SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED [M.S.]

Choice Based Credit System
(CBCS Pattern)
Faculty of Science and Technology
Syllabus of B.Sc. Computer Science S.Y.
Effective from Academic Year (2017-2018)
Under Graduate (UG) Program

Semester	Subject Code	Course Name	Credit				Total	
			Internal	Marks	External	Marks	Credits	Marks
Semester – III	S3.1(AEC)	Numerical Aptitude	1	25	3	75	**4**	100
	S3.2(CC)	Data Structure	1	25	3	75	4	100
	S3.3(CC)	Object Oriented Concepts Using C++	1	25	3	75	4	100
	S3.4(CC)	Data Communication	1	25	3	75	4	100
	S3.5(DSE)	Elective:	1	25	3	75	4	100
		Programming Language Concept						
		Multimedia						
		8085 Programming						
	S3.6(SEC1)	Sci Lab 1	1	25	1	25	2	50
		Web Development						
		PC Installation						
	S3.Lab1	Data Structure Using C			2	50	2	50
	S3.Lab2	Object Oriented Concepts Using C++			2	50	2	50
	S3.Lab3	Elective:			2	50	2	50
		TOTAL	**6**	**150**	**22**	**550**	**28**	**700**

Semester	Subject Code	Course Name	Credit				Total Credits	
			Internal	Marks	External	Marks	Credits	Marks
Semester – IV	S4.1(AEC)	Logical Reasoning	1	25	3	75	4	100
	S4.2(CC)	RDBMS	1	25	3	75	4	100
	S4.3(CC)	Java Programming	1	25	3	75	4	100
	S4.4(CC)	Compiler Design	1	25	3	75	4	100
	S4.5(DSE)	Elective:	1	25	3	75	4	100
		Computer Algorithm						
		Computer Graphics						
		Micro Processor Interface						
	S4.6(SEC1)	SciLab 2	1	25	1	25	2	50
		E. Commerce						
		Computer Network Installation						
	S4.Lab1	RDBMS through	0	0	2	50	2	50
	S4.Lab2	Java Programming	0	0	2	50	2	50
	S4.Lab3	Elective	0	0	2	50	2	50
		TOTAL	**150**	**150**	**22**	**550**	**28**	**700**

NameofCourse	**B.Sc. CS SY**
Semester	**IIISemester**
NameofSubject	**Numerical Appitude**
SubjectCode	**S3.1(Core Course)**

Sr. No	Topic	No of Lectures
1	**Unit 1:Introduction of Number system**	9
	Numbers: Types of numbers, Divisibility tests of numbers, arithmetic progression, Geometric progression, Relationship between Arithmetic progression and Geometric progression. **HCF and LCM** : Methods of calculating highest common factor and greatest common divisor, factorization method, Division method, Finding HCF and LCM more than two numbers, LCM and HCF of fractions and decimal numbers, Applications of LCM and HCF.	
2	**Unit 2**	8
	Average: Definition of average, Formulae and theoretical problem on average. **Problem on ages**: simultaneous equations and their applications, Theoretical problems on ages, Theoretical problems on numbers.	
3	**Unit 3**	10
	Percentage: Concept of percentage, Application of percentage, Results on populations, Result on depreciations, Theoretical problem on percentage. **Profit and Loss:** Definition of cost price, selling price and profit, Formulae of profit and loss, Theoretical problems on profit and loss.	
4	**Unit 4**	9
	Time and Work: Concept of time and work, Relationship between time and work, Theoretical problems on time and work. **Time and Distance:** Concept of time and distance, Formulae of time and distance, Theoretical problems on time and distance. **Problems on Train:** Formulae of problems on train, Theoretical problems on train.	
5	**Unit 5**	8
	Boat and streams: Concept of boat and streams, Formulae of boat and streams, Theoretical problems on boat and streams. **Allegations and Mixtures:** Definition of allegation and mixtures, Rules of allegation's, Theoretical problems on mixture and allegation. **Calendar:** Concept of odd days, Leap years and ordinary years, Problems on Calendar.	
6	**Unit 6**	9
	Simple and Compound Interest: Definition of simple and Compound interest, Formulae of simple and compound interest, Relationship between simple and compound interest, Theoretical problems on simple and compound interest. **Probability:** Definition of probability, Examples of performing a random experiment, Probability of occurrence of an event, Results on probability, Theoretical problems on probability. **Permutations and combinations:** Definition of permutations and combinations, Formulae of permutation and combinations, Relationship between permutation and combinations, Problems on permutations and combinations.	

References

1) Quantitative Aptitude by Dr.R.SAggrawal , S. Chand and Company Publications

2)Quantitative Aptitude by AbijitGuha, Tata McGraw Hill Publications

3) Objective Arithmetic by S.L Gulati, Cosmos book hive Pvt,5th edition2015

Online References

www.indiabix.com/aptitude.questions-and-answer

www.practiceaptitudetests.com

www.allindiaexams.in

NameofCourse	**B.Sc. CS SY**
Semester	**IIISemester**
NameofSubject	**Data Structure**
SubjectCode	**S3.2(Core Course)**

Unit 1

1	**Introduction**		Lecturer Required	Ref no
	a	Introduction	01	01
	b	Basic terminology, elementary data organization	01	01
	c	Data structure	01	01,02
	d	Data structure operation	01	01
	e	Algorithm complexity	01	01,02

References

sr. no	Name of the book	Author	Publication
1	Data Structure	Seymour Lipschutz	MC GRAW-HILL
2	Data Structures And Algorithms Concepts, Techniques And Applications	G.A.V. Pai	MC GRAW-HILL

Unit 2

2	**Array, Records and Pointers**		Lecturer Required	Ref no
	a	Linear array	01	01
	b	Representation of linear array in memory	01	01,02
	c	Traversing linear array	01	01,02
	d	Inserting and Deleting	02	01,02
	e	Searching methods (Binary and linear search)	02	01,02
	f	Sorting Method (selection sort, bubble sort and Insertion sort)	03	01,02

References

sr. no	Name of the book	Author	Publication
1	Data Structure,	Seymour Lips chutz	MCGRAW HILL
2	Data Structures Through 'C' Language	Samiram Chattopadhyay DebabrataGhoshDastidar, Matangini Chattopadhyay	BPB PUBLICATIONS

Unit 3

3	**Linked List**		Lecturer Required	Ref no
	a	Introduction	01	01
	b	Linked list	01	01
	c	Representation of Linked list in memory	01	01
	d	Searching a linked list	02	01
	e	Memory allocation, Garbage collection	01	01
	f	insertion & Deletion into Linked List	02	01
	g	Two way Linked List	01	01

References

sr. no	Name of the book	Author	Publication
1	Data Structure,	Seymour Lipschutz	MCGRAW HILL

Unit 4

4	**Stack**		Lecturer Required	Ref no
	a	Introduction	01	01

	b	Stack	01	01,02
	c	Representation of stack (sequential & linked)	02	01,02
	d	Push & pop operation	01	01,02
	e	Arithmetic expression	01	01,02
	f	Infix, postfix & prefix	01	01,02
	g	Evaluation of postfix expression	01	01,02
	h	Recursion :factorial, Fibonacci	01	01

References

sr. no	Name of the book	Author	Publication
1	Data Structure	Seymour Lipschutz	MCGRAW HILL
2	DATA STRUCTURE USING C	M. TENENBAUM, YEDIDYAH LANGSAM,MOSHE J. AUGENSTEN	AARON PEARSON PRENTICE HALL

Unit 5

5	**Queue**		Lecturer Required	Ref no
	a	Introduction	01	01
	b	Queues	01	01
	c	Memory Representation of Queue. (sequential & linked)	02	01
	d	Insertion & Deletion on Queue.	02	01
	e	D-queue	01	01
	f	Priority Queue	01	01

References

sr. no	Name of the book	Author	Publication
1	Data Structure	Seymour Lipschutz	MCGRAW HILL

Unit 6

6	**Tree & graph**		Lecturer Required	Ref no
	a	Binary Tree	01	01,02
	b	Types of Binary tree	01	01,02
	c	Traversing of binary tree(pre-order, post-order, in-order)	02	01,02
	d	Header Nodes, Threads	01	01,02
	e	Graph	01	01,02
	f	Representation of graph	01	01,02
	g	Operations on graph	02	01,02

References

sr. no	Name of the book	Author	Publication
1	Data Structure	Seymour Lipschutz	MCGRAW HILL
2	AN INTRODUCTION TO DATA STRUCTURE WITH APPLICATION	JEANPAUL, TREMBLAY PAUL, G. SORENSON	TATA MCGRAW HILL

NameofCourse	**B.Sc. CS SY**
Semester	**IIISemester**
NameofSubject	**Object Oriented Concept Using C++**
SubjectCode	**S3.3(Core Course)**

UNIT-I

1.	Introduction to OOP's		Lectures Required	Ref. No.
	a)	Object Oriented Programming	02	1,2
	b)	Basic concepts of OOPS	02	1,2
	c)	Benefits of OOPs.	01	1,2

References:

Sr.No	Name of Book	Author	Publication
1.	OBJECT ORIENTED PROGRAMMING WITH C++	E. BALGURUSWAMI	BPB Publication
2.	C++ COMPLETE REFERENCE	H. SHEILD	BPB Publication

UNIT II

2.	Introduction to C++		Lectures Required	Ref. No.
	a)	Tokens Identifiers Keywords	02	1,2
	b)	Constant variable data types	02	1,2
	c)	Scope Resolution Operator	01	1,2
	d)	I/O statements Structure of C++ program	01	1,2
	e)	Control statements Looping	01	1,2
	f)	Type casting · Arrays, Pointer, References	02	1,2
	g)	Structure and Unions	01	1,2
	h)	Function: Call by value, Call by reference	01	1,2
	i)	Inline function, Default arguments	01	1,2
	j)	Function Overloading	01	1,2

References:

Sr.No	Name of Book	Author	Publication
1.	OBJECT ORIENTED PROGRAMMING WITH C++	E. BALGURUSWAMI	BPB Publication
2.	C++ COMPLETE REFERENCE	H. SHEILD	BPB Publication

UNIT III

3.	Class & Object		Lectures Required	Ref. No.
	a)	Define Class	01	1,2
	b)	Members Object	01	1,2
	c)	Visibility modes	01	1,2
	d)	Static members	02	1,2
	e)	Pointer to members	01	1,2
	f)	Pointer to objects	01	1,2
	g)	Constructors & Destructors	01	1,2
	h)	Friend Function	01	1,2

References:

Sr.No	Name of Book	Author	Publication
1.	OBJECT ORIENTED PROGRAMMING WITH C++	E. BALGURUSWAMI	BPB Publication
2.	C++ COMPLETE REFERENCE	H. SHEILD	BPB Publication

UNIT IV

4.	Operator Overloading & Type Conversions		Lectures Required	Ref. No.
	a)	Concept of Operator Overloading	02	1,2
	b)	Unary & Binary operator overloading	02	1,2
	c)	Rules for Overloading	01	1,2
	d)	Type conversions – Basic to Class	02	1,2
	e)	Class to basic Class to Class	02	1,2

References:

Sr.No	Name of Book	Author	Publication
1.	OBJECT ORIENTED PROGRAMMING WITH C++	E. BALGURUSWAMI	BPB Publication
2.	C++ COMPLETE REFERENCE	H. SHEILD	BPB Publication

UNIT V

5.	Inheritance & Polymorphism		Lectures Required	Ref. No.
	a)	Concept of Inheritance	01	1,2
	b)	Types of Inheritance	01	1,2
	c)	Polymorphism	01	1,2
	d)	Virtual Base Classes	02	1,2
	e)	Pointer to Derived class	01	1,2
	f)	Virtual functions	01	1,2
	g)	Rules for Virtual function	01	1,2
	h)	Pure Virtual functions	01	1,2

References:

Sr.No	Name of Book	Author	Publication
1.	OBJECT ORIENTED PROGRAMMING WITH C++	E. BALGURUSWAMI	BPB Publication
2.	C++ COMPLETE REFERENCE	H. SHEILD	BPB Publication

UNIT VI

6.	C++ I/O System		Lectures Required	Ref. No.
	a)	C++ Streams Stream classes	02	1,2
	b)	Unformatted I/O operations	02	1,2
	c)	Formatted I/O operations	01	1,2
	d)	Manipulators	01	1,2
	e)	Opening and closing file	01	1,2
	f)	file modes	01	1,2
	g)	Updating file	01	1,2

References:

Sr.No	Name of Book	Author	Publication
1.	OBJECT ORIENTED PROGRAMMING WITH C++	E. BALGURUSWAMI	BPB Publication
2.	C++ COMPLETE REFERENCE	H. SHEILD	BPB Publication

Name of Course	**B.Sc. CS SY**
Semester	**III Semester**
Name of Subject	**Data Communication**
Subject Code	**S3.4 (Core Course)**

Unit –I

1.	**Data Communication Concepts**		**Lecturers Required**	**Ref. No.**
	a)	A Communication model	02	1,2
	b)	Data Communication Task	01	1,2
	c)	Networks:- LAN, WAN	03	1,2
	d)	Wireless LAN Client Server model Peer to Peer Network Analog Signal Digital Signal	05	1,2

References:

Sr. No.	**Name of the Book**	**Author**	**Publication**
1.	Data and Computer Communications	William Stallings	Pearson Education India
2.	Local Area Network	Gerd Keiser	Tata McGraw-Hill

Unit –II

2.	**Protocol Architecture / Multiplexing**		**Lecturers Required**	**Ref. No.**
	a)	The need for protocol architecture Network architecture OSI Model TCP/IP Reference Model	04	1,2
	b)	Multiplexing: FDM, TDM	03	1,2
	c)	Connection Oriented & Connectionless services	01	1,2

References:

Sr. No.	**Name of the Book**	**Author**	**Publication**
1.	Data and Computer Communications	William Stallings	Pearson Education India
2.	Computer Networks	Andrew S. Tanenbaum	Prentice Hall of India

Unit- III

3.	**Transmission Media and Network Topology**		**Lecturers Required**	**Ref. No.**
	a)	Transmission Media- Magnetic media.: Twisted Pair, Coaxial cable Fiber optics	04	1,2
	b)	Topologies with advantages & disadvantages:- Bus, Ring, Star, Tree, Mesh.	03	1,2
	c)	Infrared. Microwave.	01	1,2

References:

Sr. No.	Name of the Book	Author	Publication
1.	Local Area Network	Gerd Keiser	Tata McGraw-Hill
2.	Computer Networks	Andrew S. Tanenbaum	Prentice Hall of India

Unit- IV

4.	Ethernet & Circuit Switching and Packet Switching:		Lecturers Required	Ref. No.
	a)	Switching : Circuit Switching, Packet Switching Message Switching	04	1,2
	b)	Ethernet: Overview of Ethernet 10 Base, 100 Base T	03	1,2
	c)	CSMA/CD	01	1,2

References:

Sr. No.	Name of the Book	Author	Publication
1.	Data and Computer Communications	William Stallings	Pearson Education India
2.	Computer Networks	Andrew S. Tanenbaum	Prentice Hall of India

Unit V

5.	Network Devices & Protocol		Lecturers Required	Ref. No.
	a)	Network Devices Hub, Switch , Repeaters Router , Gateway ,Bridge	04	1,2
	b)	Protocol: FTP, HTTP, SMTP , DNS	03	1,2
	c)	IP address	01	1,2

References:

Sr. No.	Name of the Book	Author	Publication
1.	Local Area Network	Gerd Keiser	Tata McGraw-Hill
2.	Computer Networks	Andrew S. Tanenbaum	Prentice Hall of India

Unit VI

6.	Internet & Other Technologies		Lecturers Required	Ref.No.
	a)	Internet: Internet & Intranet, Internet Service Providers, E-Mail URL	04	1,2
	b)	ISDN, Token Ring FDDI	03	1,2

References:

Sr. No.	Name of the Book	Author	Publication
1.	Local Area Network	Gerd Keiser	Tata McGraw-Hill
2.	Computer Networks	Andrew S. Tanenbaum	Prentice Hall of India

NameofCourse	**B.Sc. CS SY**
Semester	**IIISemester**
NameofSubject	**Programming Language Concepts**
SubjectCode	**S3.5 (Core Course Elective-1)**

Unit –I

1.	**Language Design Issues**		**LecturersRequired**	**Ref.No.**
	a)	Why Study Programming Languages?	1	1, 2
	b)	A Short History of Programming Languages – 1) Development of Early Languages 2) Application Domains	4	1, 2
	c)	The Impact of Programming Paradigms 1) Problem Solving	2	1
	d)	Role of Programming Languages 1) Attributes of a Good Language	2	1, 2

References:

Sr. No.	**NameoftheBook**	**Author**	**Publication**
1.	Programming Languages: Design and Implementation	Terrance W. Pratt, Marvin V. Zelkowitz and T. V. Gopal	Pearson Education
2.	Programming Languages: Design and Implementation	Terrence W. Pratt and Marvin V. Zelkowitz	Prentice Hall of India

Unit –II

2.	**Impact of Machine Architectures**		**LecturersRequired**	**Ref.No.**
	a)	The Operation of a Computer – 1) Computer Hardware 2) Translators and Virtual Architectures	5	1, 2
	b)	Binding and Binding Time	2	1, 2

References:

Sr. No.	**NameoftheBook**	**Author**	**Publication**
1.	Programming Languages: Design and Implementation	Terrance W. Pratt, Marvin V. Zelkowitz and T. V. Gopal	Pearson Education
2.	Programming Languages: Design and Implementation	Terrence W. Pratt and Marvin V. Zelkowitz	Prentice Hall of India

Unit –III

3.	**Language Translation Issues**		**LecturersRequired**	**Ref.No.**
	a)	Programming Language Syntax – 1) General Syntactic Criteria 2) Syntactic Elements of a Language	5	1, 2
	b)	Stages in Translation – 1) Analysis of the Source Program 2) Synthesis of the Object Program	5	1, 2

	c)	Formal Translation Models 1) BNF Grammars (Syntax Only)	2	1, 2

References:

Sr. No.	NameoftheBook	Author	Publication
1.	Programming Languages: Design and Implementation	Terrance W. Pratt, Marvin V. Zelkowitz and T. V. Gopal	Pearson Education
2.	Programming Languages: Design and Implementation	Terrence W. Pratt and Marvin V. Zelkowitz	Prentice Hall of India

Unit –IV

4.	Elementary Data Types		LecturersRequired	Ref.No.
	a)	Properties of Types and Objects – 1) Data Objects, Variables, and Constants 2) Data Types 3) Declarations 4) Type Checking 5) Assignment and Initialization	5	1, 2
	b)	Scalar Data Types – 1) Numeric Data Types (Integers Only) 2) Enumerations 3) Booleans 4) Characters	4	1, 2

References:

Sr.No.	NameoftheBook	Author	Publication
1.	Programming Languages: Design and Implementation	Terrance W. Pratt, Marvin V. Zelkowitz and T. V. Gopal	Pearson Education
2.	Programming Languages: Design and Implementation	Terrence W. Pratt and Marvin V. Zelkowitz	Prentice Hall of India

Unit –V

5.	Encapsulation		LecturersRequired	Ref.No.
	a)	Structured Data Types – 1) Structured Data Objects and Data Types 2) Specification of Data Structure Types 3) Declarations and Type Checking for Data Structures 4) Vectors	5	1, 2
	b)	Abstract Data Types 1) Evaluation of the Data Type Concept 2) Information Hiding	3	1, 2

References:

Sr.No.	NameoftheBook	Author	Publication
1.	Programming Languages: Design and Implementation	Terrance W. Pratt, Marvin V. Zelkowitz and T. V. Gopal	Pearson Education
2.	Programming Languages: Design and Implementation	Terrence W. Pratt and Marvin V. Zelkowitz	Prentice Hall of India

Unit –VI

6.	Inheritance		LecturersRequired	Ref.No.
	a)	Introduction	1	1, 2
	b)	Derived Classes	2	1, 2
	c)	Methods	1	1, 2
	d)	Abstract Classes	1	1, 2

References:

Sr.No.	NameoftheBook	Author	Publication
1.	Programming Languages: Design and Implementation	Terrance W. Pratt, Marvin V. Zelkowitz and T. V. Gopal	Pearson Education
2.	Programming Languages: Design and Implementation	Terrence W. Pratt and Marvin V. Zelkowitz	Prentice Hall of India

Name of Course	**B.Sc. (Computer Science) Second Year**
Semester	**III**
Name of Subject	**Multimedia**
Subject Code	**S3.5 (Core Course Elective-2)**

Unit –I

1.	**IIntroduction**	**Lecturers Required**	**Ref. No.**
1.1	Definition of Multimedia elements	1	1
1.2	Multimedia Elements	1	1
1.3	Multimedia Applications	1	1
1.4	Global structure of Multimedia	1	1

References:

Sr. No.	**Name of the Book**	**Author**	**Publication**
1	Multimedia System Design	By P. K. ANDLEIGH, KIRAN THAKRAR	DhanpatRai Publications

Unit –II

2.	**Data Compression**	**Lecturers Required**	**Ref. No.**
2.1	Storage space	1	1
2.2	Coding requirements	2	1
2.3	Basic compression techniques (Run length& Huffman encoding	2	1
2.4	Introduction to following compression techniques: JPEG, MPEG	2	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Multimedia : Computing Communications & Applications	By Ralf Steinmetz And Klara Nehrstedt	Pearson Education

Unit –III

3.	**Optical Storage Media &Retrieval Technologies**	Lecturers Required	Ref. No.
3.1	Basic Technology	1	1
3.2	Video Disk & other WORMS	2	1
3.3	CD-ROM and Multimedia Highway	2	1
3.4	DVD- ROM	1	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Multimedia : Computing Communications & Applications	By Ralf Steinmetz And KlaraNehrstedt	Pearson Education

Unit –IV

4.	**Sound / Audio**	Lecturers Required	Ref. No.
4.1	Basic Concept of Sound	1	1
4.2	MIDI	2	1
4.3	Digital audio	2	1
4.4	Audio file formats	1	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Multimedia : Computing Communications & Applications	By Ralf Steinmetz And Klara Nehrstedt	Pearson Education

Unit –V

5.	. **Image And Graphics**	Lecturers Required	Ref. No.
5.1	Making Still Images : BITMAPS , Vector Drawing	3	1
5.2	Colors	1	1
5.3	Image Formats	1	1
5.4	Graphics Formats	1	1
5.5	Image File Formats: BMP, JPEG, TIFF, PNG.	4	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Multimedia : Computing Communications & Applications	By Ralf Steinmetz And KlaraNehrstedt	Pearson Education

Unit –VI

6.	**Video& Animation**	Lecturers Required	Ref. No.
6.1	Basic concepts (Using Video)	1	1
6.2	Broadcast Video Standards	1	1
6.3	Television (Conventional systems, Enhanced definition systems, High Definition system)	2	1
6.4	Computer based Animation	1	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Multimedia : Computing Communications & Applications	By Ralf Steinmetz And Klara Nehrstedt	Pearson Education

Name of Course	B.Sc. (Computer Science) Second Year
Semester	III
Name of Subject	8085 Programming
Subject Code	S3.5 (Core Course Elective-3)

Unit –I

1.	Microprocessor Architecture	Lecturers Required	Ref. No.
1.1	Introduction and Block Diagram of 8085	4	1
	ALU		1
	Timing & Control Unit		1
	Register		1
	Data & Address Bus		1
1.2	Pin Configuration of 8085	2	1
1.3	Opcode and operand	1	1
1.4	Instruction word size	1	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Fundamentals of Microprocessor and Microcomputers	B. RAM	DhanpatRai Publications

Unit –II

2.	Instruction Cycle	Lecturers Required	Ref. No.
2.1	Fetch Operation	1	1
2.2	Execute Operation	1	1
2.3	Machine Cycle and State	1	1
2.4	Instruction and data flow	1	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Fundamentals of Microprocessor and Microcomputers	B. RAM	DhanpatRai Publications

Unit –III

3.	Timing Diagram	Lecturers Required	Ref. No.
3.1	Timing Diagram for Opcode Fetch Cycle	1	1
3.2	Memory Read	1	1
3.3	Memory Write	1	1
3.4	I/O Write	1	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Fundamentals of Microprocessor and Microcomputers	B. RAM	DhanpatRai Publications

Unit –IV

4.	Addressing Modes	Lecturers Required	Ref. No.
4.1	Direct Addressing	1	1
4.2	Register Addressing	1	1
4.3	Register indirect Addressing	1	1
4.4	Immediate Addressing	1	1
4.5	Implicit Addressing	1	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Fundamentals of Microprocessor and Microcomputers	B. RAM	DhanpatRai Publications

Unit –V

5.	Instruction Set of 8085	Lecturers Required	Ref. No.
5.1	Introduction	1	1
5.2	Data transfer Group	3	1
5.3	Arithmetic Group	3	1
5.4	Logical Group	3	1
5.5	Branch Control Group	3	1
5.6	I/O and Machine control Group	3	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Fundamentals of Microprocessor and Microcomputers	B. RAM	DhanpatRai Publications

Unit –VI

6.	Programming of Microprocessor 8085	Lecturers Required	Ref. No.
6.1	Introduction	1	1
6.2	Assembly Language Program	4	1

References:

Sr. No.	Name of the Book	Author	Publication
1	Fundamentals of Microprocessor and Microcomputers	B. RAM	DhanpatRai Publications

Name of Course	**B.Sc. (Computer Science) Second Year**
Semester	**II**
Name of Subject	**SciLab 1**
Subject Code	**S3.6 (Skill Enhancement Course)**

Unit –I

Sr. No	Topic Name	Lecturers Required	Ref. No.
1.	Overview	2	
	1.1 Introduction to Scilab		1
	1.2 Installation on Windows & Linux		1
	1.3 Getting Help from Scilab		1
	1.4 Exercise		1
2	Getting Started Scilab	4	1
	2.1 The console		1
	2.2 The editor		1
	2.3 Docking		1
	2.4 Using exec		1
	2.5 Batch processing		1
	Exercise		1
3	Basic elements of the language	6	1
	3.1 Creating real variables		1
	3.2 Variable names		1
	3.3 Comments and continuation lines		1
	3.4 Elementary mathematical functions		1
	3.5 Pre-de_ned mathematical variables		1
	3.6 Booleans		1
	3.7 Complex numbers		1
	3.8 Integers		1
	3.9 Floating point integers		1
	3.10 The ans variable		1
	3.11 Strings		1
	3.12 Dynamic type of variables		1

4	Matrices	4	1
	4.1 Working with Matrix		1
	4.2 Multiplication of two vectors		1
	4.3 Comparing two real matrices		1
5	Control &Looping Statement	4	1
	5.1 The if statement		1
	5.2 The select statement		1
	5.3 The for statement		1
	5.4 The while statement		1
	5.5 The break and continue statements		1

Reference : 1 The Scilab Consortium. Scilab.http://www.scilab.org

Name of Course	**B.Sc. (Computer Science) Second Year**
Semester	**II**
Name of Subject	**Web Development & PHP Programming**
Subject Code	**S3.6 (Skill Enhancement Course)**

Sr. No	Topic Name	Lecturers Required	Ref. No.
1	**Introduction to PHP** 1.1 Basic Syntax 1.2 Sending Data to the Web Browser 1.3 Understanding PHP, HTML, and White Space 1.4 Writing Comments 1.5 What Are Variables? 1.6 About Strings 1.7 About Numbers 1.8 About Constants		
2	**Programming with PHP** 2.1 Creating an HTML Form 2.2 Handling an HTML Form 2.3 Managing Magic Quotes 2.4 Conditionals and Operators 2.5 Validating Form Data 2.6 What Are Arrays? 2.7 For and While Loops		
3	**String Manipulation and Regular Expression** 3.1 Creating and accessing String, Searching & Replacing String 3.2 Formatting, joining and splitting String, String Related Library functions 3.3 Use and advantage of regular expression over inbuilt function		
4	**Creating Dynamic Web Sites** 4.1 Including Multiple Files 4.2 Handling HTML Forms with PHP Redux 4.3 Making Sticky Forms 4.4 Creating and Calling Your Own Functions 4.5 Variable Scope 4.6 Date and Time Functions 4.7 Sending Email		
5	**Using PHP with MySQL** 5.1 Connecting to MySQL and Selecting the Database 5.2 Executing Simple Queries 5.3 Retrieving Query Results 5.4 Ensuring Secure SQL 5.5 Counting Returned Records 5.6 Updating Records with PHP		

6	**Cookies and Sessions** 6.1 Using Cookies 6.2 Using Sessions 6.3 Sessions and Cookies 6.4 Improving Session Security		

References

1. PHP and MySQL for Dynamic Web Sites: Visual Quickpro Guide, Second Edition by Larry Ullman
2. Programming PHP By RasmusLerdorf, Kevin Tatroe, Peter MacIntyre

Practical Assignments For PHP Programming

1. Creating HTML FORM
2. Validating Form Data
3. Date and Time Functions
4. Sending Email.
5. Program based on arrays.
6. Program based on loops.
7. Making Sticky Forms
8. Creating and Calling Your Own Functions
9. Including multiple files.
10. Using the MySQL Client
11. Creating Databases and Tables
12. Connecting to MySQL and Selecting the Database , Executing Simple Queries , Retrieving Query Results , Ensuring Secure SQL , Counting Returned Records , Updating Records with PHP
13. Using Cookies
14. Using Sessions.

Name of Course	**B.Sc. (Computer Science) Second Year**
Semester	**II**
Name of Subject	**PC Installation**
Subject Code	**S3.6 (Skill Enhancement Course)**

Sr. No.	Title of Programme	Required Hours
1)	Study of Hardware Component on Motherboard	4 hours
2)	Study of identifying RAM type and Installation of RAM SD, DDR, DDR1, DDR2, DDR3	2 hours
3)	Study of HDD Drive and installation of HDD	1 hours
4)	Study of Assemble a Computer System.	4 hours
5)	Study of Installing Windows 7 OS	2 hours
6)	Study of BIOS options	1 hour
7)	Study of Installing Windows 8 OS	2 hours
8)	Study of Installing Application Packages/Software – Microsoft Word, PDF reader, Browsing Software's	2 hours
9)	Study of Transmission Medias – Twisted Pair Cable, Co-ax Cable, Fiber-optic Cable.	1 hours
10)	Study of Crimping CAT-5 Straight Cable	1 hours
11)	Study of Crimping CAT-5 Cross over Cable	1 hours
12)	Study of Networking Devices – Hub, Switch, Router	1 hours
13)	Study of IP addresses- IPV4, IPV6.	2 hours
14)	Study of assigning IPV4 and IPV6 addresses to computer system	1 hour
15)	Study of Windows Firewall and Windows Defender	1 hour
16)	Troubleshoot to find connectivity problem	1 hour
17)	Performing another computer using Remote Desktop	1 hour
18)	Performing another computer using Team Viewer/Ammy Admin	1 hour
19)	Installing any Local Printer	1 hour
20)	To share a printer	1 hour
21)	To share a Folder/Map a Drive	1 hour

References:

Sr. No.	Name of the book	Author	Publication
1.	COMP INSTALL AND SERVICING ISBN 1259082466, 9781259082467	BALASUBRAMANIAN D	Tata McGraw Hill Edition
2.	https://en.wikibooks.org/wiki/How_To_Assemble_A_Desktop_PC/Software	Wikibooks	Website Link

NameofCourse	**B.Sc. CS SY**
Semester	**IIISemester**
NameofSubject	**Data structure Practical**
SubjectCode	**S3.Lab-1**

Sr.No	Title of program	Required Hour
1	Write a program traversing the array.	1
2	Write a program to insert the element into array at given position.	2
3	Write a program to delete the element from array.	1
4	Write program to search an element from array.	1
5	Write a program to find element in the array using binary search.	2
6	Write a program to sort the array using for bubble sort.	1
7	Write a program to perform insertion sort on array.	2
8	Write a program to implement the selection sort on array.	2
9	Write a program to implement stack using linked list.	1
10	Write a program to implement stack using array.	1
11	Write a program to perform push & pop operations on stack.	2
12	Write a program to convert an infix expression into postfix expression.	2
13	Write a program to evaluation of postfix expression using stack.	2
14	Write a program to implement queue using linked list.	1
15	Write a program to implement queue using array.	1
16	Write a program to perform queue operation	2
17	Write a program to create a linked list & performing traversing operation.	2
18	Write a program for insertion & deletion of linked list.	2
19	Write a program to simulate tree traversing techniques.	2

Name of Course	**B.Sc. (Computer Science) Second Year**
Semester	**III Semester**
Name of Subject	**Object Oriented Concept Using C++**
Subject Code	**S3.LAB-2**

Practical NO.	Name of Practical	Remarks
1	Program to demonstrate Constant Variable.	
2	Program to demonstrate scope of Variable	
3	Program to demonstrate branching statement	
4	Program to demonstrate Looping statement	
5	Program to demonstrate simple class	
6	Program to demonstrate method parameter	
7	Program to demonstrate method overloading	
8	Program to demonstrate constructor	
9	Program to demonstrate static member	
10	Program to demonstrate Method overriding	
11	Program to demonstrate Final variable, Method and Final Class.	
12	Program to demonstrate Finilize method()	
13	Program to demonstrate Array and It’s types.	
14	Program to demonstrate String class and it’s method.	
15	Program to demonstrate String Buffer and it’s method.	
16	Program to demonstrate inheritance and its Types	
17	Program to demonstrate Abstract method and Abstract Class.	
18	Program to demonstrate Multiple catch statement	
19	Program to demonstrate finally clause	
20	Program to demonstrate package	
21	Program to demonstrate interface	
22	Program to demonstrate Applet life cycle	
23	Program to demonstrate param tag	
24	Program to demonstrate Graphics class	

Name of Course	**B.Sc. (Computer Science) Second Year**
Semester	**III**
Name of Subject	**Multimedia (Elective Practical)**
Subject Code	**S3.LAB-3**

Practical NO.	**Name of Practical**
1	Study of Multimedia Elements
2	Study of Opening Screen of Power Point
3	Study of Power Point Presentation of MM Elements
4	Study of Opening Screen of Adobe Photoshop
5	Study to change back ground color of image in Adobe Photoshop.
6	Study to Effect to back ground image in Adobe Photoshop.
7	Study to clear underexposed in Adobe Photoshop.
8	Study to apply canvas effect in Adobe Photoshop.
9	Study to enlarge your image with minimal visible Loss.
10	Study to create user defined brush in Adobe Photoshop.
11	Study to apply sketch effect in Adobe Photoshop.
12	Study to apply wind effect to text in Adobe Photoshop.
14	Study to create bouncing ball in Macromedia Flash.
15	Study to create Rolling ball in Macromedia Flash.

Name of Course	**B.Sc. (Computer Science) Second *Year**
Semester	**III**
Name of Subject	**8085 programming Practical**
Subject Code	**S3.LAB-3**

Sr.No.	Aim of practical
1.	Write an ALP to add two 8-bit numbers ,whose sum is also 8-bit.
2.	Write an ALP to add two 8-bit numbers ,whose sum is 16-bit.
3.	Write an ALP to add two 16-bit numbers ,whose sum is also 16-bit.
4.	Write an ALP to add two 16-bit numbers ,whose sum is more than 16-bits.
5.	Write an ALP to perform subtraction of two 8-bit numbers.
6.	Write an ALP to find 1's complement of 8-bit number.
7.	Write an ALP to find 1's complement of 16-bit number.
8.	Write an ALP to find 2's complement of 8-bit number.
9.	Write an ALP to find 2's complement of 16-bit number.
10.	Write an ALP to find larger number between two 8-bit numbers.
11.	Write an ALP to find larger number between array of numbers.
12.	Write an ALP to find smaller number between two 8-bit numbers.
13.	Write an ALP to find larger number between array of numbers.
14.	Write an ALP to arrange a series of numbers in ascending order.
15.	Write an ALP to arrange a series of numbers in descending order.
16.	Write an ALP to find a square of number from look-up table.

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Logical Reasoning**
SubjectCode	**S4.1(Ability Enhabcement Course)**

Unit I

1		Series, Analogy and Classification	Lectures Required	Ref no
	A	**Series:** Types of series**,** Alphabet series, Alpha numeric series, Examples on continues pattern series.	03	1
	B	**Analogy:** Completing the Analogous Pair, Direct/Simple Analogy, Choosing the Analogous Pair, Double Analogy, Number analogy, Alphabet analogy, Correlation between letters/numbers.	02	1
	C	**Classification:** Choosing the odd word, Choosing the odd numeral, Choosing the odd letter group.	02	1

References

Sr. No.	Name of the book	Author	Publication
1	A Modern Approach to Verbal & Non-Verbal Reasoning	Dr.R.SAggarwal	S. Chand and Company Publications

Unit II

2		Coding-Decoding	Lecturers Required	Ref no
	A	**Coding-Decoding:** Letter coding, Direct Letter Coding, Number/Symbol Coding.	03	1
	B	**Substitution:** Concept of substitution, Problem solving by using substitution.	01	1
	C	**Deciphering**: Deciphering messages word codes, Deciphering numbers/symbol codes for messages.	02	1

References

Sr. No.	Name of the book	Author	Publication
1	A Modern Approach to Verbal & Non-Verbal Reasoning	Dr.R.SAggarwal	S. Chand and Company Publications

Unit III

3		Blood Relation	Lectures Required	Ref no
	A	Introduction to relations	01	1
	B	Concepts of deciphering relations based problems	02	1
	C	Problems on deciphering jumbled up descriptions	01	1
	D	Relation puzzle	02	1
	E	Coded relations.	01	1

References

Sr. No.	Name of the book	Author	Publication
1	A Modern Approach to Verbal & Non-Verbal Reasoning	Dr.R.SAggarwal	S. Chand and Company Publications

Unit IV

4		Seating or Placing Arrangement	Lectures Required	Ref no
	A	Problems based on linear and circular based arrangement.	06	1

References

Sr. No.	Name of the book	Author	Publication
1	A Modern Approach to Verbal & Non-Verbal Reasoning	Dr.R.SAggarwal	S. Chand and Company Publications

Unit V

5		Direction Sense Test	Lectures Required	Ref no
	A	Introduction	01	1
	B	Problems based on angular changes in direction	02	1
	C	Problems on Shadows	01	1
	D	General Problems based on Pythagoras Theorem	01	1

References

Sr. No.	Name of the book	Author	Publication
1	A Modern Approach to Verbal & Non-Verbal Reasoning	Dr.R.SAggarwal	S. Chand and Company Publications

Unit VI

6		Syllogism and Data Sufficiency	Lectures Required	Ref no
	A	**Syllogism:** Introduction of logic, Rules of syllogism, Two statement problem, Three statement problem	07	1
	B	**Data Sufficiency**: Problems of Data sufficiency based on all Chapters.	03	1

References

Sr. No.	Name of the book	Author	Publication
1	A Modern Approach to Verbal & Non-Verbal Reasoning	Dr.R.SAggarwal	S. Chand and Company Publications
2	Test of Reasoning	Edgar Thorpe	McGraw Hill Education
3	**www.practiceaptitudetests.com**		
4	**www.allindiaexams.in**		

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**RDBMS**
SubjectCode	**S4.2(Core Course)**

Unit – I

1.		Introduction and Basic Concepts	Lecturers Required	Ref. No.
	a)	Structure of DBMS	2	1
	b)	Advantages and Disadvantages of DBMS	1	1
	c)	Users of DBMS	1	1
	d)	Relational Database: Entities, Attributes and Domains	1	1
	e)	Tuples, Relations and their schemes.	1	1

References:

1)	"An Introduction to Database Systems": -by Bipin C Desai Revised Edition GalgotiaPublication

Unit – II

2.	SQL Statements & Working With Tables	Lecturers	Ref. No.

			Required	
	a)	What is SQL?	01	1
	b)	Types of SQL Commands (DDL,DML,DQL,DCL,Transaction Control Commands	03	1
	c)	Data types in SQL	03	1
	d)	Creating Tables	03	1
	e)	Selecting from tables, WHERE Clause	01	1
	f)	Selecting from tables, DISTINCTClause, Column aliasing	03	1
	g)	Manipulation Table data	03	1
	h)	Altering Table structure	03	1
	i)	Data Constraints: Unique, Not Null, Primary Key, Foreign Key, Check, Default Constraint	03	1

References :

1)	"Oracle Database 10g PL/SQL Programming" by Scott Urman , Ron Hardman, MichaleMc Laughlin, Oracle Press, TMH, ISBN-0-07-059779-0.
2)	"Oracle Database 10g The Complete Reference" By Kevin Loney, Bob Bryla Oracle Press (TATA McGraw Hill Edition) ISBN-13:978-0-07-059425-8, ISBN-10: 0-07-059425-2
3)	SQL, PL/SQL the programming language of ORACLE 4th Edition by Ivan Bayross ISBN-81-7656964-X

Unit – III

3.	Operators & SQL Functions& Views		Lecturers Required	Ref. No.
	a)	Arithmetic Operators, Relational Operators	1	1
	b)	Comparison Operators BETWEEN , IN, LIKE, IS NULL	02	1
	c)	LOGICAL Operators: AND OR NOT	01	1
	d)	SQL Functions: Single, Multiple Row Functions	01	1
	e)	Single Row Character , Single Row Number, Single Row Date, Single Row Conversion, Single Row General Functions	05	1
	f)	Multiple Row Functions	03	1
	g)	Views	02	

References:

1)	"Oracle Database 10g PL/SQL Programming" by Scott Urman , Ron Hardman, MichaleMc Laughlin, Oracle Press, TMH, ISBN-0-07-059779-0.
2)	"Oracle Database 10g The Complete Reference" By Kevin Loney, Bob Bryla Oracle Press (TATA McGraw Hill Edition) ISBN-13:978-0-07-059425-8, ISBN-10: 0-07-059425-2
3)	SQL, PL/SQL the programming language of ORACLE 4th Edition by Ivan Bayross ISBN-81-7656964-X

Unit – IV

4.	Sorting & Grouping Data and Joining Tables &Subqueriesin ORACLE		Lecturers Required	Ref. No.
	a)	What is Sorting?	01	1
	b)	ORDER BY & ORDER BY DESC Clauses	02	1
	c)	GROUP BY & GROUP BY HAVING Clauses	02	1
	d)	What is Join? Join Styles: Theta , ANSI , Using clause	01	1
	e)	Types of Joins: Equi Joins, Non Equi Join, Outer	04	1

		Join: Left, Right, Full		
	f)	Self Join Cross Join, Joining three tables	03	1
	g)	Subqueries& its types	03	

References :

1)	"Oracle Database 10g PL/SQL Programming" by Scott Urman , Ron Hardman, MichaleMc Laughlin, Oracle Press, TMH, ISBN-0-07-059779-0.
2)	"Oracle Database 10g The Complete Reference" By Kevin Loney, Bob Bryla Oracle Press (TATA McGraw Hill Edition) ISBN-13:978-0-07-059425-8, ISBN-10: 0-07-059425-2
3)	SQL, PL/SQL the programming language of ORACLE 4th Edition by Ivan Bayross ISBN-81-7656964-X

Unit – V

5.		Introduction to PL/SQL	Lecturers Required	Ref. No.
	a)	PL/SQL Overview	02	1
	b)	Declarations Section	02	1
	c)	Executable Commands Section	02	1
	d)	Exception Handling Section	02	1

References :

1)	"Oracle Database 10g PL/SQL Programming" by Scott Urman , Ron Hardman, MichaleMc Laughlin, Oracle Press, TMH, ISBN-0-07-059779-0.
2)	"Oracle Database 10g The Complete Reference" By Kevin Loney, Bob Bryla Oracle Press (TATA McGraw Hill Edition) ISBN-13:978-0-07-059425-8, ISBN-10: 0-07-059425-2
3)	SQL, PL/SQL the programming language of ORACLE 4th Edition by Ivan Bayross ISBN-81-7656964-X

Unit – VI

6.		Database Triggers& Cursors	Lecturers Required	Ref. No.
	a)	What are Triggers? Triggers Syntax	02	1
	b)	Types of triggers Row Level Statement Level, Before , After Instead of Triggers	03	1
	c)	Enabling and Disabling Triggers Replacing and Dropping Triggers	02	1
	d)	Working With Cursor % TYPE Variable % ROWTYPE Variable	02	1

References :

1)	"Oracle Database 10g PL/SQL Programming" by Scott Urman , Ron Hardman, MichaleMc Laughlin, Oracle Press, TMH, ISBN-0-07-059779-0.
2)	"Oracle Database 10g The Complete Reference" By Kevin Loney, Bob Bryla Oracle Press (TATA McGraw Hill Edition) ISBN-13:978-0-07-059425-8, ISBN-10: 0-07-059425-2
3)	SQL, PL/SQL the programming language of ORACLE 4th Edition by Ivan Bayross ISBN-81-7656964-X

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Java Programming**
SubjectCode	**S4.3(Core Course)**

UNIT-I

Sr. No.		Introduction	Lectures Required	Ref. No
1	1.1	Java History	1	1,2,3,4
	1.2	Java Features	2	1,2,3,4
	1.3	How Java Differ from C and C++	2	1,2,3,4
	1.4	JVM	1	3,4
	1.5	Java Environment	1	4
	1.6	Java Programming Structure	1	4
	1.7	Installing and Configuring Java	1	4

References:

Sr. No	Name of Book	Writer	Publication
1	Complete Reference	Herbert Schildt	Tata McGraw-Hill publishing company Ltd.
2	Java 2 programming black books	Steven Horlzner	DreamTech press
3	Core Java Volume-I-FundamentalsEighth Edition	Cay S. Horstmann, Gary Cornell, Prentice Hall	Sun Microsystems Press
4	Programming with Java	E Balagurusamy	The McGraw Hill Education Pvt. Ltd. New Delhi

UNIT-II

Sr. No.		Overview of Java Language	Lectures Required	Ref. No
2)	2.1	Introduction, Types of Comment	1	1,2,3,4
	2.2	Java Tokens - Reserve Keywords - Identifiers - Literals - Operators - Separators	7	1,2,3,4
	2.3	Variables, Constant, Data Types, Array	3	1,2,3,4
	2.4	Type Casting	1	1,2,3,4
	2.5	Control Statement -Branching statement -Looping statement	3	1,4
	2.6	Jumping Statement- break, Continue	1	1,4

References:

Sr. No	Name of Book	Writer	Publication
1	Complete Reference	Herbert Schildt	Tata McGraw-Hill publishing company Ltd.
2	Java 2 programming black books	Steven Horlzner	DreamTech press
3	Core Java Volume-I-Fundamentals Eighth Edition	Cay S. Horstmann, Gary Cornell, Prentice Hall	Sun Microsystems Press
4	Programming with Java	E Balagurusamy	The McGraw Hill Education Pvt. Ltd. New Delhi

UNIT-III

Sr. No.	Classes, Objects and Methods		Lectures Required	Ref. No
3)	3.1	Introduction, Defining Class -Fields Declaration -Methods Declaration -Creating Objects -Visibility Control	1	1,2,3,4
	3.2	Use of 'this' Keyword	1	1,2,3,4
	3.3	Method Parameters	1	1,2,3,4
	3.4	Method Overloading	1	1,2,3,4
	3.5	Constructor and Constructor Overloading	1	1,2,3,4
	3.6	Static Members	1	1,2,3,4
	3.7	Finializer Method	1	1,2,3,4
	3.8	Inheritance and It's Types	1	1,2,3,4
	3.9	Method Overriding	1	1,2,3,4
	3.10	Final Variable, Method and Final Class	1	1,2,3,4
	3.11	Abstract Method and Abstract Class	1	1,2,3,4

References:

Sr. No	Name of Book	Writer	Publication
1	Complete Reference	Herbert Schildt	Tata McGraw-Hill publishing company Ltd.
2	Java 2 programming black books	Steven Horlzner	DreamTech press
3	Core Java Volume-I-Fundamentals Eighth Edition	Cay S. Horstmann, Gary Cornell, Prentice Hall	Sun Microsystems Press
4	Programming with Java	E Balagurusamy	The McGraw Hill Education Pvt. Ltd. New Delhi

UNIT-IV

Sr. No.	Interface, Package and Exception Handling		Lectures Required	Ref. No
4)	4.1	Defining and implementing interface	2	2,3,4
	4.2	Inner Classes	1	2,3,4
	4.3	Package -Create Package -Accessing Package	2	2,3,4
	4.4	Exception -Types of Error -Multiple catch statement -Creating User defined Exception -Finally clause	3	2,3,4

References:

Sr. No	Name of Book	Writer	Publication
1	Complete Reference	Herbert Schildt	Tata McGraw-Hill publishing company Ltd.
2	Java 2 programming black books	Steven Horlzner	DreamTech press
3	Core Java Volume-I-Fundamentals Eighth Edition	Cay S. Horstmann, Gary Cornell, Prentice Hall	Sun Microsystems Press
4	Programming with Java	E Balagurusamy	The McGraw Hill Education Pvt. Ltd. New Delhi

UNIT-V

Sr. No.	String, Stream and Files		Lectures Required	Ref. No
5)	5.1	Introduction	1	1,2,3,4
	5.2	String Classes	1	1,2,4
	5.3	StringBuffer Class	1	1,2,4
	5.4	Stream Classes -Types of Streams - Byte Stream Classes - Character Stream Classes	2	1,2,4
	5.5	File Classes	1	1,2,4

References:

Sr. No	Name of Book	Writer	Publication
1	Complete Reference	Herbert Schildt	Tata McGraw-Hill publishing company Ltd.
2	Java 2 programming black books	Steven Horlzner	
3	Core Java Volume-I-Fundamentals Eighth Edition	Cay S. Horstmann, Gary Cornell, Prentice Hall	Sun Microsystems Press
4	Programming with Java	E Balagurusamy	The McGraw Hill Education Pvt. Ltd. New Delhi

UNIT-VI

Sr. No.	Applet Programming		Lectures Required	Ref. No
6)	6.1	Introduction	1	1,2,3,4
	6.2	Creating Applets	1	1,2,3,4
	6.3	Applet Life Cycle	1	1,2,3,4
	6.4	Applet Tag	1	1,2,3,4
	6.5	Passing Parameters to Applets	1	1,2,3,4
	6.6	Working with Graphics	1	1,2,3,4

References:

Sr. No	Name of Book	Writer	Publication
1	Complete Reference	Herbert Schildt	Tata McGraw-Hill publishing company Ltd.
2	Java 2 programming black books	Steven Horlzner	DreamTech press
3	Core Java Volume-I-Fundamentals Eighth Edition	Cay S. Horstmann, Gary Cornell, Prentice Hall	Sun Microsystems Press
4	Programming with Java	E Balagurusamy	The McGraw Hill Education Pvt. Ltd. New Delhi

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Compiler Design**
SubjectCode	**S4.4(Core Course)**

UNIT-I

Sr. No.	Introduction to Compiling:	Lectures Required	Ref. No
1	Compilers and Translators, Need of translators, Phases of a compiler , Lexical analysis , Syntax analysis ,Intermediate code generation , Optimization , Code generation,Compiler construction tools, A simple one pass compiler.	7	1,2,3

References:

Sr. No	Name of Book	Writer
1	Compiler Construction -	Dhamdere (Mc-Millan)
2	Compilers - Principles, Techniques and Tools	A.V. Aho, R. Shethi and J.D. Ullman (Addisonwesley publishing company.)
3	Compiler Construction	Barret, Bates, Couch (Galgotia)

UNIT-2

Sr. No.	Programming languages	Lectures Required	Ref. No
2	High - Level programming languages Definitions of programming languages The Lexical & syntactic structure of a language, Data elements, Data structures , Operators, Assignment , Statements	7	1,2,3

References:

Sr. No	Name of Book	Writer
1	Compiler Construction -	Dhamdere (Mc-Millan)
2	Compilers - Principles, Techniques and Tools	A.V. Aho, R. Shethi and J.D. Ullman (Addisonwesley publishing company.)
3	Compiler Construction	Barret, Bates, Couch (Galgotia)

UNIT-3

Sr. No.	Lexical Analysis	Lectures Required	Ref. No
3	Role of a Lexical analyzer, input buffering, Simple approach to the design of Lexical Analysis, Regular Expression, finite automata, A language for specifying lexical analyzer	10	1,2,3

References:

Sr. No	Name of Book	Writer
1	Compiler Construction -	Dhamdere (Mc-Millan)
2	Compilers - Principles, Techniques	A.V. Aho, R. Shethi and J.D.

	and Tools	Ullman (Addisonwesley publishing company.)
3	Compiler Construction	Barret, Bates, Couch (Galgotia)

UNIT-4

Sr. No.	Syntax Analysis	Lectures Required	Ref. No
4	Role of Parser, Context free Grammar, Capabilities of context-free grammars Top-down Parsing, Predictive parsers, Bottom-Up parsing, Operator precedence parsing, LR, automatic construction of parser using YACC.	10	1,2,3

References:

Sr. No	Name of Book	Writer
1	Compiler Construction -	Dhamdere (Mc-Millan)
2	Compilers - Principles, Techniques and Tools	A.V. Aho, R. Shethi and J.D. Ullman (Addisonwesley publishing company.)
3	Compiler Construction	Barret, Bates, Couch (Galgotia)

UNIT-5

Sr. No.	Lexical Analysis	Lectures Required	Ref. No
5	**Syntax Directed Translation and intermediate code generation**	7	1,2,3
	Syntax directed definitions, Implementation of Syntax directed translators, Intermediate codePostfix Notation and Evaluation of Postfix Notation,Parse trees and syntax trees		

References:

Sr. No	Name of Book	Writer
1	Compiler Construction -	Dhamdere (Mc-Millan)
2	Compilers - Principles, Techniques and Tools	A.V. Aho, R. Shethi and J.D. Ullman (Addisonwesley publishing company.)
3	Compiler Construction	Barret, Bates, Couch (Galgotia)

UNIT-4

Sr. No.	Error detection, recovery and Introduction to Code Optimization	Lectures Required	Ref. No
4	Errors Lexical-phase errors Syntactic phase errors Semantic errors Sources of optimization Loop optimization		1,2,3

References:

Sr. No	Name of Book	Writer
1	Compiler Construction -	Dhamdere (Mc-Millan)
2	Compilers - Principles, Techniques and Tools	A.V. Aho, R. Shethi and J.D. Ullman (Addisonwesley publishing company.)
3	Compiler Construction	Barret, Bates, Couch (Galgotia)

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Computer Algorithm**
SubjectCode	**S4.5(Disciplin Specific Elective)**

Unit –I

1.	**Introduction to data structure**		**LecturersRequired**	**Ref.No.**
	a)	Concepts of data and algorithm	02	1
	b)	Time and space Complexity of an algorithm	01	1

References:

Sr. No.	**NameoftheBook**	**Author**	**Publication**
1.	Fundamentals of computer algorithm	Elis Horowitz, Sahani, Rajshekharan	Galgotia Publication, 2001, ISBN 81-7515-257-5

Unit –II

2.	**Divide and Conquer**		**LecturersRequired**	**Ref.No.**
	a)	General Method, Binary search	04	1
	b)	Merge sort, Quick sort,	04	1
	c)	Strassen's matrix multiplication algorithm	04	1

References:

Sr. No.	**NameoftheBook**	**Author**	**Publication**
1.	Fundamentals of computer algorithm	Elis Horowitz, Sahani, Rajshekharan	Galgotia Publication, 2001, ISBN 81-7515-257-5

Unit –III

3.	**The Greedy method**		**LecturersRequired**	**Ref.No.**
	a)	The general method	02	1
	b)	Knapsack problem	02	1
	c)	Optimal storage on tapes	02	1
	d)	Job sequencing with deadlines	02	1
	e)	Optimal merge pattern	02	1
	f)	Minimum spanning tree, Shortest path	02	1

References:

Sr. No.	**NameoftheBook**	**Author**	**Publication**
1.	Fundamentals of computer algorithm	Elis Horowitz, Sahani, Rajshekharan	Galgotia Publication, 2001, ISBN 81-7515-257-5

Unit –IV

4.	Dynamic Programming		LecturersRequired	Ref.No.
	a)	The general method	02	1
	b)	Multistage graphs	02	1
	c)	Optimal binary search tree	02	1
	d)	Reliability Design	02	1
	e)	Travelling sales person problem	02	1

References:

Sr. No.	NameoftheBook	Author	Publication
1.	Fundamentals of computer algorithm	Elis Horowitz, Sahani, Rajshekharan	Galgotia Publication, 2001, ISBN 81-7515-257-5

Unit –V

5.	Basic search and traversal techniques		LecturersRequired	Ref.No.
	a)	Binary tree traversal	02	1
	b)	Breadth first search(BFS),	02	1
	c)	Depth first search(DFS)	02	1
	d)	Bi-connected components and DFS	02	1

References:

Sr. No.	NameoftheBook	Author	Publication
1.	Fundamentals of computer algorithm	Elis Horowitz, Sahani, Rajshekharan	Galgotia Publication, 2001, ISBN 81-7515-257-5

Unit –VI

5.	Basic search and traversal techniques		LecturersRequired	Ref.No.
	a)	The general method	02	1
	b)	The 8-Queens problem, Sum of subsets	02	1
	c)	Graph coloring, Hamiltonian cycle	02	1
	d)	Knapsack problem	02	1

References:

Sr. No.	NameoftheBook	Author	Publication
1.	Fundamentals of computer algorithm	Elis Horowitz, Sahani, Rajshekharan	Galgotia Publication, 2001, ISBN 81-7515-257-5

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Computer Graphics**
SubjectCode	**S4.5(Disciplin Specific Elective)**

UNIT I

1	**Introduction to computer graphics**		Lectures Required	Ref no
	a	Introduction	01	01
	b	Advantages of CG	01	01
	c	Applications of CG	01	01,02
	d	Display Devices	01	01
	e	Cathode ray tubes	02	01,02
	f	Color CRT monitors	01	01,02
	g	Direct View Storage Tube	01	01

References :

Sr.No.	Name of the book	Author	Publication
1	Principles of interactive computer graphics	William Newman & Robert Sproull	THM
2	Procedural elements for computer graphics	david f. Rogers	THM

UNIT II

2	**Raster Scan graphics & Transformation**		Lecturers Required	Ref no
	a	Line drawing algorithm	01	01,02
	b	Digital Differential Analyzers	02	01,02
	c	Bresenham`s Line algorithms	02	01,02

References :

Sr.No.	Name of the book	Author	Publication
1	Principles of interactive computer graphics	William Newman & Robert Sproull	THM
2	procedural elements for computer graphics	david f. Rogers	THM

UNIT III

3	**Transformation**		Lecturers Required	Ref no
	d	Two dimensional transformation	01	01,02
	e	Matrix representation	01	01,02
	f	Translation	01	01,02
	g	Rotation	01	01,02
	h	Scaling	01	01,02
	i	Reflection	01	01,02
	j	Shearing	01	01,02

References :

Sr.No.	Name of the book	Author	Publication
1	Principles of interactive computer graphics	William Newman & Robert Sproull	THM
2	procedural elements for computer graphics	david f. Rogers	THM

UNIT IV

4	**Segmented Display Files**		Lecturer Required	Ref no
	a	Segment table	01	01,02
	b	Functions for segmenting display file	01	01,02
	c	Posting &unposting segments	01	01,02

	d	Segment naming scheme	01	01,02
	e	Default error conditions	01	01,02
	f	Appending to segments	01	01,02

References :

Sr.No.	Name of the book	Author	Publication
1	Principles of interactive computer graphics	William Newman & Robert Sproull	THM
2	Computer graphics	-A.P.Gogse	

UNIT V

5	**Clipping window & display file Compilation**		Lecturer Required	Ref no
	b	2-D clipping	01	01,02
	c	Simple visibility algorithm	02	01,02
	d	End point codes	01	01,02
	e	Midpoint subdivision algorithm	01	01,02
	h	Display File Compiler	01	01,02
	i	Refresh concurrent with reconstruction	01	01,02
	j	Free storage allocation	01	01,02
	k	Display file structure	01	01,02

References :

Sr.No.	Name of the book	Author	Publication
1	Principles of interactive computer graphics	William Newman & Robert Sproull	THM
2	Computer graphics	-A.P.Gogse	

UNIT VI

6	**Geometrics Model & Graphics package**		Lecturer Required	Ref no
	b	Geometric modeling	01	01,02
	c	Symbols & instances	02	01,02
	d	Implementation of Instance transformation	02	01,02
	e	Ground rules for graphics s/w design	01	01,02
	f	Function domains	02	01,02
	g	Graphics primitives	02	01,02

References :

Sr.No.	Name of the book	Author	Publication
1	Principles of interactive computer graphics	William Newman & Robert Sproull	THM
2	procedural elements for computer graphics	david f. Rogers	THM

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Micro Processor Interface**
SubjectCode	**S4.5(Disciplin Specific Elective)**

Unit – I

1.	Introduction to Microprocessor		**Lecturers Required**	**Ref. No.**
	a)	Introduction to 8085 Microprocessor	01	1,2
	b)	Features of 8085 Microprocessor	01	1,2

	c)	Timing diagrams-Memory read, memory write, I/O read and I/O write Cycles	03	1,2

References:

Sr. No.	Name of the Book	Author	Publication
1.	Fundamentals of Microprocessors	B.Ram	BPB Publication
2.	Microprocessor architecture, Programming and applications with 8085	Ramesh S Gaonkar	
3.	The 8051 Microcontroller	Kenneth Ayala	West publishing company.

Unit-2

2.	Basic interfacing concepts		Lecturers Required	Ref. No.
	a)	What is Subroutine?	01	1,2
	b)	Stack concept	01	1,2
	c)	Interrupt Signals in 8085 Microprocessor	02	1,2
	d)	Direct Memory Access	02	1,2

References:

Sr. No.	Name of the Book	Author	Publication
1.	Fundamentals of Microprocessors	B.Ram	BPB Publication
2.	Microprocessor architecture, Programming and applications with 8085	Ramesh S Gaonkar	
3.	The 8051 Microcontroller	Kenneth Ayala	West publishing company.

Unit – III

3.	Microcontroller		Lecturers Required	Ref. No.
	a)	Introduction to Microcontroller 8051	01	3
	b)	Architecture of 8051 microcontroller	02	3
	c)	Addressing modes of 8051 microcontroller	02	3
	d)	Applications of microcontroller	01	3

References:

Sr. No.	Name of the Book	Author	Publication
1.	Fundamentals of Microprocessors	B.Ram	BPB Publication
2.	Microprocessor architecture, Programming and applications with 8085	Ramesh S Gaonkar	
3.	The 8051 Microcontroller	Kenneth Ayala	West publishing company.

Unit-4

4	8086 Microprocessor	Lecturers Required	Ref. No.
a)	Introduction and Block Diagram of 8086	03	1
b)	Features	01	1
c)	Registers	02	1
d)	Addressing modes	2	1

Unit-5

4	Instruction set and Programing 8086 Microprocessor	Lecturers Required	Ref. No.
a)	Instruction set	05	1
b)	Assembly Language Programing	05	1

Unit-6

6.	**Interfacing Devices**		**Lecturers Required**	**Ref. No.**
	a)	Keyboard	01	3
	e)	Analog -to -Digital converter	01	3
	f)	Digital-to-Analog converter	01	3
	g)	Sensors-Gas and Smoke sensors	01	3

References:

Sr. No.	**Name of the Book**	**Author**	**Publication**
1.	Fundamentals of Microprocessors	B.Ram	BPB Publication
2.	Microprocessor architecture, Programming and applications with 8085	Ramesh S Gaonkar	
3.	The 8051 Microcontroller	Kenneth Ayala	West publishing company.

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Scilab- 2**
SubjectCode	**S4.6(Skill Enhancement Course)**

Sr. No	**Topic Name**	**Lecturers Required**	**Ref. No.**
1.	Introduction	2	1
2	Scilab Environment	1	1
3	The Workspace and Working Directory	1	1
4	Creating Matrices and Some Simple Matrix Operations	2	1
5	Sub-matrices	1	1
6	Statistics	1	1
7	Working with Polynomials	1	1
8	Plotting Graphs	2	1
9	Scilab Programming Language	1	1
10	Script Files and Function Files	2	1
11	Functions in Scilab	1	1
12	File Operations	1	1
13	Polynomial Curve Fitting	2	1
14	Reading Microsoft Excel Files	1	1
15	Some Miscellaneous Command	1	1

Reference :1. www.scilab.org

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**E- Commerce**
SubjectCode	**S4.6(Skill Enhancement Course)**

Sr. No	Topic Name	Lecturers Required	Ref. No.
1.	Study of Business to Consumer E-commerce	1	
	1.1 Purchase one product from online shopping website. Example: Amazon, flipkart.		1
2.	Study of Consumer to Consumer E-commerce	1	1
	2.1 Purchase one product from another consumer.		1
3	Study of Consumer to Business E-commerce	1	1
	3.1 IN this practical give the ratings and comments regarding the products after purchasing the product.		1
4	Study of hoe to create our own online shopping website using HTML language.	1	1
	4.1 Create 4-5 html pages and link all the pages using “href” tag.		1
5	Study of Online Transaction.	1	1
	5.1 Make a payment of product using Online Transaction		1

Reference :1. E-commerce(The cutting edge of Business) by Kamlesh K. Bajaj and Debjani Nag .

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Computer Network Installation**
SubjectCode	**S4.6(Skill Enhancement Course)**

Sr. No.	**Title of Programmed**	**Required Hours**
1)	Study of Transmission Medias – Twisted Pair Cable, Co-ax Cable, Fiber-optic Cable.	1 hours
2)	Study of Color code and Crimping CAT-5 Straight Cable	1 hours
3)	Study of Crimping CAT-5 Cross over Cable	1 hours
4)	Study of Networking Devices and Connected PC with – a) Hub b) Switch c) Router	2 hours
5)	Study of IP addresses- IPV4, IPV6.	2 hours
6)	Study of assigning IPV4 and IPV6 addresses to computer system	1 hour
	To Run All Types of Network Troubleshooting Command a) Ipconfig b) Ping c) Pathping d) Tracert e) Arp f) getmac	3 Hours

7)	Study of Windows Firewall and Windows Defender	1 hour
8)	Troubleshoot to find connectivity problem	1 hour
9)	Performing another computer using Remote Desktop	1 hour
10)	Performing another computer using Team Viewer/Ammy Admin	1 hour
11)	Installing any Local Printer	1 hour
12)	To share a printer	1 hour
13)	To share a Folder/Map a Drive	1 hour

References:

Sr. No.	Name of the book	Author	Publication
1.	COMP INSTALL AND SERVICING ISBN 1259082466, 9781259082467	BALASUBRAMANIAN D	Tata McGraw Hill Edition
2.	https://en.wikibooks.org/wiki/How_To_Assemble_A_Desktop_PC/Software	Wikibooks	Website Link

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**RDBMS Practical**
SubjectCode	**S4.Lab-1**

Sr. No.	Title of Programme	Required Hours
1)	What is SQL? Types of SQL Commands	3 hours
2)	Study of Datatypes in ORACLE	3 hours
3)	Creating Tables & Retrieving , Manipulating Data from tables	3 hours
4)	Study of Altering Tables IN ORACLE	3 hours
5)	Study of Data Constraints in ORACLE	3 hours
6)	Study of Operators	3 hours
7)	Study of SQL Functions	3 hours
8)	Study of Views in ORACLE	3 hours
9)	Study of Joining Tables in ORACLE	3 hours
10)	Study of Subqueries in ORACLE	3 hours
11)	Study of in PL/SQL Blocks in ORACLE	3 hours
12)	Study of in Triggers in ORACLE	3 hours
13)	Study of in Cursors in ORACLE	3 hours

References:

1)	"Oracle Database 10g PL/SQL Programming" by Scott Urman , Ron Hardman, MichaleMc Laughlin, Oracle Press, TMH, ISBN-0-07-059779-0.
2)	"Oracle Database 10g The Complete Reference" By Kevin Loney, Bob Bryla Oracle Press (TATA McGraw Hill Edition) ISBN-13:978-0-07-059425-8, ISBN-10: 0-07-059425-2
3)	SQL, PL/SQL the programming language of ORACLE 4th Edition by Ivan Bayross ISBN-81-7656964-X

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Java Programing Practical**
SubjectCode	**S4.Lab-2**

PRACTICAL List:

1	Program to demonstrate Constant Variable.
2	Program to demonstrate scope of Variable
3	Program to demonstrate branching statement
4	Program to demonstrate Looping statement
5	Program to demonstrate simple class
6	Program to demonstrate method parameter
7	Program to demonstrate method overloading
8	Program to demonstrate constructor
9	Program to demonstrate static member
10	Program to demonstrate Method overriding
11	Program to demonstrate Final variable, Method and Final Class.
12	Program to demonstrate Finilize method()
13	Program to demonstrate Array and It's types.
14	Program to demonstrate String class and it's method.
15	Program to demonstrate String Buffer and it's method.
16	Program to demonstrate inheritance and its Types
17	Program to demonstrate Abstract method and Abstract Class.
18	Program to demonstrate Multiple catch statement
19	Program to demonstrate finally clause
20	Program to demonstrate package
21	Program to demonstrate interface
22	Program to demonstrate Applet life cycle
23	Program to demonstrate param tag
24	Program to demonstrate Graphics class

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Elective Practical**
SubjectCode	**S4.Lab-3 (Computer Algorithm)**

1	Program to demonstrate working of Merge Sort.
2	Program to demonstrate working of Quick Sort.
3	Program to demonstrate working of Binary Search.
4	Program to demonstrate working of graph coloring problem.
5	Program to demonstrate working of travelling sales person problem.
6	Program to demonstrate working of Single source shortest path.
7	Program to demonstrate working BFS.
8	Program to demonstrate working of DFS
9	Use C/C++/Java/Prolog/LISP to implement programs

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Elective Practical**
SubjectCode	**S4.Lab-3 (Computer Graphics)**

1.	Study of Graphics Library Function in C
2.	Program to draw a line, circle, rectangle etc.
3.	Program to draw multiple shapes using loops.
4.	Program to implements DDA algorithm.
5.	Program to implements Bresenhams, Algorithms.
6.	Program to implements Integer Bresenhams Algorithms.
7.	Program to implements General Bresenhams Algorithms.
8.	Program to implements Simple Visibility mode.
9.	Program to implements Mid-Point sub division algorithm.
10.	Program to implements Translation Transformation.
11.	Program to implements Rotation Transformation
12.	Program to implements Scaling Transformation
13.	Program to implements Shearing Transformation
14.	Program to implements Reflection Transformation
15.	Program for demonstration of setfillstyle and floodfill functions.
16.	Program for demonstration of getimage and putimage function.
17.	Program for creating simple animations.
18.	Program for demonstration of setting font style, font name and size.

NameofCourse	**B.Sc. CS SY**
Semester	**IVSemester**
NameofSubject	**Elective Practical**
SubjectCode	**S4.Lab-3 (Micro Processor Interface)**

Sr.No.	Aim of practical
1.	Write an ALP to add two 8-bit numbers , whose sum is also 8-bit using 8086.
2.	Write an ALP to add two 8-bit numbers , whose sum is 16-bit using 8086..
3.	Write an ALP to add two 16-bit numbers , whose sum is also 16-bit using 8086..
4.	Write an ALP to add two 16-bit numbers , whose sum is more than 16-bits using 8086..
5.	Write an ALP to perform subtraction of two 8-bit numbers using 8086..
6.	Write an ALP to find 1’s complement of 8-bit number using 8086..
7.	Write an ALP to find 1’s complement of 16-bit number using 8086..
8.	Write an ALP to find 2’s complement of 8-bit number using 8086..
9.	Write an ALP to find 2’s complement of 16-bit number using 8086..
10.	Write an ALP to find larger number from array using 8086..
11	Interfacing with Keyboard
12	Interfacing with A to D Convertor
13	Interfacings with D to A convertor
14	Interfacing with sensors
15	Application of Micro Controller 8051