

ANNEXURE

12

Program and Course Structure

B.Sc(Honors) in Computer Science

1. Standard Structure of the Program at University Level

1.1 Vision, Mission and Core Values of the University

Vision of the University

To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.

Mission of the University

- 1. Transformative educational experience**
- 2. Enrichment by educational initiatives that encourage global outlook**
- 3. Develop research, support disruptive innovations and accelerate entrepreneurship**
- 4. Seeking beyond boundaries**

Creative Campaign Can be TEDs: This is guiding principle for promotion and wide circulation among various stakeholder.

Guidelines: Similar Mnemonics can be designed by schools.

Core Values

- Integrity**
- Leadership**
- Diversity**
- Community**

Note: Detailed Mission Statements of University can be used for developing Mission Statements of Schools/ Departments.

1.2 Vision and Mission of the School

Vision of the School

To become a globally acclaimed institution of higher learning in engineering and technology promoting excellence in research, innovation and entrepreneurship

Mission of the School

- 1. To impart quality education with strong industry & academic connectivity in the expanding fields of Engineering and Technology in a conducive and enriching learning environment.**
- 2. To product technocrats equipped with technical & soft skills and experiential learning required to stay current with the modern tools in emerging technologies to fulfill professional responsibilities and uphold ethical values.**
- 3. To inculcate a culture of interdisciplinary research, innovation and entrepreneurship to provide sustainable solutions to meet the growing challenges and societal needs.**
- 4. To foster collaborative learning and to play adaptive leadership role in professional career and pursuit of higher education through effective**

1.2.1 Vision and Mission of the Department

Vision of the Department

To be known and recognized as the fountainhead of excellence in technical knowledge and research in computer science and engineering, and draw to it the students and scholars across nations.

Mission of the Department

1. To facilitate and foster the academia industry collaboration to enhance entrepreneurship skills and acquaintance with corporate culture.
2. To strengthen core competences of students to be successful, ethical , effective problem solver in Computer Science & Engineering through analytical learning
3. To promote research based activities in emerging areas of technology convergence.
4. To induce moral values and spirit of social commitment.

1.3 Programme Educational Objectives (PEO)

1.3.1 Writing Programme Educational Objectives (PEO)

The Educational Objectives of UG Program in Computer Science Engineering are:

PEO1 : The Graduate will ensconce himself/herself as effective professionals by solving real life problems using exploratory and analytical skills along with the knowledge acquired in the field of Computer Science and Engineering.

PEO2 : The Graduate will demonstrate his/her ability to accustom to rapidly changing environment in advanced areas of Computer Science and scale new height in their profession through lifelong learning.

PEO3 : The Graduate will have the ability to work and communicate effectively as a team member or leader to complete the task with minimal resources, meeting deadlines.

PEO4 : The Graduate will embrace professional code of ethics in the profession while deliberately being part of projects which contributes to the society at large without disturbing the ecological balance.

Methods of Forming PEO's

- STEP 1: The needs of the Nation and society are identified through scientific publications, industry interaction and media.
- STEP 2. Taking the above into consideration, the PEOs are established by the coordination Committee of the department.
- STEP 3. The PEOs are communicated to the alumni and their suggestions are obtained.
- STEP 4. The PEOs are communicated to all the faculty members of the department and their feedback is obtained.
- STEP 5. The PEOs are then put to the Board of Studies of the department for final approval.

[Note: Prepare a file for the same, how you arrive for PEO's]

1.3.2 Map PEOs with School Mission Statements:

PEO Statements	School Mission 1	School Mission 2	School Mission 3	School Mission 4
PEO1:	3	3	2	2
PEO2:	2	3	2	1
PEO3:	2	2	2	3
PEO4:	2	1	3	1

Enter correlation levels 1, 2, or 3 as defined below:

- 1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)**

If there is no correlation, put “-“

1.3.2.1 Map PEOs with Department Mission Statements:

PEO Statements	Department Mission 1	Department Mission 2	Department Mission 3	Department Mission 4
PEO1:	2	3	2	1
PEO2:	1	3	3	1
PEO3:	3	2	1	1
PEO4:	1	2	2	3
PEO5:	2	3	2	1

Enter correlation levels 1, 2, or 3 as defined below:

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

If there is no correlation, put “-“

1.3.3 Program Outcomes (PO's)

PO1: Communication-Students will be able to communicate in written and oral forms in such a way as to demonstrate their ability to present information clearly, logically, and critically.

PO2: Mathematics and Theory-Students will be able to apply mathematical and computing theoretical concepts in solution of common computing applications, such as computing the order of an algorithm.

PO3: Programming-Students will be able to complete successfully be able to program small-to-mid-size programs on their own. Sufficient programming skills will require use of good practice, e.g., good variable names, good use of computational units, appropriate commenting strategies.

PO4: Systems Design and Engineering-Students will be able to use appropriately system design notations and apply system design engineering process in order to design, plan, and implement software systems

PO5: Depth of Knowledge-In a self-selected area of depth in Computing, students will demonstrate a depth of knowledge appropriate to graduate study and/or lifelong learning in that area. Students should be able to read for understanding materials in that area beyond those assigned in coursework.

PO6: Preparation for Career-Students will be prepared for a career in an information technology-oriented business or industry, or for graduate study in computer science or other scientific or technical fields.

PSO1: Effectively communicating computing concepts and solutions to bridge the gap between computing industry experts and business leaders to create and initiate innovation

PSO2: Effectively utilizing their knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.

PSO3: Exhibiting their computing expertise within the computing community through corporate leadership, entrepreneurship, and/or advanced graduate study

PSO4: Developing and implementing solution based systems and/or processes that address issues and/or improve existing systems within in a computing based industry.

1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

Mapping	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	2	3	2	3	3
PO2	2	3	3	3	2
PO3	3	2	3	3	3
PO4	2	1	3	1	3
PO5	2	3	3	2	1
PO6	2	2	2	3	2

1. Slight (Low)

2. Moderate (Medium)

3. Substantial (High)

School of Engineering and Technology
B.Sc(Honors) in Computer Science
Batch: 2018 Onwards
TERM: I

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Remarks
				L	T	P		
THEORY SUBJECTS								
1.	16015	BCO101	Introduction to C Programming	3	0	0	3	NEW
2.	16016	BCO102	Basics of Digital Electronics	3	0	0	3	NEW
3.	16017	BCO103	Fundamental of Information Technology	3	0	0	3	NEW
4.	25046	EVS105	Environmental Studies	2	0	0	2	
5.	30059	MSM101	Foundation course in Mathematics	3	1	0	4	NEW
Practical/Viva-Voce/Jury								
6.	16018	BOL101	Introduction to C Programming Lab	0	0	2	1	NEW
7.	16019	BOL102	Basics of Digital Electronics Lab	0	0	2	1	NEW
8.	15987	FEN101	Functional English Beginners-I	0	0	2	1	NEW
9.	15988	FEN103	Functional English Intermediate-I	0	0	2		NEW
10.	15228	ENP 102	Functional English-I Lab	0	0	2	1	
TOTAL CREDITS							19	

School of Engineering and Technology
B.Sc(Honors) in Computer Science
Batch: 2018 Onwards
TERM: II

S. No.	Paper ID	Course Code	Course	Teaching Load			Credits	Pre-Requisite/Co Requisite
				L	T	P		
THEORY SUBJECTS								
1.		BCO104	Advance Concept in C Programming	3	0	0	3	
2.		BCO105	Computer Hardware and Trouble Shooting	3	0	0	3	
3.		HMM303	Organizational Behavior	3	0	0	3	
4.		BCO106	System Analysis & Design	3	0	0	3	
5.		MSM312	Discrete Mathematics	3	1	0	4	
Practical/Viva-Voce/Jury								
6.		BOL163	Advance Concept in C Programming Lab	0	0	2	1	
7.		BOL164	Computer Hardware and Trouble Shooting Lab	0	0	2	1	
8.		FEN102	Functional English Beginners-II	0	0	2	1	
9.		FEN104	Functional English Intermediate-II	0	0	2		
10.	15332	ENP103	Functional English-II Lab	0	0	2	1	
TOTAL CREDITS							20	

School of Engineering and Technology
B.Sc(Honors) in Computer Science
Batch: 2018 Onwards
TERM: III

S. No.	Paper ID	Course Code	Course	Teaching Load			Credits	Pre-Requisite/Co Requisite
				L	T	P		
THEORY SUBJECTS								
1.		BCO201	Computer Organization	3	0	0	3	
2.		BCO202	Operating Systems	3	1	0	4	
3.		BCO203	Web and Its Application	3	0	0	3	
4.		BCO204	Principles of Data Structures	3	1	0	4	
5.		HMM111	Values and Ethics	2	0	0	2	
Practical/Viva-Voce/Jury								
6.		BOL201	Computer Organization Lab	0	0	2	1	
7.		BOL203	Web and Its Application Lab	0	0	2	1	
8.		BOL204	Principles of Data Structures Lab	0	0	2	1	
9.		BOL201	Introduction to LINUX	0	0	2	1	
TOTAL CREDITS							20	

School of Engineering and Technology
B.Sc(Honors) in Computer Science
Batch: 2018 Onwards
TERM: IV

S. No.	Paper ID	Course Code	Course	Teaching Load			Credits	Pre-Requisite/Co Requisite
				L	T	P		
THEORY SUBJECTS								
1.		BCO205	Basics of Computer Network	3	1	0	4	
2.		BCO206	Database Management Systems	3	0	0	3	
3.		BCO207	Web Designing	3	1	0	4	
4.		BCO208	Introduction to Software Engineering	3	0	0	3	
5.		ENG202	Communication practices -I	2	0	0	2	
Practical/Viva-Voce/Jury								
6.		BOL205	Database Management Systems Lab	0	0	2	1	
7.		BOL207	Web Designing Lab	0	0	2	1	
8.		ENG202/E NP202	Communication practices -I	0	0	2	1	
TOTAL CREDITS							19	

School of Engineering and Technology
B.Sc(Honors) in Computer Science
Batch: 2018 Onwards
TERM: V

S. No.	Paper ID	Course Code	Course	Teaching Load			Credits	Pre-Requisite/Co Requisite
				L	T	P		
THEORY SUBJECTS								
1.		BCO301	Introduction to OOP using Java	3	1	0	4	
2.		BCO302	Client Server Computing	3	1	0	4	
3.			Program Elective -1	3	1	0	4	
4.			Program Elective-2	3	1	0	4	
5.		BCO303	Multimedia & Animation	3	1	0	4	
Practical/Viva-Voce/Jury								
6.		BOL301	Introduction to OOP using Java	0	0	2	1	
TOTAL CREDITS							21	

School of Engineering and Technology
B.Sc(Honors) in Computer Science
Batch: 2018 Onwards
TERM: VI

S. No.	Paper ID	Course Code	Course	Teaching Load			Credits	Pre-Requisite/Co Requisite
				L	T	P		
THEORY SUBJECTS								
1.		BCO304	Introduction to PHP	3	0	0	3	
2.		BCO305	Information Security	3	1	0	4	
3.			Program Elective -4	3	0	0	3	
4.			Program Elective-3	3	0	0	3	
Practical/Viva-Voce/Jury								
5.		BOL304	Introduction to PHP	0	0	2	1	
6.		BCA399	Project	0	0	14	7	
TOTAL CREDITS							21	

DEPARTMENTAL ELECTIVE LIST BSc. CS BATCH 2018-2022

DE-1	DE-2	DE-3	DE-4
Computer Graphics BCO 307	Multimedia & Animation BCO303	Python Programming BCO309	Data Encoding and Compression BCO311
Ecommerce BCO 306	Introduction to Distributed System BCO308	ERP BCO310	Introduction to Cloud BCA312

School: SET		Batch : 2018	
Program: BSc		Current Academic Year:	
Branch: CS/IT		Semester: 1	
1	Course Code	BCO101	Course Name: Introduction to C programming
2	Course Title	Introduction to C programming	
3	Credits	4	
4	Contact Hours (L-T-P)	3-0-2	
	Course Status	UG	
5	Course Objective	1. Learn basic programming constructs –data types, decision structures, control structures in C 2. learning logic aptitude programming in c language 3. Developing software in c programming	
6	Course Outcomes	Students will be able to: CO1: Understand core concept of c Programming CO2: Implement Array and String CO3: Implement Functions CO4: Use Union and Structure CO5: Understand and implement Pointers	
7	Course Description	Basic concepts of C programming, logic building in C programming	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	A	Introduction How to develop a program, Algorithms, Flow-charts, Types of Programming Languages,	CO1,
	B	Compiler and Linker,	CO1
	C	Testing and Debugging a program, Documentation	CO1
	Unit 2	Constants, Variables & Data Types	
	A	Identifiers and Keywords, Constants, Variables, Data types, Declaration of variables,	CO2
	B	declaration of storage class, assigning values to variables, defining symbolic constants, declaring a variable as constant, declaring a variable as volatile,.	CO2
	C	overflow and underflow of data	CO2
	Unit 3	Operators & Expressions	
	A	Arithmetic operators, Relational, Logical operators, Assignment, increment and decrement operators,	CO3
	B	conditional operators, bitwise	CO3

		operators, special operators, arithmetic expressions, evaluation of arithmetic expressions, precedence of arithmetic expressions							
	C	type conversion in expressions, operator precedence and associativity, mathematical functions.	CO3						
	Unit 4	Decision Making – Branching & Looping							
	A	Decision making with IF statement, switch statement, ? : operator	CO4						
	B	While statement, do-while statement,	CO4						
	C	for statement, Jumps in loops,	CO4						
	Unit 5	Functions							
	A	Top down approach of problem solving	CO5						
	B	standard library functions, passing values between functions, scope rules of functions	CO5						
	C	Function calling, return type of functions, call by value and call by reference, recursive functions.	CO5						
	Mode of examination	Theory							
	Weightage Distribution	<table><tr><td>CA</td><td>MTE</td><td>ETE</td></tr><tr><td>30%</td><td>20%</td><td>50%</td></tr></table>	CA	MTE	ETE	30%	20%	50%	
CA	MTE	ETE							
30%	20%	50%							
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. <i>The C Programming Language</i>							
	Other References	<div><div>1. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004.</div><div>2. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999</div></div>							

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Understand core concept of c Programming	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5

2.	CO2: Implement Array and String	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
3.	CO3: Implement Functions	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
4.	CO4: Use Union and Structure	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
5.	CO5: Understand and implement Pointers	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5

PO and PSO mapping with level of strength for Course Name Introduction to C Programming (Course Code BCO101)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	-	-	-	-	-	-	-	2	1	3	2	2	1	2
CO2	3	2	3	-	-	-	-	-	-	-	2	1	3	2	2	1	2
CO3	3	2	3	-	-	-	-	-	-	-	1	1	2	3	2	1	2
CO4	3	2	3	-	-	-	-	-	-	-	3	2	3	2	1	1	1
CO5	3	2	3	-	-	-	-	-	-	-	3	1	2	2	2	1	3

School: SET		Batch: 2018
Program: B.Sc.		Current Academic Year: 2018-19
Branch: CS/it		Semester: I
1	Course Code	BOL-101
2	Course Title	Introduction to C programming Lab
3	Credits	1
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Compulsory
5	Course Objective	4. Learn basic programming constructs –data types, decision structures, control structures in C 5. learning logic aptitude programming in c language 6. Developing software in c programming
6	Course Outcomes	Students will be able to: CO1: Understand core concept of c Programming CO2: Implement Array and String CO3: Implement Functions CO4: Show Union and Structure

		CO5: Understand and implement Pointers		
7	Course Description	Programming for problem solving gives the Understanding of C programming and implement code from flowchart or algorithm		
8	Outline syllabus	CO Mapping		
	Unit 1	Introduction		CO1
		Write a c program to swap two numbers		
		Write a c Program to Add Two Integers		
		Write a program to create a calculator		CO1
	Unit 2	Constants, Variables & Data Types		CO1, CO2
		Write a c program to convert length meter to cm		
		Write a c program to convert temp		
		Write a c program to swap two numbers		
	Unit 3	Operators & Expressions		CO1, CO2
		Write a c program to calculate interest , for p, r & t		
		Write a c program to calculate area & circumference of triangle		CO1, CO2
		Write a c program to calculate area of rectangle		CO1, CO2
	Unit 4	Decision Making – Branching & Looping		CO3, CO5
		Write a c program to find a given number is even or not		
		Write a c program to check whether given year is leap year or not		CO3, CO5
	Unit 5	Functions		CO4
		Write a c program to create a function to count number of vowels in a string		
		Write a function to calculate factorial of a number		
		Write a recursive function for Fibonacci series		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	MTE	ETE
		60%	0%	40%
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. <i>The C Programming Language</i>		
	Other References	3. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004. 4. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999		

Course outline

This course implements array and pointer and Recursive applications. The course talks primarily about Array, string, functions, structure & union and Pointers etc.

Course Evaluation

Attendance	None
Any other	CA judged on the practicals conducted in the lab , weightage may be specified
References	
Text book	Kernighan, Brian, and Dennis Ritchie. <i>The C Programming Language</i>
Other References	<ol style="list-style-type: none"> 1. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004. 2. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999
Softwares	Turbo C

School: SET		Batch : 2018	
Program: BSc		Current Academic Year: 2018-19	
Branch: CS/IT		Semester:I	
1	Course Code	BCO102	Course Name:
2	Course Title	Basics of Digital Electronics	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status		
5	Course Objective	To provide students with an overview of digital electronics that forms the basic foundation of digital computer. It includes the number system, binary logic circuit and k-maps, evaluating circuit designs within the context of digital and combinational circuits.	
6	Course Outcomes	After the successful completion of the course, the student will: <ol style="list-style-type: none"> 1) Understand the basic concepts of digital electronics and number system. Convert numbers between decimal, binary, octal, and hexadecimal number systems. 2) Define the basic logic operations; AND, OR, NAND, NOR, INVERTER and flip-flop circuits. Predict the output response as either an 	

		expression or truth-table. 3) To evaluate and simplify using Boolean algebra and/or Karnaugh mapping techniques, sum of products (SOP) and product of sums (POS) that helps in simplifying the derivation of the function to be implemented. 4) Identify combinatorial logic circuits and sequential logic circuits, and explain their operation.
7	Course Description	This course covers the core concepts of digital electronics that include AND, OR, NAND, NOR, NOT logic functions and integrated circuits, combinational and sequential logic circuits. The course also provides a study of Boolean algebra, binary and hexadecimal number systems, binary codes, and the analysis of the basic components and circuits used in semiconductor switching.
8	Outline syllabus	CO Mapping
	Unit 1	Introduction to Number System
	A	Number System Concepts- Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System
	B	Conversion from One Number System to another.
	C	Arithmetic Operation without Changing the Base, 1's Complement and 2's Complement.
	Unit 2	Logic Gates
	A	AND, OR, NOT, NAND, NOR, XOR, XNOR
	B	NAND & NOR as Universal Gates
	C	Logic Gates Applications
	Unit 3	Boolean Algebra
	A	Introduction, Theorems, Simplification of Boolean Expression using Boolean Algebra
	B	SOP & POS Forms, Realization of Boolean Expression using Gates
	C	K-Maps, Simplification of Boolean Expression using K-Maps.
	Unit 4	Combinational Logic Circuits
	A	Half Adder & Half Subtractor, Full Adder & Full Subtractor, Parallel Binary Adder, Binary Adder/Subtractor.
	B	Multiplexers & Demultiplexers, Implementation of Boolean equations using Multiplexer and Demultiplexer
	C	Encoders & Decoders
	Unit 5	Sequential Logic Circuits
	A	Latch, Flip Flops- R-S Flip-Flop, J-K Flip-Flop
	B	Master-Slave J-K Flip-Flop, Race Condition, Removing Race Condition
	C	D Flip-Flop, T Flip-Flop, Applications of Flip-Flops

	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Moris Mano, "Digital Logic and Computer Design", PHI Publications, 2002 2. Fundamental of Computers – By V.Rajaraman B.P.B. Publications			
	Other References	1. Digital Electronics (TMH) 1998 : Malvino and Leach 2. Computer Organization and Architecture : William Stallings			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Understand the basic concepts of digital electronics and number system. Convert numbers between decimal, binary, octal, and hexadecimal number systems	PO1,PO2,PO3, PO6, PSO1
2.	CO 2: Describe the basic logic operations; AND, OR, NAND, NOR, INVERTER and flip-flop circuits. Predict the output response as either an expression or truth-table.	PO1,PO2,PO3,PO5,PO6, PO12, PSO1,PSO2
3.	CO 3: Given a digital circuit, expression or truth table, evaluate and simplify using Boolean algebra and/or Karnaugh mapping techniques, sum of products (SOP) and product of sums (POS) that helps in simplifying the derivation of the function to be implemented.	PO1,PO2, PO3, PO4, PO10, PO12, PSO1,PSO2
4.	CO 4: Identify combinatorial logic circuits and sequential logic circuits, and explain their operation.	PO1,PO2, PO3,PO4, PO5, PO6, PO8, PO9, PO10, PO12 PSO1, PSO3, PSO4

PO and PSO mapping with level of strength for Course Name Basics of Electronics (Course Code BCO102)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
	CO1	3	3	2	-	-	1	-	-	-	-	-	-	2	-	-	-
	CO2	3	3	3	-	3	2	-	-	-	-	-	3	3	3	-	2
	CO3	3	3	2	2	-	-	-	-	-	2	-	1	2	3	-	2
	CO4	3	3	2	3	3	3	-	2	2	3	-	3	3	-	2	3

School: SET		Batch : 2018	
Program: B.Sc		Current Academic Year:	
Branch: CS/IT		Semester: I	
1	Course Code	BCO103	Course Name-
2	Course Title	Fundamentals of Information Technology	
3	Credits	4	
4	Contact Hours (L-T-P)	3-0-2	
	Course Status		
5	Course Objective	1. The main objective is to introduce IT in a simple language to all undergraduate students, regardless of their specialization. 2. The focus of the subject is on introducing skills relating to IT basics, computer applications 3. To understand the basic knowledge of computer	
6	Course Outcomes	Students will be able to: CO1: Have a basic understanding of personal computers and their operations. CO2: be able to identify computer hardware components and describe their function; CO3: be able to identify computer hardware components and describe their function; CO4: Understand basic concepts computer arithmetic	
7	Course Description	The course Fundamentals of Information Technology has become essential the present age of computer technology and information, as the applications of information technology can be found in all aspects of our lives.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Computers	
	A	Characteristics of Computers, Evolution of computers, Capabilities and limitations of computers, Generations of computers, Types of computers(micro, mini, main frame, supercomputers),	CO1, CO2
	B	Block diagram of computer, Basic components of a computer system- Input unit, output unit, Arithmetic logic Unit, Control unit, central processing unit, Instruction set, registers, processor speed, type of processors,	CO1, CO2
	C	Memory- main memory organization, main memory capacity, RAM, ROM, EPROM, PROM, cache memory, PCs specifications.	CO1, CO2
	Unit 2	Basic Computer Organization:	
	A	Input devices- Keyboard, Pointing Devices-mouse, Touch Screens, Joystick, Electronic pen, Trackball, Scanning Devices- Optical Scanners, OCR, OMR, Bar Code Readers, MICR, Digitizer, Electronic card reader, Image Capturing Devices-	CO1, CO2

		Digital Cameras. Output devices- Monitors- CRT, LCD/TFT			
	B	Printers- Dot matrix, Inkjet, Laser, Plotters- Drum, Flatbed, Screenimage projector.			CO1, CO2
	C	Secondary Storage Devices- Magnetic Tape, Magnetic Disks- Internal Hard Disk, External Hard Drives, Floppy Disks, Optical Disks-CD, VCD, CD-R, CD-RW, DVD, Solid State Storage-Flash Memory, USB Drives.			CO1, CO2
	Unit 3	Storage			
	A	Computer Software- Software and its Need, Types of software- System software, Application software, System software- operating system, utility program, programming languages, assemblers, compilers and interpreter			CO1, CO2, CO3
	B	introduction to operation system for PCs-DOS, windows, linux, file allocation table (FAT & FAT32), files & directory structure and its naming rules, programming languages- machine, assembly, high level, 4GL, their merits and demerits,			CO1, CO2, CO3
	C	application software and its types ? word-processing, spreadsheet, presentation graphics, Data Base Management Software, Characteristics, Uses and examples and area of application of each of them, Virus working, feature, types of viruses, virus detection prevention and cure.			CO2
	Unit 4	Software			
	A	Software and its needs, Types of S/W. System Software: Operating System, Utility Programs Programming Language: Machine Language, Assembly Language,			CO1, CO2, CO3
	B	High Level Language their advantages & disadvantages. Application S/W and its types: Word Processing,			CO1, CO2, CO3
	C	Spread Sheets Presentation, Graphics, DBMS s/w.			CO1, CO2, CO3
	Unit 5	Computer Arithmetic:			
	A	Binary, Binary Arithmetic, Number System: Positional & Non Positional, Binary			CO1 CO4
	B	Octal, Decimal, Hexadecimal, Converting from one number system to another			CO, CO4
	C	Converting from one number system to another , Converting from one number system to another.			CO1, CO2, CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	5. Computer Fundamentals by P.K.Sinha			
	Other References	1.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Have a basic understanding of personal computers and their operations.	PO1,PO2,PO3,PO4,PSO1
2.	CO2: be able to identify computer hardware components and describe their function;	PO1, PO3, PO4, PSO2
3.	CO3: Understand basic concepts and terminology of information technology.	PO1,PO2,PO3,PO4
4.	CO4: Understand basic concepts computer arithmetic	PO9, PO10,PO11, PSO5

PO and PSO mapping with level of strength for Fundamentals of Information Technology (Course Code BCO103)

CS E	CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	CO 1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1	2
	CO 2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1	2
	CO 3	3	2	3	3	-	-	-	2	1	2	3	2	1	2	1	2	2
	CO 4	3	3	3	2	--	--	--	2	1	3	2	2	1	2	1	2	2

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year:	
Branch:CS/IT		Semester:1I	
1	Course Code	BCO-104	Course Name: Advance Concept in C programming
2	Course Title	Advance Concept in C programming	
3	Credits	4	
4	Contact Hours (L-T-P)	3-0-2	
	Course Status	UG	
5	Course Objective	7. Learn basic programming constructs –data types, decision structures, control structures in C 8. learning logic aptitude programming in c language 9. Developing software in c programming	
6	Course Outcomes	Students will be able to: CO1: Implement Array CO2: Implement String CO3: Understand and implement Pointers CO4: Create Program using Structure CO5: Understand the difference between Structure and Union CO6: Creating Applications in C language	
7	Course Description	Basic concepts of C programming, logic building in C programming	
8	Outline syllabus		CO Mapping
	Unit 1	Arrays	
	A	Arrays	CO1,
	B	Two Dimensional Arrays	CO1
	C	Multi Dimensional Arrays	CO1
	Unit 2	Strings	
	A	String Handling Functions	CO2
	B	enum, Typedef, String Formatting	CO2
	C	Logic building based on strings	CO2
	Unit 3	Pointers	
	A	Introduction, declaration of pointer variables, Operations on pointers:	CO3
	B	Pointer arithmetic,	CO3
	C	Arrays of pointers, pointer of array	CO3
	Unit 4	Structures & Union	
	A	Structures - Array of Structures -	CO4
	B	Arrays within Structures - Structures within Structures -	CO4
	C	Structures and Functions - Unions	CO4,CO5

		Size of Structures.	
	Unit 5	Applications	
	A	Calculator, Bill generator	CO6
	B	Searching	CO6
	C	Sorting	CO5,CO6
	Mode of examination	Theory	
	Weightage Distribution	CA	MTE
		30%	20%
			ETE
			50%
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. <i>The C Programming Language</i>	
	Other References	6. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004. 7. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Understand core concept of c Programming	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
2.	CO2: Implement Array and String	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
3.	CO3: Implement Functions	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
4.	CO4: Create Program using Structure	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
5.	CO5: Understand the difference between Structure and Union	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
6.	CO6: Understand and implement Pointers	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5

PO and PSO mapping with level of strength for Course Name Advance Concepts of C Programming (Course Code BCO104)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	-	-	-	-	-	-	-	2	1	3	2	2	1	2
CO2	3	2	3	-	-	-	-	-	-	-	2	1	3	2	2	1	2
CO3	3	2	3	-	-	-	-	-	-	-	1	1	2	3	2	1	2
CO4	3	2	3	-	-	-	-	-	-	-	3	2	3	2	1	1	1
CO5	3	2	3	-	-	-	-	-	-	-	3	2	3	2	1	1	1
CO6	3	2	3	-	-	-	-	-	-	-	3	1	2	2	2	1	3

School: SET		Batch: 2018
Program: B.Sc.		Current Academic Year: 2018-19
Branch: CS/IT		Semester: II
1	Course Code	BOL 104
2	Course Title	Advance Concept in C programming
3	Credits	1
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Compulsory
5	Course Objective	10. Learn basic programming constructs –data types, decision structures, control structures in C 11. learning logic aptitude programming in c language 12. Developing software in c programming
6	Course Outcomes	Students will be able to: CO1: Understand core concept of c Programming CO2: Implement Array and String CO3: Implement Functions CO4: Create Program using Structure CO5: Understand the difference between Structure and Union CO6: Understand and implement Pointers
7	Course Description	Programming for problem solving gives the Understanding of C programming and implement code from flowchart or algorithm
8	Outline syllabus	CO Mapping
	Unit 1	Arrays CO1

		Write a c program to calculate the average using arrays			
		Write a c program to find the largest element of the array			
		Write a c program to add two matrix			CO1
	Unit 2	Strings			CO2
		Write a c program to concatenate two strings			
		Write a c program to find the length of strings			
		Write a c program to count vowels in a strings			
	Unit 3	Pointers			CO3
		Write a c program to swap two values using pointers			
		Write a c program to find largest number from array using pointers			
	Unit 4	Structures & Union			CO4
		Write a c program to store information of a student using structure			
		Write a c program to store information of a student using union			CO3, CO5
	Unit 5	Applications			CO5
		Write a c program to sort numbers			
		Write a c program to create a linked list for storing student details			
					CO4
	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. <i>The C Programming Language</i>			
	Other References	8. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004. 9. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999			

Course outline

This course implements array and pointer and Recursive applications. The course talks primarily about Array, string, functions, structure & union and Pointers etc.

Course Evaluation

Attendance	None
Any other	CA judged on the practicals conducted in the lab , weightage may be specified

References	
Text book	Kernighan, Brian, and Dennis Ritchie. <i>The C Programming Language</i>
Other References	3. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004. 4. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999
Softwares	Turbo C

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Understand core concept of c Programming	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
2.	CO2: Implement Array and String	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
3.	CO3: Implement Functions	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
4.	CO4: Create Program using Structure	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
5.	CO5: Understand the difference between Structure and Union	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
6.	CO6: Understand and implement Pointers	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5

School: SET		Batch : 2018	
Program: B.Sc		Current Academic Year: 2018	
Branch: CS/IT		Semester: II	
1	Course Code	BCO105	Course Name-
2	Course Title	Computer Hardware and Trouble shooting	
3	Credits	4	
4	Contact Hours (L-T-P)	3-0-2	
	Course Status		
5	Course Objective	1. The course covers topics related to personal computer components, its functions and characteristics, occupational health and safety policies and procedures 2. This course will develop essential troubleshooting and problem diagnosis skills for common personal computer systems. 3. Course work will focus on configuration 4. Installation, upgrade and preventative maintenance of personal computer systems.	
6	Course Outcomes	Students will be able to: CO1: Recognize computer components and accessories CO2: Describe basic network concept CO3: Describe basic computer software troubleshooting CO4: Describe basic network troubleshooting	
7	Course Description		
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Computers	
	A	Identifying the major components of a PC: System unit, Monitor, Keyboard, Mouse devices,	CO1, CO2
	B	Handling PC connections. Identifying the internal components of a PC: Opening a system unit, handling expansion cards.	CO1, CO2
	C	Purpose of RAM, Types of RAM Technologies: SDRAM, DDRSDRAM, RDRAM, Adding and Upgrading RAM.	CO1, CO2
	Unit 2	Basic Computer Storage	
	A	How hard drives store data: Partitions and File Systems. Installing a Hard Drive,	CO1, CO2
	B	Configuring a Hard Drive: Partitioning, Formatting	CO1, CO2
	C	Hard Drive Maintenance and Troubleshooting: ScanDisk, Defragmentation, Disk Cleanup.	CO1, CO2
	Unit 3	Basic networking concepts,	
	A	Network topologies: LAN, WAN, MAN, PAN, CAN. Networking Model .	CO1, CO2, CO3
	B	The OSI model . TCP/ IP Model , Network adapters.	CO1, CO2, CO3
	C	Introducing protocols. Cabling and troubleshooting.	CO4

	Unit 4	Information to networking devices			
	A	Introduction to various networking devices:			CO1,CO2,CO3
	B	Routers, Switches,Modems,			CO1,CO2,CO3
	C	Hubs Wired and Wireless technology.			CO1,CO2,CO3
	Unit 5	Network basic and troubleshooting			
	A	Network basic and configuration:			CO1,CO2,CO3
	B	Setting IP addresses, Sharing files and folders.			CO1,CO2,CO3
	C	Network troubleshooting. PING test, ipconfig etc.			CO1,CO2,CO3
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	10. Data Communications And Networking 4th Edition,McGrawHill, 2017 11. Assembling and troubleshooting by James Perozzo 12. Troubleshooting and Repairing Computer Printers by Stephen J. Bigelow.			
	Other References	2.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Have a basic understanding of personal computers and their operations.	PO1,PO2,PO3,PO4,PSO1
2.	CO2:	PO1, PO3, PO4, PSO2
3.	CO3: Understand basic concepts and terminology of information technology.	PO1,PO2,PO3,PO4
4.	CO4: Describe basic network troubleshooting	PO9, PO10,PO11, PSO5

PO and PSO mapping with level of strength for Course Name Computer Hardware and Trouble shooting (Course Code BCO105)

CS E	Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	CO 1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1	2
	CO 2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1	2
	CO 3	3	2	2	2	--	--	--	2	1	3	2	3	2	2	1	2	2
	CO 4	2	2	2	2	--	--	--	1	1	2	2	3	3	3	3	2	2

School: SET		Batch: 2018
Program: B.Sc.		Current Academic Year:
Branch: CS/IT		Semester: II
1	Course Code	BOL 105
2	Course Title	COMPUTER HARDWARE AND TROUBLESHOOTING LAB
3	Credits	1
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Compulsory
5	Course Objective	1. To understand the components on the motherboard 2. To perform system administration tasks 3. To understand different storage media 4. To understand system related problems and methods of troubleshooting
6	Course Outcomes	CO1: Know the fundamentals of Computer Networking. CO2: Recognize computer components and accessories. CO3: Describe various standard network models. CO4: Analyze the underlying protocols in transport layer. CO5: Describe basic computer software troubleshooting CO6: Describe basic network troubleshooting
7	Course Description	This course is designed to enable the students to get a detailed knowledge of all the hardware components that make up a computer and to understand the different interfaces required for connecting these hardware devices.
8	Outline syllabus	CO Mapping
	Unit 1	Practical based on semi-conductors
		Study and identification of standard desktop personal computer
		Understanding of Motherboard and its interfacing components

		Install and configure computer drivers and system components.	CO1, CO2
	Unit 2	Practical related to --	
		Disk formatting, partitioning	CO1, CO2
		Disk operating system commands-I	CO1, CO2
		Disk operating system commands-II	CO1, CO2
	Unit 3	Practical related to---	
		Install, upgrade and configure.	CO1,CO2,CO3
		Windows operating systems	CO1,CO2,CO3
		Remote desktop connections and file sharing	CO4
	Unit 4	Practical related to---	
		Identify, install and manage network connections Configuring IP address and Domain name system	CO1,CO2,CO3
		Install, upgrade and configure Linux operating systems.	CO1,CO2,CO3
		Installation Antivirus and configure the antivirus	CO1,CO2,CO3
	Unit 5	Practical related to---	
		Installation of printer and scanner software.	CO1,CO2,CO3
		Disassembly and Reassembly of hardware.	CO1,CO2,CO3
		Troubleshooting and Managing Systems	CO1,CO2,CO3
	Mode of examination	Jury/Practical/Viva	
	Weightage Distribution	CA 60%	MTE 0%
			ETE 40%
	Text book/s*	1. Craig Zacker& John Rourke, "The complete reference:PC hardware", Tata McGrawHill, New Delhi, 2001. 2. Mike Meyers, "Introduction to PC Hardware and Troubleshooting", Tata McGrawHill, New Delhi, 2003.	
	Other References		

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Know the fundamentals of Computer Networking.	PO1,PO2,PO3,PO4,PSO1
2.	CO2: Recognize computer components and accessories.	PO1, PO3, PO4, PSO2
3.	CO3: Describe various standard network models.	PO1,PO2,PO3,PO4
4.	CO4: Analyze the underlying protocols in transport layer.	PO9, PO10,PO11, PSO5
5.	CO5: Describe basic computer software troubleshooting	PO9, PO10,PO11, PSO5
6.	CO6: Describe basic network troubleshooting	PO1,PO2,PO3,PO4

PO and PSO mapping with level of strength for Course Name Computer Hardware and Trouble shooting (Course Code)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1	2
CO2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1	2
CO3	3	2	2	2	--	--	--	2	1	3	2	3	2	2	1	2	2
CO4	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1	2
CO5	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1	2
CO6	2	2	2	2	--	--	--	1	1	2	2	3	3	3	3	2	2

School: SET		Batch : 2018	
Program: B.Sc		Current Academic Year:	
Branch: CS/IT		Semester: II	
1	Course Code	BCO106	Course Name
2	Course Title	System Analysis and Design	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Compulsory	
5	Course Objective	1. Systems Analysis is a central part of systems development. 2. It comprises the process of turning a set of user requirements into a logical system specification and encompasses various activities to achieve this end. 3. The traditional systems lifecycle has been challenged by alternative models, for example the spiral (iterative and incremental) lifecycle and rapid application development.	
6	Course Outcomes	Students will be able to: CO1: To understand the role of systems analysis within various systems development life cycles. CO2: To develop an awareness of the different approaches that may be taken to systems analysis. CO3: To understand the systems analyst's activities, and apply current tools and techniques. CO4: Describe different life cycle models and explain the contribution of systems analysis within them.	
7	Course	This course introduces the concepts of distributed operating system,	

	Description	algorithms and design issues and challenges in Distributed system, identify the problems, and choose the relevant models and algorithms to apply.		
8	Outline syllabus			CO Mapping
	Unit 1	Fundamental of System Development:		
	A	System concept-characteristics-elements of system, types of system.		CO1, CO2
	B	Modern approach to system analysis and design, system development life cycle, approaches to improve the system development.		CO1, CO2
	C	Tools for system development, role of system analyst.		CO1, CO3
	Unit 2	System Analysis:		
	A	Determining system requirements, traditional methods, modern methods.		CO1, CO2,CO4
	B	Structuring system requirements, process modeling, data flow diagram.		CO1, CO2,CO4
	C	Logic modeling-conceptual data modeling, E-R modelling.		CO1, CO2,CO4
	Unit 3	System Design:		
	A	The Process and Stages of System Design, Design Methodologies, Development Activities.		CO1,CO2,CO3
	B	Input Design, Output Design.		CO1,CO2,CO3
	C	Types of Forms, Basics of Form Design.		CO4
	Unit 4	Implementation:		
	A	System implementation, software application testing installation.		CO1,CO2,CO3
	B	Documentation, training and support.		CO1,CO2,CO3
	C	Organizational issues in system implementation.		CO1,CO2,CO3
	Unit 5	Maintenance:		
	A	Maintaining information system.		CO1,CO2,CO3
	B	Types of maintenance.		CO1,CO2,CO3
	C	Conducting system maintenance.		CO1,CO2,CO3
	Mode of examination	Theory		
	Weightage Distribution	CA	MTE	ETE
		30%	20%	50%
	Text book/s*	Elias M. Awad, System Analysis & Design, Galgotia.		
	Other References	1. Rajaraman V, Analysis & Design of information system, PHI Jefferey A Hoffer, Moderen System Analysis & Design, Pearson Education. 2. Information Systems, ANAND PUBLICATIONS.		

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Students will identify the core concepts of distributed systems.	PO1,PO2,PO3,PO4,PSO1
2.	CO2: the way in which several machines orchestrate to correctly solve.	PO1, PO3, PO4, PSO2
3.	CO3: Students will examine how existing systems have applied the concepts of distributed systems in designing large system.	PO1,PO2,PO3,PO4
4.	CO4: Can additionally apply these concepts to develop distributed systems.	PO9, PO10,PO11, PSO5

PO and PSO mapping with level of strength for Course Name System Analysis and Design)

C S E	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
	CO1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1	2
	CO2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1	2
	CO3	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1	1	1
	CO4	2	2	2	2	1	--	--	2	3	3	3	1	2	2	2	1	3

School: SET		Batch: 2018	
Program: B.Sc		Current Academic Year: 2018-2019	
Branch: CS/IT		Semester: III	
1	Course Code	BCO201	Course Name
2	Course Title	Computer Organization	
3	Credits	4	
4	Contact Hours (L-T-P)	3-0-2	
	Course Status	Compulsory	
5	Course Objective	To understand the building blocks of computer and study various design issues.	
6	Course Outcomes	Upon successful completion of this course, the student will be able to: CO1. Identify the basic structure and functional units of a digital computer. CO2.Study the design of arithmetic and logic unit and implementation of fixedpoint and floating-point arithmetic operations CO3. Understand basic processing unit and organization of simple processor including instruction sets, instruction formats and various addressing modes CO4. Describe hierarchical memory systems including cache memories	

		CO5.Select appropriate interfacing standards for I/O devices.		
7	Course Description	This course discusses the basic structure of a digital computer and used for understanding the organization of various units such as control unit, Arithmetic and Logical unit and Memory unit and I/O unit in a digital computer.		
8	Outline syllabus		CO Mapping	
	Unit 1	Basic Computer Organization and Design		
	A	Basic of Computer, Von Neumann Architecture, Generation of Computer		CO1
	B	Classification of Computers, Digital computer: functional units and their interconnections, buses		CO1
	C	Bus architecture, types of buses and bus arbitration. Bus and memory transfer, micro-operations		CO1
	Unit 2	Data Representation and BasicComputer Arithmetic		
	A	Number systems, complements		CO1, CO2
	B	Fixed and Floating-point representation, character representation		CO1, CO2
	C	Addition, Subtraction, magnitude comparison		CO1, CO2
	Unit 3	Control Unit		
	A	Processor organization: general register organization, stack organization and addressing modes.		CO1, CO3
	B	Instruction types, formats, instruction cycles and sub cycles (fetch and execute etc), micro-operations, execution of a complete instruction.		CO1, CO3
	C	Hardwire and microprogrammed control		CO1, CO3
	Unit 4	Memory Unit		
	A	Basic concept and hierarchy, semiconductor RAM memories and types, ROM memories and types.		CO3, CO4
	B	Cache memories: concept and design issues (Performance, address mapping and replacement)		CO3, CO4
	C	Virtual memory: concept implementation		CO3, CO4
	Unit 5	I/O Organization		
	A	Peripheral devices, I/O interface, I/O ports		CO1, CO3, CO5
	B	Interrupts: interrupt hardware, types of interrupts		CO1, CO3,CO5
	C	Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access		CO1, CO3,CO5
	Mode of examination	Theory		
	Weightage Distribution	CA	MTE	ETE
		30%	20%	50%
	Text book/s*	13. M. Morris Mano, Computer System Architecture, Pearson		
	Other References	1. C. Hamacher, Z. Vranesic and S. Zaky, "Computer Organization", McGrawHill, 2002. 2. W. Stallings, "Computer Organization and Architecture - Designing for Performance", Prentice Hall of India, 2002. 3. D. A. Patterson and J. L. Hennessy, "Computer		

		Organization and Design - The Hardware/Software Interface", Morgan Kaufmann, 1998. 4. J.P. Hayes, "Computer Architecture and Organization", McGraw-Hill, 1998.	
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CO and PO Mapping

S. No.	Course Outcome	Program Educational Objectives (PEOs)& Program Specific Outcomes (PSO)
1.	CO1. Identify the basic structure and functional units of a digital computer.	PEO1, PEO2, PEO3
2.	CO2. Study the design of arithmetic and logic unit and implementation of fixedpoint and floating-point arithmetic operations	PEO 1, PEO 2, PEO 3
3.	CO3. Understand basic processing unit and organization of simple processor including instruction sets, instruction formats and various addressing modes	PEO 1, PEO 2, PEO 3, PSO 2
4.	CO4. Describe hierarchical memory systems including cache memories	PEO 1, PEO 2, PEO 3, PSO 2
5.	CO5. Select appropriate interfacing standards for I/O devices.	PEO 1, PEO 2, PEO 3, PSO 3

PEO and PSO mapping with level of strength for Course Name Computer Organization (Course Code BCA260)

BCA (CS)	COs	PEO1	PEO2	PEO3	PSO1	PSO2	PSO3
	CO1	3	2	2	-	-	-
	CO2	2	2	2	-	-	-
	CO3	3	2	2	-	2	-
	CO4	3	2	2	-	2	-
	CO5	3	2	2	-	-	2

School: SET		Batch: 2018	
Program: BCA		Current Academic Year: 2018-2019	
Branch: CS		Semester: III	
1	Course Code	BOL260	
2	Course Title	Computer Organization Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	The objective is to gain knowledge of basic concepts of computer and organization.	
6	Course Outcomes	Upon successful completion of this course, the student will be able to: CO1. Identify the basic components of computer and their working. CO2. Explain the importance types of memory and ports. CO3. Explain the importance types of mother board. CO4. Review and explain the basic operations performed on numbers CO5. Identify computer registers and their functions	
7	Course Description	Computer Organization Lab covers the complete understanding of the computer components like microprocessor, registers, memory units, motherboard, number system etc.	
8	Outline syllabus		CO Mapping
	Unit 1	Computer Anatomy	
		1. To recognize various components of Personal Computer 2. Dismantling and Assembling of a Personal Computer	CO1
	Unit 2	Computer Anatomy part - Memory and ports	
		1. Demonstrate different ports computer and their working. 2. Explain the importance types of memory and ports.	CO2
	Unit 3	Computer Anatomy part - Motherboard and cards	
		Study of Motherboard	CO3
	Unit 4	Numbering systems	
		Demonstrate the importance types of numbering systems types.	CO4
	Unit 5	Registers types	
		Explain the distinct types of computer registers and their functions	CO5
	Mode of examination	Practical/Viva	
	Weightage Distribution	CA 60%	MTE 0%
			ETE 40%
	Text book/s*	1. M. Morris Mano, Computer System Architecture, Pearson	
	Other References	3. C. Hamacher, Z. Vranesic and S. Zaky, "Computer Organization", McGrawHill, 2002.	

		4. W. Stallings, "Computer Organization and Architecture - Designing for Performance", Prentice Hall of India, 2002. 5. D. A. Patterson and J. L. Hennessy, "Computer Organization and Design - The Hardware/Software Interface", Morgan Kaufmann, 1998. 6. J.P. Hayes, "Computer Architecture and Organization", McGraw-Hill, 1998.	
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School: SET		Batch :2018	
Program: B.Sc		Current Academic Year:	
Branch:CS/IT		Semester:III	
1	Course Code	BCO202	
2	Course Title	Introduction to Operating System	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Non Elective	
5	Course Objective	4. Provide students with an overview of the application and requirements of Operating system 5. Gain insight into the challenges and limitations of resource management 6. Provide the students with practice on applying algorithms 7. Prepare students understand the principles of design of operating system 8. Enhance students skills to operate multi user multi-tasking operating system	
6	Course Outcomes	Students will be able to: CO1: To understand and implement algorithms in resource allocation and utilization. CO2: To Understand the strengths and weaknesses of the algorithms. CO3: To identify the challenges and apply suitable algorithms for them. CO4: To implement tools and utility of operating system.	
7	Course Description	This course introduces the requirement and utilization of operating system encompassing the principles to design operating systems, identify the challenges and choose the relevant and algorithms to apply.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	A	Operating System Concepts and functions, Comparison of	CO1, CO2

		different Operating system. Open-Source Operating Systems.	
	B	Types of Operating Systems (Batch, Multiprogramming, Multi Tasking)	CO1, CO2
	C	Operating System Services, System Boot	CO1, CO2
	Unit 2		
	A	Process Management Process Concepts (PCB, Process States , Process Operations),	CO1, CO2, CO4
	B	CPU Scheduling: Concept , Types of schedulers(Short term, Long term, Middle term), Dispatcher,	CO1, CO2, CO4
	C	Performance Criteria CPU Scheduling Algorithms(FCFS, SJF, Priority, Round Robin, Multilevel Queue, Multilevel feedback Queue)	CO1, CO2, CO4
	Unit 3	Deadlock Handling	
	A	Race condition, Critical sections, Mutual exclusion,	CO1, CO2
	B	Deadlock concepts & Handling Techniques: Avoidance, Prevention	CO1, CO3
	C	Deadlock Detection & Recovery	CO4
	Unit 4	Memory Management	
	A	Memory Hierarchy, Memory Management technique: Paging	CO1
	B	Segmentation, Paged segmentation	CO3
	C	Virtual memory concept, demand paging, Page replacement algorithms(FCFS, Optimal, LRU)	CO1
	Unit 5	File and Disk Management Management	
	A	Disk structure, Disk scheduling(FCFS, SSTF, SCAN, LOOK, C-SCAN, C-LOOK).	CO2, CO3
	B	File Concept, File operations, File Directories	CO1, CO2, CO3
	C	Using process & file handling Linux commands.	CO1, CO2, CO3
	Mode of examination	Theory	
	Weightage Distribution	CA 30%	MTE 20%
			ETE 50%
	Text book/s*	1. Silberschatz G, Operating System Concepts, Wiley	
	Other References	2. W. Stalling, "Operating System", Maxwell Macmillan 3. Tannenbaum A S, Operating System Design and Implementation, Prentice Hall India	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: To understand and implement algorithms in resource allocation and utilization.	PO1,PO2,PO3,PO4,PSO1
2.	CO2: To assess the strengths and weaknesses of the algorithms.	PO1, PO3, PO4, PSO2
3.	CO3: To identify the challenges and apply suitable algorithms for them.	PO1,PO2,PO3,PO4
4.	CO4: To implement tools and utility of operating system.	PO9, PO10,PO11

PO and PSO mapping with level of strength for Course Name Introduction to operating system (Course Code)

CSE	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
	CO1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1
	CO2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1
	CO3	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1	1
	CO4	2	2	2	2	1	--	--	2	3	3	3	1	2	2	2	1

School: SET		Batch :2018	
Program: B.Sc		Current Academic Year: 2018-19	
Branch:CS/IT		Semester:III	
1	Course Code	BCO203	Course Name
2	Course Title	Web and its application	
3	Credits	4	
4	Contact Hours (L-T-P)	3-0-2	
	Course Status		
5	Course Objective	This course is intended to teach the basics involved in publishing content on the World Wide Web.	
6	Course Outcomes	Students will be able to: CO1: To Understand Web Application Terminologies, Internet Tools, CO2: To Configure telnet server and login remotely using putty. CO3: To Set up FTP server for sharing files over network and establish session between ftp client and server. CO4: To Identify and discuss the security risk of a Web application	
7	Course Description	This course is an overview of the modern Web technologies used for the Web development. The purpose of this course is to give students the basic understanding of how things work in the Web world.	

8	Outline syllabus			CO Mapping
	Unit 1	Introduction to web		
	A	Introduction to Web: History of Internet, WWW, Client or Browser		CO1
	B	Locating resource on internet- URI, URL, URN		CO1
	C	Working of http, http response code		CO1
	Unit 2	Web Architecture		
	A	Web Architecture: Server, Type of server, database server, mail server, web server		CO1, CO2
	B	Components of web, usage of Web, client-server architecture, Domain Name System		CO1, CO2
	C	type of DNS servers, Example of DNS query and response		CO1, CO2
	Unit 2	Email and Telnet		
	A	mail structure, Composition of mail, component of Email, Working of email		CO1, CO2
	B	Concept of remote login, remote Login methods, Setting environment for putty		CO1,CO2
	C	login to remote system using putty		CO1, CO2
	Unit 4	FTP		
	A	FTP: FTP protocol, Usage of FTP		CO1,CO3
	B	anonymous ftp, FTP Commands		CO1,CO3
	C	Setting FileZilla server and client		CO1,CO3
	Unit 5	Security		
	A	Security: Security metrics congeniality, authenticity, integrity,		CO1,CO4
	B	Security threats, types of threats, Cryptography		CO1,CO4
	C	Symmetric and Asymmetric Cryptography		CO1,CO4
	Mode of examination	Theory		
	Weightage Distribution	CA	MTE	ETE
		30%	20%	50%
	Text book/s*	1. Douglas Comer "The Internet Book - Pearson Education", Asia		
	Other References	7. Douglas E. Comer "Internetworking with TCP/IP", Volume-I, PHI. 8. P.K. Sinha, "Introduction of Basic Computer"		

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Have a Good grounding of Web Application Terminologies, Internet Tools	PO3,PO5,PO8,PO12,PSO2,PSO3,PSO4

1.	CO2: Configure telnet server and login remotely using putty.	PO3,PO4,PO5,PO8,PO12,PSO2,PSO3,PSO4
2.	CO3: Set up FTP server for sharing files over network and establish session between ftp client and server.	PO2,PO5,PO6,PO8,PO10,PSO3,PSO5
3.	CO4:Identify and discuss the security risk of a Web application	PO4,PO5,PO8,PSO3,PSO5

PO and PSO mapping with level of strength for Course Name Data Warehouse and Data Mining (Course Code)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	3	2	1	3	2	1	2	3	2	3	3	3	2
CO2	2	2	3	3	3	2	1	3	2	1	2	3	2	3	3	3	2
CO3	2	3	2	2	3	3	1	3	2	3	2	2	2	2	3	2	3
CO4	2	2	2	3	3	2	1	3	2	2	2	2	2	2	3	2	3

School: SET		Batch :2018-2021	
Program: B.Sc		Current Academic Year: 2018-19	
Branch:CS/IT		Semester:III	
1	Course Code	BCO204	
2	Course Title	Principles of Data Structures	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Core	
5	Course Objective	1. Learn the systematic way of solving problems, various methods of organizing large amounts of data. 2. Be familiar with writing recursive methods. 3. Solve problems using data structures such as linear lists, stacks, queues, linked list binary trees, heaps binary search trees, and graphs and writing programs for these solutions. 4. Efficiently implement the different data structures and solutions for specific problems. 5. Choose the appropriate data structure and algorithm design method for a specified application.	

6	Course Outcomes	CO1: Understand the concepts of data structure, data type and ADT. CO2: Handle operations like traversing, insertion, deletion, searching etc. on various data structures. CO3:Implement and know when to apply standard algorithms for searching and sorting. CO4: Implement linked list data structure to solve various problems. CO5: Understand and apply various data structure such as stacks, queues, trees and graphs to solve various computing problems using C-programming language. CO6: Choose the data structure that efficiently model the information in a problem	
7	Course Description	This course starts with an introduction to data structures with its classification, array and pointer based implementations. As the course progresses the study of Linear and Non-Linear data structures are studied. The course talks primarily about Linked list, stacks, queue, Tree structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	A	Introduction to Data Structure, Basic Terminology: Data and information	CO1, CO2
	B	ADT, Data Organization. Data Structure – Definition	CO1, CO2
	C	Data Structure –Operations, Applications and types.	CO1, CO2
	Unit 2	ARRAYS	
	A	Definition, Representation of Linear Arrays in Memory, Types and implementation of Arrays: 1D, 2D & M-D Concept	CO2, CO5
	B	Operation on Arrays, Pointer Arrays. Applications of Arrays, Address Calculation, Matrix Operations,	CO2, CO5
	C	Sorting & Searching Algorithms-Bubble sort,Selection sort,Merge sort, linear and binary search.	CO3
	Unit 3	LINKED LIST	
	A	Concept of Linked List, Representation of linked List in memory, Memory Allocation, Garbage Collection,Overflow and Underflow	CO2,CO4
	B	Traversing a linked list, Searching a linked list, Insertion & Deletion in Linked List	CO2, CO4,
	C	More types of linked list: Doubly Linked list, Header Linked List, Two way List and Circular linked list.	CO4, CO6
	Unit 4	STACKS, QUEUES	
	A	Concepts of Stack, Operation on Stack, Array Representation of Stack, Arithmetic Expression POLISH Notation	CO2, CO5
	B	Concepts of Oueue. Operation on Oueue. Representation of	CO2, CO5

		queues			
	C	Other types of queue: Priority Queues, Deque and Circular queue.			CO2, CO5
	Unit 5	TREES AND GRAPH			
	A	Trees: Terminologies, Binary tree, Binary tree Representation, Applications			CO5, CO6
	B	Binary Search Trees, Tree Traversals			CO5, CO6
	C	Graphs: Terminology, Types, Traversal			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA 30%	MTE 20%	ETE 50%	
	Text book/s*	1. Lipschutz, “Data Structures” Schaum’s Outline Series, TMH			
	Other References	1. Aaron M. Tenenbaum, Yedidiah Langsam and Moshe J. Augenstein “Data Structures Using C and C++” , PHI 2. Horowitz and Sahani, “Fundamentals of Data Structures”, Galgotia Publication 3. Jean Paul Trembley and Paul G. Sorenson, “An Introduction to Data Structures with applications”, McGraw Hill 4. R. Kruse etal, “Data Structures and Program Design in C”, Pearson Education 5. G A V Pai, “Data Structures and Algorithms”, TMH			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	Understand the concepts of data structure, data type and ADT.	PO1, PO3, PSO1
2.	Handle operations like traversing, insertion, deletion, searching etc. on various data structures.	PO1, PO2, PSO1
3.	Implement and know when to apply standard algorithms for searching and sorting.	PO2, PO4, PO9, PSO2
4.	Implement linked list data structure to solve various problems.	PO2, PO3, PO4, PO9, PSO1, PSO2
5.	Understand and apply various data structure such as stacks, queues, trees and graphs to solve various computing problems using C-programming language.	PO2, PO3, PO9, PSO1, PSO2, PSO3
6.	Effectively choose the data structure that efficiently model the information in a problem	PO3, PO4, PO11, PSO1, PSO3

PO and PSO mapping with level of strength for Course Name Principles of Data Structures (BCA263)

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
BCA263	Principles of Data Structures	1	3	3	3	1				2		1		3	3	2		

School: SET		Batch: 2018-2021	
Program: BCA		Current Academic Year: 2018-19	
Branch:		Semester: III	
1	Course Code	BOL263	
2	Course Title	Principles of Data Structure Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	<ol style="list-style-type: none"> 1. Learn the systematic way of solving problems, various methods of organizing large amounts of data. 2. Be familiar with writing recursive methods. 3. Solve problems using data structures such as linear lists, stacks, queues, linked list binary trees, heaps binary search trees, and graphs and writing programs for these solutions. 4. Efficiently implement the different data structures and solutions for specific problems. 5. Choose the appropriate data structure and algorithm design method for a specified application. 	
6	Course Outcomes	CO1: Understand the concepts of data structure, data type and ADT. CO2: Handle operations like traversing, insertion, deletion, searching etc. on various data structures. CO3: Implement and know when to apply standard algorithms for searching and sorting. CO4: Implement linked list data structure to solve various problems. CO5: Understand and apply various data structure such as stacks, queues, trees and graphs to solve various computing problems using C-programming language. CO6: Choose the data structure that efficiently model the information in a problem	
7	Course Description	This course starts with an introduction to data structures with its classification, array and pointer based implementations. As the course progresses the study of Linear and Non-Linear data structures are studied. The course talks primarily about Linked list, stacks, queue, Tree	

		structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods.			
8	Outline syllabus				CO Mapping
	Unit 1	Introduction			
		Program on Loops and Functions.			CO1
	Unit 2	Arrays			
		Program to implement Operation on Array such as Traversing, Insertion & Deletion operation			CO1, CO2
		Program on different Searching Algorithm.			CO3
		Program on different Sorting algorithm.			CO3
	Unit 3	Linked List			
		Program to implement different operation on the following linked list: Singly, Doubly.			CO2, CO4, CO6
	Unit 4	Stack & Queue			
		Program to implement stack operation using array and linked list			CO2, CO5
		Program to convert infix expression to post fix expression			CO2, CO5
		Program on Evaluation of Post fix expression			CO2, CO5
		Program to implement queue operation using array and linked list			CO2, CO5
		Program to implement circular queue and deque.			CO2, CO5
	Unit 5	Tree & Graphs			
		Program to implement binary tree .			CO5, CO6
		Program to implement BST.			CO5, CO6
	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1. Lipschutz, "Data Structures" Schaum's Outline Series, TMH			
	Other References	1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein "Data Structures Using C and C++" , PHI 2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication 3. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill 4. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education 5. G A V Pai, "Data Structures and Algorithms" , TMH			

Course outline

This course starts with an introduction to data structures with its classification, array and pointer based implementations. As the course progresses the study of Linear and Non-Linear data structures are studied. The course talks primarily about Linked list, stacks, queue, Tree structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods..

Course Evaluation

Attendance	None
Any other	CA judged on the practicals conducted in the lab , weightage may be specified
References	
Text book	1. Lipschutz, "Data Structures" Schaum's Outline Series, TMH
Other References	1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein "Data Structures Using C and C++" , PHI 2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication 3. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill 4. R. Kruse et al, "Data Structures and Program Design in C", Pearson Education 5. G A V Pai, "Data Structures and Algorithms", TMH
Softwares	Turbo C/C++

School: SET		Batch: 2018
Program: B.Sc		Current Academic Year: 2018-19
Branch: CS/IT		Semester: III
1	Course Code	BOL203
2	Course Title	Web and its Application
3	Credits	3
4	Contact Hours (L-T-P)	1-2-0
	Course Status	Compulsory/Elective
5	Course Objective	This course is intended to teach the basics involved in publishing content on the World Wide Web.
6	Course Outcomes	Students will be able to: CO1: Have a Good grounding of Web Application Terminologies, Internet Tools,

		CO2: To Configure telnet server and login remotely using putty. CO3: Set up FTP server for sharing files over network and establish session between ftp client and server. CO4:Identify and discuss the security risk of a Web application		
7	Course Description	This course is an overview of the modern Web technologies used for the Web development. The purpose of this course is to give students the basic understanding of how things work in the Web world.		
8	Outline syllabus			CO Mapping
	Unit 1	Practical based on Introduction to web		
		1. Explore Web browser and its component. 2. Analyse URL, URI, and URN. 3. How to check the version of running Apache Web Server?		CO1 CO1 CO1
	Unit 2	Web Architecture		
		1. Analyse client server Architecture. 2. Install a web server. 3. Configure and identify the IP address of the web server.		CO1, CO2 CO1, CO2 CO1, CO2
	Unit 3	Email and Telnet		
		1. Analyse the component of Email. 2. Installing Putty. 3. Establish a Telnet Session with the ENE. 4. Creating a log file of your session using Putty.		CO1, CO2 CO1, CO2 CO1, CO2
	Unit 4	Practical related to FTP		
		1. Analyse the component of Email. 2. Installing Filezilla server. 3. To upload the file using Filezilla FTP client.		CO1,CO3 CO1,CO3 CO1,CO3
	Unit 5	Practical related to Security		
		1. Analysis of symmetric cryptography. 2. Analysis of symmetric cryptography		CO1,CO4 CO1,CO4
	Mode of examination	Jury/Practical/Viva		
	Weightage Distribution	CA 60%	MTE 0%	ETE 40%
	Text book/s*	Douglas Comer “The Internet Book - Pearson Education”, Asia		
	Other	9. Douglas E. Comer “Internetworking with TCP/IP”, Volume-I, PHI.		

References	10. P.K. Sinha, "Introduction of Basic Computer" 11. Internet as a source.	
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School: SET		Batch :2018-2021	
Program: B.Sc		Current Academic Year: 2018-2019	
Branch:CS/IT		Semester:4	
1	Course Code	BCO205	Course Name:BCA
2	Course Title	Basics of Computer Network	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Compulsory	
5	Course Objective	9. Familiarize with working of all levels of networking reference models 10. Prepare the student for entry Advanced courses in computer networking. 11. Enhance students communication and problem solving skills	
6	Course Outcomes	Students will be able to: CO1: Demonstrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model CO2: To explore fundamental issues driving network design CO3: Determine data communication methods suitability for application needs	
7	Course Description	This course provides detailed concepts of computer networking .Familiarize the student with the basic taxonomy and terminology of the computer networking area.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction:	
	A	Overview, networks in daily life, Network Topologies- Bus, Star, Ring, Mesh, Hybrid	CO1,CO3
	B	Connecting devices-Hub, Amplifier, Repeater, Router, Switch, Gateway, Modem, Multiplexers	CO1,CO3
	C	Transmission Media- Coaxial cables, twisted pair cables-Unshielded, shielded, Modes of Transmission-Simplex, half duplex and Full duplex	CO1,CO3
	Unit 2	Reference Models	
	A	Network Architecture and structure, OSI reference model and detailed functions of each layer ,	CO1,CO2
	B	TCP/IP protocol Suite	CO1
	C	Types of networks- LAN, MAN, WAN, Broadcast, Point to Point, Peer to peer Networks	CO1,CO3
	Unit 3	Data Link Layer	
	A	Framing , Errors in communication, Types of Error-Single Bit error, Burst error	CO1,CO2

	B	Flow Control- simplex protocol and stop and Wait protocol			CO1,CO2
	C	Random Access- Aloha, CSMA			CO1,CO2
	Unit 4	Network Layer& Transport Layer			
	A	IPV4 addressing basics and Header format			CO1,CO2,CO3
	B	Transport layer Basics, Process to Process delivery, TCP services and header format			CO1,CO2,CO3
	C	UDP: services, features, header format			CO1,CO2,CO3
	Unit 5	Application Layer			
	A	DNS namespace, distribution of namespace, DNS in internet, resolution			CO1,CO3
	B	Email Architecture, services and Features Network Security: Definition of -symmetric, Asymmetric			CO1, CO3
	C	Cryptography, Digital signature, Message Digest			CO1, CO3
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Forouzan, B., “Communication Networks”, TMH, Latest Edition			
	Other References	2. Tanenbaum, A.S.” Computer Networks”, 4th Edition, PHI 3. W. Stallings, “Data and Computer Communication” Macmillan Press			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1:CO1: Demonstrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model	PO11,PO12,PSO2,PSO3,PSO4
2.	CO2: Investigateand explore fundamental issues driving network design	PO1,PO3,PO5,PO7,PO10,PO11,PO12 PSO4,PSO5
3.	CO3: Determine data communication methods suitability for application needs	PO2,PO4,PO6,PO8,PO10,PSO1,PSO3

CS E	Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	CO 1											1	3		2	3	1	
	CO 2	3		3		2		3			3	1	2				1	2

	CO 3		3		2		2		2		2			1		3		
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School: SET		Batch : 2018-	
Program: B.Sc		Current Academic Year:	
Branch:CSE		Semester:4	
1	Course Code	BCO206	Course Name
2	Course Title	Data base Management System	
3	Credits	4	
4	Contact Hours (L-T-P)	3-0-2	
	Course Status	Core	
5	Course Objective	The objective of this course is to: 1. To learn about basic concepts of databases, terms, 2. Introduce students to build data base management systems 3. Apply DBMS concepts to various examples and real life applications	
6	Course Outcomes	At the end of the course student will be able to: 1. Understand the basics concepts of data base. 2. Understand and apply the knowledge of databases to E-R modelling. 3. Apply major components of Relational Database model to database design. 4. Apply Structured Query Language for data definition and data manipulation. 5. Design a normalized database.	
7	Course Description	This course introduces basic aspects of data	
8	Outline syllabus		CO Mapping
	Unit 1	INTRODUCTION TO DATABASES	
	A	Concept & Overview of DBMS, Traditional method vs Modern method of DBMS, Data Models	CO1
	B	Database languages, Database Administrator, Database Users	CO1
	C	Three Schema architecture of DBMS, Data Models ,Hierarchical, Network Data Modeling	CO1
	Unit 2	INTRODUCTION TO ENTITY-RELATIONSHIP (ER) MODEL	
	A	Relational data model concepts, Concept of keys,Entity Types, Entity Sets, Attributes, and Keys	CO1, CO2

	B	Relationship Types, Relationship Sets, Roles, and Structural Constraints,Weak Entity Types			CO1, CO2
	C	Refining the ER Design for the COMPANY Database, ER Diagrams, Naming Conventions, and Design Issues.			CO1, CO2
	Unit 3	INTRODUCTION TO SQL			
	A	Overview of the SQL Query Language,SQL Data Definition ,			CO1,CO3
	B	Basic Structure of SQL Queries, Additional Basic Operations			CO1,CO3
	C	Set Operations , Null Values, Aggregate Functions			CO1,CO3
	Unit 4	NORMALIZATION IN DESIGN OF DATABASES			
	A	Functional Dependency, Different anomalies in designing a Database,			CO1,CO4
	B	Normalization first, second and third normal forms, BoyceCodd normal form			CO1,CO4
	C	loss less join decompositions			CO1,CO4
	Unit 5	TRANSACTION MANAGEMENT			
	A	Transaction processing system, schedule and recoverability, Testing of serializability,			CO5
	B	Serializability of schedules, Conflict & view serializable schedule,			CO5
	C	Recovery from transaction failures,, Concurrency Control			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	14. Korth , Silberschatz& Sudarshan, Data base Concepts, Tata McGraw-Hill 15. Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education Inc.			
	Other References	12. Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to design, Implementation and Management, Pearson Education, Latest Edition. 13. Jeffrey D. Ullman, Jennifer Windon, A first course in Database Systems, Pearson Education. 14. Date C.J., An Introduction to Database Systems, Addison Wesley. 15. Richard T. Watson, Data Management: databases and organization, Wiley.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Understand the basics concepts of data base.	PO1,PO2,PO3,PSO1
2.	CO2:Understand and apply the knowledge of databases to E-R modelling.	PO1, PO3, PO9, PSO3
3.	CO3: Apply major components of Relational Database model to database design	PO1,PO2,PO9,PO4
4.	CO4: Apply Structured Query Language for data definition and data manipulation.Design a normalized database.	PO2, PO3,PO5, PO9, PSO2

PO and PSO mapping with level of strength for Course Name Data base Management System

CS E	Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	CO 1	3	3	3	2	--	1	--	1	2	1	2	1	3	2	2	1	2
	CO 2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1	2
	CO 3	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1	1	1
	CO 4	3	3	3	2	3	--	--	2	3	2	2	1	2	2	2	1	3

School: SET		Batch: 2018	
Program: BCA		Current Academic Year:	
Branch:		Semester: 4	
1	Course Code	BOL-265	
2	Course Title	Data Base Management System Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	<ul style="list-style-type: none"> To Develop efficient SQL programs to access Oracle databases Build database using Data Definition Language Statements Perform operations using Data Manipulation Language 	

		statements like Insert, Update and Delete		
6	Course Outcomes	By the end of this course you will be able to: CO1: Understand the concept of SQL commands in DBMS CO2: Create SQL SELECT statements that retrieve any required data CO3: Perform operations using Data Manipulation Language statements like Insert, Update and Delete CO4: Manipulate your data to modify and summaries your results for reporting		
7	Course Description	An introduction to the design and creation of relational databases. Create database-level applications and tuning robust business applications. Lab sessions reinforce the learning objectives and provide participants the opportunity to gain practical hands-on experience.		
8	Outline syllabus	CO Mapping		
	Unit 1	Practical based Data types		
		Classification SQL, Data types of SQL/Oracle		CO1,CO2
	Unit 2	Practical based on DDL commands		
		Create table , Alter table and drop table		CO1,CO2
	Unit 3	DML commands and Aggregate functions		
		Introduction about the INSERT, SELECT , UPDATE & DELETE command.,sum,avg,count,max,min		CO2,CO4
	Unit 4	Practical based on Grouping Clauses GROUP BY ORDER BY & GROUP BY HAVING		
		Briefly explain Group by, order by , having clauses with examples.		
	Unit 5	Practical based on Sub- queries, JOINS		
		Related example of Sub- queries, Joins and related examples		
	Mode of examination	Jury/Practical/Viva		
	Weightage Distribution	CA	MTE	ETE
		60%	0%	40%

	Text book/s*	1. Korth ,Silberschatz& Sudarshan, Data base Concepts, Tata McGraw-Hill	
	Other References	16. Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education Inc. 17. Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to design, Implementation and Management, Pearson Education, Latest Edition. 18. Jeffrey D. Ullman, Jennifer Windon, A first course in Database Systems, Pearson Education.	

School: SET		Batch :2018	
Program: B.Sc		Current Academic Year: 2018-19	
Branch:CS/IT		Semester: 4	
1	Course Code	BCO207	Course Name:Web Designing
2	Course Title		
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-2	
	Course Status		
5	Course Objective	The objective of this course is to provide a foundation of technologies and technical skills in web development. Based upon the development of a web, this course provides an insight of computer and networking technologies, and hands on experience in web programming.	
6	Course Outcomes	1) Design and develop a simple interactive web application 2) Demonstrate the ability to design web sites utilizing multiple tools and techniques. 3) Build dynamic web pages using JavaScript 4) Apply the network programming knowledge to setup a web site	
7	Course Description	This course is an overview of the modern Web technologies used for the Web development. The purpose of this course is to give students the basic understanding of how things work in the Web world from the technology point of view as well as to give the basic overview of the different technologies.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	A	Web Page: Static and dynamic sites, client and server end technology, URL syntax, open source web design tools overview.	CO1,CO2
	B	HTML basic tags, image map, implementation of links, table, form design.	CO1
	C	Page layout design: using frame, div and span tag, iframes, DHTML	CO1,CO2
	Unit 2	HTML5	

	A	New elements, semantic, canvas, offline webpage, canvas, SVG			CO1
	B	HTML Media: video, audio, HTML API: geolocation			CO2
	C	Location storage, Migration from HTML to HTML5.			CO2
	Unit 3	CSS			
	A	CSS: Introduction, syntax, selector, text formatting, margin, align, Positioning, background formatting, Navigation bar, and image gallery.			CO2,CO3
	B	CSS3: Introduction, colors, text formatting, fonts formatting, Background formatting			CO2
	C	2D transform, Transition, animation, user interface			CO4
	Unit 4	XML			
	A	XML: Introduction, syntax, well form XML document			CO1,CO2
	B	DTD, schema, XML Technology: xlink, xpath, xpointer, xslt			CO1,CO2
	C	displaying XML file data into HTML file			CO2
	Unit 5	Java Script			
	A	Syntax, comment, statement, variable, operators, conditional statements, looping statements			CO3,CO4
	B	functions, object, events, Accessing form elements			CO3,CO4
	C	History,pop up windows, cookies. ^[1] _[SEP]			CO3,CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	3. Ivan Bayross,”HTML,DHTML, JavaScript, Perl & CGI”, BPB Publication 4. Rick Delorme,” Programming in HTML5 with JavaScript and CSS3”, Microsoft			
	Other References	3. Burdman, “Collaborative Web Development” Addison Wesley. 4. Chris Bates, “Web Programing Building Internet Applications”, 2nd Edition, WILEY. 5. Steven Holzner,“PHP: The Complete Reference”, TataMcGraw Hill Publication			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Design and develop a simple interactive web application	PO3,PO8,PO12,PSO3
2.	CO2: Demonstrate the ability to design web sites utilizing multiple tools and techniques.	PO3,PO5,PO10,PO12,PSO1,PSO2
3.	CO3: Build dynamic web pages using JavaScript	PO3,PO12
4.	CO4: Apply the network programming knowledge to setup a web site	PO10,PO12

PO and PSO mapping with level of strength for Course Web Designing(Course Code)

CSE	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
	CSE311 CO1	1	2	3	1	1	1	2	3	2	2	1	3	2	2	3	3
	CO311 CO2	1	2	3	2	3	1	2	2	2	3	2	3	3	3	1	1
	CSE311 CO3	1	2	3	--	2	1	2	2	2	2	--	3	2	2	1	3
	CSE311 CO4	1	2	2	1	2	1	2	2	--	3	1	3	2	1	1	2

School: SET		Batch : 2018	
Program: B.Sc		Current Academic Year: 2018-2019	
Branch: CS/IT		Semester:4	
1	Course Code	BCO208	Course Name: Introduction to Software Engineering
2	Course Title	Introduction to Software Engineering	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core	
5	Course Objective	<ol style="list-style-type: none"> 1. Provide students with an overview of the Software development life cycle for software development methodologies. 2. Provide students with insights on requirement gathering activities and provide the students with design methodology practices. 3. Gain Insights about testing techniques. 4. Apply Quality management and reliability measurement techniques. 	
6	Course Outcomes	Students will be able to: CO1: Illustrate software characteristics and Implement different software development methodologies. CO2: To gather requirement from different sources. CO3: Design practices for development of a software and apply testing techniques using test cases and test suites. CO4: Explore all aspects of software maintenance process.	
7	Course Description	The objective of this course is to provide fundamental knowledge of software engineering, and make student aware of best software engineering practices, and contemporary software engineering tools.	
8	Outline syllabus	CO Mapping	
	Unit 1	Introduction to software engineering	
	A	Software Engineering Paradigms : Software Characteristics, Software myths, Software Applications,	CO1
	B	Software Engineering Definitions, System Development Life Cycle, Software Process Models,	CO1
	C	Feasibility Analysis, Technical Feasibility, Cost- Benefit	CO1

		Analysis.			
	Unit 2	Software requirement Specification			
	A	Software Requirement Engineering: System/ Software Requirement Specification,			CO2
	B	Prototyping - Specification Functional and non- functional requirements, User requirements, Data Flow Diagram (DFD),			CO2
	C	Data Dictionary, and ER diagram.			CO2
	Unit 3	Software Design			
	A	System Design: System Design, Problem Partitioning, Top-Down and Bottom-Up design, Decision tree, decision table,			CO3
	B	Software design: -Abstraction - Modularity - Software Architecture, Effective modular design – Cohesion and Coupling,			CO3
	C	Functional vs. Object- Oriented approach.			CO3
	Unit 4	Software Testing			
	A	Testing: Testing: -Levels of Testing, Integration Testing, and Structures testing, ,			CO3
	B	Black Box testing and white box testing, Unit testing, system testing, Validation and system testing and Software Maintenance.			CO3
	C	Validation and Verification, test cases, overview of debugging.			CO3
	Unit 5	Software maintenance			
	A	Software maintenance: Software maintenance, types of maintenance,			CO4
	B	Issues, techniques for maintenance, Project management, roles and responsibilities,			CO4
	C	CASE Tools.			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Pressman R S, “ <i>Software Engineering: A Practitioners Approach</i> ”, McGraw Hill.			
	Other References	1. Sommerville, Ian. “Software Engineering”, Pearson (Latest Ed). 2. Jalote, Pankaj, “Software Engineering”New Delhi: Narosa (Latest Ed.) 3. SADSE (System Analysis Design) - Prof. Khalkar and Prof. Parthasarathy. 4. Schaum’s Series, “Software Engineering” TMH			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Illustrate software characteristics and Implement different software development methodologies.	PO1,PO2,PO7,PO9,PO10, PSO1
2.	CO2: Perform requirement gathering in requirement analysis.	PO2, PO3, PO4, PO5, PSO2
3.	CO3: Design practices for development of a software and apply testing techniques using test cases and test suites.	PO1,PO2,PO3,PO4, PO6, PO9, PO11, PO12
4.	CO4: Conduct all aspects of software maintenance process.	PO6,PO11, PSO5

PO and PSO mapping with level of strength for Course Name Introduction to Software Engineering(Course Code BCA267)

C S E	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
	CO1	3	3	1	1	--	--	3	-	2	2	-	-	3	-	-	-	-
	CO2	1	2	3	3	3	--	--	1	1	1	-	-	1	2	-	-	-
	CO3	3	3	3	3	--	2	--	1	2	1	3	2	-	-	-	-	-
	CO4	1	1	1	1	-	3	--	1	1	-	3	1	1	1	1	1	3

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year:	
Branch:CS/IT		Semester: V	
1	Course Code	BCO-301	Course Name
2	Course Title	Introduction to OOP using Java	
3	Credits	5	
4	Contact Hours (L-T-P)	3-1-2	
	Course Status	UG	
5	Course Objective	Its main objective is to teach the basic concepts and techniques which form the object oriented programming paradigm	

6	Course Outcomes	<p>Students will be able to:</p> <p>CO1: Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.</p> <p>CO2: Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.</p> <p>CO3: Have the ability to write a computer program to solve specified problems.</p> <p>CO4: Be able to use the Java SDK environment to create, debug and run simple Java programs.</p>
7	Course Description	Basic <i>Object Oriented Programming (OOP)</i> concepts, including objects, <i>classes</i> , methods, parameter passing, information hiding, inheritance and polymorphism are introduced and their implementations <i>using Java</i> are discussed.
8	Outline syllabus	CO Mapping
	Unit 1	Introduction to Object Oriented Paradigm
	A	History, The meaning of Object Orientation, Features of Java, OOPs concepts object identity, CO1, CO2
	B	Encapsulation, information hiding, polymorphism CO1, CO2
	C	ByteCode, Architecture of JVM, ClassLoader Execution Engine, Garbage collection. CO1, CO2, CO6
	Unit 2	Introduction to Java
	A	Java development Kit (JDK), Introduction to IDE for java development, Setting java environment (steps for path and CLASSPATH setting). CO1, CO2, CO4
	B	Constants, Variables, Data Types, Operators, Expressions. CO1, CO2, CO4
	C	Decision Making Branching, Loops, command line argument. CO1, CO2, CO4
	Unit 3	Class & Object
	A	Arrays, Type conversion & casting, Input from keyboard, Classes Objects CO1, CO2, CO3
	B	Methods Method overloading, Constructors, Constructors overloading. CO1, CO2, CO3
	C	static keyword, Access Modifiers, String handling. keyboard, Classes Objects. CO4, CO6
	Unit 4	Inheritance, package and Interface Inheritance Implementation
	A	Multilevel Hierarchy, Overriding methods, Polymorphism, use of this and super, Constructor call in inheritance, Abstract class and method, CO1, CO2, CO3
	B	Final class, method and variable, Implementing Interface, Concept of multiple inheritance in Java, Wrapper class CO1, CO2, CO3
	C	Packages: User defined packages, built-in packages (java.lang package). CO1, CO2, CO3
	Unit 5	Exception and Multithreading
	A	Input/output: Exploring java.io, File, Stream Classes Byte Stream CO1, CO2, CO3,

		Classes and Character stream Classes.	CO6
B		reading and writing in file, Introduction to Exception Handling, Introduction to try, catch, Finally , throw and throws, Checked and Unchecked exceptions, User define exception	CO1,CO2,CO3
C		Introduction to Multithreading: Creating thread using Runnable interface and Thread class, Thread life cycle.	CO1,CO2,CO3, CO6
Mode of examination		Theory	
Weightage Distribution	CA	MTE	ETE
	30%	20%	50%
Text book/s*	1.Schildt H, "The Complete Reference JAVA2", TMH		
Other References	1. Balagurusamy E, "Programming in JAVA", TMH 2. Professional Java Programming:BrettSpell,WROX Publication		

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: The model of object oriented programming: abstract data types, encapsulation, inheritance and polymorphism	PO1,PO2,PO3,PO4,PSO1
2.	CO2: Fundamental features of an object oriented language like Java: object classes and interfaces, exceptions and libraries of object collections.	PO1, PO3, PO4, PSO2
3.	CO3: How to take the statement of a business problem and from this determine suitable logic for solving the problem; then be able to proceed to code that logic as a program written in Java.	PO1,PO2,PO3,PO4
4.	CO4: How to test, document and prepare a professional looking package for each business project using javadoc.	PO9, PO10,PO11, PSO5

PO and PSO mapping with level of strength for Course Name OOPs using java (Course Code)

CS E	Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	CO 1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1	2
	CO 2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1	2
	CO 3	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1	1	1
	CO 4	2	2	2	2	1	--	--	2	3	3	3	1	2	2	2	1	3

School: SET		Batch: 2018
Program: B.Sc.		Current Academic Year:
Branch: CS/IT		Semester: V
1	Course Code	BOL301
2	Course Title	Introduction to OOP using Java
3	Credits	1
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Compulsory
5	Course Objective	Its main objective is to teach the basic concepts and techniques which form the object oriented programming paradigm
6	Course Outcomes	<p>Students will be able to:</p> <p>CO1: Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.</p> <p>CO2: Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.</p> <p>CO3: Have the ability to write a computer program to solve specified problems.</p> <p>CO4: Be able to use the Java SDK environment to create, debug and run simple Java programs.</p>
7	Course Description	Basic <i>Object Oriented Programming (OOP)</i> concepts, including objects, <i>classes</i> , methods, parameter passing, information hiding, inheritance and polymorphism are introduced and their implementations <i>using Java</i> are discussed.
8	Outline syllabus	CO Mapping

	Unit 1	Practical based on classes and objects			CO1, CO2
		Sub unit - a, b and c detailed in Instructional Plan			
	Unit 2	Practical based on Arrays and inheritance			CO1,CO2,CO3
		Sub unit - a, b and c detailed in Instructional Plan			
	Unit 3	Practical based on package and interface			CO2,CO3,CO4
		Sub unit - a, b and c detailed in Instructional Plan			
	Unit 4	Practical based on polymorphism			CO1,CO3
		Sub unit - a, b and c detailed in Instructional Plan			
	Unit 5	Practical based on exception handling			CO1,CO2,CO3
		Sub unit - a, b and c detailed in Instructional Plan			
	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1.Schildt H, “The Complete Reference JAVA2”, TMH			
	Other References	1. Balagurusamy E, “Programming in JAVA”, TMH 2. ProfessionalJava Programming:BrettSpell,WROX Publication			

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year:Computer Graphics	
Branch:CS/IT		Semester: V	
1	Course Code	BCO-307	Course Name
2	Course Title	Computer Graphics	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	DE-1	
5	Course Objective	This course is designed to provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress,issues, and trends. A thorough introduction to computer graphics techniques,focusing on 3D modeling, image synthesis, and rendering. Topics cover: geometric transformations, geometric algorithms, 3D object models (surface, volume and implicit), visible surface algorithms, image synthesis and anti-aliasing. The interdisciplinary nature of computer graphics is emphasized in the wide variety of examples and applications.	
6	Course Outcomes	Students will be able to: CO1: Understand the technology requirement for graphics system. CO2: Construct various object to create various application. CO3: Formulate proficiency in 2D and 3D computer graphics API	

		programming. CO4: Differentiate between 2D and 3D display schemes. CO5: Discuss various animation methodology. CO6: Compare various animation techniques to formulate various models.		
7	Course Description	Computer Graphics I is a study of the hardware and software principles of interactive raster graphics. Topics include an introduction to the basic concepts, 2-D and 3-D modeling and transformations, viewing transformations, projections, rendering techniques, graphical software packages and graphics systems. Students will use a standard computer graphics API to reinforce concepts and study fundamental computer graphics algorithms.		
8	Outline syllabus			CO Mapping
	Unit 1	Introduction (Graphic System Primitives)		
	A	Concept of computer graphics, Application areas, and Display devices-CRT		CO1, CO2
	B	Raster scan and Random scan display, Color display techniques		CO1, CO2
	C	frame buffer and display file, Interactive input devices		CO1, CO2
	Unit 2	Raster Algorithms		
	A	Line drawing algorithms -- DDA and Bresenham's algorithm		CO1, CO2
	B	circle generation algorithm—Midpoint & Bresenham's algorithm, ellipses and other curves generation		CO1, CO2
	C	Area filling-Inside and Outside test, Scan line algorithm, aliasing techniques		CO1, CO2
	Unit 3	Two-dimensional Transformation		
	A	Basic transformations-Translation, rotation		CO3,CO4
	B	scaling and reflection, coordinate system		CO3,CO4
	C	windowing and clipping-point, line and polygon clipping, Segments		CO3,CO4
	Unit 4	Three-dimensional Transformation		
	A	Basic transformations-Translation		CO3,CO4
	B	3 D Rotation		CO3,CO4
	C	rotation, scaling and reflection		CO3,CO4
	Unit 5	Hidden surface removal Algorithm and Animation		
	A	Z-Buffer, Painter's Algorithm, Wornock's Algorithm, Scan line Algorithm.		CO5,CO6
	B	Introduction to Animation, Principles of Animation		CO5,CO6
	C	Types of Animation		CO5,CO6
	Mode of examination	Theory		
	Weightage Distribution	CA	MTE	ETE
		30%	20%	50%
	Text book/s*	1.Hearn, M. Baker, "Computer Graphics – C Version", 2nd Edition, Pearson Education, 2002		
	Other	1. D. Rogers, J. Adams, "Mathematical Elements for Computer Graphics", 2 nd Edition, Tata McGraw-		

	References	Hill Publication, 2002.	
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CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1:CO1: Understand the technology requirement for graphics system.	PO1,PO2,PO3,PO4,PSO1
2.	CO2: Construct various object to create various application.	PO1, PO3, PO4, PSO2
3.	CO3: Formulate proficiency in 2D and 3D computer graphics API programming.	PO1,PO2,PO3,PO4
4.	CO4: Differentiate between 2D and 3D display schemes.	PO9, PO10,PO11, PSO5
5.	CO5: Discuss various animation methodology.	PO1,PO2,PO3,PO4,PSO1
6.	CO6: Compare various animation techniques to formulate various models.	PO1,PO3,PO4,PSO2

PO and PSO mapping with level of strength for Course Name Computer Graphics (Course Code BCA205)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
BCA205 CO1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1	2
CO311 CO2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1	2
BCA205 CO3	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1	1	1
BCA205 CO4	2	2	2	2	1	--	--	2	3	3	3	1	2	2	2	1	3
BCA205 CO5	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1	1	1
BCA205 CO6	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1	2

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year: 2018-19	
Branch: CS/IT		Semester: 5	
1	Course Code	BCO-306	Course Name
2	Course Title	E-COMMERCE	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Elective	
5	Course Objective	Students will try to learn: <ol style="list-style-type: none"> 1. Understand the basic working principles of information systems and enterprises 2. Equip the students with preliminaries of technologies used in business information systems 3. Familiarize students with the Business applications and e-commerce initiatives 4. Enable the students to build decision support systems 5. Enhance the knowledge of the student about the management Security challenges in IT sector 	
6	Course Outcomes	After Successful completion of this course the student will be able to: <ol style="list-style-type: none"> 1. Understand the fundamentals of a computer based information systems and enterprises 2. Analyze the technologies associated with business information systems 3. Apply e-commerce initiatives in various Business applications 4. Evaluate significance of support systems in enterprises 5. Align to security control measures in IT sector 	
7	Course Description	The concept of electronic commerce, and to understand how electronic commerce is affecting business enterprises, governments, consumers and people in general.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Information Systems in Business	
	A	The Fundamental Roles of Information Systems, Internet and Business	CO1, CO2
	B	Globalization and Information Technology	CO1, CO2
	C	Components of an Information System, Types of	CO1, CO2

		Information Systems	
	Unit 2	Computer Hardware and Software	
	A	Computer Hardware – Trends in Computer Systems, Storage Trends and Trade Offs;	CO1, CO2
	B	Computer Software – Software Suites and Integrated Packages, Programming Packages	CO1, CO2
	C	Business Telecommunication – Networking the Enterprise, Managing Organizational Change	CO1, CO2,
	Unit 3	e-commerce and Enterprise Collaboration	
	A	Foundations of eCommerce, Business-to-Consumer eCommerce	CO1, CO3
	B	Business-to-Business eCommerce, Online Transaction Processing,	CO1, CO3, CO4
	C	Enterprise Collaboration, Groupware for Enterprise Collaboration, (Case studies)	CO1, CO3, CO4
	Unit 4	Information Systems for Decision Support, Strategic Advantages	
	A	Introduction, Decision Support Systems (DSS), Executive Information Systems	CO1,CO5
	B	Competitive Strategy Concepts, Strategic roles of Information Systems	CO1,CO5
	C	Challenges of Strategic Information systems, Sustaining strategic success	CO1,CO5
	Unit 5	Management Security Challenges & Controls	
	A	Organization and Information Technology	CO1,CO2,CO3, CO4,CO5
	B	Security and Ethical Challenges: Information systems controls, its need, Audit information systems	CO1,CO2,CO3, CO4,CO5
	C	Ethical dimensions, Computer Crime, Societal solutions, you and ethical responsibility	CO1,CO2,CO3, CO4,CO5
	Mode of examination	Theory	
	Weightage Distribution	CA	MTE
		30%	20%
			ETE
			50%
	Text book/s*	1. Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, E-Commerce: Fundamentals and Applications, John Wiley & Sons, 2003, ISBN : 9780471493037 2. James A O'Brien and George M Marakas, Management Information System, Tata McGraw Hill, 10th Edition, 2008, ISBN -13 : 978-1-25-902671-3, ISBN-10 : 1-25- 902671-X	

Other References	1. Kenneth C. Laudon, Jane P. Laudon, Management of Information Systems, Pearson, Dorling Kindersley(India) Pvt. Ltd, 12th edition, 2013, ISBN 9780132142854
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CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO-1 Understand the fundamentals of a computer based information systems and enterprises	
2.	CO-2 Analyze the technologies associated with business information systems	
3.	CO-3 Apply e-commerce initiatives in various Business applications	
4.	CO-4 Evaluate significance of support systems in enterprises	
5.	CO-5 Align to security control measures in IT sector	

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year: 2018-19	
Branch: CS/it		Semester: V	
1	Course Code	BCA 365	Course Name
2	Course Title	Client-Server Computing	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Elective	
5	Course Objective	12. Provide students with an overview of the methodologies and approaches to client server computing 13. Gain insight into the components of Client Server Application 14. Provide the students with practice of client server systems 15. Prepare students for research in the area of client server computing and related applications 16. Enhance students communication and problem solving skills	
6	Course Outcomes	Students will be able to: CO1: To understand and implement client server computing CO2: To understand the client server components CO3: To identify the application area of client server computing CO4: To know how to develop client server network and data storage is used	

		in client server architecture.	
7	Course Description	This course introduces advanced aspects of data warehousing and data mining, encompassing the principles, to analyze the data, identify the problems, and choose the relevant models and algorithms to apply.	
8	Outline syllabus		CO Mapping
	Unit 1	Client/Server Computing	
	A	DBMS concept and architecture, Single system image, Client Server architecture	CO1, CO2
	B	mainframe-centric client server computing, downsizing and client server computing	CO1, CO2
	C	Preserving mainframe applications investment through porting, client server development tools, and advantages of client server computing.	CO1, CO2
	Unit 2	Components of Client/Server application	
	A	The client: services, request for services, RPC, windows services, fax, print services, remote boot services, other remote services, Utility Services & Other Services, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), Common Object Request Broker Architecture (CORBA)	CO1, CO2,
	B	The server: Detailed server functionality, the network operating system, available platforms	CO1, CO2
	C	Network operating system, available platform, the server operating system.	CO1, CO2
	Unit 3	Client/Server Network	
	A	Client/Server Network: connectivity, communication interface technology, Interposescommunication, wide area network technologies, network topologies (Token Ring, Ethernet, FDDI, CDDI) network management,	CO1,CO2,CO3
	B	Client-Server system development: Software, Client-Server System Hardware: Network Acquisition, PC-level processing unit, Macintosh, notebooks, pen	CO1,CO2,CO3
	C	UNIX workstation, x-terminals, And server hardware.	CO1,CO2,CO3
	Unit 4	Client Server Systems Development	
	A	Services and Support, system administration,Availability, Reliability, Serviceability	CO1,CO2,CO3
	B	Software Distribution, Performance, Networkmanagement, Help Disk, Remote Systems Management Security	CO1,CO2,CO3
	C	LAN and NetworkManagement issues. Training, Training advantages of GUI Application, System Administrator Training, Database Administrator Training, End-user training.	CO1,CO2,CO3
	Unit 5	Data Storage	
	A	Magnetic disk, magnetic tape, CD-ROM, WORM, Optical disk, mirrored disk, fault tolerance	CO1,CO2,CO3 CO4
	B	RAID, RAID-Disk network interface cards. Network protectiondevices, Power Protection Devices, UPS, Surge	CO1,CO2,CO3 CO4

		protectors	
	C	The future of client server Computing Enabling Technologies, The transformationalsystem.	CO1,CO2,CO3 CO4
	Mode of examination	Theory	
	Weightage Distribution	CA	MTE
		30%	20%
	Text book/s* Other References	1. Patrick Smith & Steave Guengerich, "Client / Server Computing", PHI 2. Dawna Travis Dewire, "Client/Server Computing", TMH 3. Majumdar & Bhattacharya, "Database management System", TMH 4. Korth, Silberchatz, Sudarshan, "Database Concepts", McGraw Hill 5. Elmasri, Navathe, S.B, "Fundamentals of Data Base System", Addison Wesley	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: To understand and implement client server computing	PO1,PO2,PO4,PSO1
2.	CO2: To understand the client server components	PO1, PO3, PO4, PSO2
3.	CO3: To identify the application area of client server computing	PO1,PO2,PO3,PO4
4.	CO4: To know how to develop client server network and data storage is used in client server architecture.	PO9, PO10,PO11, PSO5

PO and PSO mapping with level of strength for Course Name Client-Server Computing

CS E	Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	CO 1	3	3	1	3	--	--	--	2	2	1	2	1	1	2	2	1	2
	CO 2	2	2	3	3	--	--	--	2	2	2	1	1	1	3	2	1	2
	CO 3	3	3	1	3	--	--	--	1	1	1	1	2	1	2	1	1	1
	CO 4	2	2	2	2	1	--	--	2	3	1	3	1	2	2	2	1	3

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year: 2018-19	
Branch: CS/IT		Semester: V	
1	Course Code	BCA366	Course Name: Multimedia and Animation
2	Course Title	Multimedia and Animation	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	DE-2	
5	Course Objective	This course emphasizes the design and implementation of 2D animation for a wide variety of multimedia products.	
6	Course Outcomes	On successful completion of the course students will be able to: 1. Design and create animation using computerized animation tools. 2. Design and create 2D models. 3. Include layout and designing	
7	Course Description		
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to computers & networks	
	A	Multimedia hardware and Multimedia software	
	B	Multimedia operating system	
	C	Multimedia communication systems.	
	Unit 2	Image and Video	
	A	Image: Creation of image(BMP & vector), image color models, Image file format, Image compression.	
	B	Video: video broadcast standard(PAL, NTSC), shooting and editing video.	
	C	Video file formats. Video tips, video compression: MPEG standards.	
	Unit 3	Animation	
	A	Principle of Animation. Animation techniques: cell animation, computer animation.	
	B	Kinematics, morphing, anti-aliasing, animation files formats.	
	C	Different animation packages: Acrobat Photoshop, flash.	

	Unit 4	2D Animation			
	A	Introduction to 2D animation.			
	B	Drawing concept and color theory & basics			
	C	Incorporating sound into 2D animation			
	Unit 5	Layout & Designing			
	A	Basic of sketching still and assignment of basic drawing, composition of basic elements.			
	B	Work in different media, such as drawing, collage and painting			
	C	Pixel and resolution: vector and bitmap Graphics.			
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	3. Multimedia Making It Work-by Tay Vaughan, Tata Mcgrwa Hills. 4. Multimedia Systems: John F, Koegel Buford Pearson.			
	Other References	6. Multimedia In Action-James E Shuman-Vikas Publishing House 7. Multimedia basic-Volumes-1 Technology.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	Design and create animation using computerized animation tools.	PO9, PO10, PO11, PSO5
2.	Design and create 2D models.	PO1, PO3, PO4, PSO2
3.	To Understand Principle of Animation	PO3, PO4, PSO2
4.	Include layout and designing	PO1, PO2, PO3, PO4

PO and PSO mapping with level of strength for Course Multimedia and Animation

	Cos	PO1	PO 2	PO3	PO4	PO5	PO 6	PO7	PO8	PO9	PO10	PO 11	PO12	PS O1	PSO2	PSO3	PSO4	PSO5
	CO1	3	3	1	3	--	--	--	2	2	1	2	1	1	2	2	1	2
	CO2	2	2	3	3	--	--	--	2	2	2	1	1	1	3	2	1	2
	CO3	3	3	1	3	--	--	--	1	1	1	1	2	1	2	1	1	1
	CO4	2	2	2	2	1	--	--	2	3	1	3	1	2	2	2	1	3

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year:	
Branch: CS/IT		Semester: V	
1	Course Code	BCO-308	Course Name: BCA
2	Course Title	Introduction to Distributed System	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Compulsory	
5	Course Objective	4. This course provides an introduction to the fundamentals of distributed computer systems, 5. Designing Algorithms used in Distributed system. 6. Various issues and challenges used in Distributed System.	
6	Course Outcomes	Students will be able to: CO1: Students will identify the core concepts of distributed systems. CO2: the way in which several machines orchestrate to correctly solve. CO3: Students will examine how existing systems have applied the concepts of distributed systems in designing large system. CO4: Can additionally apply these concepts to develop distributed systems.	
7	Course Description	This course introduces the concepts of distributed operating system, algorithms and design issues and challenges in Distributed system, identify the problems, and choose the relevant models and algorithms to apply.	
8	Outline syllabus	CO Mapping	
	Unit 1	Introduction to Distributed System	
	A	Introduction: definition, characteristics and challenges of distributed systems,	CO1, CO2

	B	architectural models (client-server)Time: Physical and logical time, event ordering,			CO1, CO2
	C	clock synchronization, message delivery ordering			CO1, CO3
	Unit 2	Synchronization			
	A	Limitation of Distributed system			CO1, CO2,CO4
	B	absence of global clock, shared memory,			CO1, CO2,CO4
	C	Logical clocks ,Lamport’s& vectors logical clocks.			CO1, CO2,CO4
	Unit 3	Distributed Algorithm			
	A	classification of Agreement Problem,Byzantine agreement problem,			CO1,CO2,CO3
	B	Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem,			CO1,CO2,CO3
	C	Application of Agreement problem, Atomic Commit in Distributed Database system.			CO4
	Unit 4	Distributed Transactions			
	A	Transactions and Concurrency Control: Transactions, Nested transactions,			CO1,CO2,CO3
	B	Locks, Optimistic Concurrency control, Timestamp ordering,			CO1,CO2,CO3
	C	Comparison of methods for concurrency control.			CO1,CO2,CO3
	Unit 5	Security			
	A	Security protocol in distributed system			CO1,CO2,CO3
	B	main threats and techniques for ensuring security (secure channels & firewalls			CO1,CO2,CO3
	C	Fault tolerance and availability			CO1,CO2,CO3
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Singhal & Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill			
	Other References	1. Ramakrishna,Gehrke," Database Management Systems", Mc Grawhill 2. Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design", Pearsonn Education. 3. Tenanuanbaum, Steen," Distributed Systems", PHI. 4. Gerald Tel, "Distributed Algorithms", Cambridge University Press.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
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1.	CO1: Students will identify the core concepts of distributed systems.	PO1,PO2,PO3,PO4,PSO1
2.	CO2: the way in which several machines orchestrate to correctly solve.	PO1, PO3, PO4, PSO2
3.	CO3: Students will examine how existing systems have applied the concepts of distributed systems in designing large system.	PO1,PO2,PO3,PO4
4.	CO4: Can additionally apply these concepts to develop distributed systems.	PO9, PO10,PO11, PSO5

PO and PSO mapping with level of strength for Course Name Introduction to Distributed System

C S E	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
	CO1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1	2
	CO2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1	2
	CO3	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1	1	1
	CO4	2	2	2	2	1	--	--	2	3	3	3	1	2	2	2	1	3

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year: 18-19	
Branch:CS/IT		Semester:VI	
1	Course Code	BCO-304	Course Name
2	Course Title	Introduction to PHP	
3	Credits	4	
4	Contact Hours (L-T-P)	3-0-2	

	Course Status	UG	
5	Course Objective	To design & develop secure web pages using server side scripting (frontend and backend)	
6	Course Outcomes	On successful completion of the course, the student will: <ol style="list-style-type: none"> 1. Apply logical processing and error handling to design and develop web pages/site. 2. Develop PHP scripts to handle HTML forms. 3. Develop dynamic website with database connectivity. 4. Develop Websites for Small business and organization or for individual 	
7	Course Description	This course introduces Concepts for PHP and learns Form handling, Session Management. How we can develop dynamic websites. It will also help students to build applications according to their problem statements.	
8	Outline syllabus		CO Mapping
	Unit 1	PHP Basics	
	A	Introduction to PHP , Working with PHP, Why PHP?, Basic Syntax of PHP	CO1
	B	PHP statement terminator and case insensitivity, Embedding PHP in HTML	CO1,CO4
	C	Comments, Variables, Assigning value to a variable, Constants, Managing Variables, Understanding variable scope, Global Variables, Static Variables	CO1
	Unit 2	Operators, Control Structures and Functions in PHP	
	A	Arithmetic Operators, Bit-wise Operators, Comparison Operators, Logical Operators, Concatenation Operator, Incrementing/Decrementing Operator, Ternary Operator	CO1,CO4
	B	Conditional Control Structures: If statement, If- else statement, If- else if statement, Nested If, Switch statement, Looping Control Structures: For loop, While loop, Do-While loop, For-each	CO1,CO4
	C	Functions, User-Defined function, Function Definition, Function with arguments, Function with return value, Call by value and call by references, Built-in functions in PHP.	CO1,CO4
	Unit 3	Array and Form Handling	
	A	Array: single, multi dimensional, numeric array, associative array	CO2,CO4
	B	Accessing form elements using GET and POST, Assigning value to form elements	CO2,CO4

	C	Form validation: validation, required, validate url, validate email Sending email, dealing with uploaded file, error handling	CO2,CO4
	Unit 4	File Handling & Session Management	
	A	Opening files in different modes, handling file open error	CO1,CO4
	B	File Operation: Reading & writing data on web page from file, deleting file, renaming file	CO1,CO4
	C	Session Management: introduction, creation, destroying and login session management	CO1,CO4
	Unit 5	PHP Database Connectivity	
	A	SQL Basic query: create, insert, select, delete, update, truncate, drop	CO3,CO4
	B	Introduction to ODBC, ODBC connection, connecting to ODBC	CO3,CO4
	C	Retrieving records, retrieving fields from record, closing connection	CO3,CO4
	Mode of examination	Theory	
	Weightage Distribution	CA	MTE
		30%	20%
			ETE
			50%
	Text book/s*	Peter MacIntyre, Rasmus Lerdorf, Kevin Tatroe, "Programming PHP", O'Reilly Publication	
	Other References	1. Steven Holzner, "Php: The Complete Reference", TMH publication 2. Ivan Bayross, "Web Enabled Commercial Applications Development Using HTML, JavaScript, DHTML and PHP", 4 th revised Edition, BPB Publication	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Apply logical processing and error handling to design and develop web pages/site.	PO4,PO9,PO12,PSO2
2.	CO2: Develop PHP scripts to handle HTML forms	PO3,PO9,PSO5

3.	CO3: Develop dynamic website with database connectivity.	PO3,PO9,PO12,
4.	CO4: Develop Websites for Small business and organization or for individual	PO3,PO4,PO7,PO9,PSO2,PSO5

PO and PSO mapping with level of strength for Course Name Introduction to PHP

	Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CS E	CO 1	2	2	2	3	2	2	1	2	3	2	2	3	2	3	2	2	1
	CO 2	1	2	3	2	1	2	-	2	3	2	1	2	2	2	2	2	3
	CO 3	2	2	3	2	1	-	-	1	3	2	-	3	2	2	1	2	2
	CO 4	2	2	3	3	1	1	3	2	3	2	2	2	2	3	2	2	3

School: SET		Batch : 2018-2021	
Program: B.Sc.		Current Academic Year: 2018-19	
Branch:CS/IT		Semester:VI	
1	Course Code	BCO-309	Course Name: Python Programming
2	Course Title	Python Programming	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Department Elective	
5	Course Objective	The objective of this course is to: 13. Explain the basic syntax of Python Program 14. Explain various programing constructs –data types, decision structures, control structures in python 15. Know how to use in-built data structures in python – Lists, Tuples, Dictionary 16. Know how to use libraries for string manipulation and File handling 17. Learn the fundamental principles of Object-Oriented Programming	
6	Course Outcomes	At the end of this course students will be able to: CO1: Use the variety of data types appropriate to specific programming problems.	

		CO2: Understand and use data structures like Lists, tuples and dictionaries. CO3: Familiarize with python string handling techniques, user defined functions& recursion CO4: Understand the concepts of math and random module, Exception handling and file handling CO5: Utilize the OOPs concepts of the Language CO6: Design small software application in Python language with extensive data processing.	
7	Course Description	This course starts with an introduction to Python, History of Python and basics syntax for writing Python Program. As the course progresses the study of decision structure, control structure and in-built data structure are studied in detail. This course mainly focuses on OOPs concepts. This course also deals with File handling, Exception Handling and Module concept.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Python	
	A	History, Features, Working with Python, Installing Python, basic syntax to write a program, The concept of data types	CO1
	B	Variables, Constants, Identifiers, keywords, Arithmetic and Logical operators and Boolean expressions. Debugging, comments in the program	CO1
	C	Conditional Statements : If, If-else, Nested if-else; Looping: For, While, Nested loops; Control Statements: Break, Continue, Pass	CO1, CO2
	Unit 2	Lists, Tuples and Dictionaries	
	A	Lists; Creation, Attributes, Accessing, Operations, Searching and sorting in Lists; Linear, Binary; Bubble, Selection, Insertion	CO2, CO3
	B	Tuple; Accessing, operations, working with Tuples	CO2, CO6
	C	Dictionaries; Notations, Accessing, Operations, Working with Dictionaries	CO2, CO3
	Unit 3	Functions, Recursion &String	
	A	Defining, Calling, Types of functions , Passing parameters with call by value and call by reference, Global and local variables	CO2, CO3
	B	Recursion, Writing recursive functions, Factorial Using recursion , Fibonacci series Using Recursion	CO2, CO3, CO6
	C	String; Accessing, Manipulation /Operation, String methods, Slicing.	CO3, CO4
	Unit 4	Module, File Handling & Exception Handling	
	A	Importing Module, Creating Module, Packages, Math and Random Module	CO4, CO6
	B	Need of File Handling, Different modes of operation,	CO3, CO4

		Opening, Writing, Reading, Closing and Appending Data in file, Accessing and Manipulating Files			
	C	Exception, Exception Handling, Try and Except clause, Finally clause, User defined Exceptions			CO4, CO6
	Unit 5	Object Oriented Programming Concepts			
	A	Overview of OOP concepts, Class and objects, Attributes			CO2, CO3, CO5, CO6
	B	Adding methods to a class, Passing an Object as Parameter to a method, Overloading; Method Overloading and Operator Overloading			CO2, CO3, CO5, CO6
	C	Inheritance; Types of inheritance and Overriding			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Tony Gaddis, Starting Out with Python, 3rd edition, Pearson 2. Y. Daniel Liang, Introduction to Programming Using Python, Pearson 3. Jason R .Briggs, Python For Kids, San Francisco 4. E Balagurusamy, Introduction to Computing & Problem solving Using Python, TMH			
	Other References	1. Downey, Allen B., Think Python: How to Think Like a Computer Scientist. O'Reilly, 2012. Obtain free PDF at http://www.greenteapress.com/thinkpython/ 2. Python Programming: An Introduction to Computer Science (Second Edition) John Zelle, ISBN 978-1-59028-241-0-9, Franklin, Beedle & Associates Inc., 2003. 3. Budd T A, Exploring Python , 2011, Tata McGraw Hill Education			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	Use the variety of data types appropriate to specific programming problems.	PO1, PO12, PSO3
2.	Understand and use data structures like Lists, tuples and dictionaries.	PO2, PO9, PSO2
3.	Familiarize with python string handling techniques, user defined functions& recursion	PO3, PO5, PO9, PSO2
4.	Understand the concepts of math and random module,	PO1, PO2, PO4, PO9,

	Exception handling and file handling	PSO2
5.	Utilize the OOPs concepts of the Language	PO2, PO3, PO4, PO5, PO9, PSO1, PSO2
6.	Design small software application in Python language with extensive data processing.	PO2, PO3, PO4, PO9, PSO1

**PO and PSO mapping with level of strength for Course Name Python Programming
(Course Code)**

Course Code	Course Name	PO 1	PO 2	PO3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
PC	Python Programming	1	3	3	3	2				3			1	2	3	1

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE	Python Programming															
	C01	2											1			2
	C02		2							2					2	
	C03		3	2		1									2	
	C04	3	3	3	2					3					3	
	C05		3	2	3	2				3				2	3	
	C06				1					2				2		

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE	Python Programming															
	CO1	2											1			2
	CO2		2							2					2	
	CO3		3	2		1									2	
	CO4	3	3	3	2					3					3	
	CO5		3	2	3	2				3				2	3	
	CO6				1					2				2		

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year: 2018-19	
Branch: CS/IT		Semester: VI	
1	Course Code	BCO-310	Course Name:
2	Course Title	ENTERPRISE RESOURCE PLANNING	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Departmental Elective	
5	Course Objective	Students will try to learn: 6. With the basic concepts of ERP systems for manufacturing or service companies, and the differences among (Material Requirement Planning) MRP, MRP II, and ERP systems; 7. Apply the principles of ERP systems, their major components, and	

		the relationships among these components; 8. With the knowledge of typical ERP systems, and the advantages and limitations of implementing ERP systems. 9. To comprehend the technical aspects of ERP systems 10. To be able to map business processes using ERP concepts and techniques.	
6	Course Outcomes	After Successful completion of this course the student will be able to: 1. <u>Classify</u> different processes of the organization and relationship among all processes . 2. <u>Examine</u> systematically the planning mechanisms in an enterprise, and identify all components in an ERP system and the relationships among the components; 3. To <u>describe</u> the Generic Model of ERP and General ERP Implementation Methodology. 4. To <u>apply</u> the concepts of BPR, SCM and CRM. 5. To <u>demonstrate</u> knowledge of SAP and Oracle Apps.	
7	Course Description	This course will explore the concepts, principles, and state-of-the-art methods insuccessfully integrating Enterprise Resource Planning (ERP) systems into extantenterprise architectures. The course will help both functional area and IT managersunderstand the respective role of users, enterprise architects, developers and managersin the selection, preparation, implementation and management of large and complexenterprise applications.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Enterprise Resource Planning	
	A	Introduction of the term Business Process Reengineering(BPR) ,BPR Methodology, Current BPR Tools	CO1, CO2
	B	Introduction to material requirement planning (MRP), Definition of Enterprise Resource Planning (ERP); Evolution of ERP; Characteristics, Features	CO1, CO2
	C	Components and needs of ERP; ERP Vendors; Benefits & Limitations of ERP Packages	CO1, CO2
	Unit 2	Enterprise Modeling and Integration of ERP	
	A	Need to focus on Enterprise Integration/ERP; Information mapping	CO1, CO2

	B	Role of common shared Enterprise database; System Integration, Logical vs. Physical System Integration			CO1, CO2
	C	Benefits & limitations of System Integration, ERP's Role in Logical and Physical Integration			CO1, CO2,
	Unit 3	ERP Architecture and Implementation Methodology of ERP			
	A	Generic Model of ERP system; Core Modules functionality; Types of ERP architecture			CO1, CO3
	B	Difficulty in selecting ERP, Approach to ERP selection, Request for Proposal approach			CO1, CO3, CO4
	C	Evaluation Criteria of ERP packages; Project Implementation Team Structure			CO1, CO3, CO4
	Unit 4	Introduction to SAP , Oracle APPS			
	A	SAP, Integrated SAP Model, SAP Architecture			CO1,CO5
	B	Oracle Apps, Oracle AIM Methodology			CO1,CO5
	C	A Comparative assessment of ERP Packages			CO1,CO5
	Unit 5	Supply Chain Management and Customer Relationship Management			
	A	Definition of Supply Chain Management (SCM); Aims of SCM; Benefits of SCM; ERP Vs SCM			CO1,CO2,CO3, CO4,CO5
	B	Definition of Customer Relationship Management (CRM); CRM Evolution; CRM Component			CO1,CO2,CO3, CO4,CO5
	C	Case Study			CO1,CO2,CO3, CO4,CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Enterprise Systems For Management, Luvai F. Motiwalla, Jeff Thompson, Pearson Education., 2nd Ed., 2011. ISBN-10: 0132145766 ISBN-13: 978- 0132145763 2. Enterprise Resource Planning, Ravi Shankar, S.Jaiswal, Galgotia Publication Pvt. Ltd., 1st Ed., 1999. ISBN 81-203-0417-9			
	Other References	Enterprise Resource Planning by Mary Sumner , Prentice Hall , 2005			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO-1 <u>Classify</u> different processes of the organization and relationship among all processes	
2.	CO-2 <u>Examine</u> systematically the planning mechanisms in an enterprise, and identify all components in an ERP system and the relationships among the components	
3.	CO-3 To <u>describe</u> the Generic Model of ERP and General ERP Implementation Methodology.	
4.	CO-4 To <u>apply</u> the concepts of BPR, SCM and CRM.	
5.	CO-5 To <u>demonstrate</u> knowledge of SAP and Oracle Apps.	

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year: 2018-19	
Branch: CS/IT		Semester: VI	
1	Course Code	BCO-305	Course Name:
2	Course Title	Information Security	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status		
5	Course Objective	Introduce to Information Security theories, techniques & applications that are often required.	
6	Course Outcomes	On successful completion of this module students will be able to: CO1: Understand basic concepts of information security & Apply different symmetric and asymmetric key ciphers CO2: Apply basic mathematical methods of modular arithmetic. CO3: Understand types and objectives of virus CO4: Evaluate the different firewall design principles.	
7	Course Description	This course introduces basic concepts of Information security & public key cryptography. Also imparts the knowledge of types of virus & system security.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	A	Information Security Concepts, Elements of security, security policy, security techniques, Models, terminology	CO1, CO2
	B	encryption methods, cryptography, cryptanalysis & steganography	CO1, CO2
	C	Mathematics of cryptography- GCD, Euclidean, Extended Euclidean algorithm	CO1, CO2

	Unit 2	Symmetric key Cryptosystem			
	A	Introduction to symmetric key cryptography, Substitution Cipher			CO1
	B	Mono-alphabetic substitution cipher:- Caesar cipher, additive and multiplicative cipher			CO1
	C	Polyalphabetic substitution cipher- playfair cipher, hill cipher, Transposition cipher- rail fence cipher, column cipher			CO1
	Unit 3	Public key cryptosystem & Authentication			
	A	Public key cryptosystem, authentication , application , symmetric vs asymmetric cryptosystem			CO1
	B	RSA-key generation , encryption and decryption			CO1,CO2
	C	Authentication – introduction , methods-password based, two factor, biometrics, MD2			CO1,CO2
	Unit 4	Virus			
	A	Malicious software- virus, worms, zombie, logic bombs, trapdoors, spyware, Trojan horse			CO3
	B	Phases of virus and worm propagation			CO3
	C	Types of virus , worms, Attacks –Hoax , backdoor, brute force, denial of service, distributed denial of service, spoofing , sniffing, replay, traffic analysis			CO3
	Unit 5	System Security			
	A	Intruders, intrusion detection , introduction detection system, password management			CO4
	B	Anomaly based intrusion detection system , rule based intrusion detection system			CO4
	C	Firewalls- firewall design principles, firewall types			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. V. Pachghare” cryptography and Information security”- PHI 2. Behrouz A. Forouzan, “Cryptography And Network Security”- McGraw Hill			
	Other References	1. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons Inc, 2001. 2. William Stallings, “Cryptography And Network Security – Principles and Practices”, Prentice Hall of India, Fourth Edition			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Understand basic concepts of information security & Apply different symmetric and asymmetric key ciphers	PO1,PO2,PSO2

2.	CO2: Apply basic mathematical methods of modular arithmetic.	PO1,PO2,PSO2
3.	CO3: Understand types and objectives of virus	PO1,PSO1,PSO2
4.	CO4: Evaluate the different firewall design principles.	PO2,PSO2

PO and PSO mapping with level of strength for Course Name Information Security(Course Code)

CS E	Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	CO 1	3	3	2	1	1	2	1	1	1	1	2	2	2	3	1	1	2
	CO 2	3	3	2	2	2	1	2	2	1	1	2	2	2	3	1	1	2
	CO 3	3	2	1	2	1	2	1	1	2	1	1	2	3	3	2	2	1
	CO 4	2	3	2	1	1	2	1	1	1	2	2	1	2	3	2	2	1

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year: 2018-19	
Branch:CS/IT		Semester: VI	
1	Course Code	BCO-311	Course Name
2	Course Title	Data Encoding and Compression	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Departmental Elective	
5	Course Objective	17. Provide students with an overview of the methodologies and approaches to data encoding 18. Gain insight into the challenges and limitations of different data encoding techniques 19. Provide the students with practice on applying data coding solutions 20. Prepare students for research in the area of data encoding and compression ,related applications 21. Enhance students communication and problem solving skills	
6	Course Outcomes	Students will be able to: CO1: To understand mathematical preliminaries and lossy and lossless compression. CO2: To learn the simple lossless encoding techniques. CO3: To understand the fundamentals of information theory and algorithms.	

		CO4: To learn about various lossless compression standards with image and video compression.			
7	Course Description	This course introduces advanced aspects of data encoding and compression, encompassing the fundamental principles, to analyze the encoding, identify the appropriate compression, and choose the relevant algorithms to apply.			
8	Outline syllabus			CO Mapping	
	Unit 1	Introduction			
	A	Mathematical Preliminaries			CO1
	B	Lossy and Lossless compression			CO1
	C	Application of compression			CO1
	Unit 2	Simple lossless encoding			
	A	Run length encoding Huffman coding			CO1, CO2
	B	LZW coding, Run length encoding,			CO1, CO2
	C	Arithmetic coding			CO1, CO2
	Unit 3	Fundamentals of Information Theory			
	A	Concepts of entropy, probability models			CO1,CO2,CO3
	B	Markova models, Fundamentals of coding theory,			CO1,CO2,CO3
	C	Algorithmic information theory & Minimum description			CO1,CO2,CO3
	Unit 4	Lossless Compression standards			
	A	zip, gzip,			CO1,CO2,CO3 ,CO4
	B	bzip, unix compress			CO1,CO2,CO3 ,CO4
	C	GIF, JBIG			CO1,CO2,CO3 ,CO4
	Unit 5	Image & Video compression			
	A	Basis functions and transforms from an intuitive point			CO1,CO2,CO3 ,CO4
	B	JPEG, MPEG, Vector Quantization			CO1,CO2,CO3 ,CO4
	C	case study of WinZip, WinRar			CO1,CO2,CO3 ,CO4
	Mode of examination	Theory			
	Weightage Distribution	CA			MTE
		30%			20%
	Text book/s* Other References	16. Introduction to Data Compression, 3rd Edition, Khalid Sayood, Morgan Kauffman			
		17.		ETE	
				50%	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: To understand mathematical preliminaries and lossy and lossless compression.	PO1,PO2,PO3,PO4,PSO1
2.	CO2: To learn the simple lossless encoding techniques.	PO1, PO2, PO4, PSO2
3.	CO3: To understand the fundamentals of information theory and algorithms.	PO1,PO2,PO4
4.	CO4: To learn about various lossless compression standards with image and video compression.	PO8,PO9, PO10,PO12, PSO5

PO and PSO mapping with level of strength for Course Name Data encoding and compression (Course Code)

CS E	Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	CO 1	3	3	3	3	--	--	--	--	2	1	2	1	3	1	1	1	2
	CO 2	3	2	1	3	--	--	--	2	2	2	1	1	1	3	2	1	2
	CO 3	3	3	1	3	--	--	--	1	1	1	3	2	1	1	1	1	1
	CO 4	2	2	2	2	1	--	--	1	1	1	1	1	1	1	1	1	3

School: SET		Batch : 2018	
Program: B.Sc.		Current Academic Year: 2018-19	
Branch: -CS/IT		Semester: VI	
1	Course Code	BCA-312	Course Name
2	Course Title	Introduction to Cloud	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Departmental Elective	
5	Course Objective	22. Provide students with an overview of the fundamental concepts of Cloud Computing. 23. Gain insight into the challenges and limitations Models of cloud computing. 24. To learn the various technologies of the cloud computing paradigm and	

		learn about recent advances in Cloud Computing and enabling technologies. 25. Prepare students for research in the area of cloud Computing risks and cloud security challenges. 26. Enhance students communication and problem solving skills	
6	Course Outcomes	Students will be able to: CO1: To understand the cloud computing Concepts. CO2: Explain how and why this paradigm came about and the influence of several enabling technologies like Google file systems CO3: Build cloud based applications using Amazon AWS and/or Google App Engine. CO4: Understanding of Cloud Computing risk issues.	
7	Course Description	This course introduces advanced aspects of Cloud Computing, encompassing the principles, to analyze the cloud, identify the problems, and choose the relevant models and algorithms to apply.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction Cloud Computing	
	A	Introduction to distributed systems, Defining Cloud Computing, Understanding of Cloud Architecture: Infrastructure, Platform, Virtual Appliances, Communication Protocols, Applications, Understanding Services: SaaS, PaaS, IaaS	CO1, CO2
	Unit 2	Understanding Abstraction and Virtualization	
	A	Advanced Load Balancing, the Google Cloud, Virtual machine types Storage in the Cloud: Google file system.	CO1, CO2,CO4
	Unit 3	Cloud Computing with the Titans	
	A	Google Web Services: Google app Engine, Google Web Toolkit. Amazon: Amazon Elastic Cloud Computing, Amazon Simple Storage System	CO1,CO2,CO3
	Unit 4	Cloud Computing Risk Issues	
	A	The CIA Triad: Confidentiality, Integrity, And Availability. Common Threats and Vulnerability: Logon Abuse, Inappropriate System Use, Eavesdropping, Denial-of-service (DoS) Attack, Session Hijacking Attack. Cloud Service Provider (CSP) Risks: Back Door, Spoofing, Replay Attack, Social Engineering Attack, Dumpster Diving, Trojan Horse and Malware.	CO1,CO2,CO3
	Unit 5	Cloud Computing Security Challenges	
	A	Security Policy Implementation, Policy Types: Senior Management Statement of Policy, Regulatory Policies, Advisory Policies, And Informative Policies.	CO1,CO2,CO3
	Mode of examination	Theory	

Weightage Distribution	CA	MTE
	30%	20%
Text book/s* Other References	18. Barrie Sosinsky “ <i>Cloud Computing (Bible)</i> ”, Wiley 19. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter “ <i>Cloud Computing: A Practical Approach</i> ” TATA McGRAW-HILL Edition. 20. Ronald L. Krutz and Russell Dean Vines, “ <i>Cloud Security: A comprehensive Guide to Secure Cloud Computing</i> ”, WILEY.	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: To understand and implement classical algorithms in data mining and data warehousing.	PO1, PO2, PO3, PO4, PSO1
2.	CO2: To assess the strengths and weaknesses of the algorithms.	PO1, PO3, PO4, PSO2
3.	CO3: To identify the application area of algorithms, and apply them.	PO1, PO2, PO3, PO4
4.	CO4: To integrating and interpreting the data sets and improving effectiveness, efficiency and quality for data analysis.	PO9, PO10, PO11, PSO5

PO and PSO mapping with level of strength for Course Name Introduction to Cloud (Course Code)

C S E	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
	CO1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2	1	2
	CO2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2	1	2
	CO3	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1	1	1
	CO4	2	2	2	2	1	--	--	2	3	3	3	1	2	2	2	1	3