out, serial – in parallel – out, parallel – in serial – out, parallel – in parallel – out and bidirectional shift registers using IC 7474.
b.	Study of ID 7495.
c.	Implementation of digits using seven segment displays.

B. Sc. (Information Technology)			Semester – I	
Course Name: Discrete Mathematics Practical			**Course Code: IT23107VS**	
Periods per week			3	
Credits			2	
			Hours	**Marks**
Evaluation System		**Practical Examination**	2½	50
List of Practical: Write the programs for the following using SCILAB				
1.	**Set Theory**			
a.	Inclusion Exclusion principle.			
b.	Power Sets			
c.	Mathematical Induction			
2.	**Functions and Algorithms**			
a.	Recursively defined functions			

b.	Cardinality	
c.	Polynomial evaluation	
d.	Greatest Common Divisor	
3.	**Counting**	
a.	Sum rule principle	
b.	Product rule principle	
c.	Factorial	
d.	Binomial coefficients	
e.	Permutations	
f.	Permutations with repetitions	
g.	Combinations	
h.	Combinations with repetitions	
i.	Ordered partitions	
j.	Unordered partitions	
4.	**Probability Theory**	
a.	Sample space and events	
b.	Finite probability spaces	
c.	Equiprobable spaces	
d.	Addition Principle	
e.	Conditional Probability	
f.	Multiplication theorem for conditional probability	
g.	Independent events	
h.	Repeated trials with two outcomes	
5.	**Graph Theory**	
a.	Paths and connectivity	
b.	Minimum spanning tree	
c.	Isomorphism	
6.	**Directed Graphs**	
a.	Adjacency matrix	
b.	Path matrix	

7.	**Properties of integers**	
a.	Division algorithm	
b.	Primes	
c.	Euclidean algorithm	
d.	Fundamental theorem of arithmetic	
e.	Congruence relation	
f.	Linear congruence equation	
8.	**Algebraic Systems**	
a.	Properties of operations	
b.	Roots of polynomials	
9.	**Boolean Algebra**	
a.	Basic definitions in Boolean Algebra	
b.	Boolean algebra as lattices	
10.	**Recurrence relations**	
a.	Linear homogeneous recurrence relations with constant coefficients	
b.	Solving linear homogeneous recurrence relations with constant coefficients	
c.	Solving general homogeneous linear recurrence relations	

B. Sc (Information Technology)	**Semester – I**
Course Name: Communication Skills Practical	**Course Code: IT23105OE**
Periods per week	**3**

Credits			2	
			Hours	Marks
Evaluation System		Practical Examination	2½	50
List of Practical Questions:				
1.	Communication Origami, Guessing Game, Guessing the emotion			
2.	Body Language, Follow All Instructions, Effective Feedback Skills			
3.	The Name Game, Square Talk (Effective Communication), Room 101 (Influential and persuasive skills)			
4.	Back to Back Communication, Paper Shapes (Importance of two-way communication), Memory Test(Presentation Skills)			
5.	Exercises on Communication Principles			
6.	Exercises on communication icebreakers			
7.	Communication exercises			
	For the following practicals, Microsoft Office, Open Office, Libre Office or any other software suite can be used.			
8.	Use of word processing tools for communication			
	Group Discussion, PPT presentation, Debate			
9.	Use of spreadsheet tools for communication			
10.	Use of presentation tools for communication			

SEMESTER II

B. Sc. (Information Technology)		Semester – II	
Course Name: Object Oriented Programming		**Course Code:IT23201MM**	
Periods per week		3	
Credits		2	
Evaluation System	**Theory Examination**	60	
	Internal	40	

Learning outcomes:

1. Students understand the basic concept of OOPs, difference between procedure oriented and object-oriented approach, advantages of OOPs. How OOPs can handle real world problems.

2. students get understanding of Classes and Objects. Understand the use of constructor and destructor.

3. students understand the concept of polymorphism with operator overloading and function overloading. Understand the virtual function and abstract classes.

4. students understand the concept of inheritance. How code reuse can be achieved using inheritance. Understand what is Exception, how exceptions are handled and importance of exception handling.

5. Student Understand the generic classes and generic functions. Understand the use of file handling.

Unit	Details	No. of Lectures
I	**Object Oriented Methodology:** Introduction, Advantages and Disadvantages of Procedure Oriented Languages, what is Object Oriented? Benefits and Application of OOPS, characteristics of oops, Difference between C and C++, Basic Data Types in C++, Variables in C++, Scope of variables. **Principles of OOPS**: Basic Concepts of OOPS: Objects, Classes, Data Abstraction and Data Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing. **Functions:** Returning values from functions, Reference arguments, Inline function, Default arguments. **Classes and Objects**: Simple classes (Class specification, class members accessing), Defining member functions, passing object as an argument, Returning object from functions, friend classes, Pointer to object.	**(10)**

	Constructors and Destructors: Introduction, Default Constructor, Parameterized Constructor and examples, Destructors		
II	**Polymorphism:** Concept of function overloading, overloaded operators, overloading unary and binary operators, Conversion: Basic conversion (Type casting), Data Conversion between objects and basic types. **Exception Handling:** Introduction, Exception Handling Mechanism, Concept of throw & catch with example. **Inheritance**: Introduction, understanding inheritance, Advantages provided by inheritance, choosing the access specifier, Derived class declaration, derived class constructors, class hierarchies, multiple inheritance, multilevel inheritance, containership, hybrid inheritance.	**(10)**	
III	**Virtual Functions:** Introduction and need, Pure Virtual Functions, Static Functions, this Pointer, **Templates:** Introduction, Function Template and examples, Class Template and examples. **Working with Files:** Introduction, File Operations, Various File Modes, File Pointer and their Manipulation	**(10)**	

Books and References:					
Sr. No.	**Title**	**Author/s**	**Publisher**	**Edition**	**Year**
1.	Object Oriented Analysis and Design	Timothy Budd	TMH	3rd	2012
2.	Mastering C++	K R Venugopal,	Tata McGraw	2nd	2011

		Rajkumar Buyya, T Ravishankar	Hill	Edition	
3.	C++ for beginners	B. M. Hirwani	SPD		2013
4.	Effective Modern C++	Scott Meyers	SPD		
5.	Object Oriented Programming with C++	E. Balagurusamy	Tata McGraw Hill	4th	
6.	Learning Python	Mark Lutz	O' Reilly	5th	2013
7.	Mastering Object Oriented Python	Steven F. Lott	Pact Publishing		2014

B. Sc (Information Technology)		Semester – II	
Course Name: Web Programming		Course Code: IT23202MM	
Periods per week		3	
Credits		2	
		Marks	
Evaluation System	Theory Examination	60	
	Internal	40	

Learning outcome:

1. Students will get basic knowledge about the Internet & its functionality, protocols, different types of web browsers & its working.

2. Students will learn about HTML Scripting language so they are able to create their own webpage**.**

3. Students will be able to create their own scripts.

4. PHP is one of the many server-side languages so students can learn to build websites.

5. Students will get advanced knowledge about how to implement databases in PHP using MYSQL, How to create & Set Cookies & Session so they can create their Websites more user-friendly & attractive.

Unit	Details	No. of Lectures
I	**Internet and the World Wide Web:** What is the Internet? Introduction to the internet and its applications, E-mail, telnet, FTP, e-commerce, video conferencing, e-business. **HTML5:** Introduction, Why HTML5? Formatting text by using tags, using lists and backgrounds, Creating hyperlinks and anchors. Style sheets, CSS formatting text using style sheets, formatting paragraphs using style Sheets. **HTML5 Page layout and navigation:** Creating navigational aids: planning site organization, creating text based navigation bar, creating graphics based navigation bar, creating graphical navigation bar, creating image map, redirecting to another URL, creating division based layouts: HTML5 semantic tags, creating divisions, creating HTML5 semantic layout, positioning and formatting divisions. **HTML5 Tables, Forms and Media:** Creating tables: creating simple table, specifying the size of the table, specifying the width of the column, merging table cells, using tables for page layout, formatting tables: applying table borders, applying background and foreground fills, changing cell padding, spacing and alignment, creating user forms: creating basic form, using check boxes and option buttons, creating lists, additional input types in HTML5, Incorporating sound and video: audio and video in HTML5, HTML multimedia basics, embedding video clips,	(10)

	incorporating audio on web Page.	
II	**Core JavaScript (Properties and Methods of Each) :** Array, Boolean, Date, Function, Math, Number, Object, String, regExp	**(10)**
	Documents and its associated objects: document, link area, Anchor, Image, Applet, layer	
	Events and Event Handlers : General Information about Events, Defining Event Handlers, event, onAbort, onBlur, onChange, onClick, onDblClick, onDragDrop, onError, onFocus, onKeyDown, onKeyPress, onKeyUp, onLoad, onMouseDown, onMouseMove, onMouseOut, onMouseOver, onMouseUp, onMove, onReset, onResize, onSelect, onSubmit, onUnload **INTRODUCTION TO JSON**	
III	**PHP:** Why PHP and MySQL? Server-side scripting, PHP syntax and variables, comments, types, control structures, branching, looping, termination, functions, passing information with PHP, GET, POST, formatting form variables, superglobal arrays, strings and string functions, regular expressions, arrays, number handling, basic PHP errors/problems **Advanced PHP and MySQL :** PHP/MySQL Functions, Integrating web forms and databases, Displaying queries in tables, Building Forms from queries, String and Regular Expressions, Sessions, Cookies and HTTP, E-Mail	**(10)**

Books and References:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Web Design The Complete Reference	Thomas Powell	Tata McGraw Hill		-
2.	HTML5 Step by Step	Faithe Wempen	Microsoft Press		2011
3.	PHP 5.1 for Beginners	Ivan Bayross Sharanam Shah,	SPD		2013
4.	PHP Project for Beginners	SharanamShah, Vaishali Shah	SPD		2015
5.					
6.	PHP 6 and MySQL Bible	Steve Suehring, Tim Converse, Joyce Park	Wiley		2009
7.	Head First HTML 5 programming	Eric Freeman	O'Reilly		2013
8.	JavaScript 2.0: The Complete Reference	Thomas Powell and Fritz Schneider	Tata McGraw Hill	2nd	

B. Sc. (Information Technology)	Semester – II
Course Name: Microprocessor Architecture	Course Code: IT23204MN
Periods per week	3
Credits	2
	Marks

Evaluation System	Theory Examination	
	Internal	

Learning outcomes:

1. Student get basic information regarding microprocessor 8085&8155
2. Students get information regarding assembly language programme
3. Student get information regarding stack, counters and time delays in 8085 microprocessors
4. Student get basic information regarding various code conversion in 8085 microprocessors
5. Students get detailed information regarding new Processors in the market.

Unit	Details	No. of Lectures
I	**Microprocessor, microcomputers, and Assembly Language:** Microprocessor, Microprocessor Instruction Set and Computer Languages, , Applications. Microprocessor Architecture and Microcomputer System: Microprocessor Architecture and its operations, Memory, I/O Devices, Microcomputer System, Logic Devices and Interfacing. 8085 Microprocessor Architecture and Memory Interface: Introduction, 8085 Microprocessor unit, 8085-Based Microcomputer, Memory Interfacing, Interfacing the 8155 Memory Segment, Illustrative Testing and Troubleshooting Memory Interfacing Circuit, Interfacing Input Devices, Memory Mapped I/O 8086 pin diagram.	(10)
II	**Introduction to 8085 Assembly Language Programming:** The 8085 Programming Model, Instruction Classification, Instruction, Data and Storage, Writing assembling and Execution of a simple program, Data Transfer Operations, Arithmetic Operations, Logic Operation,	(10)

	Branch Operation, Writing Assembly Languages Programs, Debugging a Program. Looping, Counting and Indexing, Additional Data Transfer and16-BitArithmetic Instructions, Arithmetic Instruction Related to Memory, Logic Operations: Rotate, Logics Operations: Compare, Counters and Time Delays, Illustrative Program: Hexadecimal Counter, Illustrative Program: Generating Pulse Waveforms, Debugging Counter and Time-Delay Programs. **Stacks and Sub-Routines:** Stack, Subroutine, Restart, Conditional Call, Return Instructions, Advanced Subroutine concepts. **Code Conversion, BCD Arithmetic, and 16-Bit Data Operations:** BCD-to-Binary Conversion, Binary-to-BCD Conversion, BCD-to- Seven-Segment-LED Code Conversion, Binary-to-ASCII and ASCII- to-Binary Code Conversion, BCD Addition, BCD Subtraction,	
III	**Software Development System and Assemblers:** Microprocessors-Based Software Development system, Operating System and Programming Tools, Assemblers and Cross-Assemblers, Writing Program Using Cross Assemblers. **Interrupts:** The 8085 Interrupt, 8085 Vectored Interrupts, Restart as S/W Instructions, Additional I/O Concepts and processes. **The Pentium and Pentium Pro microprocessors:** Introduction, Special Pentium registers, Memory management, Pentium instructions, Pentium Pro microprocessor, Special Pentium Pro features. **Core 2 and later Microprocessors:** Introduction, Pentium II software changes, Pentium IV and Core 2, i3, i5, i7, i9 processors specification., SUN SPARC Microprocessor: Architecture, Register file, data types and instruction format	(10)

Books and References:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Microprocessors Architecture, Programming and Applications with the 8085.	Ramesh Gaonkar	PENRAM	Fifth	2012
2.	Computer System Architecture	M. Morris Mano	PHI		1998
3.	Structured Computer Organization	Andrew C. Tanenbaum	PHI		

B. Sc. (Information Technology)		Semester – II
Course Name: Numerical and Statistical Methods		**Course Code: PIT23210VE**
Periods per week		3
Credits		2
		Marks
Evaluation System	**Theory Examination**	
	Internal	

Learning outcomes:

1. Develops the mathematical skills of the students in the areas of numerical methods.
2. Develops problem solving skills with both theoretical and computational oriented problems.
3. Develops problem solving skills with both theoretical and computational oriented problems.
4. Understand numerical techniques to find the roots of nonlinear equations and solutions of systems of linear equations.

5. Explores the basic concepts of modern probability theory and its applications for decision-making in economics, business, and other fields of social sciences.

Unit	Details	No. of Lectures
I	**Introduction to Numerical Analysis and their applications.** **Approximations and Round-Off Errors:** Significant Figures, Accuracy and Precision, Error Definitions, Round-Off Errors **Truncation Errors and the Taylor Series:** The Taylor Series, Error Propagation, Total Numerical Errors, Formulation Errors and Data Uncertainty **Interpolation:** Forward Difference, Backward Difference, Newton's Forward Difference Interpolation, Newton's Backward Difference Interpolation, Lagrange's Interpolation. **Solutions of Algebraic and Transcendental Equations:** The Bisection Method, The Newton-Raphson Method, The Regula-falsi method, The Secant Method. **Solution of simultaneous algebraic equations (linear) using iterative methods:** Gauss Elimination Method, Gauss-Jordan Method, Gauss-Seidel Method.	(10)
II	**Numerical differentiation and Integration:** Numerical differentiation, Numerical integration using Trapezoidal Rule, Simpson's $1/3^{rd}$ and $3/8^{th}$ rules. **Numerical solution of 1st and 2nd order differential equations:** Taylor series, Euler's Method, Modified Euler's Method, Runge-Kutta Method for 1st and 2nd Order Differential Equations.	(10)

III	**Random variables:** Discrete and Continuous random variables, Probability density function, Probability distribution of random variables, Expected value, Variance. **Distributions:** Discrete distributions: Binomial, Poisson, Bernoulli, Continuous distributions: uniform distributions (derivation of mean and variance only and state other properties and discuss their applications) Normal distribution states all the properties and its applications. **Correlation and regression:** **Correlation** , Linear Regression, Multiple Linear regression, General Linear Least Squares, Nonlinear Regression, **Linear Programming:** Linear optimization problem, Formulation and Graphical solution, Basic solution and Feasible solution.	**(10)**

Books and References:					
Sr. No.	**Title**	**Author/s**	**Publisher**	**Edition**	**Year**
1.	Introductory Methods of Numerical Methods	S. S. Shastri	PHI	Vol – 2	
2.	Numerical Methods for Engineers	Steven C. Chapra, Raymond P. Canale	Tata Mc Graw Hill	6th	2010
3.	Numerical Analysis	Richa rd L. Burde n, J. Douglas Faires	Cengage Learning	9th	2011

4.	Fundamentals of Mathematical Statistics	S. C. Gupta, V. K. Kapoor			
5.	Elements of Applied Mathematics	P.N.Wartikar and J.N.Wartikar	A. V. Griha, Pune	Volume 1 and 2	

B. Sc (Information Technology)		Semester – I	
Course Name: Operating Systems		**Course Code: IT23205OE**	
Periods per week		**3**	
Credits		**2**	
		Marks	
Evaluation System	**Theory Examination**		30
	Internal	-	20

Learning Outcomes:

After successful completion of this course students will be able to

1. To learn about system design so they can extend the features of operating system solve any problem occurring in operating system.

2. Understand how program memory addresses relate to physical memory addresses, memory management in base-limit machines, and swapping.

3. Get broad idea about Input and output devices & its functionality as well as the power management.

4. Learn about virtualization so they get knowledge about how virtualization process will take place.

5. Get familiar with different types of operating system & its functionality in detail.

Unit	Details	No. of Lectures
I	**Introduction:** What is an operating system? computer hardware, different operating systems, operating system concepts, system calls, operating system structure. **Processes and Threads:** Processes, threads, interprocess communication, scheduling, IPC problems. **Memory Management:** No memory abstraction, memory abstraction: address spaces, virtual memory, design issues for paging systems, implementation issues, and segmentation.	**(10)**
II	**File Systems:** Files, directories, file system implementation, file-system management and optimization, MS-DOS file system, UNIX V7 file system, CD ROM file system, What is Shell? Basic Shell commands. **Input-Output:** Principles of I/O hardware, Principles of I/O software, I/O software layers, disks, clocks, user interfaces: keyboard, mouse, monitor, thin clients, power management **Deadlocks:** Resources, introduction to deadlocks, deadlock detection and recovery, deadlock avoidance, deadlock prevention.	**(10)**
III	**Virtualization and Cloud:** History, requirements for virtualization, type 1 and 2 hypervisors, techniques for efficient virtualization, hypervisor microkernels, memory virtualization, I/O virtualization Clouds. **Multiple Processor Systems** Multiprocessors, multicomputer, distributed systems.	**(10)**

	Case Study on LINUX and ANDROID: History of Unix and Linux, Linux Overview, Processes in Linux, Memory management in Linux, I/O in Linux, Linux file system, security in Linux.	

OPEN ELECTIVES

B. Sc (Information Technology)		Semester – I	
Course Name: Direct Tax II		Course Code:AF23205OE	
Periods per week		3	
Credits		2	
			Marks
Evaluation System	Theory Examination		30
	Internal		20

Units	Topics	No of Hours
Unit I	**Tax rates of Individual**	10
	Slab rates as per new and old tax regime, partial integration, special rates, rebate, surcharge, H&E cess	
Unit II	**Return of Income & Assessments**	10
	Sec 139 Excluding u/s 139(4A), 139(4B), 139(4C) & 139 (4D) Summary assessment Sec 143(1), Scrutiny assessment Sec. 143(3), Best Budget Assessment Sec. 144, Faceless Assessment Sec. 144B, Income Escaping Assessment Sec. 147 & 148A, Faceless Assessment of income escaping assessment Sec. 151A	
Unit III	**Tax Deduction at Source Advance Tax, Interest Payable**	10
	Deduction of Taxes at Source Sec: 192 Sec: 194A Sec: 194C Sec: 194H Sec: 194I Sec: 194J **Advance Tax** U/S 207, 208, 209, 210 & 211 **Interest Payable** U/S 234A, 234B, 234C	

Open Elective offered by IT Department

B. Sc. (Information Technology)		Semester – II	
Course Name: Office Automation		Course Code: IT23206OE	
Periods per week		3	
Credits		2	
			Marks
Evaluation System	Theory Examination		30
	Internal		20

Learning outcomes:

Students will be able to

- Indicate the names and functions of the Word interface components.
- Create, edit, save, and print documents to include documents with lists and tables.
- Format text and to use styles.
- Add a header and footer to a document.
- Add a footnote to a document.
- Add a graphic to a document.
- Work with Cells and Worksheets.
- Calculate Your Data.
- Format your Workbook.
- Add Charts and Graphics.
- Collaborate with Others.
- Analyze your Data.
- Create, edit, save, and print presentations.
- Format presentations.
- Add a graphic to a presentation.
- Create and manipulate simple slide shows with outlines and notes.

Unit	Details	No. of Lectures

I	**Word Processing; MS Word**: Features, Creating, Saving and Opening Documents in Word, Interface, Toolbars, Ruler, Menus, Keyboard 100 Shortcut, Editing, Previewing, Printing,& Formatting a Document, Advanced Features of MS Word, Find & Replace, Using Thesaurus, Using Auto- Multiple Functions, Mail Merge, Handling Graphics, Tables & Charts, Converting a word document into various formats like- Text, Rich Text format, Word perfect, HTML,PDF etc..	**(10)**
II	**Worksheet- MS-Excel:** Worksheet basics, creating worksheet, entering into worksheet, heading information, data, text, dates, alphanumeric values, saving & quitting worksheet, **Using Basic Functions: sum,avg,count,max,min** **Mathematical Function:** Sumif,sumifs,if,nested if,AND,OR,NOT **Text Function:** Upper,lower,left,mid,right,trim,concat Sorting data Graph,charts	**(10)**
III	**MS Power Point:** Creating slide show with animations. Autocentnt Wizard,creating a lank presentation, autolayout, Power point screen:screen layout and Views, insert a new slide,applying design template, changing slide layout,reordering and hiding slides, slide show and editing custom slide. Resizing a text box ,Text box properties,Delete a text bo,Bulleted lists,Numbered lists,Adding notes,Video and Audio, Adding text Editing options,Formatting text,Replace fonts,Line spacing ,Change case Spelling check, Color schemes , Adding clip art,Adding an image from a file Editing graphic,AutoShapes,WordArt,Backgrounds, Action buttons Slide animation Animation preview Slide transitions Slide show options Slide master Header and footer Slide numbers Date and time	**(10)**

PRACTICALS

B. Sc. (Information Technology)		Semester – II	
Course Name: Object Oriented Programming Practical		**Course Code: IT23203MM**	
Periods per week		3	
Credits		2	
		Hours	**Marks**
Evaluation System	**Practical Examination**	**2½**	**50**
List of Practical: To be implemented using Object-Oriented language			
1.	**Classes and methods**		
a.	Design an employee class for reading and displaying the employee information, the getInfo() and displayInfo() methods will be used respectively. Where getInfo() will be private method		
b.	Design the class student containing getData() and displayData() as two of its methods which will be used for reading and displaying the student information respectively.Where getData() will be a private method.		
c.	Design the class Demo which will contain the following methods: readNo(), factorial() for calculating the factorial of a number, reverseNo() will reverse the given number, isPalindrome() will check the given number is palindrome, isArmstrong() which will calculate the given number is armStrong or not.Where readNo() will be a private method.		
d.	Write a program to demonstrate function definition outside class and accessing class members in function definition.		
2.	**Using friend functions.**		
a.	Write a friend function for adding the two complex numbers, using a single class		
b.	Write a friend function for adding the two different distances and display its sum, using two classes.		

c.	Write a friend function for adding the two matrix from two different classes and display its sum.	
3.	**Constructors and method overloading.**	
a.	Design a class Complex for adding the two complex numbers and also show the use of constructor.	
b.	Design a class Geometry containing the methods area() and volume() and also overload the area() function .	
c.	Design a class StaticDemo to show the implementation of static variable and static function.	
4.	**Operator Overloading**	
a.	Overload the operator unary(-) for demonstrating operator overloading.	
b.	Overload the operator + for adding the timings of two clocks, And also pass objects as an argument.	
c.	Overload the + for concatenating the two strings. For e.g "Py" + "thon" = Python	
5.	**Inheritance**	
a.	Design a class for single level inheritance using public and private type derivation.	
b.	Design a class for multiple inheritance.	
c.	Implement the hierarchical inheritance.	
6.	**Virtual functions and abstract classes**	
a.	Implement the concept of method overriding.	
b.	Show the use of virtual function	
c.	Show the implementation of abstract class.	
7.	**String handling**	
a.	String operations for string length , string concatenation	
b.	String operations for string reverse, string comparison,	
c.	Console formatting functions.	

8.	**Exception handling**
a.	Show the implementation of exception handling
b.	Show the implementation for exception handling for strings
c.	Show the implementation of exception handling for using the pointers.
9.	**File handling**
a.	Design a class FileDemo open a file in read mode and display the total number of words and lines in the file.
b.	Design a class to handle multiple files and file operations
c.	Design a editor for appending and editing the files
10.	**Templates**
a.	Show the implementation for the following
b.	Show the implementation of template class library for swap function.
c.	Design the template class library for sorting ascending to descending and vice-versa

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B. Sc. (Information Technology)			Semester – II	
Course Name: Microprocessor Architecture Practical			Course Code: IT23207VS	
Periods per week			3	
Credits			2	
			Hours	Mar ks
Evaluation System		Practical Examination	2½	50

List of Practical	
1.	**Perform the following Operations related to memory locations.**
a.	Store the data byte 32H into memory location 4000H.
b.	Exchange the contents of memory locations 2000H and 4000H
2.	**Simple assembly language programs.**
a.	Subtract the contents of memory location 4001H from the memory location 2000H and place the result in memory location 4002H.
b.	Subtract two 8-bit numbers.
c.	Add the 16-bit number in memory locations 4000H and 4001H to the 16-bit number in memory locations 4002H and 4003H. The most significant eight bits of the two numbers to be added are in memory locations 4001H and 4003H. Store the result in memory locations 4004H and 4005H with the most significant byte in memory location 4005H.
d.	Add the contents of memory locations 40001H and 4001H and place the result in the memory locations 4002Hand 4003H.
e.	Subtract the 16-bit number in memory locations 4002H and 4003H from the 16-bit number in memory locations 4000H and 4001H. The most significant eight bits of the two numbers are in memory locations 4001H and 4003H. Store the result in memory locations 4004H and 4005H with the most significant byte in memory location 4005H.
f.	Find the l's complement of the number stored at memory location 4400H and store the complemented number at memory location 4300H.
g.	Find the 2's complement of the number stored at memory location 4200H and store the complemented number at memory location 4300H.
3.	**Packing and unpacking operations.**
a.	Pack the two unpacked BCD numbers stored in memory locations 4200H and 4201H and store results in memory location 4300H. Assume the least significant digit is stored at 4200H.

b.	Two digit BCD number is stored in memory location 4200H. Unpack the BCD number and store the two digits in memory locations 4300H and 4301H such that memory location 4300H will have a lower BCD digit.
4.	**Register Operations.**
a.	Write a program to shift an eight bit data four bits right. Assume that data is in register C.
b.	Program to shift a 16-bit data 1 bit left. Assume data is in the HL register pair
c.	Write a set of instructions to alter the contents of the flag register in 8085.
d.	Write a program to count number of l's in the contents of D register and store the count in the B register.
5.	Multiple memory locations.
a.	Calculate the sum of a series of numbers. The length of the series is in memory location 4200H and the series begins from memory location 4201H. a. Consider the sum to be an 8 bit number. So, ignore carries. Store the sum at memory location 4300H. b. Consider the sum to be a 16 bit number. Store the sum at memory locations 4300H and 4301H
b.	Multiply two 8-bit numbers stored in memory locations 2200H and 2201H by repetitive addition and store the result in memory locations 2300H and 2301H.
c.	Divide 16 bit number stored in memory locations 2200H and 2201H by the 8 bit number stored at memory location 2202H. Store the quotient in memory locations 2300H and 2301H and remainder in memory locations 2302H and 2303H.
d.	Find the number of negative elements (most significant bit 1) in a block of data. The length of the block is in memory location 2200H and the block itself begins in memory location 2201H. Store the number of negative elements in memory location 2300H
e.	Find the largest number in a block of data. The length of the block is in memory location 2200H and the block itself starts from memory location 2201H. Store the maximum number in memory location 2300H. Assume that the numbers in the

	block are all 8 bit unsigned binary numbers.
6.	**Calculations with respect to memory locations.**
a.	Write a program to sort given 10 numbers from memory location 2200H in the ascending order.
b.	Calculate the sum of a series of even numbers from the list of numbers. The length of the list is in memory location 2200H and the series itself begins from memory location 2201H. Assume the sum to be 8 bit number so you can ignore carries and store the sum at memory location 2Sample problem:
c.	Calculate the sum of a series of odd numbers from the list of numbers. The length of the list is in memory location 2200H and the series itself begins from memory location 2201H. Assume the sum to be 16-bit. Store the sum at memory locations 2300H and 2301H.
d.	Find the square of the given numbers from memory location 6100H and store the result from memory location 7000H
e.	Search the given byte in the list of 50 numbers stored in the consecutive memory locations and store the address of memory location in the memory locations 2200H and 2201H. Assume byte is in the C register and the starting address of the list is 2000H. If byte is not found store 00 at 2200H and 2201H
f.	Two decimal numbers, six digits each, are stored in BCD package form. Each number occupies a sequence of byte in the memory. The starting address of first number is 6000H Write an assembly language program that adds these two numbers and stores the sum in the same format starting from memory location 6200H
g.	Add 2 arrays having ten 8-bit numbers each and generate a third array of results. It is necessary to add the first element of array 1 with the first element of array-2 and so on. The starting addresses of array l, array2 and array3 are 2200H, 2300H and 2400H, respectively

7.	**Assembly programs on memory locations.**

a.	Write an assembly language program to separate even numbers from the given list of 50 numbers and store them in the another list starting from 2300H. Assume starting address of 50 number list is 2200H	
b.	Write assembly language program with proper comments for the following: A block of data consisting of 256 bytes is stored in memory starting at 3000H. This block is to be shifted (relocated) in memory from 3050H onwards. Do not shift the block or part of the block anywhere else in the memory.	
c.	Add even parity to a string of 7-bit ASCII characters. The length of the string is in memory location 2040H and the string itself begins in memory location 2041H. Place even parity in the most significant bit of each character.	
d.	A list of 50 numbers is stored in memory, starting at 6000H. Find number of negative, zero and positive numbers from this list and store these results in memory locations 7000H, 7001H, and 7002H respectively	
e.	Write an assembly language program to generate fibonacci numbers.	
f.	Program to calculate the factorial of a number between 0 to 8.	
8.	**String operations in assembly programs.**	
a.	Write an 8085 assembly language program to insert a string of four characters from the tenth location in the given array of 50 characters	
b.	Write an 8085 assembly language program to delete a string of 4 characters from the tenth location in the given array of 50 characters.	
c.	Multiply the 8-bit unsigned number in memory location 2200H by the 8-bit unsigned number in memory location 2201H. Store the 8 least significant bits of the result in memory location 2300H and the 8 most significant bits in memory location 2301H.	
d.	Divide the 16-bit unsigned number in memory locations 2200H and 2201H (most significant bits in 2201H) by the B-bit unsigned number in memory location 2300H store the quotient in memory location 2400H and remainder in 2401H	

e.	DAA instruction is not present. Write a subroutine which will perform the same task as DAA.
9.	**Calculations on memory locations.**
a.	To test RAM by writing '1' and reading it back and later writing '0' (zero) and reading it back. RAM addresses to be checked are 40FFH to 40FFH. In case of any error, it is indicated by writing 01H at port 10
b.	Arrange an array of 8 bit unsigned no in descending order
c.	Transfer ten bytes of data from one memory to another memory block. Source memory block starts from memory location 2200H where as destination memory block starts from memory location 2300H
d.	Write a program to find the Square Root of an 8 bit binary number. The binary number is stored in memory location 4200H and the square root in 4201H.
e.	Write a simple program to Split a HEX data into two nibbles and store it in memory
10.	**Operations on BCD numbers.**
a.	Add two 4 digit BCD numbers in HL and DE register pairs and store result in memory locations, 2300H and 2301H. Ignore carry after 16 bit.
b.	Subtract the BCD number stored in E register from the number stored in the D register
c.	Write an assembly language program to multiply 2 BCD numbers

B. Sc. (Information Technology)	**Semester – II**
Course Name: Web Programming Practical	**Course Code: IT23208SE**

Periods per week			3	
Credits			2	
			Hours	Marks
Evaluation System		Practical Examination	2½	50

List of Practicals

1.	**Use of Basic Tags**
a.	Design a web page using different text formatting tags.
b.	Design a web page with links to different pages and allow navigation between web pages.
c.	Design a web page demonstrating all Style sheet types
2.	**Image maps, Tables, Forms and Media**
a.	Design a web page with Imagemaps.
b.	Design a web page demonstrating different semantics
c.	Design a web page with different tables. Design a webpages using table so that the content appears well placed.
d.	Design a web page with a form that uses all types of controls.
e.	Design a web page embedding with multimedia features.
3.	**Java Script**
a.	Using JavaScript design, a web page that prints factorial/Fibonacci series/any given series.
b.	Design a form and validate all the controls placed on the form using Javascript.
c.	Write a JavaScript program to display all the prime numbers between 1 and 100.
a.	Write a JavaScript program to accept a number from the user and display the sum of its digits.
d.	Write a program in JavaScript to accept a sentence from the user and display the number of words in it. (Do not use split () function).
e.	Write a javascript program to design a simple calculator.

4.	**Control and looping statements and Java Script references**
a.	Design a web page demonstrating different conditional statements.
b.	Design a web page demonstrating different looping statements.
c.	Design a web page demonstrating different Core JavaScript references (Array, Boolean, Date, Function, Math, Number, Object, String, regExp).
5.	**Basic PHP I**
a.	Write a PHP Program to accept a number from the user and print it factorial.
b.	Write a PHP program to accept a number from the user and print whether it is prime or not.
6.	**Basic PHP II**
a.	Write a PHP code to find the greater of 2 numbers. Accept the no. from the user.
b.	Write a PHP program to display the following Binary Pyramid: 1 0 1 1 0 1 0 1 0 1
7.	**String Functions and arrays**
a.	Write a PHP program to demonstrate different string functions.
b.	Write a PHP program to create a one dimensional array.
8.	**PHP and mysql**
a.	Write a PHP code to create: ● Create a database College ● Create a table Department (Dname, Dno, Number_Of_faculty)
b.	Write a PHP program to create a database named "College". Create a table named "Student" with the following fields (sno, sname, percentage). Insert 3 records of your choice. Display the names of the students whose percentage is between 35 to 75 in a tabular format.
c.	Design a PHP page for authenticating a user.

9.	**Email**
a.	Write a program to send email with attachment.
10.	**Sessions and Cookies**
a.	Write a program to demonstrate use of sessions and cookies.

B. Sc. (Information Technology)	Semester – II	
Course Name: Numerical and Statistical Methods Practical	**Course Code: IT23209AE**	
Periods per week	**3**	
Credits	**2**	
	Hours	**Marks**
Evaluation System — Practical Examination	**2½**	**50**

List of Practical (Using scilab)

1.	**Iterative Calculation**
a.	Program for iterative calculation.
b.	Program to calculate the roots of a quadratic equation using the formula.
c.	Program to evaluate e^x using infinite series.
2.	**Solution of algebraic and transcendental equations:**
a.	Program to solve algebraic and transcendental equations by bisection method.
b.	Program to solve algebraic and transcendental equations by false position method.

c.	Program to solve algebraic and transcendental equations by Secant method.
d.	Program to solve algebraic and transcendental equation by Newton Raphson method.
3.	**Interpolation**
a.	Program for Newton's forward interpolation.
b.	Program for Newton's backward interpolation.
c.	Program for Lagrange's interpolation.
4.	**Solving linear system of equations by iterative methods**
a.	Program for solving linear systems of equations using Gauss Jordan method.
b.	Program for solving linear systems of equations using Gauss Seidel method.
5.	**Numerical Differentiation**
a.	Programming to obtain derivatives numerically.
6.	**Numerical Integration**
a.	Program for numerical integration using Trapezoidal rule.
b.	Program for numerical integration using Simpson's $1/3^{rd}$ rule.
c.	Program for numerical integration using Simpson's $3/8^{th}$ rule.
7.	**Solution of differential equations**
a.	Program to solve differential equation using Euler's method
b.	Program to solve differential equations using modified Euler's method.
c.	Program to solve differential equation using Runge-kutta 2nd order and 4th order methods.
8.	**Random variables and distributions**
a.	Program to generate random variables.
b.	Program to fit binomial distribution.
c.	Program to fit Poisson distribution.

9	**Distributions**	
a.	Program for Uniform distribution.	
b.	Program for Bernoulli distribution	
c.	Program for Negative binomial distribution.	
10.	**Correlation and Regression**	
a.	Program for Correlation	
b.	Program for Linear regression.	
c.	Program for multiple linear regression.	
d.	Program for nonlinear regression	