Program and Course Structure

School of Engineering Technology
Bachelor in Computer Application (BCA)

2019 ADMISSION BATCH

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

Core Values

- Integrity
- Leadership
- Diversity
- Community

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 conductive 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 mentoring and counselling.

1.2.1Vision 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.

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: An ability to apply knowledge of computing and mathematics appropriate to the discipline.

PO2: An ability to identify, formulate, and develop solutions to computational challenges.

PO3: An ability to design, implement, and evaluate a computational system to meet desired needs within realistic constraints.

PO4: An ability to function effectively on teams to accomplish shared computing design, evaluation, or implementation goals.

PO5: An understanding of professional, ethical, legal, security, and social issues and responsibilities for the computing profession.

PO6: An ability to communicate and engage effectively with diverse stakeholders.

PO7: An ability to analyze impacts of computing on individuals, organizations, and society.

PSO1: Able to draw upon foundational knowledge, learn, adapt and successfully bring to bear analytical and computational approaches on changing societal and technological challenges.

PSO2: Is a leader and a responsible citizen whose strengths come from an ability to draw on and contribute to diverse teams, expertise, and experiences.

PSO3: Drives scientific and societal advancement through technological innovation and entrepreneurship.

PSO4: Is and remains engaged with the University of Colorado, the state of Colorado, and technical and scientific professional communities.

1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

Mapping	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	3	3	2	1	3
PO2	3	3	3	1	2
PO3	1	2	2	1	1
PO4	3	2	3	1	3
PO5	2	3	3	2	2
PO6	1	2	3	3	2
PO7	3	2	1	3	1

1. Slight (Low)

2. Moderate (Medium)

3. Substantial (High)

School of Engineering and Technology							
BCA							
Batch: 2019 Onwards						TERM: I	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA160	Introduction to C Programming	3	1	0	4	
2	BCA161	Basics of Digital Electronics	3	1	0	4	
3	BCA162	Fundamental of Information Technology	3	0	0	3	
4	EVS112	Environmental Studies	3	0	0	3	
5	MTH119	Mathematics in Computer Applications	3	1	0	4	
Practical/Viva-Voce/Jury							
6	ARP101	Communicative English-1	1	0	2	2	
7	BCP160	Introduction to C Programming Lab	0	0	2	1	
8	BCP162	Basics of Digital Electronics Lab	0	0	2	1	
TOTAL CREDITS						**22**	

School of Engineering and Technology							
BCA							
Batch: 2019 Onwards						TERM: III	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA260	Computer Organization	3	0	0	3	
2	BCA261	Operating Systems	3	1	0	4	
3	BCA262	Web and Its Application	3	0	0	3	
4	BCA263	Principles of Data Structures	3	1	0	4	
5	HMM111	Values and Ethics	2	0	0	2	
Practical/Viva-Voce/Jury							
6	ARP203	Logical Skills Building and Soft Skills	1	0	2	2	
7	BCP260	Computer Organization Lab	0	0	2	1	
8	BCP262	Web and Its Application Lab	0	0	2	1	
9	BCP263	Principles of Data Structures Lab	0	0	2	1	
10	BCP201	Introduction to LINUX	0	0	2	1	
TOTAL CREDITS						**22**	

School of Engineering and Technology							
BCA							
Batch: 2019 Onwards						TERM: IV	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA264	Basics of Computer Network	3	1	0	4	
2	BCA265	Database Management Systems	3	0	0	3	
3	BCA266	Web Designing	3	1	0	4	
4	BCA267	Introduction to Software Engineering	3	0	0	3	
5	ENG202	Communication practices -I	2	0	0	2	
Practical/Viva-Voce/Jury							
6	ARP204	Quantitative and Qualitative Aptitude Sill Building	1	0	2	2	
7	BCP265	Database Management Systems Lab	0	0	2	1	
8	BCP266	Web Designing Lab	0	0	2	1	
9	ENP202	Communication practices -I Lab	0	0	2	1	
TOTAL CREDITS						**21**	

School of Engineering and Technology							
BCA							
Batch: 2019 Onwards						TERM: V	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA360	Introduction to OOP using Java	3	1	0	4	
2	BCA361	E Commerce	3	1	0	4	
3		Program Elective-1	3	0	0	3	
	BCA 364	Computer Graphics					
	BCA365	Client Server Computing					
5		Program elective-2	3	0	0	3	
	BCA366	Multimedia & Animation					
	BCA367	Introduction to Distributed System					
6	BCA314	Essentials of Digital Marketing	3	0	0	3	
Practical/Viva-Voce/Jury							
7	ARP301	Personality Development and Decision making Skills	1	0	2	2	
8	BCP360	Introduction to OOP using Java	0	0	2	1	
TOTAL CREDITS						**20**	

School of Engineering and Technology							
BCA							
Batch: 2019 Onwards						TERM: VI	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA362	Introduction to PHP	3	0	0	3	
2	BCA363	Information Security	3	1	0	4	
3		Program Elective -3	3	0	0	3	
	BCA368	Python Programming					
	BCA369	ERP					
4		Program Elective-4	3	0	0	3	
	BCA370	Data Encoding and Compression					
	BCA371	Introduction to Cloud					
Practical/Viva-Voce/Jury							
5	ARP302	Campus to Corporate	1	0	2	2	
6	BCP362	Introduction to PHP	0	0	2	1	
7	BCA399	Project	0	0	12	6	
TOTAL CREDITS						**22**	

BCA PE-1		**BCA PE-2**		**BCA PE-3**		**BCA PE-4**	
BCA 364	Computer Graphics	BCA 366	Multimedia & Animation	BCA 368	Python Programming	BCA 370	Data Encoding and Compression
BCA 365	Client Server Computing	BCA 367	Introduction to Distributed System	BCA 369	ERP	BCA 371	Introduction to Cloud

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester:1**	
1	Course Code	**BCA160** Course Name: Introduction to C programming	
2	Course Title	Introduction to C programming	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	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: Illustrate Flowchart and Algorithm to the given Problem CO2: Understand core concept of c Programming CO3: Implement Array and String CO4: Implement Functions CO5: Use Union and Structure CO6: 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, CO2
	B	Compiler and Linker,	CO2
	C	Testing and Debugging a program, Documentation	CO2
	Unit 2	**Constants, Variables & Data Types**	
	A	Identifiers and Keywords, Constants, Variables, Data types,Declaration of variables,	CO3
	B	declaration of storage class, assigning values to variables, defining symbolic constants, declaring a variable as constant, declaring a variable as volatile,.	CO3
	C	overflow and underflow of data	CO3
	Unit 3	**Operators & Expressions**	
	A	Arithmetic operators, Relational, Logical operators, Assignment, increment and decrement operators,	CO4

	B	conditional operators, bitwise operators, special operators, arithmetic expressions, evaluation of arithmetic expressions, precedence of arithmetic expressions			CO4
	C	type conversion in expressions, operator precedence and associativity, mathematical functions.			CO4
	Unit 4	**Decision Making – Branching & Looping**			
	A	Decision making with IF statement, switch statement, ? : operator			CO5
	B	While statement, do-while statement,			CO5
	C	for statement, Jumps in loops,			CO5
	Unit 5	**Functions**			
	A	Top down approach of problem solving			CO6
	B	standard library functions, passing values between functions, scope rules of functions			CO6
	C	Function calling, return type of functions, call by value and call by reference, recursive functions.			CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. *The C Programming Language*			
	Other References	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			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Illustrate Flowchart and Algorithm to the given Problem	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
2.	CO2: Understand core concept of c Programming	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
3.	CO3: Implement Array and String	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
4.	CO4: Implement Functions	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
5.	CO5: Use Union and Structure	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

	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
BCA160	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
	CO6	3	2	3	-	-	-	-	-	-	-	2	1	3	2	2	1	2

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch: CS/IT		**Semester: I**	
1	Course Code	BCP160	
2	Course Title	Introduction to C programming Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	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: Illustrate Flowchart and Algorithm to the given Problem CO2: Understand core concept of c Programming CO3: Implement Array and String CO4: Implement Functions CO5: Use Union and Structure 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	**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	
		Write a c program to concatenate two strings	
	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. *The C Programming Language*			
	Other References	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			

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. *The C Programming Language*
Other References	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

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Illustrate Flowchart and Algorithm to the given Problem	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
2.	CO2: Understand core concept of c Programming	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
3.	CO3: Implement Array and String	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
4.	CO4: Implement Functions	PO1,PO2,PO3,PO11,PO12 PSO1,PSO2,PSO3,PSO4,SPO5
5.	CO5: Use Union and Structure	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

	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
BCP 160	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
	CO6	3	2	3	-	-	-	-	-	-	-	2	1	3	2	2	1	2

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch: CS/IT		**Semester: I**	
1	Course Code	BCA161 | Course Name: BCA	
2	Course Title	Basics of Digital Electronics	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	UG	
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: 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. 5) Design & implement different types of sequential logic circuits using Flip Flops. 6) 6. Design & implement different types of Counters, a, c, k Registers, and Programmable Logic Devices	
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	CO1
	B	Conversion from One Number System to another.	CO1
	C	Arithmetic Operation without Changing the Base, 1‟s Complement and 2‟s Complement.	CO1
	Unit 2	**Logic Gates**	
	A	AND, OR, NOT, NAND, NOR, XOR, XNOR	CO2

	B	NAND & NOR as Universal Gates			CO2
	C	Logic Gates Applications			CO2
	Unit 3	**Boolean Algebra**			
	A	Introduction, Theorems, Simplification of Boolean Expression using Boolean Algebra			CO2, CO3
	B	SOP & POS Forms, Realization of Boolean Expression using Gates			CO2, CO3
	C	K-Maps, Simplification of Boolean Expression using K-Maps.			CO2, CO3
	Unit 4	**Combinational Logic Circuits**			
	A	Half Adder & Half Subtractor, Full Adder & Full Subtractor, Parallel Binary Adder, Binary Adder/Subtractor.			CO2,CO3, CO4,CO6
	B	Multiplexers & Demultiplexers, Implementation of Boolean equations using Multiplexer and Demultiplexer			CO2,CO3, CO4,CO6
	C	Encoders & Decoders			CO2,CO3, CO4
	Unit 5	**Sequential Logic Circuits**			
	A	Latch, Flip Flops- R-S Flip-Flop, J-K Flip-Flop			CO2,CO3, CO4,CO5
	B	Master-Slave J-K Flip-Flop, Race Condition, Removing Race Condition			CO2,CO3, CO4,CO5
	C	D Flip-Flop, T Flip-Flop, Applications of Flip-Flops			CO2,CO3, CO4,CO5
	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
5	CO5: Design & implement different types of sequential logic circuits using Flip Flops.	PO1,PO2, PO3,PO4, PO5, PO6, PO8, PO9, PO10, PO12 PSO1, PSO3, PSO4
6.	CO6: Design & implement different types of Counters, a, c, k Registers, and Programmable Logic Devices	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 BCA161)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CSE	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
	CO5	3	3	2	3	3	3	-	2	2	3	-	3	3	-	2	3
	CO6	3	3	3	-	3	2	-	-	-	-	-	3	3	3	-	2

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester:I**	
1	Course Code	BCA162 | Course Name- BCA	
2	Course Title	**Fundamentals of Information Technology**	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	UG	
5	Course Objective	• The main objective is to introduce IT in a simple language to all undergraduate students, regardless of their specialization. • The focus of the subject is on introducing skills relating to IT basics, computer applications • To understand the basic knowledge of computer	
6	Course Outcomes	Students will be able to: **CO1**:Identity categories of computers. **CO2:** Have a basic understanding of personal computers and their operations. **CO3:**be able to identify computer hardware components and describe their function; **CO4: Identify the role of software Operating system overview** **CO5:** The focus of the subject is on introducing skills relating to IT basics, computer applications **CO6:** 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,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,CO3
	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,	CO1, CO2

		MICR, Digitizer, Electronic card reader, Image Capturing Devices-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,Applicationsoftware, System software-operating system, utility program, programming languages, assemblers, compilersand interpreter			CO1,CO2,CO3,C04
	B	introduction to operation system forPCs-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,CO4
	C	application softwareand 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, typesof viruses, virus detection prevention and cure.			CO2,CO4
	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			CO1CO4
	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*	1. Computer Fundamentals by P.K.Sinha			

	Other References		

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	**CO1: : Identity categories of computers.**	
2.	**CO2:** Have a basic understanding of personal computers and their operations.	PO1,PO2,PO3,PO4,PSO1
3.	**CO3:**be able to identify computer hardware components and describe their function;	PO1, PO3, PO4, PSO2
4.	**CO4**: Identify the role of softwareOperating system overview	PO1, PO3, PO4, PSO2
5.	**CO5:** Understand basic concepts and terminology of information technology.	PO1,PO2,PO3,PO4
6.	**CO6:** Understand basic concepts computer arithmetic	PO9, PO10,PO11, PSO5

PO and PSO mapping with level of strength for Fundamentals of Information Technology (Course Code BCA 162)

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

Schools: SET		Batch : 2019 Current Academic Year: 2019-20 Semester: 1st
1	Course Code	**ARP101**
2	Course Title	Communicative English-1
3	Credits	2
4	Contact Hours (L-T-P)	1-0-2
5	Course Objective	To minimize the linguistic barriers that emerges in varied socio-linguistic environments through the use of English. Help students to understand different accents and standardise their existing English. Guide the students to hone the basic communication skills - listening, speaking, reading and writing while also uplifting their perception of themselves, giving them self-confidence and building positive attitude.
6	Course Outcomes	CO1 Learn to use correct sentence structure and punctuation as well as different parts of speech. CO2 Learning new words its application and usage in different contexts helpful in building meaning conversations and written drafts. Develop over all comprehension ability, interpret it and describe it in writing. Very useful in real life situations and scenarios. CO2 A recognition of one's self and abilities through language learning and personality development training leading up to greater employability chances. Learn to express oneself through writing while also developing positive perception of self. To be able to speak confidently in English CO3 To empower them to capitalise on strengths, overcome weaknesses, exploit opportunities, and counter threats. To ingrain the spirit of Positive attitude in students through a full length feature film followed by a storyboarding activity. Create a Self Brand, identity and self esteem through various interesting and engaging classroom activity CO4 Exposing students to simulataions and situations wherein students learn to describe people and situations and handle such situations effectively and with ease. Teaching students how to engage in meaningful dialogues and active conversational abilities to navigate through challenging situations in life and make effective conversations. CO12 Learn how to transform adverse beginnings into positive endings – through writing activities like story completion.
7	Course Description	The course is designed to equip students, who are at a very basic level of language comprehension, to communicate and work with ease in varied workplace environment. The course begins with basic grammar structure and pronunciation patterns, leading up to apprehension of oneself through written and verbal expression as a first step towards greater employability.

8	Outline syllabus – ARP 201		
	Unit A	**Sentence Structure**	**CO Mapping**
	Topic 1	Subject Verb Agreement	CO1
	Topic 2	Parts of speech	
	Topic 3	Writing well-formed sentences	
	Unit B	**Vocabulary Building & Punctuation**	
	Topic 1	Homonyms/ homophones, Synonyms/Antonyms	CO1
	Topic 2	Punctuation/ Spellings (Prefixes-suffixes/Unjumbled Words)	CO1, CO1
	Topic 3	Conjunctions/Compound Sentences	CO1, CO2
	Unit C	**Writing Skills**	
	Topic 1	Picture Description – Student Group Activity	CO3
	Topic 2	Positive Thinking - Dead Poets Society-Full-length feature film - Paragraph Writing inculcating the positive attitude of a learner through the movie | SWOT Analysis – Know yourself	CO3, CO2, CO3
	Topic 3	Story Completion Exercise –Building positive attitude - The Man from Earth (Watching a Full length Feature Film)	CO2, CO3, CO4
	Unit D	**Speaking Skill**	
	Topic 1	Self-introduction/Greeting/Meeting people – Self branding	CO2, CO3
	Topic 2	Describing people and situations - To Sir With Love (Watching a Full length Feature Film)	CO3, CO4
	Topic 3	Dialogues/conversations (Situation based Role Plays)	CO2, CO4, CO4
9	Evaluations	*Class Assignments/Free Speech Exercises / JAM Group Presentations/Problem Solving Scenarios/GD/Simulations (60% CA and 40% ETE*	*N/A*
10	Texts & References | Library Links	• Blum, M. Rosen. *How to Build Better Vocabulary*. London: Bloomsbury Publication • Comfort, Jeremy(et.al). *Speaking Effectively*. Cambridge University Press	

Observations:

1. A Single Consolidated Syllabus has now replaced the Previous Functional English Beginners -1 and Functional English Intermediate -1

2. Credits previously allocated to FEN 01 Lab Sessions have been dissolved
3. The Pearson Voice Labs have been completely eliminated

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester:II**	
1	Course Code	**BCA163**	Course Name: Advance Concept in C programming
2	Course Title	Advance Concept in C programming	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	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: Implement Array CO2: Implement String CO3: Understand and implement Pointers CO4: Crete 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 Size of Structures.	CO4,CO5
	Unit 5	**Applications**	
	A	Calculator, Bill generator	CO6
	B	Searching	CO6

	C	Sorting			CO5,CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. *The C Programming Language*			
	Other References	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			

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: Crete 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 Concept in C Programming (Course Code BCA 163)

	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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch: CSE		**Semester: II**	
1	Course Code	BCP 163	
2	Course Title	Advance Concept in C programming LAB	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
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: Crete 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	Practical	

	examination				
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. *The C Programming Language*			
	Other References	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			

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. *The C Programming Language*
Other References	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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester:II**	
1	Course Code	BCA164 | Course Name- BCA	
2	Course Title	**Computer Hardware and Trouble shooting**	
3	Credits		
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	UG	
5	Course Objective	1. The course covers topics related to personal computer components, itsfunctions and characteristics, occupational health and safety policies and procedures 2. This course will develop essential troubleshooting and problem diagnosis skills forcommon 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:**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	The course covers topics related to personal computer components, itsfunctions and characteristics, occupational health and safety policies and procedures	
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,CO4
	C	Introducing protocols. Cabling and troubleshooting.			CO4,CO5,CO6
	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,CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Data Communications And Networking 4th Edition,McGrawHill, 2017 2. Assembling and troubleshooting by James Perozzo 3. Troubleshooting and Repairing Computer Printers by Stephen J. Bigelow.			
	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 Troubleshooting (Course Code BCA164)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CSE	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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester:II**	
1	Course Code	BCP 164	
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	CO1, CO2
		Understanding of Motherboard and its interfacing components	CO1, CO2
		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	MTE	ETE	
		60%	0%	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				

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester:2**	
1	Course Code	BCA165 | Course Name BCA	
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 Description	This course introduces the concepts of distributed operating system, algorithms and design issues and challenges in Distributed system, dentify 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 (Course Code BCA 165)

	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 : 2019**	
Program:BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester:2**	
1	Course Code	BCA166 | Course Name: Graph Theory	
2	Course Title	Graph Theory	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	UG	
5	Course Objective	Objective of this course is to: 1. Explain basic concepts in graph theory, 2. Define how graphs serve as models for many standard problems, 3. Discuss the concept of graph, tree, Euler graph and cut set and 4. Learn and apply concepts in the applications of graphs in science, business and industry.	
6	Course Outcomes	Students will be able to: CO1: Demonstrate some of the most important notions of graph theory and develop their skill in solving basic exercises CO2: Understand the basic concepts of graphs, connected and disconnected graphs, and interpret the fundamentals of graphs and trees and to relate them with the use in computer science applications CO3: Apply spanning trees concept to solve the classical problems like TSP etc. CO4: Explore the concepts and applications of cut-sets and circuits in graph CO5: Explore a graph with the help of matrices and to find a minimal spanning tree for a given weighted graph CO6: Apply graph-theoretic algorithms and methods used in computer science	
7	Course Description	The course will cover the fundamental concepts of Graph Theory: simple graphs, digraphs, Eulerian and Hamiltonian graphs, trees, networks, paths and cycles, Cut-sets and circuit.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	
	A	Introduction: Finite and Infinite graphs, Incidence & Degree, Isolated vertex,Pendant Vertex	CO1
	B	Null Graph, Various types of graph, sub graphs, handshaking lemma	CO1
	C	special properties of graphs and various operations on graphs, walks, Path, and circuits connected graph	CO1, CO6
	Unit 2	**Trees**	
	A	Disconnected graphs and Components, Euler graphs, Operations on graphs more on Euler Graphs	CO2
	B	Hamiltonian paths and cycles, Trees, some properties of trees	CO2
	C	pendant Vertices in a tree, Distance and centers in a tree	CO2
	Unit 3	**Binary Trees**	
	A	Basic terminology related to Rooted and Binary trees	CO3
	B	Importance of binary tree, Binary search tree	CO3

	C	Finding all spanning tree of a graph, , algorithms to find spanning trees in a weighted graph (Kruskal& Prim)			CO3
	Unit 4	**Cut-Sets**			
	A	Cut-Set, Some Properties of Cut-Set, All Cut-Sets in a graph, concept of planar graph			CO4
	B	Path-Sets, some properties of paths sets in a graph.			CO4
	C	Fundamental Circuits & Cut-Sets, Connectivity and separability.			CO4, CO6
	Unit 5	**Matrix representation of graphs**			
	A	Directed graph, undirected graph, circuit matrix, fundamental circuit matrix and finding their Ranks.			CO5
	B	Matrix representation of graph,incidence matrix A(G), sub matrices of A(G), Rank of A(G),			CO5
	C	Circuit matrix, fundamental circuit matrix and finding their Ranks, Relationship among Af , Bf , and Cf and its deduction.			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Deo, N, Graph *theory with applications to Engineering and Computer Science*, Prentice Hall India			
	Other References	1. Wilson R J, *Introduction to Graph Theory*, Pearson Education 2. Harary, F, *Graph Theory*, Narosa 3. Bondy& Murthy, *Graph theory and application*. Addison Wesley.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	**CO1:**Demonstrate some of the most important notions of graph theory and develop their skill in solving basic exercises.	PSO1
2.	**CO2**: Understand the basic concepts of graphs, directed graphs, and weighted graphs and interpret the fundamentals of graphs and trees and to relate them with the use in computer science applications	PSO1, PSO2
3.	CO3: Apply spanning trees concept to solve the classical problems like TSP etc.	PSO2
4.	**CO4:**explore the concepts and applications of cut-sets and circuits in graph	PSO2, PSO3
5.	**CO5:**explore a graph with the help of matrices and to find a minimal spanning tree for a given weighted graph	PSO2
6	**CO6:** Apply graph-theoretic algorithms and methods used in computer science	PSO2, PSO3

PO and PSO mapping with level of strength for Course Name Graph Theory(Course Code BCA 166)

Cos	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	1
CO2	3	3	1	2	2
CO3	2	3	1	2	1
CO4	2	3	3	1	2
CO5	2	3	2	1	1
CO6	2	3	3	2	2

Schools: SET		**Batch :** 2019	
		Current Academic Year: 2019-20	
		Semester: 2nd (Second)	
1	Course Code	**ARP102**	
2	Course Title	Communicative English -2	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
5	Course Objective	To Develop LSRW skills through audio-visual language acquirement, creative writing, advanced speech et al and MTI Reduction with the aid of certain tools like texts, movies, long and short essays.	
6	Course Outcomes	**CO1** Move from primary self-assessment to larger goal and vision statement realisation with the help of feature length films as enablers and multimedia as language facilitators. **CO2** To develop a positive attitude through written expression of positive thought process and outlook with the help of writing activities like story completion et al. **CO3** Learn advanced writing skills in English like full length essays et al. **CO4** Master the science of speech and correct pronunciation through the accent-neutralisation program followed by reading sessions applying the lessons learnt.	
7	Course Description	The course takes the learnings from the previous semester to an advanced level of language learning and self-comprehension through the introduction of audio-visual aids as language enablers. It also leads learners to an advanced level of writing, reading, listening and speaking abilities, while also reducing the usage of L1 to minimal in order to increase the employability chances.	
8	Outline syllabus – ARP 202		
	Unit A	**Acquiring Vision, Goals and Strategies through Audio-visual Language Texts**	**CO Mapping**
	Topic 1	Pursuit of Happiness / Goal Setting & Value Proposition in life	CO1
	Topic 2	12 Angry Men / Ethics & Principles	
	Topic 3	The King's Speech / Mission statement in life | strategies & Action Plans in Life	
	Unit B	**Creative Writing**	
	Topic 1	Story Reconstruction - Positive Thinking	CO2
	Topic 2	Theme based Story Writing - Positive attitude	
	Topic 3	Learning Diary Learning Log – Self-introspection	

	Unit C	**Writing Skills 1**	
	Topic 1	Precis	CO3
	Topic 2	Paraphrasing	
	Topic 3	Essays (Simple essays)	
	Unit D	**MTI Reduction/Neutral Accent through Classroom Sessions & Practice**	
	Topic 1	Vowel, Consonant, sound correction, speech sounds, Monothongs, Dipthongs and Tripthongs	CO4
	Topic 2	Vowel Sound drills , Consonant Sound drills, Affricates and Fricative Sounds	
	Topic 3	Speech Sounds | Speech Music| Tone | Volume| Diction |Syntax |Intonation | Syllable Stress |	
	Unit E	**Gauging MTI Reduction Effectiveness through Free Speech**	
	Topic 1	Jam sessions	*N/A*
	Topic 2	Extempore	
	Topic 3	Situation-based Role Play	
9	Evaluations	*Class Assignments/Free Speech Exercises / JAM Group Presentations/Problem Solving Scenarios/GD/Simulations (60% CA and 40% ETE*	*N/A*
10	Texts & References | Library Links	• Wren, P.C.&Martin H. *High English Grammar and Composition*, S.Chand& Company Ltd, New Delhi. • Blum, M. Rosen. *How to Build Better Vocabulary*. London: Bloomsbury Publication • Comfort, Jeremy(et.al). *Speaking Effectively*. Cambridge University Press. The Luncheon by W.Somerset Maugham - http://mistera.co.nf/files/sm_luncheon.pdf	

Observations:

1. A Single Consolidated Syllabus has now replaced the Previous Functional English Beginners -2 and Functional English Intermediate -2

2. Credits previously allocated to FEN 02 the Lab Sessions have been dissolved

3. The Pearson Voice Labs have been completely eliminated

School: SET		**Batch: 2018**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch: CS		**Semester: III**	
1	Course Code	BCA260 Course Name	
2	Course Title	Computer Organization	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	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 fixed point 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 Basic Computer 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 micro programmed 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*	1. 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.			

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 : 2019**			
Program: BCA		**Current Academic Year: 2019-20**			
Branch: CS		**Semester: III**			
1	Course Code	BCP260			
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	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1. 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.			

School:		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester: II**	
1	Course Code	BCA261	
2	Course Title	Operating Systems	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Non Elective	
5	Course Objective	• Provide students with an overview of the application and requirements of Operating system • Gain insight into the challenges and limitations of resource management • Provide the students with practice on applying algorithms • Prepare students understand the principles of design of operating system • 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 different Operating system. Open-Source Operating Systems.	CO1, CO2
	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 CriteriaCPU 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 Linuxcommands.			CO1,CO2,CO3
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Silberschatz G, Operating System Concepts, Wiley			
	Other References	1. W. Stalling, "Operating System", Maxwell Macmillan 2. 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 operating systems (Course Code BCA 261)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CSE	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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester: 2**	
1	Course Code	BCA262 | Course Name: BCA	
2	Course Title	Web and its application	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	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	1. Douglas E. Comer "Internetworking with TCP/IP", Volume-I, PHI. 2. 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 Web and its application (Course Code BCA262)

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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester:2**	
1	Course Code	BCP262	
2	Course Title	Web and its Application LAB	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	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	MTE	ETE	
		60%	0%	40%	
	Text book/s*	Douglas Comer "The Internet Book - Pearson Education", Asia			
	Other References	1. Douglas E. Comer "Internetworking with TCP/IP", Volume-I, PHI. 2. P.K. Sinha, "Introduction of Basic Computer" 3. Internet as a source.			

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester:**III	
1	Course Code	BCA263	
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	CO2, CO5

		Concept			
	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 Queue, Operation on Queue, Representation of queues			CO2, CO5
	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	MTE	ETE	
		30%	20%	50%	
	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			

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

CO and PO Mapping

Course Code	Course Name	PO1	PO2	PO3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO 4	PSO5
BCA 263	**Principles of Data Structures**																	
	CO1	2		3												2		
	CO2	3	2											2				
	CO3		3	3	2					3				3	3	3		
	CO4		3	2						3				3	3			
	CO5		2		3					2					2			
	CO6	2		1	2							2		3		3		

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

Course Code	Course Name	PO1	PO2	PO3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4	PSO5
BCA263	**Principles of Data Structures**	**1**	**3**	**3**	**3**	**1**				**2**		**1**		**3**	**3**	**2**		

School: SET		**Batch :** 2019	
		Current Academic Year: 2019-20	
		Semester: 3rd	
1	Course Code	**ARP203**	
2	Course Title	Logical Skills Building and Soft Skills	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
5	Course Objective	To enhance holistic development of students and improve their employability skills. To provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To step up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a student will have entered the threshold of his/her 1st phase of employability enhancement and skill building activity exercise.	
6	Course Outcomes	CO1: *Know Yourself – A proven Student engagement model to assess individual skill level* CO2: *To identify a student's TNI/TNA (Training Need Identification and Analysis) data* CO3: *To make students self-aware | raise self-esteem & effectiveness* CO4: *To build positive thinking in students and reinforce positive attitude building* CO5: *How to build positive emotional competence in students | GOAL Setting and SMART Goals* CO6: *Enhancing LSRW (Listening Speaking Reading Writing) | Verbal Abilities - 1* CO7: *Understanding AMCAT + ELITMUS Study patterns for Quantitative aptitude and Logical | Analytical Reasoning*	
7	Course Description	This Level 1 blended training approach equips the students for Industry employment readiness and combines elements of soft skills and numerical abilities to achieve this purpose.	
8	Outline syllabus – ARP 203		
	Unit 1	**BELLS (Building Essential Language and Life Skills)**	**CO Mapping**
	A	Subject Verb Agreement | One word substitution, writing well formed sentences, tense, preposition,	*CO1, CO2,*
	B	Idioms, phrases, spotting the errors , root verb error, prefix & suffix	*CO3*
	C	*Know Yourself*: Techniques of Self Awareness | Self Esteem & Effectiveness| Building Positive Attitude | Building Emotional Competence	*CO4, CO5,CO6*
	D	Positive Thinking & Attitude Building | Goal Setting and SMART Goals – Milestone Mapping | Enhancing L S R W G and P (Listening Speaking Reading) | Verbal Abilities - 1	*CO5, CO6*
	Unit 2	**Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical**	

	A	Syllogism | Letter Series | Coding, Decoding , Ranking & Their Comparison Level-1	*CO7*
	B	Number Puzzles	*CO7*
	C	Selection Based On Given Conditions	*CO7*
	Unit 3	**Quantitative Aptitude**	
	A	Number Systems Level 1 | Vedic Maths Level-1	*CO7*
	B	Percentage ,Ratio & Proportion | Mensuration - Area & Volume |Algebra	*CO7*
	Weightage Distribution	*Class Assignment/Free Speech Exercises / JAM – 60% | Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%*	
	Text book/s*	*Wiley's Quantitative Aptitude-P Anand* | ***Quantum CAT - Arihant Publications*** | ***Quicker Maths- M. Tyra*** | *Power of Positive Action (English, Paperback, Napoleon Hill)* | *Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon* | *Goal Setting (English, Paperback, Wilson Dobson*	

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester: III**	
1	Course Code	BCP263	
2	Course Title	Principles of Data Structures Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
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**	
		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 etal, "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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch: CSE		**Semester: III**	
1	Course Code	BCP201	
2	Course Title	Introduction to LINUX	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	Introduces the UNIX/Linux operating system, including: task scheduling and management, memory management, input/output processing, internal and external commands, shell configuration, and shell customization. Explores the use of operating system utilities such as text editors, electronic mail, file management, scripting, and C/C++ compilers	
6	Course Outcomes	On completion of this course the student should be able to: 1. To Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security, and develop shell scripts to perform more complex tasks. 2. To accomplish typical personal, office, technical, and software development tasks. 3. To Analyze system performance and network activities. Effectively use software development tools including libraries, preprocessors, compilers, linkers, and make files. 4. Comprehend technical documentation, prepare simple readable user documentation and adhere to style guidelines.	
7	Course Description	This courses introduces Linux Operating System	
8	Outline syllabus		CO Mapping
	Unit 1	**Practical based on Basic Linux Commands**	CO1, CO2, CO4
		Introduction to Unix, Unix architecture, Features of Unix, Internal & External Commands, Basic unix commands: pwd, cd, mkdir, rmdir, ls, help, man, whatis	
	Unit 2	**Practical based on File Management**	CO1, CO2. CO3, CO4
		Unix file system, file permission, file handling commands: cat, touch, cp, rm, mv, more/less, lp, wc, cmp, diff, comm.,dos2unix & unix2dos, gzip&gunzip, zip & unzip, tar	
	Unit 3	**Practical based on process Management**	CO2, CO3, CO4
		Process basics: PID, PPID, ps, process states, zombies, foreground and background processes, nice, kill.	
	Unit 4	**Practical Based on Filters**	CO2, CO3, CO4
		Simple filters: pr, head, tail, cut, paste, sort, nl, tr,grep	
	Unit 5	**Practical Based on Shell Scripting**	CO1, CO2,

					CO3, CO4
		Shell scripts, execution of shell scripts, using command line arguments, loops , condition			
	Mode of examination	Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1. Sumitabha Das, “Unix Concepts and Applications”, Tata McGraw Hill.			
	Other References	1. Unix Shell programming by Stephen G. Kochan and Patric Wood 2. Unix and shell programming by Richard F. Gilberg and Behrouz A. forouzan			

School: SET		**Batch :2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:NA		**Semester:4**	
1	Course Code	BCA264 | Course Name: BCA	
2	Course Title	**Basics of Computer Network**	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	UG	
5	Course Objective	1. Familiarize with working of all levels of networking reference models 2. Prepare the student for entry Advanced courses in computer networking. 3. 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:**Investigate and 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

PO and PSO mapping with level of strength for Course Name Basics of Computer Network (BCA264)

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

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CSE		**Semester:4**	
1	Course Code	BCA 265	Course Name:BCA
2	Course Title	**Database Management Systems**	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	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*	1. Korth , Silberschatz& Sudarshan, Data base Concepts, Tata McGraw-Hill 2. Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education Inc.			
	Other References	1. Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to design, Implementation and Management, Pearson Education, Latest Edition. 2. Jeffrey D. Ullman, Jennifer Windon, A first course in Database Systems, Pearson Education. 3. Date C.J., An Introduction to Database Systems, Addison Wesley. 4. 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 Database Management Systems (Course Code BCA 265)

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

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester: 4**	
1	Course Code	BCP265	
2	Course Title	DataBase Management Systems Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	• 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: Understandthe 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**	CO1,CO4
		Briefly explain Group by, order by , having clauses with examples.	
	Unit 5	**Practical based on Sub- queries, JOINS**	CO1,CO4
		Related example of Sub- queries, Joins and related examples	
	Mode of	Jury/Practical/Viva	

	examination				
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1. Korth , Silberschatz& Sudarshan, Data base Concepts, Tata McGraw-Hill			
	Other References	1. Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education Inc. 2. Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to design, Implementation and Management, Pearson Education, Latest Edition. 3. Jeffrey D. Ullman, Jennifer Windon, A first course in Database Systems, Pearson Education.			

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester:4**	
1	Course Code	BCA266 | Course Name: Web Designing	
2	Course Title	Web Designing	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	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	CO3,CO4

		statements, looping statements			
	B	functions, object, events, Accessing form elements			CO3,CO4
	C	History, pop up windows, cookies.			CO3,CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Ivan Bayross,"HTML,DHTML, JavaScript, Perl & CGI", BPB Publication 2. Rick Delorme," Programming in HTML5 with JavaScript and CSS3", Microsoft			
	Other References	1. Burdman, "Collaborative Web Development" Addison Wesley. 2. Chris Bates, "Web Programing Building Internet Applications", 2nd Edition, WILEY. 3. 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 BCA 266)

	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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:NA		**Semester:4**	
1	Course Code	**BCP266**	
2	Course Title	Web Designing LAB	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Provide the knowledge to design and develop web application with and without database. Students will gain the skills and project-based experience needed for entry into web application and development careers. It provides information about web technologies that relate to the interface between web servers and their clients.	
5	Course Objective	On successful completion of this module students will be able to: 1. Design interactive web pages 2. Design web pages/site having validation on user data access. 3. Develop web site for small business and organization or for individual 4. Client server communication RMI	
6	Course Outcomes	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 different computers and devices to communicate and share resources as well as to give the basic overview of the different technologies.	
7	Course Description		
8	Outline syllabus		CO Mapping
	Unit 1	**HTML**	
		1. Design web pages for your college containing a description of the courses, departments, faculties, library etc, use href, list tags. **2.** Create your class timetable using table tag. **3.** Create user Student feedback form (use textbox, text area , checkbox, radio button, select box etc.)	CO1, CO2
	Unit 2	**HTML**	
		4. Create a web page using frame. Divide the page into two parts with Navigation links on left hand side of page (width=20%) and content page on right hand side of page (width = 80%). On clicking the navigation Links corresponding content must be shown on the right hand side. **5.** Write html5 code to develop a webpage having two navigations **6.** Create your resume using HTML tags also experiment with colors, text , link , size and also other tags you studied	CO1,CO2
	Unit 3	**CSS & CSS3**	
		7. Defining CSS using various types of selectors 8. Design a web page of your home town with an	CO2, CO3,CO4

		attractive background color, text color, an Image, font etc. (use internal CSS). 9. Use Inline CSS to format your resume that you created. 10. Use External CSS to format your class timetable as you created. 11. Use External, Internal, and Inline CSS to format college web page that you created.	
	Unit 4	**XML & DTD**	
		12. Write XML code for displaying student information 13. Write DTD for student schema	CO1,CO2,CO3
	Unit 5	**Java Script**	
		14. Develop a JavaScript to display today's date. 15. Develop simple calculator for addition, subtraction, multiplication and division operation using JavaScript 16. Create HTML Page with JavaScript which takes Integer number as input and tells whether the number is ODD or EVEN. 17. Create HTML Page that contains form with fields Name, Email, Mobile No , Gender , FavoriteColor and a button now write a JavaScript code to combine and display the information in textbox when the button is clicked. 18. Implement Validation in above Feedback Form. 19. Use regular expression for validation in Feedback Form. 20. Using ajax retrieve data from a TXT file and display it	CO3,CO4
	Mode of examination	Jury/Practical/Viva	
	Weightage Distribution	CA: 60% / MTE: 0% / ETE: 40%	
	Text book/s*	1. Ivan Bayross,"HTML,DHTML, JavaScript, Perl & CGI", BPB Publication 2. Schildt H, "The Complete Reference JAVA2", TMH 3. Schildt H, "The Complete Reference J2EE", TMH	
	Other References	1. Rick Delorme," Programming in HTML5 with JavaScript and CSS3", Microsoft	

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch: BCA		**Semester:**4	
1	Course Code	BCA267 | 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	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 Analysis.	CO1
	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	CO3

		Structures testing, ,			
	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, "*Software Engineering: A Practitioners Approach"*, 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)**

	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

ENG202: Communication Practices 1

SYLLABUS

1	Course number	**ENG202**			
2	Course Title	**Communication Practices I**			
3	Credits	3			
4	Contact Hours (L-T-P)	2-0-2			
5	Course Objective	To develop learning about common forms of verbal and non-verbal communication in the work place. To improve the accuracy of expressions. To learn to use communication in professional situations..			
6	Course Outcomes	Students would be able to : **C01:** Recognize the fundamentals of Technical Communication (Accuracy, Brevity and Clarity). **C02:**Employ Grammatical Techniques to make effective sentences **C03:** Enhance writing skills through paragraph writing and short stories **C04:** Form arguments on topics of general interests. **C05:** Understand about Interaction in Formal Cross Cultural Domain, Body language in Cross Cultural Domain. **C06:** Practice formal communication skills and Negotiation techniques.			
7	Outline syllabus: **Communicaztion Practices I**				
			TOPICS	**REF. & CHAPTER**	**COs & POs**
7.01	ENG 202--.A	**Unit A**	**Sentence Construction**		
7.02	ENG 202---.A1	Unit A Topic 1	Accuracy/Brevity/Clarity	Ref.1, Ref.4	CO1,CO2

7.03	ENG 202---.A2	Unit A Topic 2	Redundancy/Parallelism	Ref.1, Ref.4	CO1,CO2
7.04	ENG 202---.A3	Unit A Topic 3	Common Errors	Ref.1, Ref.4	CO1,CO2
7.05	ENG 202---.B	**Unit B**	**Paragraph Writing**		
7.06	ENG 202---.B1	Unit B Topic 1	Short Story Writing	Ref.4	CO2, CO3, CO4
7.07	ENG 202---.B2	Unit B Topic 2	Writing on Technical Topics	Ref.4	CO2, CO3, CO4
7.08	ENG 202---.B3	Unit B Topic 3	Argumentative Writing (Any Topic of general interest)	Ref.4	CO2, CO3, CO4
7.09	ENG 202---.C	**Unit C**	**Case Studies**		
7.10	ENG 202---.C1	Unit C Topic 1	Cross Cultural Communication/ Parameters of Global Communication, Negotiation	Ref.2, Ref.3	CO5 CO5 CO5
7.11	ENG 202---.C2	Unit C Topic 2	Interaction/Body language in Formal Domain, Etiquette	Ref.2, Ref.3	CO5
7.12	ENG 202---.C3	Unit C Topic 3	Case Analysis : Theory and Practice	Ref.2, Ref.3	CO5
7.13	ENG 202---.D	**Unit D**	**Professional Writing**		
7.14	ENG 202---.D1	Unit D Topic 1	Letters : Format and Types	Ref.1, Ref.4	CO1,CO2, CO6

7.15	ENG 202---.D2	Unit D Topic 2	Business E-mail		Ref.1, Ref.4	CO1,CO2, CO6		
7.16	ENG 202---.D	**Unit E**	Memorandum		Ref.1, Ref.4	CO1,CO2, CO6		
7.17	ENG 202---.E	**Unit E**	**Reading Comprehension**				Practice	CO4, CO5, PO9, PO10, PO12
7.18	ENG 202---.E1	Unit E Topic 1	One Act Play: The Refund by Fritz Karinthy	-	CO1, CO2, CO3			
7.19	ENG 202---.E2	Unit E Topic 2	*Short Story : The Last Leaf by O . Henry*	-	CO1, CO2, CO3			
7.20	ENG 202---.E3	Unit E Topic 3	*Reflection and Discussion on the texts*	-	CO1, CO2, CO3			
8	ENG 202---.D3						Unit D Topic 3	Memorandum Through Suggested Aids CO4, CO5, PO9, PO10, PO12
8.1	Course work: 30%							
8.2	Attendance	None						
8.3	Homework	10 assignments, no weight						
8.4	Quizzes	7 best quizzes (based on assignments); 20 marks						
8.5	Lab	Evaluation of work done on each lab turn in the lab notebook and feedback from oral quiz about the work done that day. Zero, if the student is absent. 0.75N best marks out of N such evaluations: 10 marks						
8.6	Presentations	None						
8.7	Any other	None						
8.9	MTE	One, 20%						
8.10	End-term Examination: One, 50%							
9	References							

9.1	Text book	Raman, Meenakshi and Sangeeta Sharma. *Technical Communication : Principles and Practice* .New Delhi: Oxford. (Reading materials to be supplied by the faculty)
9.2	Other references	1. Sharma, R.C and Krishna Mohan. *Business Correspondence and Report Writing.* New Delhi: Tata McGraw-Hill. 2. Lesikar, Raymond V, Marie E Flately and Kathryn Rentz. *Business Communication making Connections in a Digital World.* New Delhi: Tata McGraw-Hill. 3. Banerji, Meera and Krishna Mohan. *Developing Communication Skills.* Macmillan Publishers India. 4. Rizvi, Ashraf. M. *Effective Technical Communication.* New Delhi: Tata McGraw-Hill. **5. *Lewis, Norman. Word Power Made Easy.***

Mapping of Outcomes vs. Topics

Outcome no. → Syllabus topic↓	1	2	3	4	5	6	7	8	9	10	11	12
ENG 202---.A	X	X										
ENG 202---.A1	X	X										
ENG 202---.A2	X	X										
ENG 202---.A3	X	X										
ENG 202---.B		X	X	X								
ENG 202---.B1		X	X	X								
ENG 202---.B2		X	X	X								
ENG 202---.B3		X	X	X								
ENG 202---.C					X							
ENG 202---.C1					X							
ENG 202---.C2					X							
ENG 202---.C3					X							
ENG 202---.D												
ENG 202---.D1	X	X				X						
ENG 202---.D2	X	X				X						
ENG 202---.D3	X	X				X						
ENG 202---.E												
ENG 202---.E1												
ENG 202---.E2												
ENG 202---.E3												

School: SET		**Batch :** 2019	
		Current Academic Year: 2019-20	
		Semester: 4th	
1	Course Code	**ARP204**	
2	Course Title	Quantitative and Qualitative Aptitude Sill Building	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
5	Course Objective	To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a will have entered the threshold of his/her 2nd phase of employability enhancement and skill building activity exercise.	
6	Course Outcomes	CO1: *Learn what is VMOSA (Vision, Mission, Values and Ethics) Communication Process* CO2: *Communication Styles and flexing and 4 social styles of communication* CO3: *Understand Listening Skills and Listening Styles* CO4: *Understanding the Art of giving feedback and probing* CO5: *Business writing skills and non-verbal communication* CO6: *MTI Reduction Program | Verbal Abilities - 2* CO7: *2nd Level proficiency in Quant & Aptitude Reasoning abilities*	
7	Course Description	This course bundle allows students to build vision, mission and strategy statements while exposing them to various models of communication along with MTI reduction and the 2nd level of quant, aptitude and reasoning abilities	
8	Outline syllabus – ARP204		CO MAPPING
	Unit 1	**Communicate to Conquer**	
	A	*VMOSA (Vision, Mission, Values and Ethics)* |Business Communication - Verbal Communication Skills | Barriers in communication | Basics of effective communication – PRIDE Model	CO1,
	B	Different styles of communication & style flexing (Based on the 4 social styles-Analytical, Driving, Expressive, Amiable) | Importance of Listening & practice of Active Listening - Sentence Arrangements, Correction Analogies| The Art of Giving Feedbacks| Feedback Skills | Asking fact finding questions- Probing Skills	CO2, CO3,CO4
	C	Email Etiquette | Business Writing Skills| Telephone Etiquette Skills (Telephone Handling Skills) | Non Verbal Communication-Kinesics, Proxemics, Paralanguage | MTI Reduction Program | Verbal Abilities - 2	CO5, CO6
	Unit 2	**Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical**	

	A	Coding Decoding , Ranking & Their Comparison Level-2	CO7
	B	Series, Blood Relations & Number Puzzle	CO7
	Unit 3	**Quantitative Aptitude**	
	A	Number System Level 2	CO7
	B	Vedic Maths Level-2 | Probability | Permutation & Combination	CO7
	C	Percentage, Profit & Loss ,Partnership, Simple Interest & Compound Interest	CO7
	Weightage Distribution	*(CA)Class Assignment/Free Speech Exercises / JAM – 60% | (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%*	
	Text book/s*	*Wiley's Quantitative Aptitude-P Anand* | ***Quantum CAT – Arihant Publications*** | ***Quicker Maths- M. Tyra*** | *Power of Positive Action (English, Paperback, Napoleon Hill)* | *Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon* | *Goal Setting (English, Paperback, Wilson Dobson*	

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester: V**	
1	Course Code	**BCA360**	Course Name: BCA
2	Course Title	Introduction to OOP using Java	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	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	Students will be able to: CO1: Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc. CO2: Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc. CO3: Have the ability to write a computer program to solve specified problems. CO4: Be able to use the Java SDK environment to create, debug and run simple Java programs. CO 5: Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms. CO 6 : Understand the principles of inheritance, packages and interfaces	
7	Course Description	Basic *Object Oriented Programming* (*OOP*) concepts, including objects, *classes*, methods, parameter passing, information hiding, inheritance and polymorphism are introduced and their implementations *using Java* 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 inheritance Java virtual machine,	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, CO5,CO4
	Unit 3	**Class & Object**			
	A	Arrays, Type conversion & casting, Input from keyboard, Classes Objects			CO1,CO2,CO3
	B	MethodsMethod 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.langpackage).			CO1,CO2,CO3
	Unit 5	**Exception and Multithreading**			
	A	Input/output: Exploring java.io, File, StreamClassesByte Stream Classes and Character stream Classes.			CO1,CO2,CO3,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
5.	CO 5: Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms	PO1,PO2,PO3,PO4
6.	CO 6 : Understand the principles of inheritance, packages and interfaces.	PO1, PO3, PO4, PSO2

PO and PSO mapping with level of strength for Course Name Introduction to OOPs using java (Course Code BCA360)

	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 : 2019**			
Program: BCA		**Current Academic Year: 2019-20**			
Branch:CSE		**Semester: V**			
1	Course Code	BCP360			
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	Students will be able to: CO1: Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc. CO2: Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc. CO3: Have the ability to write a computer program to solve specified problems. CO4: Be able to use the Java SDK environment to create, debug and run simple Java programs. CO 5: Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms. CO 6 : Understand the principles of inheritance, packages and interfaces			
7	Course Description	Basic *Object Oriented Programming* (*OOP*) concepts, including objects, *classes*, methods, parameter passing, information hiding, inheritance and polymorphism are introduced and their implementations*using Java* 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. ProfessionalJavaProgramming:BrettSpell,WROX Publication			

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester: V**	
1	Course Code	BCA364 | Course Name : BCA	
2	Course Title	Computer Graphics	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	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 References	1. D. Rogers, J. Adams, "Mathematical Elements for Computer Graphics", 2nd Edition, Tata McGraw-Hill Publication, 2002.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	**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 BCA364)

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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch: CS/IT		**Semester: V**	
1	Course Code	BCA 365 Course Name	
2	Course Title	**Client Server Computing**	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Elective	
5	Course Objective	• Provide students with an overview of the methodologies and approaches to client server computing • Gain insight into the components of Client Server Application • Provide the students with practice of client server systems • Prepare students for research in the area of client server computing and related applications • 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. **CO 5:**To understand basic network and Internet protocols including sockets, stream and packet protocols such as TCP, UDP, HTTP, FTP and SMTP protocols for creating simple two tier client server applications; **CO 6:** To Identify multi-tier client server computing systems with remote and web services protocols for creating distributed client server systems;	
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	CO1, CO2,

		(CORBA)	
	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, Interposes communication, 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, Network management, Help Disk, Remote Systems Management Security	CO1,CO2,CO3
	C	LAN and Network Management 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 protection devices, Power Protection Devices, UPS, Surge protectors	CO1,CO2,CO3 CO4
	C	The future of client server Computing Enabling Technologies, The transformational system.	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
5.	**CO 5:**To understand basic network and Internet protocols including sockets, stream and packet protocols such as TCP, UDP, HTTP, FTP and SMTP protocols for creating simple two tier client server applications.	PO1, PO3, PO4, PSO2
6.	**CO 6:** To Identify multi-tier client server computing systems with remote and web services protocols for creating distributed client server systems.	PO1,PO2,PO3,PO4

PO and PSO mapping with level of strength for Course Name Client-Server Computing (Course Code BCA 365)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester:V**	
1	Course Code	BCA366 | Course Name: Multimedia & Animation	
2	Course Title	**Multimedia & Animation**	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	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: CO1. Design and create animation using computerized animation tools. CO2. Design and create 2D models. CO3. To Understand Principle of Animation CO4. Include layout and designing	
7	Course Description	Multimedia is the combined use of text, graphics, sound, animation, and video. A primary objective of this workshop is to teach participants how to develop multimedia programs. Another objective is to demonstrate how still images, sound, and video can be digitized on the computer.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to computers & networks**	
	A	Multimedia hardware and Multimedia software	CO1
	B	Multimedia operating system	CO1
	C	Multimedia communication systems.	CO1
	Unit 2	**Image and Video**	
	A	Image: Creation of image(BMP & vector), image color models, Image file format, Image compression.	CO1
	B	Video: video broadcast standard(PAL, NTSC), shooting and editing video.	CO1
	C	Video file formats. Video tips, video compression: MPEG standards.	CO1
	Unit 3	**Animation**	
	A	Principle of Animation. Animation techniques: cell animation, computer animation.	CO3
	B	Kinematics, morphing, anti-aliasing, animation files formats.	CO3
	C	Different animation packages: Acrobat Photoshop, flash.	CO3
	Unit 4	**2D Animation**	

	A	Introduction to 2D animation.			CO2
	B	Drawing concept and color theory & basics			CO2
	C	Incorporating sound into 2D animation			CO2
	Unit 5	**Layout & Designing**			
	A	Basic of sketching still and assignment of basic drawing, composition of basic elements.			CO4
	B	Work in different media, such as drawing, collage and painting			CO4
	C	Pixel and resolution: vector and bitmap Graphics.			CO4
	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	4. Multimedia In Action-James E Shuman-Vikas Publishing House 5. 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 (Course Code BCA 366)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester: V**	
1	Course Code	BCA367 | Course Name: BCA	
2	Course Title	Introduction to Distributed System	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	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, dentify 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	CO1,CO2,CO3

		transactions,			
	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)
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 (Course Code BCA 367)

	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CSE	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 :** 2019
		Current Academic Year: 2019-20
		Semester: 5th
1	Course Code	**ARP 301**
2	Course Title	Personality Development and Decision making Skills
3	Credits	2
4	Contact Hours (L-T-P)	1-0-2
5	Course Objective	To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a student will have entered the threshold of his/her 3rd phase of employability enhancement and skill building activity exercise.
6	Course Outcomes	CO1: *Understanding Personality and its traits | The art of impression management* CO2: *Personality Development and Transformation – Value & Ethics – Contribution to the society.* CO3: *Behavioural and Interpersonal Skills* CO4: *Avoiding Arguments | The Art of Assertiveness* CO5: *Argument Handling - Verbal & Writing Skills* CO6: *The 4M Model | Verbal Abilities-3* CO7: *Level 3 of Quant , Aptitude and Reasoning abilities*
7	Course Description	This bundles Training approach attempts to explore the personality, character, and the natural style of the student. This helps to develop character, personality, confidence and interpersonal abilities within the student along with level 3 readiness in quant, aptitude and reasoning skills

8	Outline syllabus – ARP301		
	Unit 1	**Impress to Impact**	**CO MAPPING**
	A	What is Personality?|Who Am I? Creating a positive impression – The 3 V's of Impression | Individual Differences and Personalities	CO1
	B	Personality Development and Transformation – Value & Ethics| Building Self Confidence | Behavioural and Interpersonal Skills (My contribution towards society/ nation)	CO2, CO3
	C	Avoiding Arguments – Essay Writing | The Art of Assertiveness | The Personal Effectiveness Grid | Assessing our Strengths & Limitations and Creating an Action Plan for Learning with the 4M Model | Verbal Abilities-3	CO4, CO5, CO6,
	Unit 2	**Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical**	
	A	Numbers & Digits , Mathematical Operations | Analytical Reasoning	CO7
	B	Cubes & Cuboids | Statement & Assumptions	CO7

	C	Strong & Weak Argument	CO7
	Unit 3	**Quantitative Aptitude**	
	A	Work & Time ,Pipes & Cistern	CO7
	B	Time ,Speed & Distance, Quadratic & Linear Equations, Logs & Inequalities	CO7
	C	Sequence & Series, Logarithms, Data Interpretation | Data sufficiency - Level 1	CO7
	Weightage Distribution	*(CA)Class Assignment/Free Speech Exercises / JAM – 60% | (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%*	
	Text book/s*	*Wiley's Quantitative Aptitude-P Anand* | ***Quantum CAT – Arihant Publications*** | ***Quicker Maths- M. Tyra*** | *Power of Positive Action (English, Paperback, Napoleon Hill)* | *Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon* | *Goal Setting (English, Paperback, Wilson Dobson*	

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch: BCA		**Semester: 5**	
1	Course Code	BCA361 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:** 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: 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 Information Systems	CO1, CO2
	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	ETE	
		30%	20%	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			

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	PO1,PO2,PO3,PO4
2.	CO-2 Analyze the technologies associated with business information systems	PO9, PO10,PO11, PSO5
3.	CO-3 Apply e-commerce initiatives in various Business applications	PO1, PO3, PO4, PSO2
4.	CO-4 Evaluate significance of support systems in enterprises	PO1,PO2,PO3,PO4
5.	CO-5 Align to **security** control measures in IT sector	PO9, PO10,PO11, PSO5

PO and PSO mapping with level of strength for e-commerce (Course Code BCA361)

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	2	2	1	2	1
CO2	3	2	3	3	--	--	--	2	2	2	1	1
CO3	3	3	3	3	--	--	--	1	1	1	3	2
CO4	2	2	2	2	1	--	--	2	3	3	3	1
CO5	2	2	2	2	1	--	--	2	3	3	3	1

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester: VI**	
1	Course Code	BCA362 | Course Name: BCA	
2	Course Title	Introduction to PHP	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status		
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: 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,	CO2,CO4

		validate email Sending email, dealing with uploaded file, error handling			
	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	ETE	
		30%	20%	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",4th 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(Course Code BCA362)

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

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:CS/IT		**Semester:**VI	
1	Course Code	BCA368 | Course Name: BCA	
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:** 1. Explain the basic syntax of Python Program 2. Explain various programing constructs –data types, decision structures, control structures in python 3. Know how to use in-built data structures in python – Lists, Tuples, Dictionary 4. Know how to use libraries for string manipulation and File handling 5. 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:	CO1, CO2

		Break, Continue, Pass			
	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, Opening, Writing, Reading, Closing and Appending Data in file, Accessing and Manipulating Files			CO3, CO4
	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, Exception handling and file handling	PO1, PO2, PO4, PO9, 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 BCA 368)

Course Code	Course Name	PO1	PO2	PO3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
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 : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester:VI**	
1	Course Code	BCA369 | Course Name: BCA	
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:** 1. 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; 2. Apply the principles of ERP systems, their major components, and the relationships among these components; 3. With the knowledge of typical ERP systems, and the advantages and limitations of implementing ERP systems. 4. To comprehend the technical aspects of ERP systems 5. 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. ***Classify*** different processes of the organization and relationship among all processes . 2. ***Examine*** systematically the planning mechanisms in an enterprise, and identify all components in an ERP system and the relationships among the components; 3. To ***describe*** the Generic Model of ERP and General ERP Implementation Methodology. 4. To ***apply*** the concepts of BPR, SCM and CRM. 5. To ***demonstrate*** 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 ***Classify*** different processes of the organization and relationship among all processes	PO1.PO4, PO6
2.	CO-2 ***Examine*** systematically the planning mechanisms in an enterprise, and identify all components in an ERP system and the relationships among the components	PO1,PO2,PSO2
3.	CO-3 To ***describe*** the Generic Model of ERP and General ERP Implementation Methodology.	PO1,PSO1,PSO2
4.	CO-4 To ***apply*** the concepts of BPR, SCM and CRM.	PO2,PSO2
5.	CO-5 To ***demonstrate*** knowledge of SAP and Oracle Apps.	PO1,PO2,PSO2

PO and PSO mapping with level of strength for Enterprise Resource Planning (Course Code BCA 369)

Course Objectives	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
CO1	3	3	2	1	1	2	1	1	1	1	2	2
CO2	3	3	2	2	2	1	2	2	1	1	2	2
CO3	3	2	1	2	1	2	1	1	2	1	1	2
CO4	2	3	2	1	1	2	1	1	1	2	2	1
CO5	3	3	2	1	1	2	1	1	1	1	2	2

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester: VI**	
1	Course Code	BCA363 | Course Name: BCA	
2	Course Title	**Information Security**	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status		
5	Course Objective	Introduce toInformation 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, Eucledian , Extended Eucledian 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 BCA 363)

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

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch:		**Semester: VI**	
1	Course Code	BCA 370	Course Name: BCA
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	• Provide students with an overview of the methodologies and approaches to data encoding • Gain insight into the challenges and limitations of different data encoding techniques • Provide the students with practice on applying data coding solutions • Prepare students for research in the area of data encoding and compression ,related applications • 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	1. Introduction to Data Compression, 3rd Edition, Khalid Sayood, Morgan Kauffman			
				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 BCA370)

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

School: SET		**Batch : 2019**	
Program: BCA		**Current Academic Year: 2019-20**	
Branch: -CS/IT		**Semester: VI**	
1	Course Code	BCA371	Course Name: BCA
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	• Provide students with an overview of the fundamental concepts of Cloud Computing. • Gain insight into the challenges and limitations Models of cloud computing. • To learn the various technologies of the cloud computing paradigm and learn about recent advances in Cloud Computing and enabling technologies. • Prepare students for research in the area of cloud Computing risks and cloud security challenges. • 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	CO1,CO2,CO3

		Simple Storage System	
	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	1. Barrie Sosinsky "*Cloud Computing (Bible)"*,Wiley 2. Anthony T.Velte, Toby J. Velte, Robert Elsenpeter"Cloud Computing: A Practical Approach" TATA McGRAW-HILL Edition. 3. Ronald L. Krutz and Russell Dean Vines, "Cloud Security: A comprehensive Guide to Secure Cloud Computing", 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 BCA371)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CSE	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 :** 2019
		Current Academic Year: 2019-20
		Semester: 6th
1	Course Code	**ARP 302**
2	Course Title	Campus to Corporate
3	Credits	2
4	Contact Hours (L-T-P)	1-0-2
5	Course Objective	To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a will have entered the threshold of his/her 4th phase of employability enhancement and skill building activity exercise.
6	Course Outcomes	CO1: *Understanding basics of Human Resources* CO2: *Role Clarity | KRA | KPI | Understanding JD* CO3: *Conflict Management* CO4: *Art of Communication - Verbal* CO5: *Understanding Personal Branding* CO6: *Relationship Management | Verbal Abilities-4* CO 7: *Resume/ CV Writing | Writing Skills* CO8: *Level-4 Quant & aptitude, Reasoning abilities*
7	Course Description	This penultimate stage introduces the student to the basics of Human Resources. Allows the student to understand and interpret KRA | KPI and understand Job descriptions. A student also understands how to manage conflicts, brand himself/herself, understand relations and empathise others with level-4 of quant, aptitude and logical reasoning
8	Outline syllabus – ARP 302	

	Unit 1	**Ace the Interview**	**CO MAPPING**
	A	HR Sensitization (Role Clarity | KRA | KPI | Understanding JD) | Conflict Management	CO1, CO2, CO3
	B	Mock Interviews| GD's| Extempore |JAM| Impromptu speeches| Personal Branding	CO4, CO5
	C	Empathy VS Sympathy | Relationship Management | Verbal Abilities-4	CO6
	D	Resume/ CV Writing | Sentence Correction –Spotting error | Synonyms & Antonyms	CO7
	Unit 2	**Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical**	
	A	Sitting Arrangement & Venn Diagrams | Puzzles | Distribution | Selection	CO8
	B	Direction Sense | Statement & Conclusion | Strong & Weak Arguments	CO8
	C	Analogies, Odd One out | Cause & Effect	CO8
	Unit 3	**Quantitative Aptitude**	CO8
	A	Average , Ratio & Proportions, Mixtures & Allegation	CO8
	B	Geometry-Lines, Angles & Triangles	CO8

	C	Problem of Ages | Data Sufficiency - L2	CO8
	Weightage Distribution	*(CA)Class Assignment/Free Speech Exercises / JAM – 60% | (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%*	
	Text book/s*	*Wiley's Quantitative Aptitude-P Anand |* ***Quantum CAT – Arihant Publications | Quicker Maths- M. Tyra |*** *Power of Positive Action (English, Paperback, Napoleon Hill) | Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon | Goal Setting (English, Paperback, Wilson Dobson*	

School: SET	Batch : 2019-23

MTH119 Mathematics Paper for BCA Students –Term I

MATHEMATICS IN COMPUTER APPLICATIONS

Unit 1: SET THEORY: Sets introduction, Set Discription, types of sets, Venn Diagram, Set Operation, Laws of Sets, Algebra of sets, Partition of sets.Inclusive -exclusive principle.

Unit 2:MATHEMATICAL LOGIC: Propositional Logic: Preposition, First order logic, Basic logicaloperations, Tautologies, Contradictions.Algebra of Proposition, Logical implication, Logical equivalence.

Unit 3: RELATION AND FUNCTIONS: Relation: Type and compositions of relations, Pictorialrepresentation of relations, Closures of relations, Equivalence relations, Partial ordering relation.Function: Types, Composition of function, Recursively definedfunction, Mathematical Induction.

Unit 4: ORDERED SETS AND LATTICES: Ordered Sets and Lattices: Introduction, Ordered set, Hassediagram of partially ordered set, Consistent enumeration, Isomorphic ordered set, Well ordered set, Lattices, Properties of lattices, Bounded lattices, Distributivelattices, and Complemented lattices.

Unit 5: NUMBER THEORY: Counting: Basic counting principles, factorial notation, Binomialcoefficients, Permutations, Combinations,Properties of the Integers: Order and inequalities, absolute value,mathematical induction, division algorithm, divisibility, Primes,Greatest Common Divisor, Eucledian Algorithm, Fundamental theorem of arithmetic, Congruence relation,Congruence Equations.

Text Book:

Liu C.L. and Mohapatra, D.P., " Elements of Discrete Mathematics" , SiE edition, TMH, 2008

References:

1. Kenneth H.R.,' Discrete Mathematics and its Applications", Mc-graw hill.
2. Biggs N., "Discrete Mathematics", 3rd edition, Oxford University

Program: B.TECH/BCA/BSc		**Current Academic Year: 2019-20**	
Branch: CE		**Semester: I**	
1	Course Code	EVS112	Course Name: Environmental Studies
2	Course Title	Environmental Studies	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core	
5	Course Objective	This course is aimed to inculcate the environmental values translating into pro-conservation actions. Honorable Supreme Court of India has made it 'mandatory' to introduce a basic course on environment at the undergraduate level	
6	Course Outcomes	CO1: Acquire the basic knowledge and understanding of problems of environment and need of sustainable development CO2: Understand Importance of ecosystem and need for its conservation CO3: Explore importance of various natural resources available and create awareness for conservation and reduction of exploitation CO4: Assess importance of relationship between human culture, natural resources, biodiversity and need for its conservation CO5: Identify causes and effects of environmental pollution on human and create awareness amongst the society.	
7	Course Description	Introduction, Ecosystem, Natural resources, Biodiversity and Conservation, Pollution	
8	Outline syllabus		CO Mapping/lecture hours
	Unit 1	**Introduction to environmental studies**	**06**
	A	Multidisciplinary nature of environmental studies; Human population and growth;	CO1
	B	Components of environment, Scope and importance	
	C	Concept of sustainability and sustainable development. Environmental ethics	
	Unit 2	**Ecosystem**	**08**

	A	What is ecosystem? Structure and function of ecosystem	
	B	Energy flow in an ecosystem; food chain, food web and ecological succession	CO2
	C	Case study of following ecosystem: forest, grassland, desert, aquatic (pond, stream, lake, river, ocean, estuaries)	
	Unit 3	**Natural Resources: Renewable and non-Renewable resources**	**08**
	A	Land use resources, land degradation, soil erosion; Deforestation (causes and impacts, effects on biodiversity and tribal population	
	B	Water: use and overexploitation surface and ground water, flood, droughts, conflicts over water (international & inter state)	CO3
	C	Heating of earth and circulation of air, air mass formation & precipitation; Energy resources: Renewable, nonrenewable, alternate energy source.	
	Unit 4	**Biodiversity and Conservation**	**09**
	A	Levels of biological diversity: genetic, species and ecosystem diversity.	
	B	Threats to biodiversity; Conservation of biodiversity; natural reserves, wild life conflict.; Disaster management (flood, earthquake, cyclone &landslide)	CO4
	C	Ecosystem and biodiversity services: ecological, economic, social, ethical, aesthetic and informational value. Environmental movements (Chipko, Silent valley, Bishnions of Rajasthan.)	
	Unit 5	**Environmental pollution**	**09**
	A	Environmental pollution: Types, causes, effects and control (air, water, soil, chemical & noise) carbon footprint	
	B	Solid waste management; Environment laws: EPA, Air (pollution control) act, water (pollution control) act, Kyoto protocol, Montreal Protocol, CBD	CO5
	C	Nuclear hazard, climate change, global warming, acid rain, ozone layer depletion.	

	Mode of examination	Theory+ 5 hours of field work			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text Books	1.Environmental Studies: R. Rajagopalan, Oxford University Press 2. Environmental Pollution: Causes, Effects & Control by K.C Agrawal 3. Environmental Sciences by Daniel B Botkin & Edward A Keller Publisher: John Wiley & Sons. 4. Environmental Studies by Dr. Suresh K Dhameja, Published by : S K Kataria & Sons New Delhi			
	Suggested references	1.Carson,R,2002.*Silent Spring*.Houghton Miffin Harcourt. 2.Groom,Martha J.Grey K.Meffe and Carl Ronald carroll.*Principles of conservation of Biology.* 3.Gleeson,B. and Low,N.1999.*Global Ethics and environment*,London 4.Pepper,I.L.,Gerba,C.P. & Brusseau,M.L.2011*Environment and Pollution Science*.			