### **DEPARTMENT OF INFORMATION TECHNOLOGY**

### VISION

• To become a front-runner in preparing graduates to be efficient problem solvers, researchers, innovators and entrepreneurs, and making them competent professionals by enabling them to take up any kind of challenges in Information Technology industry or any organizations they serve.

### MISSION

- To uplift rural students of our region through advanced quality education in Information Technology.
- Offer high-quality Postgraduate programs in order to prepare our graduates to become leaders in their profession.
- To provide technical solutions in the field of Information Technology to the local society.
- To provide need-based quality training in the field of Information Technology.
- To maintain state-of-the-art facilities and laboratories where students and faculty can enhance their understanding of technology.
- To provide students with the tools to become productive, participating global citizens and life-long learners.
- To provide an atmosphere for students and faculty for continuous learning to investigate, apply and transfer knowledge.

### **PROGRAMME OUTCOMES**

After completion of the Programme, the students will be able to

- PO1 understand the fundamental concepts of Information Technology.
- PO2 gain knowledge on programming language to construct applications and packages to solve realworld problems using Information Technology concepts
- PO3 develop necessary skills to design digital system and acquire knowledge on computer hardware concepts and its functionality.
- PO4 enhance problem solving techniques, analytical and communication skills, team work and potential to develop software and network management.
- PO5 recognize the social and ethical responsibilities of a professional working in the discipline
- PO6 create, select, and apply appropriate techniques, resources, and modern computing and IT tools including prediction and modelling to complex scientific activities with an understanding of the limitations.
- PO7 life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### **PROGRAMME EDUCATIONAL OBJECTIVES**

The objectives of this Programme is to equip/prepare the students to

- PEO1 effectively communicating computing concepts and solutions to bridge the gap between computing industry experts and business leaders to create and initiate innovation
- PEO2 effectively utilizing their knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.
- PEO3 exhibiting their computing expertise within the computing community through corporate leadership, entrepreneurship, and/or advanced graduate study

### **PROGRAMME SPECIFIC OUTCOMES**

After completion of the Programme, the students will be able to

- PSO1 professionally skilled in the areas of programming, multimedia, web designing, and networking and to obtain knowledge in various domain-based electives.
- PSO2 accomplish the skill to design and develop computer programs, evaluate and recognize potential risks and provide innovative solutions.
- PSO3 explore technical knowledge in diverse areas of applications and experience an environment conducive in cultivating skills for successful career, entrepreneurship and higher studies. Effectively integrate IT-based solution into the user environment

### **GRADUATE ATTRIBUTES**

- 1) **Knowledge of the discipline**: Attribute describes the capability of demonstrating comprehensive and considered knowledge of a discipline.
- 2) **Creativity:** Creativity is a skill that underpins most activities, although this may be less obvious in some Disciplines. Students are required to apply imaginative and reflective thinking to their studies.
- 3) **Intellectual Rigour:** Intellectual Rigour is the commitment to excellence in all scholarly and intellectual activities, including critical judgement. The students are expected in having clarity in thinking.
- 14) **Problem Solving Skills:** Problem solving skills empower students not only within the context of their programme but also, in their personal and professional lives.
- 5) **Lifelong Learning:** The skill of being a lifelong learner means a graduate is open, curious, willing to investigate, and consider new knowledge and ways of thinking.
- 6) **Communication and Social Skill:** The ability to communicate clearly and to work well in a team setting is critical to sustained and successful employment.
- 7) **Self-Management:** Graduates must have capabilities for self-organisation, self-review, personal development and life-long learning.

## PROGRAMME STRUCTURE FOR B.Sc(IT) (For those admitted from in the academic year 2023-24 and onwards)

	Course			Contact	Evom		Marks		Cre dits
Category	Type	Course Code	Course Title	Hours	Exam Hours	CIA	ESE	Total Mark s	
Semester-1									
PART-I	Language	U23TA1L1	Tamil– I	6	3	25	75	100	3
PART-II	English	U23EN1L1	English – I	6	3	25	75	100	3
	Core-1	U23IT101	Programming in C	5	3	25	75	100	5
PART-III	Core-2 (Core Lab-1)	U23IT1P1	C Programming Lab	5	3	40	60	100	5
	Elective Generic -1(Allied)	U23IT1A1	Digital Logic Fundamentals	4	3	25	75	100	3
PART-IV	Skill Enhancement Course SEC1 (NME – 1)	U23IT1S1	Office Automation	2	-	50	-	50	2
	Foundation Course	U23ITFC1	Fundamentals of Computers	2	-	50	-	50	2
	TOTAL 30							600	23
			Somestor II						
PART-I	Language	U23TA2L2	Tamil– II	6	3	25	75	100	3
PART-II	English	U23EN2L2	English – II	6	3	25	75	100	3
	Core-3	U23IT202	JAVA Programming	5	3	25	75	100	5
	Core-4 (Core Lab-2)	U23IT2P2	JAVA Programming Lab	5	3	40	60	100	5
PART-III	Elective Generic-2 (Allied)	U23IT2A2	Data structures	4	3	25	75	100	3
	Comprehension - 1(Self Study Course- Online Exam)	U23IT2C1	Comprehension in Information Technology – I	-	1	-	50	50	1
PART-IV	Skill Enhancement Course SEC2 (NME – 2)	U23IT2S2	Basics of Internet	2	-	50	-	50	2
	Skill Enhancement Course SEC3 (DSC)	U23IT2SP	Introduction to Office Automation & HTML	2	2	-	50	50	2
		FOTAL		30				650	24

			Semester-III						
PART-I	Language	U23TA3L3	Tamil– III	6	3	25	75	100	3
PART-II	English	U23EN3L3	English – III	6	3	25	75	100	3
	Core-05	U23IT303	Relational Database Management System	5	3	25	75	100	5
PART-III	Core-06 (Core Lab 3)	U23IT3P3	RDBMS Lab	5	3	40	60	100	5
	Elective Generic -3 (Allied)	U23IT3A3	Discrete Mathematics	4	3	25	75	100	3
DADT IV	Skill Enhancement Course SEC4 (DSC)	U23IT3SP	Entrepreneurial Based- Web Designing Lab	2	-	50	-	50	2
FART-IV	Ability Enhancement Compulsory Course	U23AE301	Environmental Studies	2	-	50	-	50	2
	TOTAL			30				600	23
			Semester-IV						
PART-I	Language	U23TA4L4	Tamil– IV	6	3	25	75	100	3
PART-II	English	U23EN4L4	English– IV	6	3	25	75	100	3
	Core-07	U23IT404	.NET Programming	4	3	25	75	100	4
	Core-08 (Core Lab-4)	U23IT4P4	.NET Programming Lab	4	3	40	60	100	4
PART-III	Elective Generic - 4 (Allied)	U23IT4A4	IOT and its Applications	4	3	25	75	100	3
	Comprehensi on – II (Self Study Course - Online Exam)	U23IT4C2	Comprehension in Information Technol ogy – II	-	1	-	50	50	1
	Skill Enhancement Course SEC5 (DSC)	U23IT4S3	Quantitative Aptitude	2	2	-	50	50	2
PART-IV	Skill Enhancement Course SEC6 (DSC)	U23IT4SP	IOT Lab	2	2	-	50	50	2
	Ability Enhancement Compulsory Course	U23AE402	Yoga & Value Education	2	-	50	-	50	2
	Internship/ Industrial Training/Mini Project (Carried out during II year Summer Vacation)	U23IT5IT	Internship/Industrial Training/Mini Project	-	-	-	-	_	Co mpl etio n
	- /	TOTAL	1	30				700	24

			Semester-V						
	Core-09	U23IT505	PYTHON Programming	5	3	25	75	100	4
	Core-10	U23IT506	Operating Systems	5	3	25	75	100	4
	Core-11 (Core Lab- 5)	U23IT5P5	PYTHON Programming Lab	5	3	40	60	100	4
	Core Elective - 1	U23IT5EP1A	Big Data Analytics Lab						
PART-III		U23IT5EP1B	Computer Graphics Lab	4	3	40	60	100	3
	Con Elori o 2	U23IT5EP1C	React JS Lab				-	-	
	Core Elective -2	U23II 5E2A	Grid Computing	4	2	25	75	100	2
		U23IT5E2D	Cryptography	4	5	23	15	100	3
	Core-12	U23IT5E2C	Major Group						
	Major Project	025115101	Project with Viva Voce	5	3	40	60	100	5
	Skill	U23IT5SP	Multimedia Lab						
	Enhancement Course SEC7 (DSC)			2	2	-	50	50	2
PART-IV	Internship/ Industrial Training/Mini Project	U23IT5IT	Internship/ Industrial Training//Mini Project	-	-	40	60	100	2
	Proficiency	U23GS5SS	General Studies						
	Enhancement Course (Self- Study Course			-	-	-	-	Comp letion	2
	MOOC/Spoken Tu	torial (Self Study	Course - online)	-	-	-	-	Comp letion	2
	Т	OTAL		30				750	31
			Semester-VI						
	Core-13	U23IT607	Data Mining	6	3	25	75	100	4
	Core-14	U23IT608	Data Communication and Networking	6	3	25	75	100	4
	Core – 15 (Core Lab-6)	U23IT6P6	Data Mining Lab	6	3	40	60	100	4
	Core Elective -3	U23IT6EP3A	PHP Scripting Lab	5	3	40	60	100	3
PART-III		U23IT6EP3B	Image Processing Lab						
		U23IT6EP3C	Flutter Lab						
	Core Elective -4	U23IT6E4A	Trends in Computing	5	3	25	75	100	3
		U23IT6E4B	Natural Language Processing						
		U23IT6E4C	Robotics and its Applications						
	Comprehension – III (Self Study Course- Online	U23IT6C3	Comprehension in Information Technology – III	-		-	50	50	1

	Exam)									
PART-IV	Professional Competency Skill Enhancement (SEC8)	nal U23ITPC1 Human Comp ncy Interaction				2	-	50	50	2
	Extra Department Course Open Elective – (Self Study Course)	To be selected from offered by other	rom the courses departments	5	-	3	-	100	100	3
Part-V	Extension Activitie	s – YRC,NSS, Ph	ysical Education	on	-	-	-	-	Comp letion	1
	NCC*				-	-	-	-	-	-
	Tot	al		30				70	0	25
	Grand	Total		180						150

\*As per UGC norms, those students who opt NCC under extension activities will be studying the prescribed syllabi of the UGC which will include Theory, Practical & Camp components. Such students who qualify the prescribed requirements will earn an additional **24 credits**.

### Part-III B.Sc. IT / Semester – I / Core-1:

### **PROGRAMMING IN C (U23IT101)**

Lecture Hours	: 70	Tutorial Hours : 05
Practical Hours	:-	No. of Credits : 05
<b>Contact Hours per Semester</b>	:75	
<b>Contact hours per Week</b>	: 05	
Internal Marks	: 25	
External Marks	: 75	
Total Marks	: 100	

#### **Objectives of the Course**

The main objective of the Course is

• to provide students with understanding of code organization and functional hierarchical decomposition with using complex data types.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- CO1 outline the fundamental concepts of C programming languages, and its features
- **CO2** demonstrate the programming methodology.
- CO3 identify suitable programming constructs for problem solving.
- **CO4** select the appropriate data representation, control structures, functions and concepts based on the problem requirement.
- **CO5** evaluate the program performance by fixing the errors.

CO1 3 2 2 3 2 2   CO2 3 3 2 3 2 2   CO3 3 3 3 3 2 2   CO4 3 3 2 3 2 2   CO4 3 3 2 3 2 2   CO5 2 3 3 2 2 2   Co5 2 3 3 2 2 2   Total 0 14 14 12 14 10 10   and PSOs 93.3 93.3 80 93.3 66.6 66.6   Percentage 93.3 93.3 80 93.3 66.6 66.6	1		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO2 3 3 2 3 2 2   CO3 3 3 3 3 3 2 2   CO4 3 3 2 3 2 2   CO4 3 3 2 3 2 2   CO5 2 3 3 2 2 2   CO5 2 3 3 2 2 2   Total Contributi 14 14 12 14 10 10   and PSOs 93.3 93.3 80 93.3 66.6 66.6   Percentage 93.3 93.3 80 93.3 66.6 66.6   Ontributi 0 0 0 0 0 0 0		CO1	3	2	2	3	2	2	3	3	3	3
CO3 3 3 3 3 3 2 2   CO4 3 3 2 3 2 2 2   CO5 2 3 3 2 2 2 2   CO5 2 3 3 2 2 2 2   Total Contributi on of COs to POs and PSOs 14 14 12 14 10 10   Weighted of Course Contributi 93.3 93.3 80 93.3 66.6 66.6		CO2	3	3	2	3	2	2	3	2	3	2
CO4 3 3 2 3 2 2   CO5 2 3 3 2 2 2   Total Contributi on of COs to POs and PSOs 14 14 12 14 10 10   Weighted Percentage of Course Contributi 93.3 93.3 80 93.3 66.6 66.6		CO3	3	3	3	3	2	2	3	3	3	2
CO5 2 3 3 2 2 2   Total Contributi on of COs to POs and PSOs 14 14 12 14 10 10   Weighted Percentage of Course Contributi 93.3 93.3 80 93.3 66.6 66.6		CO4	3	3	2	3	2	2	2	2	3	2
Total Contributi on of COs to POs and PSOs141412141010Weighted Percentage of Course93.393.38093.366.666.6		CO5	2	3	3	2	2	2	2	3	2	2
Weighted   93.3   93.3   80   93.3   66.6   66.6     Percentage   of Course		Total Contributi on of COs to POs and PSOs	14	14	12	14	10	10	13	13	14	11
on to POs	(	Weighted Percentage of Course Contributi on to POs	93.3	93.3	80	93.3	66.6	66.6	86.6	86.6	93.3	73.3

### **Unit I Studying Concepts of Programming Languages**

Studying Concepts of Programming Languages- Language Evaluation Criteria - Language design -Language Categories - Implementation Methods - Programming Environments - Overview of C: History of C- Importance of C- Basic Structure of C Programs-Executing a C Program- Constants, Variables and Data types - Operators and Expressions - Managing Input and Output Operations

### **Unit II Decision Making And Branching**

Decision Making and Branching: Decision Making and Looping - Arrays - Character Arrays and Strings.

### **Unit III User Defined Functions**

User Defined Functions: Elements of User Defined Functions- Definition of Functions- Return Values and their Types- Function Call- Function Declaration- Categories of Functions- Nesting of Functions-Recursion.

### **Unit IV Structures And Unions**

Structures and Unions: Introduction- Defining a Structure- Declaring Structure Variables Accessing Structure Members- Structure Initialization- Arrays of Structures- Arrays within Structures- Unions- Size of Structures.

### **Unit V Pointers**

Pointers: Understanding Pointers- Accessing the Address of a Variable- Declaring Pointer Variables-Initializing of Pointer Variables- Accessing a Variable through its Pointer- Chain of Pointers- Pointer Expressions- Pointer and Scale Factor- Pointer and Arrays- Pointers and Character Strings- Array of Pointers- Pointer as Function Arguments- Functions Returning Pointers- Pointers to Functions- File Management in C

### **Recommended Text**

- 1. Robert W. Sebesta, Concepts of Programming Languages, Fourth Edition, Addison Wesley, 2012.
- 2. Balaguruswamy, E. Programming in ANSI C, Fifth Edition, Tata McGraw Hill Publications, 2010.

### **Reference Books**

- 1. Ashok Kamthane, *Programming with ANSI & Turbo C*, Pearson Education, 2009.
- 2. Byron Gottfried, Programming with C, Schaums Outline Series, Tata McGraw Hill Publications, 2010.

### Website and E-learning sources

- 1. http://www.tutorialspoint.com/cprogramming/
- 2. http://www.cprogramming.com/
- 3. http://www.programmingsimplified.com/c-program-examples
- 4. http://www.programiz.com/c-programming
- 5. http://www.cs.cf.ac.uk/Dave/C/CE.html
- 6. http://fresh2refresh.com/c-programming/c-function/

# (L-14hrs; T-1hr)

(L-14hrs; T-1hr)

## (L-14hrs; T-1hr)

(L-14hrs; T-1hr)

### (L-14hrs: T-1hr)

### Part-III B.Sc. IT / Semester – I / Core-2 (Core Lab-1):

### C PROGRAMMING LAB (U23IT1P1)

Lecture Hours	: -	Tutorial Hours : -
Practical Hours	: 75	No. of Credits : 05
<b>Contact Hours per Semester</b>	:75	
<b>Contact hours per Week</b>	: 05	
Internal Marks	: 40	
External Marks	: 60	
Total Marks	: 100	

### **Objectives of the Course**

The main objective of the Course is

• to provide students with understanding of code organization and functional hierarchical decomposition with using complex data types.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** analyze the syntax and semantics of C programs.
- **CO2** identify the problem and solve using C programming techniques.
- **CO3** identify suitable programming constructs for problem solving.
- **CO4** analyze various concepts of C language to solve the problem in an efficient way.
- **CO5** develop a C program for a given problem and test for its correctness.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	3	3	2	2	3	3	3	3
CO2	3	3	2	3	2	2	3	2	3	2
CO3	3	3	3	2	2	2	3	3	3	2
CO4	3	3	2	3	3	2	2	2	3	2
CO5	2	3	2	3	3	3	2	3	2	2
Total Contribut ion of COs to POs and PSOs	14	14	12	14	12	11	1 3	13	14	11
Weighted Percentag e of Course Contribut ion to POs	93.3	93.3	80	93.3	80	73.3	86.6	86.6	93.3	73.3
0- No Co	rrelation		1	- Weak		2- Mo	derate		3- St	rong

### **List of Practicals**

- 1. Programs using Input/ Output functions
- 2. Programs on conditional structures
- 3. Command Line Arguments
- 4. Programs using Arrays
- 5. String Manipulations
- 6. Programs using Functions
- 7. Recursive Functions
- 8. Programs using Pointers
- 9. Files
- 10. Programs using Structures & Unions

### (All the practicals are compulsory)

#### **Recommended Text**

1. Robert W. Sebesta, Concepts of Programming Languages, Fourth Edition, Addison Wesley, 2012.

2. Balaguruswamy, E. Programming in ANSI C, Fifth Edition, Tata McGraw Hill Publications, 2010.

#### **Reference Books**

- 1. Ashok Kamthane, Programming with ANSI & Turbo C, Pearson Education, 2009.
- 2. Byron Gottfried, Programming with C, Schaums Outline Series, Tata McGraw Hill Publications, 2010.

- 1. http://www.tutorialspoint.com/cprogramming/
- 2. http://www.cprogramming.com/
- 3. http://www.programmingsimplified.com/c-program-examples
- 4. http://www.programiz.com/c-programming
- 5. http://www.cs.cf.ac.uk/Dave/C/CE.html
- 6. http://fresh2refresh.com/c-programming/c-function/

### Part-III B.Sc IT / Semester – I / Elective Generic-1: DIGITAL LOGIC FUNDAMENTALS (U23IT1A1)

Lecture Hours	: 55	Tutorial Hours : 05
Practical Hours	:-	No. of Credits : 03
<b>Contact Hours per Semester</b>	: 60	
Contact hours per Week	:04	
Internal Marks	: 25	
External Marks	: 75	
Total Marks	: 100	

### **Objectives of the Course**

The main objective of the Course is

- to learn basic building blocks of the digital circuits has been discussed.
- to gain knowledge about number system and perform conversion between one base to another base.

#### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** understand the concepts of number system, logical gates, Circuits, Flip flops and registers.
- **CO2** understand the digital logics, various combinational logical circuit, Multiplexers and registers.
- **CO3** apply the concepts of number system, code, Karnaugh Map, 2's Complement, : Binary Addition and Binary Subtraction, Serial in serial out, serial in parallel out, parallel in serial out and parallel in parallel out.
- CO4 analyze the types of logical gates, Karnaugh Simplifications, Sign-Magnitude Numbers.
- **CO5** evaluate Excess-3 Code, Gray Code and Flipflops.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	3	2	3	3	2	3	3	3	3
CO2	2	3	2	3	2	2	2	3	3	2
CO3	2	2	2	3	3	3	2	3	3	3
CO4	2	2	2	3	3	3	3	2	3	2
CO5	2	2	2	2	3	2	3	3	2	2
Total Contrib ution of COs to POs and PSOs	11	12	10	14	14	12	1 3	14	14	12
Weighte d Percenta ge of Course Contrib ution to POs	73.3	80	66.6	93.3	93.3	80	86.6	93.3	93.3	80
0- No Correl	ation	1	1- Weal	۱ ۲	1	2- Mo	derate	1	3- Str	ong

### Unit I Number Systems & Codes & Digital Logic

**Number System:** Binary Number System, Binary to Decimal Conversion, Decimal to Binary Conversion, Octal Numbers, Hexadecimal Numbers. **Codes:** The ASCII Code, the Excess-3 Code, The Gray Code, Complements, Signed Binary Numbers, Binary Storage and Registers. **Digital Logic:** The Basic gates NOT, OR, AND, Universal Logic Gates NOR, NAND.

### **Unit II Combinational Logic Circuits**

**Combinational Logic Circuits :** Boolean Laws and Theorems , Sum of Products Method , Truth Table to Karnaugh Map , Pairs, Quads and Octets , Karnaugh Simplifications , Don't Care Conditions, Product of Sums Method, Product of Sums Simplification, HDL Implementation Models. **Data Processing Circuits:** Multiplexers , De-multiplexers , 1-of- 16 Decoders , BCD-to-Decimal Decoders , Seven Segment decoders , Encoders , Exclusive-OR gates.

### **Unit III Arithmetic Circuits**

**Arithmetic Circuits:** Binary Addition, Binary Subtraction, Unsigned Binary Numbers, Sign-Magnitude Numbers, 2's Complement Representation, 2's Complement Arithmetic, Arithmetic Building Blocks, The Adder-subtracted, Arithmetic Logic Unit, Binary Multiplication and Division, Arithmetic Circuits Using HDL. **Clocks and Timing Circuits:** Clock Waveforms, TTL Clock, 555 Timer, A stable.

### Unit IV Flip-Flops, Registers and Counters

**Flip – Flops:** RS Flip Flops, Edge Triggered RS Flip Flops, Edge Triggered D Flip Flops, Edge Triggered JK Flip Flops, JK Master Slave Flip Flops. **Registers and Counters:** Registers, Shift Registers, Ripple Counters, Synchronous Counters, Other Counters, HDL for Registers and Counters.

### Unit V Memory and Programmable Logic

Memory and Programmable Logic: Introduction, Random Access Memory, Memory Decoding, Error Detection and Correction, Read Only Memory. Digital Integrated Circuits: Switching Circuits, 7400 TTL, TTL Parameters, TTL Overview. Applications: Multiplexing Displays, Frequency Counters, Time Measurement, Digital Voltmeter.

### **Recommended Text**

1. Albert Paul Malvino& Donald Leach.P, by *Digital Principles and Applications* Seventh Edition, Tata McGraw Hill Education Private Limited, 2011.

### **Reference Books**

- 1. Anand Kumar.A, Fundamentals of Digital Circuits, Second Edition, PHI Learning Pvt Limited, 2012.
- 2. MorrisMano.M, Digital Logic and Computer Design, Sixth Edition, Pearson Education, India, 2016.
- 3. John Wakerly.F, *Digital Design Principles and Practices*, FifthEdition, Pearson publications. 2017.
- 4. SonaliSingh, Digital Logic Design, First Edition, BPB Publications, 2015.
- 5. Dr.Narendra.S, Jadhav.S, *Digital Logic Design*, First Edition, NiraliPrakashan, 2018.

### Website and E-learning sources

- 1. https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/
- 2. http://examradar.com/digital-electronics-digital-logic-short-study-notes/
- 3. https://www.gatevidyalay.com/digital-electronics/
- 4. https://www.smartzworld.com/notes/digital-logic-design-and-computer-organization-notes-pdf/dldco-notes-pdf/
- 5. http://www.ee.surrey.ac.uk/Projects/CAL/digital-logic/gatesfunc/index.html
- 6. https://faculty.kfupm.edu.sa/coe/ashraf/RichFilesTeaching/COE043\_200/Chapter%205.html

## (L-11hrs; T-1hr)

(L–11hrs; T-1hr)

# (L–11hrs; T-1hr)

### (L–11hrs; T-1hr)

(L–11hrs; T-1hr)

### Part-IV B.Sc.IT / Semester – I / Skill Enhancement Course SEC1 (NME-1):

Lecture Hours	: 30	Tutorial Hours : -
Practical Hours	:-	No. of Credits : 02
<b>Contact Hours per Semester</b>	: 30	
Contact hours per Week	:02	
Internal Marks	: 50	
External Marks	: -	
Total Marks	: 50	

### **OFFICE AUTOMATION (U23IT1S1)**

#### **Objectives of the Course**

The main objective of the Course is

• to enhance and upgrade the existing system by increasing its efficiency and effectiveness.

#### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** understand the basics of computer systems and its components.
- **CO2** analyse and apply the basic concepts of a word processing package.
- **CO3** design the concepts of electronic spread sheet software.
- **CO4** develop a database management system.
- **CO5** create a presentation using PowerPoint tool.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	3	2	3	2	2	3	2	3	2
CO3	3	3	3	3	2	2	3	3	3	2
CO4	3	3	2	3	2	2	2	2	3	2
CO5	2	3	3	2	2	3	2	3	2	2
Total Contributio n of COs to POs and PSOs	14	14	12	14	11	12	1 3	13	14	1 1
Weighted Percentage of Course Contributio n to POs	93.3	93.3	80	93.3	73.3	80	86.6	86.6	93.3	73.3
0- No Correla		1- Weal	k		2- Mo	derate		3-Str	ong	

### **Unit I Introductory Concepts**

Introductory concepts: Memory unit- CPU-Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems & its features: -Windows. Introduction to Programming Languages.

### **Unit II Word Processing**

**Word Processing:** Open, Save and close word document; Editing text – tools, formatting, bullets; Spell Checker - Document formatting - Paragraph alignment, indentation, headers and footers, numbering; printing-Preview, options, merge.

### **Unit III Spreadsheets**

Spreadsheets: Excel-opening, entering text and data, formatting, navigating; Formulas-entering, handling and copying; Charts-creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics.

### **Unit IV Database Concepts**

**Database Concepts:** The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and reports; Linking of datafiles; Understanding Programming environment in DBMS: Developing menu drive applications in query language (MS–Access).

### **Unit V Power Point**

**Power point:** Introduction to Power point - Features – Understanding slide typecasting & viewing slides - creating slide shows. Applying special object - including objects & pictures - Slide transition-Animation effects, audio inclusion, timers.

### **Recommended Text**

1. Peter Norton, Introduction to Computers, Tata Mc Graw Hill.

### **Reference Book**

1. Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, *Microsoft 2003*, Tata McGrawHill.

### Website and E-learning sources

- 1. https://www.udemy.com/course/office-automation-certificate-course/
- 2. https://www.javatpoint.com/automation-tools

### (L-6hrs)

(L-6hrs)

(L-6hrs)

(L-6hrs)

(L-6hrs)

### Part-IV B.Sc. IT / Semester – I / Foundation Course FUNDAMENTALS OF COMPUTERS (U23ITFC1)

Lecture Hours	: 30	Tutorial Hours : -
Practical Hours	: -	No. of Credits : 02
<b>Contact Hours per Semester</b>	: 30	
Contact hours per Week	:02	
Internal Marks	: 50	
External Marks	: -	
Total Marks	: 50	

### **Objectives of the Course**

The main objective of the Course is

• to study the Basic knowledge about programming concepts

#### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** outline the Computer fundamentals and various problem solving concepts in Computers.
- **CO2** describe the basic computer organization, software, computer languages, software development life cycle and the need of structured programming in solving a computer problem.
- **CO3** identify the types of computer languages, software, computer problems and examine how to set up expressions and equations to solve the problem.
- **CO4** choose most appropriate programming languages, constructs and features to solve the problems in diversified domains.
- **CO5** analyze the design of modules and functions in structuring the solution and various Organizing tools in problem solving.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	3	3	3	3	3
CO2	3	2	2	2	3	2	3	2	3	3
CO3	3	3	3	3	2	2	3	3	3	2
CO4	3	2	2	2	2	3	2	2	3	2
CO5	2	3	2	2	3	2	2	3	2	2
Total										
Contribut										
ion of	14	12	11	11	12	12	13	13	1/	12
COs to	17	12	11	11	12	12	15	15	17	12
POs and										
PSOs										
Weighted	93.3	80	73.3	73.3	80	80	86.6	86.6	93.3	80
Percentag										
e of										
Course										
Contribut										
ion to POs										
0- No Correlation 1- Weak 2- Moderate 3- Strong										

### **Unit I Introduction to Computers**

**Introduction:** Characteristics of Computers - Evolution of Computers **Basic Computer Organization:** I/O Unit - Storage Unit - Arithmetic Logic Unit - Control Unit - Central Processing Unit .

### **Unit II Computer Software**

**Computer Software:** Types of Software - System Architecture **Computer Languages:** Machine Language - Assembly Language - High Level Language - Object Oriented Languages

### **Unit III Problem Solving Concepts**

**Problem Solving Concepts:** Problem Solving in Everyday life - Types of Problems - Problem solving with computers - Difficulties with Problem Solving .

### Unit IV Problem Solving Concepts for the Computer

**Problem Solving concepts for the computer:** Constant Variables - Data Types - Functions - Operators - Expressions and Equations - **Organizing the Solution:** Analyzing the problem - Algorithm - Flowchart - Pseudo code.

### **Unit V Programming Structure**

**Programming Structure:** Structuring a solution - Modules and their function - Local and Global variables - Parameters - Return values - Sequential Logic Structure - Problem solving with Decision - Problem Solving with Loops .

### **Recommended Text**

1. Dromey R.G, *How to Solve it by Computer*, Prentice Hall International Series in Computer Science, 2007.

### **Reference Book**

1. Murthy, C. S. V. *Fundamentals of Computers*, Third Edition, Himalaya Publishing House, 2009.

### Website and E-learning sources

- 1. http://www.tutorialspoint.com/computer\_fundamentals/
- 2. http://www.comptechdoc.org/basic/basictut/
- 3. http://www.homeandlearn.co.uk/
- 4. http://www.top-windows-tutorials.com/computer-basics/
- 5. https://www.programiz.com/article/flowchart-programming (Algorithm and flow chart)

### (L-6hrs)

(L-6hrs)

(L-6hrs)

(L-6hrs)

### (L-6hrs)

### Part-III B.Sc. IT / Semester – II / Core – 3: JAVA PROGRAMMING (U23IT202)

Lecture Hours	: 70	Tutorial Hours : 05
Practical Hours	:-	No. of Credits : 05
<b>Contact Hours per Semester</b>	: 75	
Contact hours per Week	: 05	
Internal Marks	: 25	
External Marks	: 75	
Total Marks	: 100	

### **Objectives of the Course**

The main objective of the Course is

• to study the basic JAVA programming concepts

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** outline the basic terminologies of OOP, programming language techniques, JDBC and Internet programming concepts.
- **CO2** solve problems using basic constructs, mechanisms, techniquess of Java.
- **CO3** analyse and explain the behavior of simple programs involving different techniques such as Inheritance, Packages, Interfaces,Exception Handling, Thread, JDBC and Servlets.
- CO4 assess various problem-solving strategies in Java.
- CO5 design GUI based JDBC applications with Servlet .

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	2	3	3	3	3
CO2	2	3	2	2	2	2	3	2	3	2
CO3	2	3	3	3	2	2	3	3	3	2
CO4	2	3	2	2	2	2	2	2	3	2
CO5	3	3	2	2	2	2	2	2	2	2
Total Contrib ution of COs to POs and PSOs	12	14	11	11	10	10	13	12	14	11
Weighte d Percent age of Course Contrib ution to POs	86.6	93.3	80	93.3	66.6	66.6	86.6	80	93.3	73.3
0- No Cor	0- No Correlation 1- Weak					2- Moderate 3- St			3- Stron	Ig

### **Unit I Fundamentals of Object**

Fundamentals of Object- Oriented Programming: Introduction – Object Oriented Paradigm – Concepts of Object – Oriented Programming – Benefits of OOP – Evolution: Java History- Java Features - Differs from C and C++ - Overview of Java Language: Java Program-Structure – Tokens – Java Statements – Java Virtual Machine – Command Line Arguments.

#### **Unit II Constants, Variables and Data Types**

Constants, Variables and Data Types – Operators and Expressions – Decision making adBranching – Looping – Arrays - Strings – Collection Interfaces and classes.

### **Unit III Classes Objects and Methods**

Classes objects and methods: Introduction – Defining a class – Method Declaration – Constructors - Method Overloading – Static Members – Nesting of methods – Inheritance – Overriding – Final variables and methods – Abstract methods and classes.

### **Unit IV Multiple Inheritance**

Multiple Inheritance: Defining Interfaces – Extending Interfaces – Implementing Interfaces – Packages: Creating Packages – Accessing Packages – Using a Package – Managing Errors and Exceptions -Multithreaded Programming

### **Unit V Layout Managers**

Layout Managers - JDBC – Java Servlet: - Servlet Environment Role – Servlet API – Servlet Life Cycle – Servlet Context – HTTP Support – HTML to Servlet Communication.

#### **Recommended Text**

- 1. Balagurusamy E, *Programming with Java*, Tata McGraw Hill Edition India Private Ltd, 4th Edition, 2010.
- 2. Xavier C,"Java Programming A Practical Approach", Tata McGraw Hill Edition Private Ltd

#### **Reference Books**

- 1. Naughton.P and Schildt.H, Java 2 The Complete Reference, TMH, 3rd Edition, 1999.
- 2. Jaison Hunder & William Crawford , Java Servlet Programming", O'Reilly, 2002.
- 3. Jim Keogh, J2EE: The Complete Reference, Tata McGraw Hill Edition, 2002.

#### Website and E-learning sources

- 1. http://javabeginnerstutorial.com/core-java/
- 2. http://www.tutorialspoint.com/java/
- 3. http://beginnersbook.com/java-tutorial-for-beginners-with-examples/
- 4. http://www.homeandlearn.co.uk/java/java.html
- 5. http://www.journaldev.com/1877/servlet-tutorial-java (Unit V : Servlet API)

#### (L-14hrs; T-1hr)

(L-14hrs; T-1hr)

(L-14hrs; T-1hr)

#### (L-14hrs; T-1hr) Interfaces – Packages

### (L-14hrs; T-1hr)

### Part-III B.Sc. IT / Semester – II / Core-4 (Core Lab 2) : JAVA PROGRAMMING LAB (U23IT2P2)

Lecture Hours	: -	Tutorial Hours : -
Practical Hours	:75	No. of Credits : 05
<b>Contact Hours per Semester</b>	:75	
Contact hours per Week	:05	
Internal Marks	: 40	
External Marks	: 60	
Total Marks	: 100	

### **Objectives of the Course**

The main objective of the Course is

• to impart knowledge about java programming concepts.

#### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** learn and understand the concepts of basic programs and arrays.
- CO2 apply operators and class with methods and Inheritance .
- CO3 analyse the method interfaces, packages and Exception Handling
- **CO4** evaluate java program with appropriate concepts like Threads, Linked List, Stack. and Queue
- **CO5** write a Java program using working with database using JDBC.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	3	3	2	2	3	3	3	3
CO2	2	3	3	3	2	2	3	2	3	2
CO3	3	3	3	2	2	3	2	3	3	2
CO4	3	3	3	3	3	2	2	2	3	2
CO5	3	3	2	3	2	2	2	3	2	2
Total										
Contribu										
tion of	14	14	14	14	11	11				
COs to	14	14	14	14	11	11	12	13	14	11
POs and										
PSOs										
Weighted	93.3	93.3	93.3	93.3	73.3	73.3	80	80	93.3	73.3
Percenta										
ge of										
Course										
Contribu										
tion to										
POs										
0- No Corre	0- No Correlation			ζ.		2- N	Ioderate		3- Sti	ong

### **List of Practicals**

- 1. Basic Programs
- 2. Arrays
- 3. Strings
- 4. ArrayList, HashSet and Vector collection classes
- 5. Classes and Objects
- 6. Interfaces
- 7. Inheritance
- 8. Packages
- 9. Exception Handling
- 10. Threads
- 11. Linked List
- 12. Stacks
- 13. Queue
- 14. Sorting
- 15. Binary Tree Representation
- 16. Working with Database using JDBC
- 17. Web application using Servlet

### (All the practicals are compulsory)

#### **Recommended Text**

- 1. Balagurusamy E, "*Programming with Java*, Tata McGraw Hill Edition India Private Ltd, 4th Edition,2010.
- 2. Xavier C, Java Programming A Practical Approach, Tata McGraw Hill Edition Private Ltd.

#### **Reference Books**

- 1. Naughton.P and Schildt.H, Java 2 The Complete Reference, TMH, 3rd Edition, 1999.
- 2. Jaison Hunder & William Crawford, Java Servlet Programming, O'Reilly, 2002.
- 3. Jim Keogh, J2EE: The Complete Reference, Tata McGraw Hill Edition, 2002.

- 1. http://javabeginnerstutorial.com/core-java/
- 2. http://www.tutorialspoint.com/java/
- 3. http://beginnersbook.com/java-tutorial-for-beginners-with-examples/
- 4. http://www.homeandlearn.co.uk/java/java.html
- 5. http://www.journaldev.com/1877/servlet-tutorial-java (Unit V : Servlet API)

### Part-III B.Sc. IT / Semester – II / Elective Generic – 2: DATA STRUCTURES (U23IT2A2)

Lecture Hours	: 55	Tutorial Hours : 05	
Practical Hours	:-	No. of Credits : 03	
<b>Contact Hours per Semester</b>	: 60		
<b>Contact hours per Week</b>	:04		
Internal Marks	: 25		
External Marks	: 75		
Total Marks	: 100		

### **Objectives of the Course**

The main objective of the Course is

• to learn and understand the concepts of basic data structures such as stack, Queues and Linked list.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** learn and understand the basic concepts of data structure, arrays, stacks, queues, trees, sorting.
- CO2 apply the concepts of bubble sort, insertion sort, merge sort, quick sort and heap sort.
- **CO3** analyze the binary tree and binary search tree, shortest path
- **CO4** evaluate dynamic programming.
- **CO5** develop a program using list, matrix, linked list, stack and queue concepts and 8 Queens .

**CO-PO and PSO Mapping (Course Articulation Matrix)** 

	<b>PO1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	3	2	3	3	3	2	3	3	2
CO3	3	3	3	3	2	2	2	2	3	2
CO4	3	3	2	2	3	3	3	2	2	2
CO5	2	3	2	3	3	2	3	3	2	2
Total Contrib ution of COs to POs and PSOs	14	14	11	14	14	13	13	13	13	11
Weighte d Percenta ge of Course Contrib ution to POs	93.3	93.3	73.3	93.3	93.3	86.6	86.6	86.6	86.6	73.3
0- No Corre	0- No Correlation					2	- Modera	ate	3-	Strong

### **Unit I Introduction and Overview**

Introduction and overview: Basic Terminology – Data Structures – Operations - Algorithms: Complexity – Time Space – Algorithmic Notation – Control Structures – Complexity of Algorithms – Notations Arrays: Representation – Operations - Linear Search – Binary Search.

### Unit II Stack & Queue

Stack: Representation – Arithmetic expressions: Polish Notation – Recursion: Towers of Hanoi - Queue – Priority Queue - Linked Lists: Introduction – Representation of Linked Lists – Traversing a Linked Lists – Searching a Linked List.

### **Unit III Insertion into a Linked List**

Insertion into a Linked List – Deletion into Linked List – Header Linked Lists – Two-way Lists –Doubly Linked List - Trees : Binary Trees – Representation – Traversal using Recursion – Binary Search Trees.

### Unit IV Sorting

Sorting : Bubble Sort Insertion Sort, Selection Sort, Merge Sort, Quick Sort, Heap Sort.

### **Unit V Graphs**

Graph – Graph Theory Terminology –Sequential Representation – Warshalls Algorithm – Shortest Path – Linked Representation - Traversals – Dynamic Programming – All Pairs Shortest Path - Greedy – Knapsack – Back Tracking – 8 Queens.

### **Recommended Text**

1. Seymour Lipschutz, Theory and Problems of Data Structures, Tata McGraw-Hill Edition, 1986.

### **Reference Books**

- 1. Horowitz.H, Sahni.S, Rajasekaran.S, Computer Algorithms, Galgotia Publications, 1998.
- 2. Robert Kruse, Tondo, Bruce Leung C. L, *Data Structur es and Program Design in C*, Second Edition, Prientice Hall Publications, 2019.

### Website and E-learning sources

- 1. http://www.cs.sunysb.edu/~skiena/214/lectures/
- 2. http://datastructures.itgo.com/graphs/dfsbfs.htm
- 3. http://oopweb.com/Algorithms/Documents/PLDS210/VolumeFrames.html
- 4. http://discuss.codechef.com/questions/48877/data-structures-and-algorithms
- 5. http://code.tutsplus.com/tutorials/algorithms-and-data-structures--cms-20437
- 6. ttps://www.tutorialspoint.com/data\_structures\_algorithms/insertion\_sort\_algorithm.htm (Unit IV : Insertion Sorting)

#### (L-11hrs; T-1hr)

### (L-11hrs; T-1hr)

## (L-11hrs; T-1hr)

## (L-11hrs; T-1hr)

### (L-11hrs; T-1hr)

### Part-IV B.Sc. IT / Semester – II / Skill Enhancement Course SEC2 (NME-2): BASICS OF INTERNET (U23IT2S2)

Lecture Hours	: 30	Tutorial Hours : -	
Practical Hours	:-	No. of Credits : 02	
<b>Contact Hours per Semester</b>	: 30		
Contact hours per Week	:02		
Internal Marks	: 50		
External Marks	: -		
Total Marks	: 50		

### **Objectives of the Course**

The main objective of the Course is

• to discuss elementary Internet concepts and history using a successful Internet connection.

#### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** learn the Characteristics WWW.
- CO2 understand feature of internet technology.
- CO3 understand the classification of internet.
- **CO4** analyse internet life styles.
- **CO5** learn future possibilities of internet.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	3	2	3	2	2	3	2	3	2
CO3	3	3	3	3	2	3	3	3	3	2
CO4	2	3	2	3	2	2	2	2	3	2
CO5	2	3	3	2	2	2	2	3	2	2
Total Contri										
bution of COs to POs and	13	14	12	14	11	12	13	13	14	11
PSOs Weight ed Percent age of Course Contri bution to POs	86.6	93.3	80	93.3	73.3	80	86.6	86.6	93.3	73.3

<b>Unit I WWW</b> The emergence of internet as a mass medium – the world of 'world wide web.	(L-6 hrs)
<b>Unit II Features</b> Features of internet as a technology.	(L-6 hrs)
<b>Unit III Infotainment</b> Internet as a source of infotainment – classification based on content and style.	(L-6 hrs)
<b>Unit IV Effects of Internet</b> Demographic and psychographic descriptions of internet 'audiences' – effect of internet onth life-styles.	(L-6 hrs) e values and
<b>Unit V Cyber Crime</b> Present issues such as cyber crime and future possibilities.	(L-6 hrs)

### **Recommended Text**

- 1. Mastering HTML5 and CSS3 Made Easy, TeachUComp Inc., 2014.
- 2. Thomas Michaud, Foundations of Web Design: Introduction to HTML & CSS.

### **Reference Books**

- 1. Douglas E.Comer, *The Internet Book: Everything You Need to Know About Computer Networking and How the Internet Works*, 30 March 2000.
- 2. Harley Hahn, *The Internet complete reference (2nd ed.)*, McGraw-Hill, Inc., United States, February 1996,

- 1. https://www.teachugcomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf
- 2. https://www.w3schools.com/html/default.asp.

### Part-IV B.Sc. IT / Semester – II / Skill Enhancement Course (DSC) SEC3: INTRODUCTION TO OFFICE AUTOMATION & HTML (U23IT2SP)

Lecture Hours	: -	Tutorial Hours : -
Practical Hours	: 30	No. of Credits : 02
<b>Contact Hours per Semester</b>	: 30	
Contact hours per Week	:02	
Internal Marks	:-	
External Marks	: 50	
Total Marks	: 50	

### **Objectives of the Course**

The main objective of the Course is

• to enable the students in craft word documents, excel & HTML

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** understand the basics of computer systems and its components.
- **CO2** analyse and apply the basic concepts of a word processing package.
- **CO3** design the concepts of electronic spread sheet software.
- **CO4** develop a database management system.
- **CO5** create a presentation using PowerPoint tool.

	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	3	2	3	2	2	3	2	3	2
CO3	3	3	3	3	2	2	3	3	3	2
CO4	2	3	2	3	2	3	2	2	3	2
CO5	2	3	3	2	2	2	2	3	2	2
Total										
Contribu										
tion of										
COs to	13	14	12	14	11	12	13	13	14	11
POs and										
PSOs										
Weighted	86.6	93.3	80	93.3	73.3	80	86.6	86.6	93.3	73.3
Percenta										
ge of										
Course										
Contribu										
tion to										
POs										
0- No Correlation			1- Wea	k		2- Moderate 3- Stro			3- Stron	g

### **List of Practicals**

#### **MS-WORD:**

- 1. Prepare a word document and Insert Header and Footer.
- 2. Preparer a Bio-Data and insert the contents of qualification within the table.
- 3. Mail Merge.

#### MS-EXCEL:

- 1. Apply formulas and functions .
- 2. Prepare a chart for population growth.

#### **MS – POWERPOINT:**

- 1. Create a power point presentation with animation.
- 2. Create a power point presentation with 4 slides. Set slide transition time of 3 seconds and display your presentation.

#### MS – ACCESS:

- 1. Create a student database. Set a field to primary key.
- 2. Create a salary bill preparation with report.

#### HTML:

- 1. Develop a HTML document for your profile. Design the page with background color, text color, and suitable headings in different formats.
- 2. Develop a HTML document for our college course details. Design the page with nested
- 3. Ordered and unordered lists.
- 4. Design your class timetable using table tags.
- 5. Develop a HTML document for your department with the list of items shown in a frame. When you click an item, the details of the item must appear in another frame.
- 6. Develop a HTML document using form attributes.
- 7. Design our college website.

#### (All the practicals are compulsory)

#### **Recommended Text**

- 1. Vikas Gupta, Comdex Computer Course Kit, (XP Edition), Dreamtech Press, New Delhi, 2009.
- 2. FiruzaAibara ,HTML for beginners, Shrott Publishers and Distributors Pvt. Ltd., 2nd Edition, 2010.

#### **Reference Books**

- 1. Peter Norton, Introduction to Computers, sixth edition, McGraw Hill Companies, 2008.
- 2. Stephen L. Nelson, *The Complete Reference Office 2000*, Tata McGraw Hill Publishing Company Limited, New Delhi, 1999.
- 3. N.Krishnan, *Computer Fundamentals and windows with Internet Technology*, Scitech Publications (India) Pvt Ltd, 2018
- 4. Thomas A. Powell, HTML The Complete Reference, McGraw Hill Osborne Media, Second Edition, 2003.
- 5. Jamsa Kris, Andy Anderson, Konrad King, HTML & Web Design Tips & Techniques Tips and Techniques, McGraw Hill, India, 2002.

- 1. https://www.docsity.com/en/office-automation-computer-fundamentals-lecture-slides/286724/
- 2. https://khpditweebly.weebly.com/office-automation-notes.html
- 3. https://codescracker.com/bca/bca-computer-fundamental-and-office-automation.html
- 4. https://www.kullabs.com/classes/subjects/units/lessons/notes/note-detail/1191
- 5. https://www.cs.uct.ac.za/mit\_notes/web\_programming.html
- 6. https://www.geeksforgeeks.org/html-basics/
- 7. https://www.yourhtmlsource.com/starthere/whatishtml.html.

### Part-III B.Sc. IT / Semester – III / Core-5:

### **RELATIONAL DATABASE MANAGEMENT SYSTEM (U23IT303)**

Lecture Hours	: 70	Tutorial Hours : 05	
Practical Hours	:-	No. of Credits : 05	
<b>Contact Hours per Semester</b>	: 75		
Contact hours per Week	: 05		
Internal Marks	: 25		
External Marks	: 75		
Total Marks	: 100		

### **Objectives of the Course**

The main objective of the Course is

• to learn the fundamental elements of database system and provide the students a strong foundation in database technology and to learn the fundamentals of data models to make a study of SQL and relational database design.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** learn and understand of data base system, relational algebra, basic SQL operations and pl/sql operations.
- CO2 apply the concept of E-R Model, Normalization, Data Functions and Functions & Packages
- **CO3** analyze the Relational Algebra, joins and Commands.
- **CO4** evaluate Mapping Constraints, E-R Diagram, Simple tests against a list of values and triggers.
- **CO5** create the Clusters, Sequences, Procedures and Packages.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	3	3	2	3
CO2	3	3	2	3	2	3	3	2	2	3
CO3	3	3	3	3	2	2	3	3	3	3
CO4	3	3	2	3	2	2	2	2	2	3
CO5	2	3	3	2	2	2	2	3	3	2
Total										
Contrib										
ution of										
COs to	14	1/	12	14	11	12	13	13	12	1
POs	14	14	12	14	11	12	15	15	12	4
and										
PSOs										
Weighte	93.3	93.3	80	93.3	73.3	80	86.6	86.6	80	93.3
d										
Percent										
age of										
Course										
Contrib										
ution to										
POs										
0- No Cor	relation		1-	Weak			2- Mod	erate	3-	Strong

### Unit I Overview Of Database Systems

**Introduction:** Purpose of Database Systems- Data Models, Database Languages, Transaction Management, Storage Management, Database Users and Administrators, System Structure. **E-R Model:** Entities and Entity sets, Relationship Sets, Mapping Constraints, E-R Diagram.

### **Unit II Relational Datamodel**

**Relational Algebra:** Tuple Relational Calculus, Domain Relational Calculus, Integrity Constraints. Normalization: Boyce-Codd Normal Form, Third Normal Form, Fourth Normal Form, Domain – Key Normal Form.

### **Unit III Basic Sql Operations**

**Basic SQL Operations:** Creating a Table, Insert, Rollback, Commit, Auto Commit, Delete, Update, Select, From, Where and Order by, **Single value tests**: Single value tests, LIKE, Simple tests against a list of values, Combining Logic, Dropping tables, Dropping a Column, Creating a table from a table, **Data Functions:** Conversation functions, Translate, Decode, Creating a view – Advanced Sub queries – Outer Joins – Natural and Inner Joins – Union, Intersect & Minus– Indexes– Clusters.

### **Unit IV Basics of Object**

**Relational Databases :** Objects – Abstract Data Types – Nested tables – Varying arrays –Naming conventions for objects – structure of an object – **Users Roles and Privilege** : Creating a user – Password management – Three Standard roles – Format for grant command – Revoking privileges – What users can Grant : Moving to another user –Create a role – Granting privileges to a role – Granting a role to another role – Adding Password to a role – Removing password from a role – Enabling & Disabling Roles – Revoking Privilege from a role – Drop role.

### **UNIT V Introduction PL/SQL**

**PL/SQL Overview** – Declaration section – Executable commands section – Exception handling Section – **Triggers:** Syntax – Types of Triggers: Row Level – Statement Level –Database Level Triggers – Enabling & Disabling Triggers – Replacing & Dropping Triggers – Procedures, **Functions & Packages:** Syntax – Compile – Replace – Drop Procedure, Functions & Packages.

### **Recommended Text**

- 1. Abraham Silberschatz, Henry F.Korth, S.Sudarshan , *Database System Concepts*, McGraw –Hill Education, 2010.
- 2. Kevin Loney, George Koch And the Experts at TUSC, *ORACLE 9i The Complete Reference*, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2002.
- 3. RamezElmasri, Shankant B. Navathe, *Database Systems*, 6<sup>th</sup> Edition, Pearson, 2011.

### **Reference Books**

- 1. Rajesh Narang, Database Management Systems, PHI Learning Pvt. Ltd., 2006.
- 2. Raghu Ramakrishnan, Johannes Gehrke, *Database Management Systems*, McGraw Hill Education, 2002.
- 3. Michael Abbay, Mike Corey, Ian Abramson, *ORACLE 9i A Beginner's Guide*, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2002.
- 4. Gehani, The Database Application Book using the MYSQL Database, Universities Press, 2002.

### Website and E-learning sources

- 1. https://www.javatpoint.com/dbms-er-model-concept
- 2. https://beginnersbook.com/2015/04/mapping-constraints-in-dbms/
- 3. https://www.tutorialspoint.com/plsql/plsql\_cursors.html
- 4. https://www.javatpoint.com/oracle-inner-join
- 5. https://www.tutorialspoint.com/plsql/plsql\_packages.html

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### (L-14hrs; T-1hr)

### (L-14hrs; T-1hr)

# (L-14hrs: T-1hr)

(L-14hrs; T-1hr)

#### U23IT-29

### Part-III B.Sc. IT / Semester – III / Core-06 (Core Lab -3):

### **RDBMS LAB (U23IT3P3)**

Lecture Hours	:-	Tutorial Hours : -
Practical Hours	: 60	No. of Credits : 05
<b>Contact Hours per Semester</b>	: 60	
Contact hours per Week	:04	
Internal Marks	: 40	
External Marks	: 60	
Total Marks	: 100	

#### **Objectives of the Course**

The main objective of the Course is

• to provide the students a strong foundation on database technology and learn the fundamentals of data models to make a study of SQL and relational database design.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- CO1 learn and understand SQL and PL/SQL.
- **CO2** apply the concept of aggregate operators, trigger, joins and sub queries.
- CO3 analyze the concept of different commands in SQL.
- **CO4** evaluate the various mathematical operations using conditional structure.
- CO5 create tables of students, course, employee using PL/SQL Procedure and triggers.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	3	2	3	3	3
CO2	3	2	3	3	3	3	3	2	3	2
CO3	2	3	2	3	2	2	2	3	3	2
CO4	3	3	2	3	2	2	3	2	3	2
CO5	2	3	2	3	2	2	3	3	2	2
Total Contrib										
ution of COs to POs and PSOs	13	14	12	14	11	12	13	13	14	11
Weight ed Percent age of Course Contrib ution to POs	86.6	93.3	80	93.3	73.3	80	86.6	86.6	93.3	73.3
0- No Cori	relation		1- We	eak		2- Moderate			3- Strong	

### **List of Praticals**

- 1. Create a simple table and write three queries to process a table.
- 2. Demonstrate query processing using aggregate operators.
- 3. Write oracle code for demonstrating the Database Querying Simple queries, Nested queries, Sub queries and Joins.
- 4. Write oracle code to create employee records and delete the retired employees and store it on to another table with same structure.
- 5. Create a course table and create a procedure that displays the instructor details, class details and student details of a particular table which the user inputs.
- 6. Write a database trigger before insert for each row on the course table not allowing transactions on Sundays and Saturdays.
- 7. Create a package that contains overloaded functions for
  - i. Adding five integers
  - ii. Subtracting two integers
  - iii. Multiplying three integers
- 8. Write PL/SQL block to increase the salary by 10% if the salary is > 2500 and < 3000.
- 9. Write PL/SQL block to display the names of those employees getting salary > 3000. Create and insert records into the following tables. (Insert minimum 10 records in each table).
- 10. Create Student information table.
- 11. Create Department information table.
- 12. Create Course information table.
- 13. Create Student grade information table in PL/SQL.

#### (All the practicals are compulsory)

#### **Recommended Text**

- 1. Abraham Silberschatz, Henry F.Korth, S.Sudarshan, *Database System Concepts*, McGraw –Hill Education, 2010.
- 2. Kevin Loney, George Koch And the Experts at TUSC, *ORACLE 9i The Complete Reference*, Tata McGraw Hill Publishing Company Ltd., New Delhi.
- 3. RamezElmasri, Shankant B. Navathe, *Database Systems*, 6th Edition, Pearson.

#### **Reference Books**

- 1. Rajesh Narang, Database Management Systems, PHI Learning Pvt. Ltd., 2006.
- 2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, McGraw Hill Education, 2002.
- 3. Michael Abbay, Mike Corey, Ian Abramson, *ORACLE 9i A Beginner's Guide*, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2002.
- 4. Gehani, The Database Application Book using the MYSQL Database, Universities Press.

- 1. https://www.javatpoint.com/dbms-er-model-concept
- 2. https://beginnersbook.com/2015/04/mapping-constraints-in-dbms/
- 3. https://www.tutorialspoint.com/plsql/plsql\_cursors.html
- 4. https://www.javatpoint.com/oracle-inner-join
- 5. https://www.tutorialspoint.com/plsql/plsql\_packages.html

### Part-III B.Sc. IT / Semester – III / Elective Generic- 3: DISCRETE MATHEMATICS (U23IT3A3)

Lecture Hours	: 55	Tutorial Hours : 05
Practical Hours	:-	No. of Credits : 03
<b>Contact Hours per Semester</b>	: 60	
Contact hours per Week	:04	
Internal Marks	: 25	
External Marks	: 75	
Total Marks	: 100	

### **Objectives of the Course**

The main objective of the Course is

• to familiarize the prospective learners with mathematical structures that are fundamentally discrete.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** identify the truth table.
- CO2 understand the set theory and functions.
- **CO3** evaluate the matrices.
- **CO4** learn graph theory.
- **CO5** apply tree concepts.

	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	3	2	3	2	2	3	2	3	2
CO3	3	3	3	3	2	2	3	3	3	2
CO4	3	3	2	3	2	2	2	2	3	2
CO5	2	3	3	2	2	3	2	3	2	2
Total										
Contribu										
tion of							1			
COs to	14	14	12	14	11	12	3	13	14	11
POs and							5			
PSOs										
Weighte	93.3	93.3	80	93.3	73.3	80	86.6	86.6	93.3	73.3
d										
Percenta										
ge of										
Course										
Contribu										
tion to										
POs										
0- No Correl	ation		1-Weak		2-Moderate 3-Stron				ng	

#### U23IT-33

### **Course Content**

### Unit I Logic

Logic - introduction - connectives - truth table - Tautology implication and equivalence of formulae.

### **Unit II Set Theory**

# Set theory - Relations, equivalence relations - partial order - Function - binary operations - groups: Definition and examples - elementary properties.

### **Unit III Matrices**

Matrices: Elementary transformations - Inverse of a matrix - Rank of a matrix - Simultaneous linear equations - Cayley Hamilton theorem.

#### Unit IV Graph theory

Graph theory: Introduction -Definition and examples - degrees and sub graphs - matrices-connectedness: walks, trials and paths, connectedness and components.

### **Unit V Trees**

Eulerian graphs - Hamilton graph - Trees: characteristics of trees, centre of a tree.

### **Recommended Text**

- 1. S.Arumugam& A. ThangapandiIsaac, Modern Algebra, Scitech publications 2005.
- 2. Dr.M.K.Venkatraman, Dr.N.Sridharan, Dr.N.Chandrasekaran, *Discrete Mathematic*, National Publishing Company, 2000.
- 3. S.Arumugam and S.Ramachandran, Invitation to Graph Theory, Scitech Publications, Chennai, 2005.

UNIT I: (Text Book 1) Chapters 1,2,3.1,3.2 UNIT II: (Text Book 2) Chapter 9 UNIT III: (Text Book 1) Chapters 7.3 - 7.7 UNIT IV: (Text Book 3) Chapters 2.0,2.1, 2.2, 2.3, 2.8, 4.0, 4.1, 4.2 UNIT V : (Text Book 3) Chapters 5,6

#### **Reference Books**

- 1. Liu, C.L. Elements of Discrete Mathematics, Tata McGraw-Hill Edition .
- 2. Graham, Knuth, Patashnik, *Concrete Mathematics (Foundation for Computer Science)*, Second Edition, Pearson Education.
- 3. Semyour Lipschutz, Marc Lipson, Schaum's out lines, Discrete Mathematics, McGraw Hill Inc.
- 4. Joshi K.D. Foundations in Discrete Mathematics, New Age Publication, New Delhi.

#### Website and E-learning sources

- 1. https://www.geeksforgeeks.org/discrete-mathematics-tutorial/
- 2. https://www.javatpoint.com/discrete-mathematics-tutorial
- 3. https://brilliant.org/wiki/discrete-mathematics/
- 4. https://discrete.openmathbooks.org/

### (L-11hrs; T-1hr)

(L-11hrs; T-1hr)

#### (L-11hrs; T-1hr)

### (L-11hrs; T-1hr)

### (L-11hrs; T-1hr)

### Part-IV B.Sc. IT / Semester – III / Skill Enhancement Course SEC4(DSC): ENTREPRENEURIAL BASED - WEB DESIGNING LAB (U23IT3SP)

Lecture Hours	: -	Tutorial Hours : -
Practical Hours	: 30	No. of Credits : 02
<b>Contact Hours per Semester</b>	: 30	
Contact hours per Week	:02	
Internal Marks	: 50	
External Marks	:-	
Total Marks	: 50	
External Marks Total Marks	:- : 50	

### **Objectives of the Course**

The main objective of the Course is

• to provide students with understanding of web forms and web pages and embed audio video in an HTML page.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- CO1 know the basic concept in HTML, Concept of resources in HTML.
- **CO2** know Design concept, Concept of Meta Data, Understand the concept of save the files.
- **CO3** understand the page formatting, Concept of list.
- **CO4** create Links, Know the concept of creating link to email address.
- **CO5** understanding concept of adding images, Understand the table creation.

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	3	2	3	2	3	3	2	3	2
CO3	3	3	3	3	2	2	3	3	3	2
CO4	3	3	2	3	2	2	2	2	3	2
CO5	2	3	3	2	2	2	2	3	2	2
Total										
Contrib										
ution of										
COs to	14	14	12	14	11	12	13	13	14	11
POs and										
PSOs										
Weighte	93.3	93.3	80	93.3	73.3	80	86.6	86.6	93.3	73.3
d Domoort										
Percent										
age of										
Contrib										
ution to										
POs										
0- No Correlation			1- Wea	ık	2- N	/ Ioderate	<u> </u>	3- Stron	lg	1

### **List of Practicals**

- 1. Acquaintance with elements, Tags and basic structure of HTML files.
- 2. Practicing use of multimedia components (Image, Video & Sound) in HTML document.
- 3. Designing of webpage-Document Layout.
- 4. Designing of webpage-Working with List.
- 5. Designing of webpage-Working with Tables.
- 6. Practicing Hyper linking of web pages.
- 7. Designing of webpage- working with Frames.
- 8. Working with Background, Text and Font properties.
- 9. Working with list properties.
- 10. Designing with cascading style sheet-Internal style sheet.
- 11. Designing with cascading style sheet-External style sheet.

#### (All the practicals are compulsory)

#### **Recommended Text**

- 1. Dreamtech press, Kogent Learning, HTML in simple steps, 2010.
- 2. Murray, Tom/Lynchburg, Creating a Web Page and Web Site, 2008.

#### **Reference Books**

- 1. Laura Lemay, RafeColburn, Jennifer Kyrnin, *Mastering HTML, CSS & Javascript Web Publishing*, 2016.
- 2. DT Editorial Services (Author), HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery), Paperback, 2nd Edition,2016.

- 1. http://www.tutorialspoint.com/
- 2. https://html.com/frames/
- 3. https://www.geeksforgeeks.org/html-forms/
- 4. https://www.javatpoint.com/html-tutorial

### Part-III B.Sc. IT / Semester – IV / Core – 07: .NET PROGRAMMING (U23IT404)

Lecture Hours	: 55	Tutorial Hours : 05
Practical Hours	:-	No. of Credits : 04
<b>Contact Hours per Semester</b>	: 60	
Contact hours per Week	:04	
Internal Marks	: 25	
External Marks	: 75	
Total Marks	: 100	

### **Objectives of the Course**

The main objective of the Course is

- to give an insight of object-oriented concepts, design user experience and functional requirements C#.NET application,
- to create and manipulate GUI components in C# .NET, Design and Implement database connectivity using ADO.NET in window based application.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** learn and understand the fundamentals of C# Language Basics, Web Forms ,State management and Validation Controls.
- CO2 apply web controls into the web pages, Cookies, Configuring Session State and Using Application State.
- **CO3** analyze the web control events, AutoPostBack, using the validation controls and databases.
- **CO4** evaluate the State management, Databinding and Data Controls.
- **CO5** create a basic class, an interactive web page and the data controls.

	PO1	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	2	3	3	3	3
CO2	2	3	2	2	2	2	3	2	3	2
CO3	2	3	3	3	2	2	3	3	3	2
CO4	2	3	2	2	2	2	2	2	3	2
CO5	3	3	2	2	2	2	2	2	2	2
Total										
Contrib										
ution of	12	14	11	11	10	10				
COs to	12	14	11	11	10	10	13	12	14	11
POs and										
PSOs										
Weighte	86.6	93.3	80	93.3	66.6	66.6	86.6	80	93.3	73.3
d										
Percenta										
ge of										
Course										
Contrib										
ution to										
POs										
0- No Corre	lation		1- Wea	k		2- N	Aoderate		3- Stror	ng

### Unit I Introduction to .Net

**Introduction to .NET**: The Evolution of Web Development, The .NET Framework. **The C# Language:** C# Language Basics, Variables and Data Types, Variable Operations, Object-Based Manipulation, Conditional Logic, Loops, Methods.

**Types, Objects, and Namespaces:** The Basics About Classes, Building a Basic Class, Understanding Namespaces and Assemblies.

### **Unit II Web Form Fundamental**

**Web Form Fundamentals:** Understanding the Anatomy of an ASP.NET Application, Introducing Server Controls, Taking a Deeper Look at HTML Control Classes, Using the Page Class, Using Application Events, Configuring an ASP.NET Application.

**Web Controls:** Stepping Up to Web Controls, Web Control Classes, List Controls, Web Control Events and AutoPostBack, An Interactive Web Page.

### Unit III Error Handling, Logging, and Tracing

**Error Handling, Logging, and Tracing:** Avoiding Common Errors, Understanding Exception Handling, Throwing Your Own Exceptions, Using Page Tracing.

**State Management:** Using View State, Transferring Information Between Pages, Using Cookies, Managing Session State, Configuring Session State, Using Application State.

### **Unit IV Validation and Rich Controls**

**Validation:** Understanding Validation, Using the Validation Controls. **Rich Controls:** The Calendar, The AdRotator, Pages with Multiple Views. **Styles, Themes, and Master Pages:** Styles, Themes, Master Page Basics, Advanced Master Pages.

### **Unit V Ado.Net Fundamentals**

Understanding Databases, Understanding SQL Basics, Understanding the Data Provider Model, Using Direct Data Access. **Data Binding:** Introducing Data Binding, Using Single-Value Data Binding, Using Repeated-Value Data Binding.

**The Data Controls:** The GridView, Formatting the GridView, Selecting a GridView Row, Editing with the GridView The DetailsView and FormView.

### **Recommended Text**

1. Matthew MacDonald, *Beginning ASP.NET 4.5 in C#*, A press,2012.

#### **Reference Books**

- 1. Thuan L.Thai and Hoang Lam, O Reilly, NET Framework Essentials, 3rd Edition, 2003.
- 2. Christian Nagel, Professional C# and .NET, John Wiley & Sons Inc ,2021.
- 3. Simon Robinson, Advanced .NET Programming, ,WROX Press Ltd,2002.

### Website and E-learning sources

- 1. https://www.geeksforgeeks.org/introduction-to-net-framework
- 2. https://www.javatpoint.com/asp-net-web-form-introduction
- 3. https://www.studocu.com/in/document/university-of-mumbai/aspnet-with-c/chapter-08-error-handling-logging-and-tracing
- 4. https://www.c-sharpcorner.com/UploadFile/puranindia/validation-controls-in-Asp-Net
- 5. https://docs.microsoft.com/en-us/dotnet/framework/data/adonet
- 6. https://www.c-sharpcorner.com/UploadFile/0fd387/data-controls-in-Asp-Net.

#### U23IT-37

### (L-11hrs; T-1hr)

(L-11hrs; T-1hr)

# (L-11hrs; T-1hr)

## (L-11hrs; T-1hr)

### (L-11hrs; T-1hr)

### Part-III B.Sc. IT/Semester – IV / Core-08 (Core Lab – 4): .NET PROGRAMMING LAB (U23IT4P4)

Lecture Hours	:-	Tutorial Hours : -
Practical Hours	: 60	No. of Credits : 04
<b>Contact Hours per Semester</b>	: 60	
Contact hours per Week	:04	
Internal Marks	: 40	
External Marks	: 60	
Total Marks	: 100	

#### **Objectives of the Course**

The main objective of the Course is

• to enable the students design and develop programs in C#.Net using Web controls &ADO access.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** understand the variables and data types, conditional logic, loops and for Object oriented concepts of C#.
- **CO2** use the different types of web controls.
- **CO3** analyze the state management concept, Rich Control and AdRotator control.
- **CO4** evaluate the validation operation
- **CO5** create interactive web pages.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	3	3	2	2	3	3	3	3
CO2	2	3	3	3	2	2	3	2	3	2
CO3	3	3	3	2	2	3	2	3	3	2
CO4	3	3	3	3	3	2	2	2	3	2
CO5	3	3	2	3	2	2	2	3	2	2
Total Contrib ution of COs to POs and PSOs	14	14	14	14	11	11	12	13	14	11
Weighte d Percenta ge of Course Contrib ution to POs	93.3	93.3	93.3	93.3	73.3	73.3	80	80	93.3	73.3

### PART A

### **List of Practicals**

- 1. Write C# programs for understanding C# basics involving Conditional Logic and Loops
- 2. Write C# programs for Object oriented concepts of C# Program using classes and Objects
- 3. Write a Program to generate the Login control.
- 4. Write a program using Web Control Events and using AutoPostBack.
- 5. Write a program to create an Interactive Web Pages.
- 6. Write a program using Exception Handling.
- Design ASP.NET Pages for State Management usinga. Cookiesb. Session Statec. Application State
- 8. Write a Program to using Rich Control and AdRotator control.
- 9. Write a Program to display the selected date in the calendar.
- 10. Write a Program to perform validation operation.
- 11. Design the Master Page and apply the various styles and themes.
- 12. Write a Program to create link in data list.
- 13. Write a Program to display how data bind using dropdown list.
- 14. Write a Program to implement paging concept data grid and dataset.
- 15. Create Student Mark List using SQL Provider.

### (All the practicals are compulsory)

#### **Recommended Text**

1. Matthew MacDonald, Beginning ASP.NET 4.5 in C#, A press, 2012.

#### **Reference Books**

- 1. Thuan L.Thai and Hoang Lam, O'Reilly, NET Framework Essentials, 3rd Edition, 2003.
- 2. Christian Nagel, Professional C# and .NET, John Wiley & Sons Inc, 2021.
- 3. Simon Robinson, Advanced .NET Programming, WROX Press Ltd,2002.

- 1. https://www.geeksforgeeks.org/introduction-to-net-framework.
- 2. https://www.javatpoint.com/asp-net-web-form-introduction.
- 3. https://www.studocu.com/in/document/university-of-mumbai/aspnet-with-c/chapter-08-error-handling-logging-and-tracing.

# <u>PART –B</u> <u>MINI PROJECT WORK</u>

#### **Instructions**:

- A team of 5-6 members will be formed as a group.
- Each group should select a minimum of one project from the listed topics and complete the project using any one of the platforms listed below

### **List of Platforms**

- ≻ C
- ➤ Java
- > RDBMs
- ► .NET

### **List of Projects**

### **Topics**

- 1. Online student's attendance monitoring system.
- 2. Bus Ticket Reservation and Cancelation Technique.
- 3. Employee Leave Maintenance.
- 4. Functionality Website for Employee.
- 5. Multi Store Transaction Portal.
- 6. Students Database Management.
- 7. Hospital Management Database.
- 8. Chat application.
- 9. Online Library Management System.
- 10. Currency Converter.
- Students are encouraged to take any number of projects listed above if they desire so.

### Part-III B.Sc. IT / Semester – IV / Elective Generic -4: IOT AND ITS APPLICATIONS (U23IT4A4)

Lecture Hours	: 55	Tutorial Hours : 04
Practical Hours	:-	No. of Credits : 03
<b>Contact Hours per Semester</b>	: 60	
<b>Contact hours per Week</b>	:04	
Internal Marks	: 25	
External Marks	:75	
Total Marks	: 100	

### **Objectives of the Course**

The main objective of the Course is

- to learn fundamentals of IOT and to build hardware and software for IOT based systems..
- to connect people to physical things and also physical things to other physical things all in real time.
- to introduce some of the application areas where Internet of Things can be applied.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** understand the various concepts, terminologies and architecture of IoT systems.
- CO2 use sensors and actuators for designing IoT.
- CO3 understand and apply various protocols for designing IoT systems.
- **CO4** perform analytics on data streams.
- **CO5** create various applications of IoT.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	3	2	3	3	2	3	3	3	3
CO2	2	3	2	3	2	2	2	3	3	2
CO3	2	2	2	3	3	3	2	3	3	3
CO4	2	2	2	3	3	3	3	2	3	2
CO5	2	2	2	2	3	2	3	3	2	2
Total										
Contribut										
ion of	11	10	10	14	14	10	12	14	14	10
COs to	11	12	10	14	14	12	15	14	14	12
POs and										
PSOs										
Weighted	73.3	80	66.6	93.3	93.3	80	86.6	93.3	93.3	80
Percentag										
e of										
Course										
Contribut										
ion to										
POs										
0- No Correla	ation		1- Weak		•	2- Moder	ate	3- 9	Strong	•

### Unit I Fundamentals of IOT

Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Architectures, Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, About Things in IoT, The Identifiers in IoT, About the Internet in IoT, IoT frameworks, IoT and M2M.

### Unit II Sensors Networks

Sensors Networks: Definition, Types of Sensors, Types of Actuators, Examples and Working, IoT Development Boards: Arduino IDE and Board Types, RaspberriPi Development Kit, RFID Principles and components, Wireless Sensor Networks: History and Context, The node, Connecting nodes, Networking Nodes, WSN and IoT.

### **Unit III Wireless Technologies for IOT**

Wireless Technologies for IoT: WPAN Technologies for IoT: IEEE 802.15.4, Zigbee, HART, NFC, Z-Wave, BLE, Bacnet, Modbus. IP Based Protocols for IoT IPv6, 6LowPAN, RPL, REST, AMPO, CoAP, MQTT. Edge connectivity and protocols

### **Unit IV Data Handling & Analytics:**

Data Handling& Analytics: Introduction, Bigdata, Types of data, Characteristics of Big data, Data handling Technologies, Flow of data, Data acquisition, Data Storage, Introduction to Hadoop. Introduction to data Analytics, Types of Data analytics, Local Analytics, Cloud analytics and applications.

### **Unit V IOT Applications**

IoT APPLICATIONS: IoT Applications for Value Creations Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management

### **Recommended Text**

- 1. Hakima Chaouchi, The Internet of Things Connecting Objects to the Web, ISBN: 978-1-84821-140-7, Wiley Publications.
- 2. Olivier Hersent, David Boswarthick, and Omar Elloumi, The Internet of Things: Key Applications and Protocols, WileyPublications.
- 3. Vijay Madisetti and ArshdeepBahga, Internet of Things (A Hands-on-Approach), 1<sup>st</sup> Edition, VPT, 2014.
- 4. J. Biron and J. Follett, Foundational Elements of an IoT Solution, O'Reilly Media, 2016.
- 5. Keysight Technologies, The Internet of Things: Enabling Technologies and Solutions for Design and Test, Application Note, 2016.

### **Reference Books**

- 1. Michael Miller, The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World, kindle version.
- 2. Daniel Minoli, Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications, ISBN: 978-1-118-47347-4, Willy Publications.
- 3. Pethuru Raj and Anupama C. Raman, The Internet of Things: Enabling Technologies, Platforms, and Use Cases, CRC Press

### (L-11hrs; T-1hr)

(L-11hrs; T-1hr)

(L-11hrs; T-1hr)

(L-11hrs; T-1hr)

(L-11hrs; T-1hr)

# U23IT-42

- 1. https://www.simplilearn.com
- 2. https://www.javatpoint.com
- 3. https://www.w3schools.com
- 4. https://onlinecourses.nptel.ac.in/noc17\_cs22/course
- 5. http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot\_prot/index.html

### Part-IV B.Sc. IT/Semester – IV / Skill Enhancement Courses / SEC5 / (DSC): QUANTITATIVE APTITUDE (U23IT4S3)

L	ecture Hours	: 25	Tutorial Hours : 05	
Р	ractical Hours	:-	No. of Credits : 02	
C	Contact Hours per Semester	: 30		
C	Contact hours per Week	:02		
I	nternal Marks	: -		
E	External Marks	: 50		
Т	'otal Marks	: 50		

#### **Objectives of the Course**

The main objective of the Course is

• to demonstrate various principles involved in solving Mathematical problems and thereby reducing the time taken for performing job functions.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** solve problems related HCF & LCM of numbers and Decimal Fractions.
- **CO2** analyze the Square roots and Cube roots, Average, Problems on ages.
- **CO3** analyze the difference between problems on percentages, profit and loss.
- **CO4** learn the basic concepts of Time and work, Time and distance.
- **CO5** create sequences and series in the form of arithmetic and geometric progressions.

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	3	2	3	2	2	3	2	3	2
CO3	3	3	3	3	2	2	3	3	3	2
CO4	2	3	2	3	2	2	2	2	3	2
CO5	2	3	3	2	2	2	2	3	2	2
Total										
Contribu										
tion of										
COs to	13	14	12	14	11	11	13	13	14	11
POs and										
PSOs										
Weighte	86.6	93.3	80	93.3	73.3	73.3	86.6	86.6	93.3	73.3
d										
Percenta										
ge of										
Course										
Contribu										
tion to										
POs										
0- No Correl	ation		1- Weak			2- Moder	ate	3	<b>3-</b> Strong	

Unit I Numbers Numbers - HCF & LCM of numbers – Decimal Fractions	(L-5hrs; T-1hr)
Unit II Average Square roots and Cube roots- Average – Problems on ages.	(L-5hrs; T-1hr)
Unit III Profit and Loss Percentage – Profit and Loss – Ratio and Proportion.	(L-5hrs; T-1hr)
<b>Unit IV Time and Work</b> Time and Work – Time and Distance.	(L-5hrs; T-1hr)

### **Unit V Arithmetic Progression**

(L-5hrs; T-1hr)

Arithmetic progression: nth term of A.P sum to n terms of an A.P Geometric Progression. 'nth term of G.P sum to n terms of an G.P and in finite terms of G.P

#### **Recommended Text**

1. Aggarwal, R.S. Quantitative Aptitude, S. Chand & Company Ltd, New Delhi, Reprint 2011.

#### **Reference Books**

- 1. Praveen, R.V. Quantitative Aptitude and reasoning, PHI Learning, 2<sup>nd</sup>Edition 2013.
- 2. Tyra, M. Magical book on Quicker Maths, BSC Publishing Co. Pvt.Ltd, Delhi. Reprint, 2011.
- 3. Abhijit Guha, *Quantitative Aptitude for Competitive Exams*, TataMc Graw Hill Company, New Delhi. 4<sup>th</sup> Edition.

- 1. https://www.javatpoint.com/aptitude/
- 2. https://www.indiabix.com/aptitude/questions-and-answers/
- 3. https://www.amazon.in/Quantitative-Aptitude-Competitive-Examinations-Revised/
- 4. https://www.geeksforgeeks.org/quantitative-aptitude/

### Part-IV B.Sc. IT/ Semester – IV / Skill Enhancement Courses (DSC) SEC6: IOT LAB (U23IT4SP)

Lecture Hours : 30		Tutorial Hours : -	
Practical Hours :-		No. of Credits : 02	
<b>Contact Hours per Semester</b>	: 30		
Contact hours per Week	:02		
Internal Marks : -			
External Marks : 50			
Total Marks : 50			

#### **Objectives of the Course**

The main objective of the Course is

• to identify all techniques of software development and demonstrate these techniques by solving variety of problems spanning the breadth of the language.

### **Course Learning Outcomes (for Mapping with POs and PSOs)**

On completion of the Course, the students will be able to

- **CO1** learn the concepts of arduino .
- **CO2** apply the interfacing arduino with lcd and led.
- **CO3** examine the light and gas sensor.
- **CO4** review the data visualization and analytics .
- **CO5** develop real time applications using Arduino.

	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	3	2	3	2	2	3	2	3	2
CO3	3	3	3	3	2	2	3	3	3	2
CO4	3	3	2	3	2	2	2	2	3	2
CO5	2	3	3	2	2	2	2	3	2	2
Total Contrib ution of COs to POs and PSOs	14	14	12	14	11	11	13	13	14	11
Weight ed Percent age of Course Contrib ution to POs	93.3	93.3	80	93.3	73.3	73.3	86.6	86.6	93.3	73.3

### **List of Practicals**

- 1. Write a python program to demonstrate different number datatypes.
- 2. Write a python program to arithmetic operations.
- 3. Write a python program for looping statement.
- 4. Interfacing Arduino with LCD.
- 5. Ultrasonic Sensor and buzzer with Arduino.
- 6. Write a program for monitor temperature using Arduino.
- 7. Program using Arduino IDE for blink LED.
- 8. Program for RGB LED using Arduino
- 9. Gas sensor detector with Arduino.

### (All the practicals are compulsory)

#### **Recommended Text**

- 1. Arshdeep Bahga, Vijay Madisetti, Internet of Things-A Hands –on Approach.
- 2. OLIVIER HERSENT, DAVID BOSWARTHICK, OMAR ELLOUMI, *The Internet of Things*.
- 3. Vlasios Tslatsis, Stamatis Karnouskes, Jan Holler, David Boyle, Catherine , *Internet of Things Technologies and Applications for a new Age of Intelligence*, Second Edition.

#### **Reference Books**

- 1. Honbo Zhou, The Internet of Things in the Cloud: A Middleware Perspective, CRC Press, 2012.
- 2. 2. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), Architecting the Internet of Things, Springer, 2011.
- 3. David Easley and Jon Kleinberg, *Networks, Crowds, and Markets: Reasoning About a Highly Connected World*, Cambridge University Press, 2010.
- 4. Olivier Hersent, David Boswarthick, Omar Elloumi , *The Internet of Things Key applications and Protocols*, Wiley, 2012.
- 5. Vijay Madisetti and ArshdeepBahga, Internet of Things (A Hands-on-Approach),1st Edition, VPT, 2014.
- 6. Francis daCosta, *Rethinking the Internet of Things A Scalable Approach to Connecting Everything*", 1st Edition, Apress Publications, 2013.
- 7. CunoPfister, *Getting Started with the Internet of Things*, OReilly Media, 2011.

- 1. http://www.beechamresearch.com/download.aspx?id=18
- 2. http://www.idc.com/getdoc.jsp?containerId=prUS25658015
- 3. https://www.abiresearch.com/press/the-internet-of-things-will-drive-wireless-connect/
- 4. http://grouper.ieee.org/groups/2413/
- 5. https://www.iotivity.org
- 6. http://www.iiconsortium.org/IIRA.htm
- 7. http://openinterconnect.org/oic-news-releases/open-interconnect-consortium-forms-liaisonwith-the-industrial-internet-consortium-to-accelerate-iot-standards/
- 8. https://en.wikipedia.org/wiki/Internet\_of\_things