



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

Choice Based Credit System(CBCS Pattern)

Faculty of Computer Studies

**Syllabus of BCA SY**

Under-Graduate (UG) Programs

Semester	Subject Code	Course Name	Credit		Total Credits
			Internal	External	
Semester – III	S3.AEC.1	1. <b>Logical Reasoning</b>	1	3	4
	S3.CC.2	2. Object Oriented Programming using C++	1	3	4
	S3.CC.3	3. Data Structure	1	3	4
	S3.CC.4	4. System Analysis and Design	1	3	4
	S3.CC.5	5. <b>Elective</b> 1) Multimedia and Applications 2) Data Communications 3) E-Commerce Technologies	1	3	4
	S3.Lab 1	6. Lab Course – 1 (OOC)	-	2	2
	S3.Lab 2	7. Lab Course – 2 (Data Structure)	-	2	2
	S3.Lab 3	8. Lab Course – 3 (Elective)		2	2
	S3.SEC.1	9. 1. Office Automation 2. Web Development and PHP Programming 3. PC Installation.		2	2
		<b>TOTAL</b>			<b>28</b>
Semester – IV	S4. AEC.1	1) Numerical Aptitude	1	3	4
	S4.CC.2	2) Java Programming	1	3	4
	S4.CC.3	3) Relational Database Management System	1	3	4
	S5.CC.4	4) <b>Event Driven Programming</b>	1	3	4
	S5.CC.4	5) <b>Elective</b> 1) Computer Graphics. 2) Computer Architecture and Microprocessor 3) Operating System	1	3	4
	S4.Lab 1	6) Lab Course – 1 (Java Programming)	-	2	2
	S4.Lab 2	7) Lab Course – 2 (RDBMS)	-	2	2
	S4.Lab 3	8) Lab Course – 3 (Elective)		2	2
	S4.SEC-1	9) 1. Desktop Publishing -I 2. 3. XML Programming		2	2
		<b>TOTAL</b>			<b>28</b>

<b>Name of Course</b>	<b>BCA Second Year</b>
<b>Semester</b>	<b>III</b>
<b>Name of Subject</b>	<b>Logical Reasoning</b>
<b>Subject Code</b>	<b>S3.AEC.1</b>

### UNIT I

1	Series, Analogy and Classification		Lectures Required	Ref no
A	<b>Series:</b> Types of series, Alphabet series, Alpha numeric series, Examples on continues pattern series.		03	1
B	<b>Analogy:</b> Completing the Analogous Pair, Direct/Simple Analogy, Choosing the Analogous Pair, Double Analogy, Number analogy, Alphabet analogy, Correlation between letters/numbers.		02	1
C	<b>Classification:</b> 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	<b>Coding-Decoding:</b> Letter coding, Direct Letter Coding, Number/Symbol Coding.		03	1
B	<b>Substitution:</b> Concept of substitution, Problem solving by using substitution.		01	1
C	<b>Deciphering:</b> 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	<b>Syllogism:</b> Introduction of logic, Rules of syllogism, Two statement problem, Three statement problem	07	1
	B	<b>Data Sufficiency:</b> Problems of Data sufficiency based on all Chapters.	03	1

**References**

<b>Sr. No.</b>	<b>Name of the book</b>	<b>Author</b>	<b>Publication</b>
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	<b><a href="http://www.practiceaptitudetests.com">www.practiceaptitudetests.com</a></b>		
4	<b><a href="http://www.allindiaexams.in">www.allindiaexams.in</a></b>		

<b>Name of Course</b>	<b>BCA Second Year</b>
<b>Semester</b>	<b>III</b>
<b>Name of Subject</b>	<b>OBJECT ORIENTED CONCEPT USING C++</b>
<b>Subject Code</b>	<b>S3.CC.2</b>

### 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

<b>Name of Course</b>	<b>BCA Second Year</b>
<b>Semester</b>	<b>III Semester</b>
<b>Name of Subject</b>	<b>Data Structure</b>
<b>Subject Code</b>	S3.CC.3 (Core Course)

### UNIT I

<b>1</b>	<b>Introduction</b>	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 II

<b>2</b>	<b>Array, Records and Pointers</b>	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 Lipschutz	MCGRAW HILL
2	Data Structures Through 'C' Language	Samiram Chattopadhyay, Debabrata Ghosh, Dastidar, Matangini Chattopadhyay	BPB PUBLICATIONS

### UNIT III

<b>3</b>	<b>Linked List</b>	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 IV**

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 Lipchitz	MCGRAW HILL
2	DATA STRUCTURE USING C	M. TENENBAUM, YEDIDYAH LANGSAM,MOSHE J. AUGENSTEN	AARON PEARSON PRENTICE HALL

**UNIT V**

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 VI**

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. SORENSEN	TATA MCGRAW HILL

<b>NameofCourse</b>	<b>BCA Second Year</b>
<b>Semester</b>	<b>IIISemester</b>
<b>NameofSubject</b>	<b>System Analysis &amp; Design</b>
<b>SubjectCode</b>	S3.CC.4 (Core Course)

### UNIT – I

<b>1.</b>	<b>System Concept &amp; System Development Life Cycle</b>		<b>Lecturers Required</b>	<b>Ref. No.</b>
	a)	System Concept: Definition, Characteristics,	02	1, 2, 3, 4
	b)	Elements of system, Physical and abstract system,	02	1, 2, 3, 4
	c)	Open and closed system, man-made information systems.	02	1, 2, 3, 4
	d)	System Development Life Cycle: Various phases of system development,	03	1, 2, 3, 4
	e)	Considerations for system planning and control for system success.	02	1, 2, 3, 4
	f)	Role of system analyst	02	1, 2, 3, 4

#### References :

1)	Igor Hawryszkiewycz, “Introduction to System Analysis and Design”, 4th edition, Prentice-Hall.
2)	Jeffrey L. Whitten, and Lonnie D. Bentley, “Systems analysis and Design Methods”, 4th edition, Tata McGraw-Hill.
3)	Mark Lejk, and David Deeks, “An Introduction to System Analysis Techniques”, Prentice Hall.
4)	Don Yeates, Maura Shields and David Helmy, “System Analysis and Design”, Longman group limited, 1994.

### UNIT – II

<b>2.</b>	<b>System Planning</b>		<b>Lecturers Required</b>	<b>Ref. No.</b>
	a)	Basis for planning in system analysis: Dimensions of Planning.	03	1, 2, 3, 4
	b)	Initial Investigation: Determining user’s requirements and analysis,	03	1, 2, 3, 4
	c)	fact finding process and techniques.	03	1, 2, 3, 4

**References :**

1)	Igor Hawryszkiewycz, "Introduction to System Analysis and Design", 4th edition, Prentice-Hall.
2)	Jeffrey L. Whitten, and Lonnie D. Bentley, "Systems analysis and Design Methods", 4th edition, Tata McGraw-Hill.
3)	Mark Lejk, and David Deeks, "An Introduction to System Analysis Techniques", Prentice Hall.
4)	Don Yeates, Maura Shields and David Helmy, "System Analysis and Design", Longman group limited, 1994.

**UNIT – III**

<b>3.</b>	<b>Tools of structured Analysis</b>		<b>Lecturers Required</b>	<b>Ref. No.</b>
	a)	Data Flow diagram	01	1, 2, 3, 4
	b)	Data dictionary	01	1, 2, 3, 4
	c)	IPO charts	01	1, 2, 3, 4
	d)	HIPO charts	01	1, 2, 3, 4
	e)	Gantt charts	01	1, 2, 3, 4
	f)	Pseudo codes	01	1, 2, 3, 4
	g)	Flow charts,	01	1, 2, 3, 4
	h)	Decision tree,	01	1, 2, 3, 4
	i)	Decision tables.	01	1, 2, 3, 4

**References :**

1)	Igor Hawryszkiewycz, "Introduction to System Analysis and Design", 4th edition, Prentice-Hall.
2)	Jeffrey L. Whitten, and Lonnie D. Bentley, "Systems analysis and Design Methods", 4th edition, Tata McGraw-Hill.
3)	Mark Lejk, and David Deeks, "An Introduction to System Analysis Techniques", Prentice Hall.
4)	Don Yeates, Maura Shields and David Helmy, "System Analysis and Design", Longman group limited, 1994.

**UNIT – IV**

<b>4.</b>	<b>Feasibility study &amp; Cost-Benefit Analysis</b>		<b>Lecturers Required</b>	<b>Ref. No.</b>
	a)	Feasibility study: Technical	02	1, 2, 3, 4
	b)	Operational & Economic Feasibilities.	02	1, 2, 3, 4
	c)	Cost/Benefit Analysis introduction.	02	1, 2, 3, 4
	d)	Data analysis cost and benefit analysis of a system.	03	1, 2, 3, 4

**References:**

1)	Igor Hawryszkiewycz, "Introduction to System Analysis and Design", 4th edition, Prentice-Hall.
2)	Jeffrey L. Whitten, and Lonnie D. Bentley, "Systems analysis and Design Methods", 4th edition, Tata McGraw-Hill.
3)	Mark Lejk, and David Deeks, "An Introduction to System Analysis Techniques", Prentice Hall.
4)	Don Yeates, Maura Shields and David Helmy, "System Analysis and Design", Longman group limited, 1994.

**UNIT- V**

5.	Form and database design	Lecturers Required	Ref. No.
a)	Input/ Output and Form Design, File Organization and database design: Introduction to files and database	03	1, 2, 3, 4
b)	File structures and organization,	02	1, 2, 3, 4
c)	Objectives of database design,	02	1, 2, 3, 4
d)	Logical and physical view of data.	02	1, 2, 3, 4

**References:**

1)	Igor Hawryszkiewycz, "Introduction to System Analysis and Design", 4th edition, Prentice-Hall.
2)	Jeffrey L. Whitten, and Lonnie D. Bentley, "Systems analysis and Design Methods", 4th edition, Tata McGraw-Hill.
3)	Mark Lejk, and David Deeks, "An Introduction to System Analysis Techniques", Prentice Hall.
4)	Don Yeates, Maura Shields and David Helmy, "System Analysis and Design", Longman group limited, 1994.

**UNIT - VI**

6.	System implementation	Lecturers Required	Ref. No.
a)	System testing: Introduction,	01	1, 2, 3, 4
b)	objectives of testing,	01	1, 2, 3, 4
c)	test planning,	01	1, 2, 3, 4
d)	testing techniques.	02	1, 2, 3, 4
e)	Quality assurance: Goal of quality assurance,	02	1, 2, 3, 4
f)	levels of quality assurance,	02	1, 2, 3, 4
g)	System implementation and software maintenance: primary activities in maintenance,	02	1, 2, 3, 4
h)	Reducing maintenance costs.	02	1, 2, 3, 4

**References :**

1)	Igor Hawryskiewycz, "Introduction to System Analysis and Design", 4th edition, Prentice-Hall.
2)	Jeffrey L. Whitten, and Lonnie D. Bentley, "Systems analysis and Design Methods", 4th edition, Tata McGraw-Hill.
3)	Mark Lejk, and David Deeks, "An Introduction to System Analysis Techniques", Prentice Hall.
4)	Don Yeates, Maura Shields and David Helmy, "System Analysis and Design", Longman group limited, 1994.

<b>Name of Course</b>	<b>BCA Second Year</b>
<b>Semester</b>	<b>III</b>
<b>Name of Subject</b>	<b>Multimedia and Applications</b>
<b>Subject Code</b>	<b>S3.5 Elective (I)</b>

#### UNIT –I

<b>1.</b>	<b>Introduction</b>	<b>Lecturers Required</b>	<b>Ref. No.</b>
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:

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

#### UNIT –II

<b>2.</b>	<b>Data Compression</b>	<b>Lecturers Required</b>	<b>Ref. No.</b>
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:

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

### UNIT –III

3.	<b>Optical Storage Media &amp; Retrieval Technologies</b>	LecturersRequired	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.	<b>Sound / Audio</b>	LecturersRequired	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 KlaraNehrstedt	Pearson Education

### Unit –V

5.	<b>. Image And Graphics</b>	LecturersRequired	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.	<b>Video&amp; Animation</b>	LecturersRequired	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 KlaraNehrstedt	Pearson Education

NameofCourse	BCA Second Year
Semester	IIISemester
NameofSubject	Data Communication
SubjectCode	S3.5 Elective (II)

### UNIT –I

1.	Data Communication Concepts	Lecture rsRequi	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.	NameoftheBook	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	Lecturer sRequir	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	01	1,2

#### References:

Sr. No.	NameoftheBook	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.	<b>Transmission Media and Network Topology</b>		<b>Lecturers Required</b>	<b>Ref.No.</b>
	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.	NameoftheBook	Author	Publication
1.	Local Area Network	Gerd Keiser	Tata McGraw-Hill
2.	Computer Networks	Andrew S. Tanenbaum	Prentice Hall of India

### UNIT IV

4.	<b>Ethernet &amp; Circuit Switching and Packet Switching:</b>		<b>Lecturers Required</b>	<b>Ref.No.</b>
	a)	Switching Circuit Switching Packet Switching Message Switching	04	1,2
	b)	Ethernet  Overview of Ethernet	03	1,2
	c)	CSMA/CD	01	1,2

**References:**

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

### Unit V

	<b>Network Devices &amp; Protocol</b>		<b>Lecture rsRequi</b>	<b>Ref.No.</b>
	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:**

<b>Sr. No.</b>	<b>NameoftheBook</b>	<b>Author</b>	<b>Publication</b>
1.	Local Area Network	Gerd Keiser	Tata McGraw-Hill
2.	Computer Networks	Andrew S. Tanenbaum	Prentice Hall of India

### UNI

### T VI

<b>6.</b>	<b>Internet &amp; Other Technologies</b>		<b>Lecture rsRequi</b>	<b>Ref.No.</b>
	a)	Internet Internet & Intranet Internet Service Providers  E-Mail	04	1,2
	b)	ISDN, Token Ring FDDI	03	1,2

**References:**

<b>Sr. No.</b>	<b>NameoftheBook</b>	<b>Author</b>	<b>Publication</b>
1.	Local Area Network	Gerd Keiser	Tata McGraw-Hill
2.	Computer Networks	Andrew S. Tanenbaum	Prentice Hall of India

<b>Name of Course</b>	<b>BCA Second Year</b>
<b>Semester</b>	<b>III Semester</b>
<b>Name of Subject</b>	<b>Lab Course – 1 (OOC)</b>
<b>Subject code</b>	<b>S3.Lab1</b>

### List of Practical's

- 1) Simple C++ program
- 2) Program on data types
- 3) Program for looping and branching statement
- 4) Program for Reference variable
- 5) Program for function overloading
- 6) Program for friend function and inline function
- 7) Program for static data member and function
- 8) Program for operator overloading
- 9) Program for Inheritance
- 10) Program for virtual function
- 11) Program for File handling
- 12) Program for Template classes
- 13) Program for File IO to read Entire File.
- 14) Program on Virtual Classes
- 15) Program on Template Function

<b>Name of Course</b>	<b>BCA Second Year</b>
<b>Semester</b>	<b>III Semester</b>
<b>Name of Subject</b>	<b>Lab Course – 2 (Data Structure)</b>
<b>Subject code</b>	<b>S3.Lab2</b>

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

## References

1	Data structures through C language	samiranchattopadhyay DebabrataGhoshDastidar matanginiChattopadhyay	BPB publication s
2	Data Structures Using C & C++	YedidyahLangsam Moshe j.Augenstein Aaron M. Tenanbaum	PHI Learning
3	Data Structures, algorithms and applications In C++	SartajSahni	MC Graw-Hill

NameofCourse	BCA Second Year
Semester	IIISemester
NameofSubject	Office Automation
SubjectCode	S3.SEC1(1)

### **S3.SEC.1 (1) Office Automation**

#### 1. MS-Word

Opening screen of MS-Word 10, Formatting using different tools (font, paragraph, borders and shading, page setup, find and replace), working with tables, custom dictionary, mail-merge

#### 2) MS-Excel

Opening screen of MS – Excel, working with formulas and functions, creating and formatting charts.

#### 3) MS-PowerPoint

Opening screen of MS-PowerPoint, designing and applying animation effects.

#### 4) MS-Access.

Creating tables in MS-Access, applying query, database connectivity

### **LIST FOR PRACTICALS**

1. Study opening screen of MS-Word (title bar, menu-bar, tool box, status bar, standard tool bar, task bar)
2. Study of Font tool box.
3. Study of paragraph dialog box.
4. Study of basic Editing tools (cut, copy, paste, undo, redo).
5. Study of page setup (how to take the printouts).
6. Study of find and replace dialog box.
7. Study of creating custom dictionary.
8. Study of border and shading dialog box.
9. Study of Working with different styles in MS-Word.
10. Study of Working with tables.
11. Study of creating time table by the help of tables.
12. Study of Opening screen of MS-Excel.
13. Study of Data validation in MS-Excel.
14. Study of data sorting and data filtering in MS-Excel.
15. Study of goal seek and scenario manager in MS-Excel.
16. Working with formulas in MS-Excel (how to build formula, difference between function and formulas).
17. Study of different basic functions MS-Excel.
18. Study of string Functions.
19. Study of logical functions.



20. Creating mark sheet by using different functions.
21. Study of mathematical functions.
22. Study with financial functions
23. Study with date and time functions.
24. Creating charts in MS-Excel.
25. Study of exploring charts in MS-Excel.
26. Study of opening screen of MS-PowerPoint.
27. Study of design and animation effects in MS-PowerPoint
28. Study of making PowerPoint presentation (with different effects).
29. Study of opening screen of MS-Access.
30. Study of creating tables in MS-Access.
31. Study of applying query in MS-Access.
32. Study of database connectivity in MS-Access.

**References:-**

<b>Sr. No.</b>	<b>Name of the Book</b>	<b>Author</b>	<b>Publication</b>
1.	Microsoft office 2000	Complete	BPB Publication
2.	Mastering Word 2000	Mansfield	BPB Publication
3.	Essential MS-Word 2000	M-Marmel	BPB Publication
4.	MS-Access	VarshaVarmaShekhar	-
5.	Teach Yourself MS-Excel 2000 In 24 Hours	-	BPB Publication.

NameofCourse	BCA Second Year
Semester	IIISemester
NameofSubject	Web Development and PHP Programming
SubjectCode	S3.SEC1 (2)

### **S3.SEC.1 (2)Web Development and PHP Programming**

#### **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**

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.

NameofCourse	BCA Second Year
Semester	IIISemester
NameofSubject	PC Installation
SubjectCode	S3.SEC.1 (3)

### S3.SEC.1 (3)(PC Installation)

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:**

<b>Sr. No.</b>	<b>Name of the book</b>	<b>Author</b>	<b>Publication</b>
1.	COMP INSTALL AND SERVICING ISBN 1259082466, 9781259082467	BALASUBRAMANIAN D	Tata McGraw Hill Edition
2.	PC Installation and LAN Setup	J.C.Shaikh	J S Publication
3.	<a href="https://en.wikibooks.org/wiki/How_To_Assemble_A_Desktop_PC/Software">https://en.wikibooks.org/wiki/How_To_Assemble_A_Desktop_PC/Software</a>	Wikibooks	Website Link

NameofCourse	BCA Second Year
Semester	IVSemester
NameofSubject	Numerical Aptitude
SubjectCode	S4.AEC.1

### UNIT I

1.	<b>Introduction of Number system</b>	Lectures Required	Ref. No.
	a) <b>Numbers:</b> Types of numbers	02	1,2
	b) Divisibility tests of numbers	02	1,2
	c) arithmetic progression	01	1,2
	d) Geometric progression	02	1,2
	e) Relationship between Arithmetic progression and Geometric progression	01	1,2
	f) <b>HCF and LCM</b> : Methods of calculating highest common factor and greatest common divisor	01	1,2
	g) factorization method, Division method, Finding HCF and LCM more than two numbers	01	1,2
	h) LCM and HCF of fractions and decimal numbers, Applications of LCM and HCF.	01	1,2

Sr.No	Name of Book	Author	Publication
1.	1) Quantitative Aptitude by Dr.R.SAggrawal , S. Chand and Company Publications	Dr.R.SAggrawal , S. Chand	Company Publication
2.	Quantitative Aptitude	AbijitGuha	Tata McGraw Hill Publications
3.	Objective Arithmetic	S.L Gulati	Cosmos book hive Pvt,5 <sup>th</sup> edition2015

## UNIT II

2.	<b>Average, Problem on ages, Percentage, and Profit and Loss</b>		Lectures Required	Ref. No.
	a)	<b>Average:</b> Definition of average, Formulae and theoretical problem on average.	02	1,2
	b)	<b>Problem on ages:</b> simultaneous equations and their applications	02	1,2
	c)	Theoretical problems on ages, Theoretical problems on numbers.	01	1,2
	d)	<b>Percentage:</b> Concept of percentage, Application of percentage, Results on populations, Result on depreciations, Theoretical problem on percentage.	02	1,2
	e)	<b>Profit and Loss:</b> Definition of cost price, selling price and profit, Formulae of profit and loss, Theoretical problems on profit and loss.	01	1,2

Sr.No	Name of Book	Author	Publication
1.	1) Quantitative Aptitude by Dr.R.SAggrawal , S. Chand and Company Publications	Dr.R.SAggrawal , S. Chand	Company Publication
2.	Quantitative Aptitude	AbijitGuha	Tata McGraw Hill Publications
3.	Objective Arithmetic	S.L Gulati	Cosmos book hive Pvt,5 <sup>th</sup> edition2015

## UNIT III

3.	<b>Percentage,</b>		Lectures Required	Ref. No.
	a)	<b>Percentage:</b> Concept of percentage, Application of percentage, Results on populations,	02	1,2
	b)	Result on depreciations, Theoretical problem on percentage.	02	1,2

Sr.No	Name of Book	Author	Publication
1.	1) Quantitative Aptitude by Dr.R.SAggrawal , S. Chand and Company Publications	Dr.R.SAggrawal , S. Chand	Company Publication
2.	Quantitative Aptitude	AbijitGuha	Tata McGraw Hill Publications
3.	Objective Arithmetic	S.L Gulati	Cosmos book hive Pvt,5 <sup>th</sup> edition2015

#### UNIT IV

4.	<b>Time and Work, Time and Distance and Problems on Train</b>		Lectures Required	Ref. No.
	a)	<b>Time and Work:</b> Concept of time and work, Relationship between time and work, Theoretical problems on time and work	02	1,2
	b)	<b>Time and Distance:</b> Concept of time and distance, Formulae of time and distance, Theoretical problems on time and distance.	02	1,2
	c)	<b>Problems on Train:</b> Formulae of problems on train, Theoretical problems on train.	01	1,2

Sr.No	Name of Book	Author	Publication
1.	1) Quantitative Aptitude by Dr.R.SAggrawal , S. Chand and Company Publications	Dr.R.SAggrawal , S. Chand	Company Publication
2.	Quantitative Aptitude	AbijitGuha	Tata McGraw Hill Publications
3.	Objective Arithmetic	S.L Gulati	Cosmos book hive Pvt,5 <sup>th</sup> edition2015

#### UNIT V

5.	<b>Boat and streams, Allegations and Mixtures, and Calendar</b>		Lectures Required	Ref. No.
	a)	<b>Boat and streams:</b> Concept of boat and streams, Formulae of boat and streams, Theoretical problems on boat and streams.	02	1,2
	b)	<b>Allegations and Mixtures:</b> Definition of allegation and mixtures, Rules of allegation's, Theoretical problems on mixture and allegation.	02	1,2
	c)	<b>Calendar:</b> Concept of odd days, Leap years and ordinary years, Problems on Calendar.	01	1,2



Sr.No	Name of Book	Author	Publication
1.	1) Quantitative Aptitude by Dr.R.SAggrawal , S. Chand and Company Publications	Dr.R.SAggrawal , S. Chand	Company Publication
2.	Quantitative Aptitude	AbijitGuha	Tata McGraw Hill Publications
3.	Objective Arithmetic	S.L Gulati	Cosmos book hive Pvt,5 <sup>th</sup> edition2015

### UNIT VI

6.	<b>Simple and Compound Interest, Probability, and Permutations and combinations</b>	Lectures Required	Ref. No.
a)	<b>Simple and Compound Interest:</b> 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.	02	1,2
b)	<b>Probability:</b> Definition of probability, Examples of performing a random experiment, Probability of occurrence of an event, Results on probability, Theoretical problems on probability.	02	1,2
c)	<b>Permutations and combinations:</b> Definition of permutations and combinations, Formulae of permutation and combinations, Relationship between permutation and combinations, Problems on permutations and combinations.	01	1,2

Sr.No	Name of Book	Author	Publication
1.	1) Quantitative Aptitude by Dr.R.SAggrawal , S. Chand and Company Publications	Dr.R.SAggrawal , S. Chand	Company Publication
2.	Quantitative Aptitude	AbijitGuha	Tata McGraw Hill Publications
3.	Objective Arithmetic	S.L Gulati	Cosmos book hive Pvt,5 <sup>th</sup> edition2015

<b>Name of Course</b>	BCA Second Year
<b>Semester</b>	IV Semester
<b>Name of Subject</b>	Java Programming
<b>Subject code</b>	S4.CC.2

### UNIT-I

<b>Sr. No.</b>	<b>Introduction</b>		<b>Lectures Required</b>	<b>Ref. No</b>
<b>1</b>	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

#### References:

<b>Sr. No</b>	<b>Name of Book</b>	<b>Writer</b>	<b>Publication</b>
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-II

<b>Sr. No.</b>	<b>Overview of Java Language</b>		<b>Lectures Required</b>	<b>Ref. No</b>
<b>2)</b>	2.1	Introduction, Types of Comment	1	1,2,3,4
	2.2	Java Tokens <ul style="list-style-type: none"> <li>- Reserve Keywords</li> <li>- Identifiers</li> <li>- Literals</li> <li>- Operators</li> <li>- Separators</li> </ul>	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 <ul style="list-style-type: none"> <li>- Branching statement</li> <li>- Looping statement</li> </ul>	3	1,4

**References:**

<b>Sr. No</b>	<b>Name of Book</b>	<b>Writer</b>	<b>Publication</b>
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**

<b>Sr. No.</b>	<b>Classes, Objects and Methods</b>		<b>Lectures Required</b>	<b>Ref. No</b>	
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	Finalizer 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

**References:**

<b>Sr. No</b>	<b>Name of Book</b>	<b>Writer</b>	<b>Publication</b>
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 <ul style="list-style-type: none"> <li>- Create Package</li> <li>- Accessing Package</li> </ul>	2	2,3,4
	4.4	Exception <ul style="list-style-type: none"> <li>- Types of Error</li> <li>- Multiple catch statement</li> <li>- Creating User defined Exception</li> <li>- Finally clause</li> </ul>	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 and Stream		Lectures Required	Ref. No
5)	5.1	Introduction	1	1,2,3,4
	5.2	String Classes	1	1,2,3,4
	5.3	StringBuffer Class	1	1,2,3,4
	5.4	Stream Classes <ul style="list-style-type: none"> <li>- Types of Streams</li> <li>- Byte Stream Classes</li> <li>- Character Stream Classes</li> </ul>	2	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-VI

<b>Sr. No.</b>	<b>Applet Programming</b>		<b>Lectures Required</b>	<b>Ref. No</b>
<b>6)</b>	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:

<b>Sr. No</b>	<b>Name of Book</b>	<b>Writer</b>	<b>Publication</b>
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

Name of Course	B.C.A SY
Semester	IV Semester
Name of Subject	Relational Database Management System
Subject Code	S4.CC.3

### 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 Galgotia Publication
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### Unit – II

2.	SQL Statements & Working With Tables	Lecturers Required	Ref. No.
	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, DISTINCT Clause, 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

3)	(TATA McGraw Hill Edition) ISBN-13:978-0-07-059425-8, ISBN-10: 0-07-059425-2 SQL, PL/SQL the programming language of ORACLE 4 <sup>th</sup> Edition by Ivan Bayross ISBN-81-7656964-X
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### 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 4 <sup>th</sup> Edition by Ivan Bayross ISBN-81-7656964-X

### Unit – IV

4.	Sorting & Grouping Data and Joining Tables & Subqueries in 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 Join: Left, Right, Full	04	1
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 4 <sup>th</sup> 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 4 <sup>th</sup> 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 4 <sup>th</sup> Edition by Ivan Bayross ISBN-81-7656964-X

NameofCourse	BCA SY
Semester	IVSemester
NameofSubject	Event Driven Programming
SubjectCode	S5.CC.4

### Unit –I

1.	Introduction to Event Driven Programming		Lectures Require	Ref.No.
	a)	What is Event	01	1,2
	b)	Event Handling in .Net Framework	02	1,2
	c)	Event Handler Arguments	02	1,2
	d)	Creating and Using Events	03	1,2

#### References:

Sr. No.	NameoftheBook	Author	Publication
1.	Professional VB.Net 2003	Bill Evjen, Bills Hollis	Wrox Publication
2.	Mastering Visual	EvangelosPatroutsos	BPB Publication

### Unit –II

2.	Visual Basic : Language		Lectures Require	Ref.No.
	a)	Variables and Data Types	03	1,2
	b)	Arrays	02	1,2
	c)	Flow Control Statements	03	1,2
	d)	Subroutines and Functions	02	

#### References:

Sr. No.	NameoftheBook	Author	Publication
1.	Mastering Visual Basic.Net	EvangelosPatroutsos	BPB Publication
2.	Visual Basic. Net	Billy Hollis, Rockford	Wrox Publication

### Unit- III

3.	Building Windows Application		Lectures Require	Ref.No.
	a)	Properties and Events of Form	02	1,2
	b)	Designing Menus	02	1,2
	c)	Building Dynamic Form	01	1,2
	d)	Windows Controls	04	
	e)	SDI and MDI Application		

**References:**

<b>Sr. No.</b>	<b>NameoftheBook</b>	<b>Author</b>	<b>Publication</b>
1.	Mastering Visual Basic.Net	EvangelosPatroutsos	BPB Publication
2.	Visual Basic.Net Programming Black Book	Steven Holzner	Dreamtech Press

**Unit- IV**

<b>4.</b>	<b>Building Custom Classes and Controls</b>	<b>Lectures Require</b>	<b>Ref.No.</b>
	a) Creating and Using Custom Class	02	1,2
	b) Inheritance	01	1,2
	c) Polymorphism	01	1,2
	d) Creating and Using Custom Control	02	

**References:**

<b>Sr. No.</b>	<b>NameoftheBook</b>	<b>Author</b>	<b>Publication</b>
1.	Mastering Visual Basic.Net	EvangelosPatroutsos	BPB Publication
2.	Visual Basic. Net	Billy Hollis, Rockford	Wrox Publication

**Unit V**

<b>5.</b>	<b>Working with String, DateTime and Error Handling</b>	<b>Lectures Require</b>	<b>Ref.No.</b>
	a) Char Class	01	1,2
	b) String Class	02	1,2
	c) DateTime Class	01	1,2
	d) Types of Errors	01	
	e) Structured Exception Handling	02	

**References:**

<b>Sr. No.</b>	<b>NameoftheBook</b>	<b>Author</b>	<b>Publication</b>
1.	Mastering Visual Basic.Net	EvangelosPatroutsos	BPB Publication
2.	Visual Basic.Net Programming Black Book	Steven Holzner	Dreamtech Press

## Unit VI

<b>6.</b>	<b>Database Connectivity Using ADO.Net</b>	<b>Lectures Require</b>	<b>Ref.No.</b>
	a) ADO.Net Architecture	02	1,2
	b) Characteristics of ADO.Net	01	1,2
	c) Data Set	01	
	d) Data Grid Control	01	
	e) Connected Mode Database Connection	03	
	f) Disconnected Mode Database Connection	03	

### References:

<b>Sr. No.</b>	<b>NameoftheBook</b>	<b>Author</b>	<b>Publication</b>
1.	Mastering Visual Basic.Net	EvangelosPatroutsos	BPB Publication
2.	Visual Basic.Net Programming Black Book	Steven Holzner	Dreamtech Press

Name of Course	BCA Second Year
Semester	IV Semester
Name of Subject	Computer Graphics
Subject Code	S4.CC.5 Elective (1)

### UNIT I

<b>1</b>	<b>Introduction to computer graphics</b>		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

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

<b>2</b>	<b>Raster Scan graphics &amp; Transformation</b>		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

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

<b>3</b>	<b>Transformation</b>		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

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

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

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

<b>6</b>	<b>Geometrics Model &amp; Graphics package</b>		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

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

Name of Course	B.Sc(SE)SY
Semester	IV Semester
Name of Subject	Computer Architecture and Microprocessor
Subject Code	S4.CC.5 Elective (II)

### Unit – I

1.	Introduction to Processor Design		Lectures Required	Ref. No.
	a)	Processor level components.	01	1
	b)	Processor organization	01	1
	c)	Information representation	01	1
	d)	Instruction types: Depending on address, operation and design complexity.	03	1
	e)	Vector concepts	02	1

#### References:

Sr. No.	Name of the Book	Author	Publication
1.	Computer Architecture and Organization	J.P. Hayes (MGH)	McGraw-Hill International editions

### Unit – II

2.	Control Unit and Memory Organization		Lectures Required	Ref. No.
	a)	Hardwired control unit	03	1
	b)	Microprogrammed control unit	01	1
	c)	Virtual Memory	02	1
	d)	Memory: Hierarchies, Allocation and Segmentation.	03	1
	e)	High speed Memories: Interleaved and Associative memory	02	1

#### References:

Sr. No.	Name of the book	Author	Publication
1.	Computer Architecture and Organization	J.P. Hayes (MGH)	McGraw-Hill International editions

### Unit – III

3.	8085 Microprocessor Architecture	Lectures Required	Ref. No.
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	a)	Features of 8085 microprocessor	01	1
	b)	Block diagram of 8085 microprocessor	03	1
	c)	Pin diagram of 8085 microprocessor	02	1
	d)	De-multiplexing of address and data bus	01	1
	e)	Instruction cycle: Fetch and Executive cycle	01	1

**References:**

Sr. No.	Name of the book	Author	Publication
1.	Microprocessor 8085	B.RAM	DhanpatRai publications

**Unit – IV**

4.	Addressing modes of 8085 Microprocessor		Lecturers Required	Ref. No.
	a)	Register addressing mode	01	1
	b)	Direct addressing mode	01	1
	c)	Register indirect addressing mode	01	1
	d)	Immediate addressing mode	01	1
	e)	Implicit/Implied addressing mode	01	1

**References:**

Sr. No.	Name of the book	Author	Publication
1.	Microprocessor 8085	B.Ram	DhanpatRai publications

**Unit – V**

5.	Instruction set of Intel 8085 Microprocessor		Lecturers Required	Ref. No.
	a)	Data Transfer group of instructions	02	1
	b)	Arithmetic group of instructions	02	1
	c)	Logical group of instructions	02	1
	d)	Branch group of instructions	02	1
	e)	I/o and machine control group of instructions	02	1

**References:**

Sr. No.	Name of the book	Author	Publication
1.	Microprocessor 8085	B.Ram	DhanpatRai publications

**Unit – VI**

6.	Assembly Language Programming of 8085 Microprocessor		Lecturers Required	Ref. No.
	Assembly language programming		06	1

**References:**

<b>Sr. No.</b>	<b>Name of the book</b>	<b>Author</b>	<b>Publication</b>
1.	Microprocessor 8085	B.Ram	DhanpatRai publications

NameofCourse	BCA Second Year
Semester	IVSemester
NameofSubject	Operating System
SubjectCode	S4.CC.5 Elective (III)

### Unit –I

1.	Introduction	Lecturer sRequire	Ref.No.
	a) What Operating System Do – 1) User View 2) System View 3) Defining OS	1	1
	b) Computer System Organization	2	1
	c) Computer System Architecture – 1) Single Processor System 2) Multiprocessor System	2	1
	d) Extended Machine Concept	1	2
	e) Operating System Structure	1	1
	f) An Operating System Resource Manager	2	2

### References:

Sr. No.	NameoftheBook	Author	Publication
1	Operating System Concepts	Abraham Silberschatz, Peter Galvin, Greg Gagne	WILEY India Edition 8 <sup>th</sup> Edition
2	Operating Systems	Stuart E. Madnick, John J. Donovan	Tata McGraw-Hill Publishing Limited

### Unit –II

2.	System Structure	Lecturer sRequire	Ref.No.
	a) Operating System Services	1	1
	b) User Operating System Interface – 1) Command Interpreter 2) GUI	1	1, 2
	c) System Boot	1	1, 2
	d) System Calls	1	1, 2

	e)	Types of System Calls – 1) Process Control 2) File Management 3) Device Management 4) Information Maintenance 5) Communication 6) Protection	3	1
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**References:**

Sr.No.	NameoftheBook	Author	Publication
1	Operating System Concepts	Abraham Silberschatz, Peter Galvin, Greg Gagne	WILEY India Edition 8 <sup>th</sup> Edition
2	Operating Systems	AchyutGodbole, AtulKahate	McGraw Hill Education Third Edition

**Unit –III**

3.	Process Management	LecturersRequire	Ref.No.
a)	Process Concept – 1) The Process 2) Process States 3) Process Control Block	3	1, 2
b)	Process Scheduling – 1) Scheduling Queues 2) Schedulers 3) Context Switching	3	1, 2
c)	Scheduling Criteria	1	1
d)	Scheduling Algorithms – 1) FCFS 2) SJF 3) Priority Scheduling 4) Round-Robin Scheduling	4	1

**References:**

Sr.No.	NameoftheBook	Author	Publication
1	Operating System Concepts	Abraham Silberschatz, Peter Galvin, Greg Gagne	WILEY India Edition 8 <sup>th</sup> Edition
2	Operating Systems	AchyutGodbole, AtulKahate	McGraw Hill Education Third Edition

## Unit –IV

<b>4.</b>	<b>Multithreaded Programming</b>	<b>Lecturer sRequire</b>	<b>Ref.No.</b>
	a) Overview	1	1, 2
	b) Multithreading Models	2	1, 2
	c) Thread Libraries – pthreads	1	1

### References:

<b>Sr.No.</b>	<b>NameoftheBook</b>	<b>Author</b>	<b>Publication</b>
1	Operating System Concepts	Abraham Silberschatz, Peter Galvin, Greg Gagne	WILEY India Edition 8 <sup>th</sup> Edition
2	Operating Systems	AchyutGodbole, AtulKahate	McGraw Hill Education Third Edition

## Unit – V

<b>5.</b>	<b>Memory Management</b>	<b>Lecturer sRequire</b>	<b>Ref.No.</b>
	a) Introduction	1	2
	b) Contiguous Memory Allocation 1) Memory Allocation 2) Fragmentation	2	1
	c) Paging 1) Basic Method 2) Hardware Support	2	1
	d) Segmentation 1) Basic Method 2) Hardware Support	3	1

### References:

<b>Sr. No.</b>	<b>NameoftheBook</b>	<b>Author</b>	<b>Publication</b>
1	Operating System Concepts	Abraham Silberschatz, Peter Galvin, Greg Gagne	WILEY India Edition 8 <sup>th</sup> Edition
2	Operating Systems	AchyutGodbole, AtulKahate	McGraw Hill Education Third Edition

## Unit –VI

6.	File System	Lecturer sRequire	Ref.No.
	a) File concept	1	1
	b) Access Methods 1) Sequential 2) Direct	2	1
	c) Directory and Disk Structure 1) Directory Overview 2) Single Level Directory 3) Two Level Directory 4) Tree Structure Directory	3	1
	d) Allocation Methods 1) Contiguous Allocation 2) Linked Allocation 3) Indexed allocation	3	1
	e) Free Space Management 1) Bit Vector 2) Linked List 3) Grouping 4) Counting	2	1

### Reference:

Sr.No.	NameoftheBook	Author	Publication
1	Operating System Concepts	Abraham Silberschatz, Peter Galvin, Greg Gagne	WILEY India Edition 8 <sup>th</sup> Edition

<b>Name of Course</b>	BCA Second Year
<b>Semester</b>	IV Semester
<b>Name of Subject</b>	Lab Course – 1 (Java Programming)
<b>Subject code</b>	S4.Lab1

**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

Name of Course	B.C.A SY
Semester	IV Semester
Name of Subject	Lab Course – 2 (RDBMS)
Subject Code	<b>S4.Lab 2</b>

<b>Sr. No.</b>	<b>Title of Programme</b>	<b>Required Hours</b>
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 4 <sup>th</sup> Edition by Ivan Bayross ISBN-81-7656964-X



