SHARDA UNIVERSITY
Beyond Boundaries

SCHOOL OF ENGINEERING AND TECHNOLOGY
Bachelor in Computer Application (BCA)
BCA with Specialization in Multimedia and Animations

Programme Code: SET0103
Duration- 3 Years Full Time

PROGRAM STRUCTURE
AND
CURRICULUM & SCHEME OF EXAMINATION
2020

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**

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

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 counseling.**

Core Values

- **Industry & Academic Connectivity**
- **Experiential learning**
- **Interdisciplinary research**
- **Global**

1.2 Vision and Mission of the Department

Vision of the Department

To be recognized as the fountainhead of excellence in technical knowledge and research in computer science and engineering to attract students and scholars across the globe

Mission of the Department

1. **To strengthen core competency of students to be successful, ethical, effective problem solver in Computer Science & Engineering through analytical learning.**
2. **To promote interdisciplinary research & innovation-based activities in emerging areas of technology globally**
3. **To facilitate and foster the industry-academia collaboration to enhance entrepreneurship skills and acquaintance with corporate culture.**
4. **To inculcate in them a higher degree of social consciousness and moral values towards solving interdisciplinary societal problems using industry-academia collaboration**

Core Values

- **Competency**
- **Global**
- **Entrepreneurship Skills**
- **Interdisciplinary research**

1.3 Programme Educational Objectives (PEO)

1.3.1 Writing Programme Educational Objectives (PEO)

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

The Program Educational Objectives (PEOs) of UG Program in Computer Science & Engineering are:

PEO-1 The graduates will establish themselves as professionals by solving real-life problems using exploratory and analytical skills acquired in the field of Computer Science and Engineering.

PEO-2 The graduates will provide sustainable solutions to ever changing interdisciplinary global problems through their Research & Innovation capabilities.

PEO-3 The graduates will become employable, successful entrepreneur as an outcome of Industry-Academia collaboration.

PEO-4 The graduates will embrace professional code of ethics while providing solution to multidisciplinary social problems in industrial, entrepreneurial and research environment to demonstrate leadership qualities

Methods of Forming PEO's

STEP 1 : The needs of the Nation and society are identified through scientific publications, industry interaction and media.

STEP 2. Taking the above into consideration, the PEOs are established by the Coordination Committee of the department.

STEP 3. The PEOs are communicated to the alumni and their suggestions are obtained.

STEP 4. The PEOs are communicated to all the faculty members of the department and their feedback is obtained.

STEP 5. The PEOs are then put to the Board of Studies of the department for final approval.

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

1.3.2 Map PEOs with Mission Statements:

DEPARTMENT PEOs / DEPT OF CSE MISSION STATEMENTS	1. The graduates will establish themselves as professionals by solving real-life problems using exploratory and analytical skills acquired in the field of Computer Science and Engineering.	2. The graduates will be able to provide sustainable solutions to ever changing interdisciplinary global problems through their Research & Innovation capabilities.	3. The graduates will become employable, successful entrepreneur and innovator as an outcome of Industry-Academia collaboration.	4. The graduates will be able to embrace professional code of ethics while providing solution to multidisciplinary social problems in industrial, entrepreneurial and research environment to demonstrate leadership qualities.	
1. To strengthen core competency of students to be successful, ethical, effective problem solver in Computer Science & Engineering through analytical learning.	3	3	2	2	10/12
2. To promote interdisciplinary research & innovation based activities in emerging areas of technology globally.	2	3	2	2	9/12
3. To facilitate and foster the industry-academia collaboration to enhance entrepreneurship skills and acquaintance with corporate culture.	2	2	3	3	10/12
4: To inculcate in them a higher degree of social consciousness and moral values towards solving interdisciplinary societal problems using industry-academia collaboration	2	2	2	3	9/12
	9/12	10/12	9/12	10/12	83%

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:	**Computing knowledge**:	Apply the knowledge of computing fundamentals to Identify, formulate, and solve problems in the areas of computer applications
PO2:	**Problem Analysis and Design of solutions:**	Apply analytical skills in solving computer based problems using fundamentals of computer science and application domains.
PO3:	**Modern tool usage**:	Ability to select and apply modern IT Tools and technologies for innovative software solutions and applications.
PO4:	**Technical Skill Development**	To develop and sharpen their IT/ programming, networking and data management skills required for identifying problems and issues relating to the Disciplinary area and field of study/ higher education.
PO5:	**Societal Concern:**	Recognize & appreciate the role of computing to design state-of-the-art methodologies for solving real life problems for the betterment of the society
PO6:	**Environment and Sustainability**:	Actively involved with knowledge, skills and right attitude to give sustainable solutions for the benefit of environment.
PO7:	**Ethics:**	Pertain ethical principles and entrust to professional ethics and responsibilities in a global economic environment.
PO8:	**Individual and team work**:	Ability to work effectively as an individual, and in assorted teams.
PO9:	**Communication:**	Development of good communication skills in both written and verbal form in a substantial technical manner.
PO10:	**Life-long learning:**	Ability to engage in independent and life-long learning through professional activities.
PSO1:	**Multimedia Applications**	Professionally trained in the areas of multimedia, animation, web designing, effective media management, and to acquire knowledge in various domain multimedia applications.
PSO2:		Develop competence in the field of, system analysis and design, multimedia and graphics, web design, data & information security, networking, and recent areas of cloud computing.

1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

Mapping	PEO1	PEO2	PEO3	PEO4
PO1:	3	3	2	1
PO2:	3	3	3	1
PO3:	2	2	3	2
PO4:	2	3	2	2
PO5:	1	2	2	3
PO6:	1	1	2	3
PO7:	1	1	2	3
PO8:	1	2	3	1
PO9:	1	1	3	2
PO10:	2	3	1	1
PSO1:	2	3	1	3
PSO2:	3	3	2	2

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

1.3.5 Program Outcome Vs Courses Mapping Table[1]:

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

[1] Cel value will contain the correlation value of respective course with PO.

1.3.5.2 COURSE ARTICULATION MATRIX[2]

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

[2] Each course outcome (Based on Blooms Taxanomy-CO1, CO2, CO3, CO4, CO5, and CO6) of the course needs to map with PO. This table evolves once faculty has mapped each course outcomes of their respective course with PO's.

Course Outcome

- **Course Outcomes**–What is it?
  - Course outcomes (COs) are clear statements of what a student should be able to demonstrate on completion of a course.
  - COs should be assessable and measurable knowledge, skills, abilities and attitudes that student attains by the end of the course.
  - It is generally good idea to identify between 4 and 7 outcomes.
  - All courses in a particular programme shall have their own PO.
  - Each CO is mapped to relevant PO.
  - The teaching learning process and assessment process are to be designed in a way to achieve the COs.

Beginning words for Course Outcome:

Active verbs developed based on Bloom's Taxonomy

Knowledge	Understand	Apply	Analyze	Evaluate	Create
define	explain	solve	analyze	reframe	design
identify	describe	apply	compare	criticize	compose
describe	interpret	illustrate	classify	evaluate	create
label	paraphrase	modify	contrast	order	plan
list	summarize	use	distinguish	appraise	combine
name	classify	calculate	infer	judge	formulate
state	compare	change	separate	support	invent
match	differentiate	choose	explain	compare	hypothesize
recognize	discuss	demonstrate	select	decide	substitute
select	distinguish	discover	categorize	discriminate	write
examine	extend	experiment	connect	recommend	compile
locate	predict	relate	differentiate	summarize	construct
memorize	associate	show	discriminate	assess	develop
quote	contrast	sketch	divide	choose	generalize
recall	convert	complete	order	convince	integrate
reproduce	demonstrate	construct	point out	defend	modify
tabulate	estimate	dramatize	prioritize	estimate	organize
tell	express	interpret	subdivide	find errors	prepare
copy	Identify	Manipulate	survey	grade	produce
discover	indicate	Paint	advertise	measure	rearrange
duplicate	Infer	Prepare	appraise	predict	rewrite
enumerate	relate	produce	Break down	rank	role-play

(Reference: Retrieved from http://www.teachthought.com/learning/249-blooms-taxonomy-verbs-for-critical-thinking/)

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA							
Batch: 2020 Onwards						TERM: I	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA167	Problem solving using C Programming	3	0	0	3	
2	BCA168	Digital Electronics & Computer Organization	3	0	0	3	
3	BCA162	Fundamental of Information Technology	3	0	0	3	
4	EVS112	Environmental Studies	3	0	0	3	
5	MTH136	Mathematics in Computer Applications	3	1	0	4	
Practical/Viva-Voce/Jury							
6	ARP101	Communicative English-1	1	0	2	2	
7	BCP167	Problem solving using C Programming Lab	0	0	2	1	
8	BCP168	Digital Electronics & Computer Organization Lab	0	0	2	1	
TOTAL CREDITS						**20**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA							
Batch: 2020 Onwards						TERM: II	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA362	Introduction to OOPs using Java	3	0	0	3	
2	BCA169	Data Structures and Algorithms	4	0	0	4	
3	BCA170	Discreate structure	3	1	0	4	
4	BCA171	Operating Systems	3	0	0	3	
5	HMM111	Values and Ethics	2	0	0	2	
Practical/Viva-Voce/Jury							
6	ARP102	Communicative English -2	1	0	2	2	
7	BCP362	Introduction to OOPs using Java Lab	0	0	2	1	
8	BCP169	Data Structures and Algorithms Using C Lab	0	0	2	1	
9	BCP171	Operating Systems Using Linux Lab	0	0	2	1	
TOTAL CREDITS						**21**	
Summer Internship-I: In summer after 1st year Summer Internship (To be evaluated in 3rd Semester)							

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA							
Batch: 2020 Onwards						TERM: III	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA272	Problem solving using Python Programming	3	0	0	3	
2	BCA265	Database Management Systems	3	0	0	3	
3	BCA273	Electronic Commerce & Applications	3	0	0	3	
4	Open Elective -1		3	0	0	3	
	HMM303	Organizational Behavior					
		Psychology & Sociology					
		Management Information Systems (MIS)					
Practical/Viva-Voce/Jury							
5	ARP203	Aptitude Reasoning and Business Communication Skills - Basic	1	0	2	2	
6	**ECC301**	Community Connect	-	-	-	2	
7	BCP272	Problem solving using Python Programming Lab	0	0	2	1	
8	BCP265	Database Management Systems Lab	0	0	2	1	
9	BCP291	Project Based Learning-1	0	0	2	1	
10	BCP295	Summer Internship-I	-	-	-	1	
TOTAL CREDITS						**20**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA							
Batch: 2020 Onwards						TERM: IV	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA274	Introduction to Computer Network	3	0	0	3	
2	BCA275	Fundamentals of Android	3	0	0	3	
3	BCA276	Web Designing and its Application	3	0	0	3	
4	Program Elective-1		3	0	0	3	
	BCO011	Data Encoding and Compression					
	BCO012	Graph Theory					
	BCA013	Information Security and Cyber Laws					
5	BCA314	Essentials of Digital Marketing	3	0	0	3	
Practical/Viva-Voce/Jury							
6	ARP204	Aptitude Reasoning and Business Communication Skills-Intermediate	1	0	2	2	
7	BCP274	Introduction to Computer Network Lab	0	0	2	1	
8	BCP275	Fundamentals of Android Lab	0	0	2	1	
9	BCP276	Web Designing and its Application Lab	0	0	2	1	
10	BCP292	Project Based Learning-2	0	0	2	1	
TOTAL CREDITS						**21**	
Summer Internship-II: In summer after 2nd year Summer Internship (To be evaluated in 5th Semester)							

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA							
Batch: 2020 Onwards						TERM: V	
S. No.	Course Code	Course	Teaching Load			Credits	Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	BCA372	Introduction to PHP	3	0	0	3	
2	BCA371	Introduction to Cloud Computing	3	0	0	3	
3	BCA268	Introduction to Software Engineering	3	0	0	3	
4		Program Elective-2	3	0	0	3	
	BCA021	Client Server Computing					
	BCO021	IT Project Management					
	BCO022	Introduction to Distributed System					
5		Program Elective-3	3	0	0	3	
	BCO031	Computer Graphics					
	BCO032	Multimedia & Animation					
	BCA033	Front End Design Tool VB.Net					
Practical/Viva-Voce/Jury							
6	BCP372	Introduction to PHP Lab	0	0	2	1	
7		Program Elective-4	0	0	2	1	
	BOL031	Computer Graphics Lab					
	BOL032	Multimedia & Animation Lab					
	BCP033	Front End Design Tool VB.Net Lab					
8	BCP393	Project-1	0	0	4	2	
9	BCP395	Summer Internship-II	-	-	-	2	
TOTAL CREDITS						**21**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA							
Batch: 2020 Onwards						TERM: VI	
S. No.	Course Code	Course	Teaching Load			Credits	Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	Program Elective -4		3	0	0	3	
	BCA041	Introduction to IOT and Applications					
	BCO041	Soft Computing					
	BCA043	Introduction to AIML					
2	Program Elective-5		3	0	0	3	
	BCA051	Softwere Testing					
	BCO051	System Analysis & Design					
	BCO052	Mobile Computing					
Practical/Viva-Voce/Jury							
1	Program Elective -4		0	0	2	1	
	BCP041	Introduction to IOT and Applications Lab					
	BOL041	Soft Computing Lab					
	BCP043	Introduction to AIML Lab					
2	Program Elective-5		0	0	2	1	
	BCP051	Softwere Testing Lab					
	BOL051	System Analysis & Design Lab					
	BOL052	Mobile Computing Lab					
3	BCP394	Project-2	-	-	-	9	
TOTAL CREDITS						**17**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA with Specialization in Multimedia and Animation							
Batch: 2020 Onwards						TERM: I	
S. No.	Course Code	Course	Teaching Load			Credits	Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	BCA167	Problem solving using C Programming	3	0	0	3	
2	BCA168	Digital Electronics & Computer Organization	3	0	0	3	
3	BCA162	Fundamental of Information Technology	3	0	0	3	
4	EVS112	Environmental Studies	3	0	0	3	
5	MTH136	Mathematics in Computer Applications	3	1	0	4	
Practical/Viva-Voce/Jury							
6	ARP101	Communicative English-1	1	0	2	2	
7	BCP167	Problem solving using C Programming Lab	0	0	2	1	
8	BCP168	Digital Electronics & Computer Organization Lab	0	0	2	1	
TOTAL CREDITS						**20**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA with Specialization in Multimedia and Animation							
Batch: 2020 Onwards						TERM: II	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA362	Introduction to OOPs using Java	3	0	0	3	
2	BCA169	Data Structures and Algorithms	4	0	0	4	
3	BCA270	Fundamentals of Creative Multimedia	3	0	0	3	
4	BCA171	Operating Systems	3	0	0	3	
5	HMM111	Values and Ethics	2	0	0	2	
Practical/Viva-Voce/Jury							
6	ARP102	Communicative English -2	1	0	2	2	
7	BCP362	Introduction to OOPs using Java Lab	0	0	2	1	
8	BCP169	Data Structures and Algorithms Using C Lab	0	0	2	1	
9	BCP171	Operating Systems Using Linux Lab	0	0	2	1	
10	BCP270	Fundamentals of Creative Multimedia Lab	0	0	2	1	
TOTAL CREDITS						**21**	
Summer Internship-I: In summer after 1st year Summer Internship (To be evaluated in 3rd Semester)							

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA with Specialization in Multimedia and Animation							
Batch: 2020 Onwards						TERM: III	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA272	Problem solving using Python Programming	3	0	0	3	
2	BCA269	Visual Programming with VB	3	0	0	3	
3	BCA273	Electronic Commerce & Applications	3	0	0	3	
4	Open Elective -1		3	0	0	3	
	HMM303	Organizational Behavior					
		front-end web development: HTML, CSS and JavaScript					
		Management Information Systems (MIS)					
Practical/Viva-Voce/Jury							
5	ARP203	Aptitude Reasoning and Business Communication Skills - Basic	1	0	2	2	
6	**ECC301**	Community Connect	-	-	-	2	
7	BCP272	Problem solving using Python Programming Lab	0	0	2	1	
8	BCP269	Visual Programming with VB Lab	0	0	2	1	
9	BCP291	Project Based Learning-1	0	0	2	1	
10	BCP295	Summer Internship-I	-	-	-	1	
TOTAL CREDITS						**20**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA with Specialization in Multimedia and Animation							
Batch: 2020 Onwards						TERM: IV	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA277	Multimedia authoring and production	3	0	0	3	
2	BCA275	Fundamentals of Android	3	0	0	3	
3	BCA276	Web Designing and its Application	3	0	0	3	
4	Program Elective-1		3	0	0	3	
	BCO011	Data Encoding and Compression					
	BCA014	Digital Audio and Computer Music					
	BCA013	Information Security and Cyber Laws					
5	BCA314	Essentials of Digital Marketing	3	0	0	3	
Practical/Viva-Voce/Jury							
6	ARP204	Aptitude Reasoning and Business Communication Skills-Intermediate	1	0	2	2	
7	BCP277	Multimedia authoring and production Lab	0	0	2	1	
8	BCP275	Fundamentals of Android Lab	0	0	2	1	
9	BCP276	Web Designing and its Application Lab	0	0	2	1	
10	BCP292	Project Based Learning-2	0	0	2	1	
TOTAL CREDITS						**21**	
Summer Internship-II: In summer after 2nd year Summer Internship (To be evaluated in 5th Semester)							

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA with Specialization in Multimedia and Animation							
Batch: 2020 Onwards						TERM: V	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BCA372	Introduction to PHP	3	0	0	3	
2	BCA371	Introduction to Cloud Computing	3	0	0	3	
3	**BCA373**	Virtual Reality	3	0	0	3	
4	Program Elective-2		3	0	0	3	
	BCA271	Computer Modeling and Animation					
	BCO021	IT Project Management					
	BCO022	Introduction to Distributed System					
5	Program Elective-3		3	0	0	3	
	BCA034	Audio Video Broadcasting System					
	BCO032	Multimedia & Animation					
	BCA033	Front End Design Tool VB.Net					
Practical/Viva-Voce/Jury							
6	BCP372	Introduction to PHP Lab	0	0	2	1	
7	Program Elective-3		0	0	2	1	
	BCP034	Audio-Video Broadcasting Systems Lab					
	BOL032	Multimedia & Animation Lab					
	BCP033	Front End Design Tool VB.Net Lab					
8	BCP393	Project-1	0	0	4	2	
9	BCP395	Summer Internship-II	-	-	-	2	
TOTAL CREDITS						**21**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
BCA with Specialization in Multimedia and Animation							
Batch: 2020 Onwards						TERM: VI	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	Program Elective -4		3	0	0	3	
	BCA044	Web design, publishing and graphics					
	BCA045	Instructional Design for multimedia					
	BCA046	Corporate multimedia production					
2	Program Elective-5		3	0	0	3	
	BCA054	Digital design and animation					
	BCA055	Multimedia security					
	BCA056	Audio Visual Productions					
Practical/Viva-Voce/Jury							
1	Program Elective -4		0	0	2	1	
	BCP044	Web design, publishing and graphics Lab					
	BCP045	Instructional Design for multimedia Lab					
	BCP046	Corporate multimedia production Lab					
2	Program Elective-5		0	0	2	1	
	BCP054	Digital design and animation Lab					
	BCP055	Multimedia Security Lab					
	BCP056	Audio Visual Productions Lab					
3	BCP394	Project-2	-	-	-	9	
TOTAL CREDITS						**17**	

C. Course Syllabuses

TERM-I

Schools: SET		Batch : 2020-20 Current Academic Year: 2020-20 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 emerge 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. 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. 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 101		
	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
4. Max Students Size =80/Batch

CO	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
CO1										3		
CO2								1	1	2		
CO3				1				1	2			
CO4		1	1							1	2	

School: SET		Batch : 2020	
Program: BCA		Current Academic Year: 2020-19	
Branch:CS/IT		Semester:I	
1	Course Code	BCA162 Course Name- BCA	
2	Course Title	Fundamentals of IT	
3	Credits	4	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	UG	
5	Course Objective	1. The main objective is to introduce IT in a simple language to all undergraduate students, regardless of their specialization. 2. The focus of the subject is on introducing skills relating to IT basics, computer applications 3. To understand the basic knowledge of computer	
6	Course Outcomes	Students will be able to: CO1: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, MICR, Digitizer, Electronic card reader, Image Capturing Devices-Digital Cameras. Output devices- Monitors- CRT, LCD/TFT	CO1, CO2
	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	applicationsoftwareand 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, PSO2

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

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CSE	CO1	3	3	3	3	--	--	--	2	2	1	3	2
	CO2	3	2	3	3	--	--	--	2	2	2	2	3
	CO3	3	2	3	3	-	-	-	2	1	2	1	2
	CO4	3	3	3	2	--	--	--	2	1	3	1	2
	CO5	3	2	3	3	--	--	--	2	2	2	2	3
	CO6	3	2	3	3	-	-	-	2	1	2	1	2

School: SET		Batch : 2020	
Program: BCA		Current Academic Year: 2020-21	
Branch:CS/IT		Semester:1	
1	Course Code	BCA167	Problem solving using C Programming
2	Course Title	Problem solving using 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: Demonstrate the algorithm, Pseudo-code and flow chart for the given problem. CO2: Develop better understanding of basic concepts of C programming. CO3: Create and implement logic using Operators and control statements. CO4: Construct and implement the logic based on iteration. CO5: Apply and utilize the modular features of the language. CO6: Design and develop solutions to real world problems using C.	
7	Course Description	Basic concepts of C programming, logic building in C programming	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	A	How to develop a program, Algorithms, Flow-charts, Types of Programming Languages	CO1, CO2
	B	Compiler and Linker,	CO1, CO2
	C	Testing and Debugging a program, Documentation	CO1, CO2
	Unit 2	Constants, Variables & Data Types	
	A	Identifiers and Keywords, Constants, Variables, Data types, Declaration of variables,	CO1, CO2
	B	declaration of storage class, assigning values to variables, defining symbolic constants, declaring a variable as constant, declaring a variable as volatile,.	CO1, CO2
	C	overflow and underflow of data	CO1, CO2
	Unit 3	Operators & Expressions	
	A	Arithmetic operators, Relational, Logical operators, Assignment, increment and decrement operators,	CO1,

					CO2,CO3
	B	conditional operators, bitwise operators, special operators, arithmetic expressions, evaluation of arithmetic expressions, precedence of arithmetic expressions			CO1, CO2,CO3
	C	type conversion in expressions, operator precedence and associativity, mathematical functions.			CO1, CO2,CO3
	Unit 4	Decision Making – Branching & Looping			
	A	Decision making with IF statement, switch statement, ? : operator			CO1, CO2,CO4
	B	While statement, do-while statement,			CO1, CO2,CO4
	C	for statement, Jumps in loops,			CO1, CO2,CO4,CO6
	Unit 5	Functions			
	A	Top down approach of problem solving			CO1, CO2,CO5,CO6
	B	standard library functions, passing values between functions, scope rules of functions			CO1, CO2,CO5,CO6
	C	Function calling, return type of functions, call by value and call by reference, recursive functions.			CO1, CO2,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: Demonstrate the algorithm, Pseudo-code and flow chart for the given problem.	PO1,PO2,PO3, PO9, PSO1,PSO2
2.	CO2: Develop better understanding of basic concepts of C programming.	PO1,PO3, PO4, PO5, PO9, PO10,PSO1,PSO2

3.	CO3: Create and implement logic using Operators and control statements.	PO1,PO3,PO4, PO9, PSO2
4.	CO4: Construct and implement the logic based on iteration.	PO1,PO2,PO3,PO4,PO9, PSO2
5.	CO5: Apply and utilize the modular features of the language.	PO1,PO2,PO3,PO4,PO9, PO10,PSO1,PSO2
6.	CO6: Design and develop solutions to real world problems using C.	PO1,PO2,PO3,PO4,PO9, PO10,PSO1

PO and PSO mapping with level of strength for Course Problem solving using C Programming (Course Code BCA 167)

Course Code_ Course Name	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PSO 1	PSO 2
BCA167_Problem solving using C Programming	CO1	3	2	3						2		2	2
	CO2	3		3	2	1				3	2	2	2
	CO3	2		2	3					2			2
	CO4	3	2	2	2					3			3
	CO5	2	2	2	2					2	1	1	2
	CO6	2	2	1	2					1	2	3	

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PSO 1	PSO 2
BCA167	Problem solving using C Programming	2.5	2	2.6	2.2	1				2	1.67	2	2.2

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School: SET		Batch :	
Program: BCA		Current Academic Year:	
Branch: CS/IT		Semester: I	
1	Course Code	BCA168 | Course Name:	
2	Course Title	Digital Electronics & Computer Organization	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	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. To understand the building blocks of computer and study various design issues	
6	Course Outcomes	CO1: Define the basic logic operations; AND, OR, NAND, NOR, INVERTER 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. CO2: Identify combinatorial logic circuits and sequential logic circuits, and explain their operation. CO3: Design & implement different types of sequential logic circuits using Flip Flops. CO4: Identify the basic structure and functional units of a digital computer & understand basic processing unit and organization of simple processor including instruction sets, instruction formats and various addressing modes CO5: Describe hierarchical memory systems including cache memories & select appropriate interfacing standards for I/O devices. CO6: Application of digital electronics in computer organization	
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. This course also 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	Logic Gates & Boolean Algebra	
	A	AND, OR, NOT, NAND, NOR, XOR, XNOR , NAND & NOR as Universal Gates	CO1, CO6
	B	Theorems, Simplification of Boolean Expression using Boolean Algebra, SOP & POS Forms, Realization of Boolean Expression using Gates	CO1, CO6

	C	K-Maps, Simplification of Boolean Expression using K-Maps(upto 4- variables)			CO1, CO6
	Unit 2	Combinational Logic Circuits			
	A	Half Adder & Half Subtractor, Full Adder & Full Subtractor			CO2, CO6
	B	Multiplexers & Demultiplexers, Implementation of Boolean equations using Multiplexer and Demultiplexer			CO2, CO6
	C	Encoders & Decoders			CO2, CO6
	Unit 3	Sequential Logic Circuits			
	A	Latch, Flip Flops- R-S Flip-Flop, J-K Flip-Flop			CO3, CO6
	B	Master-Slave J-K Flip-Flop, Race Condition, Removing Race Condition			CO3, CO6
	C	D Flip-Flop, T Flip-Flop			CO3, CO6
	Unit 4	Basic Computer Organization and Design			
	A	Digital computer: functional units and their interconnections, buses, Bus architecture, types of buses and bus arbitration. Bus and memory transfer, micro-operations			CO4, CO6
	B	Control Unit: Processor organization: general register organization, stack organization and addressing modes			CO4, CO6
	C	Memory Unit: Basic concept and hierarchy, semiconductor RAM memories and types, ROM memories and types.			CO4, CO6
	Unit 5	Cache Memories & I/O Devices			
	A	Cache memories: concept and design issues (Performance, address mapping and replacement)			CO5, CO6
	B	Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt hardware, types of interrupts			CO5, CO6
	C	Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access			CO5, CO6
	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			

School: SET		Batch: 2020-2022	
Program: BCA		Current Academic Year: 2020-2020	
Branch:		Semester: I	
1	Course Code	BCP167	
2	Course Title	Problem solving using C Programming Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	• Learn basic programming constructs –data types, decision structures, control structures in C • learning logic aptitude programming in c language • Developing software in c programming	
6	Course Outcomes	By the end of this course you will be able to: CO1: Demonstrate the algorithm, Pseudo-code and flow chart for the given problem. CO2: Develop better understanding of basic concepts of C programming. CO3: Create and implement logic using Operators and control statements. CO4: Construct and implement the logic based on iteration. CO5: Apply and utilize the modular features of the language. CO6: Design and develop solutions to real world problems using C.	
7	Course Description	Basic concepts of C programming, logic building in C programming	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	CO 1
		P1: Getting Started with computers and programming environment P2: Drawing flowcharts and implementing some computing problems	
	Unit 2	Constants, Variables & Data Types	CO1,CO2
		P4: Demonstration and use of different data types, variables, constants, storage classes P5: Demonstration of operators with the help of different use.	
	Unit 3	Operators & Expressions	CO1, CO2, CO3
		P6: Implementing some programs based on mathematical	

		expression P7: Implementing some programs based on associativity and precedence.	
	Unit 4	Decision Making – Branching & Looping	CO1, CO2, CO3, CO4,CO6
		P8: Use of if-else and nested if statements. P9: Demonstrate the use of switch statement with the help of menu-driven programs. P10: Use of nested loops to print some patterns.	
	Unit 5	Functions	CO1,CO2, CO3, CO4,CO5,CO6
		P11: Implementation of Top-Down approach for problem solving with the help of functions. P12: Demonstration of passing parameters using call by value and call by reference. P13: Implementation of recursive functions for various recursively defined problems	
	Mode of examination	Jury/Practical/Viva	
	Weightage Distribution	CA | MTE | ETE	
		60% | 0% | 40%	
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. *The C Programming Language*	
	Other References	3. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004. 4. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Demonstrate the algorithm, Pseudo-code and flow chart for the given problem.	PO1, PO3, PSO1
2.	CO2: Develop better understanding of basic concepts of C programming.	PO1, PO2, PSO1
3.	CO3: Create and implement logic using Operators and control statements.	PO2, PO4, PO9, PSO2
4.	CO4: Construct and implement the logic based on iteration.	PO2, PO3, PO4,PO5 PO9, PSO1, PSO2

5.	CO5: Apply and utilize the modular features of the language.	PO2, PO3, PO9, PSO1, PSO2
6.	CO6: Design and develop solutions to real world problems using C.	PO3, PO4, PO10., PSO1, PSO2

PO and PSO mapping with level of strength for Course Name Problem solving using C Programming Lab (Course Code BCP 167)

Course Code_ Course Name	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
BCP167_ Problem solving using C Programming Lab	CO1	2	-	3	-	-	-	-	-	-	-	3	-
	CO2	3	2	-	-	-	-	-	-	-	-	2	-
	CO3	-	3	3	2	-	1	-	-	3	-	3	3
	CO4	-	3	2	-	-	-	2	-	3	-	3	3
	CO5	-	2	-	3	-	-	-	-	2	-	-	2
	CO6	2	-	1	2	-	-	-	-	-	-	3	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
BCP167	Problem solving using C Programming Lab	2.33	2.5	2.25	2.33	-	1	2	-	2.66	-	2.8	2.66

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School: SET		Batch : 2020-2020	
Program: B. Tech		Current Academic Year: 2020-2020	
Branch: All		Semester: I	
1	Course Code	EVS-112	
2	Course Title	Environmental Science	
3	Credits	03	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Compulsory	
5	Course Objective	1. Enable students to learn the concepts, principles and importance of environmental science 2. Provide knowledge of layers of atmosphere with an insight of role of climatic elements in dispersion of pollutants 3. Provide detailed knowledge of causes, effects and control of different types of environmental pollution, solid waste management and its effect on climate change, global warming and ozone layer depletion 4. Provide knowledge about ecosystem and biodiversity conservation 5. Provide and enrich the students about social issues such as R&R, water conservation and sustainability. 6. Overall understanding of environmental components and its protection and management.	
6	Course Outcomes	CO1.Understand the principles and scope of environmental science CO2.Knowledge about various types of natural resources and its conservation CO3.Study about the structure and composition of atmosphere and factors affecting weather and climate CO4.Study about pollution causes, effects and control and solid waste management and various policies to curb pollution problem CO5.About ecosystem and biodiversity and various strategies for biodiversity conservation. CO6.Overall understanding of the concepts of various elements of environment and related phenomenon.	
7	Course Description	Environmental Science emphasises on various factors as 1. Importance and scope of environmental science 2. Natural resource conservation 3. Pollution causes, effects and control methods and solid waste management 4. Social issues associated with environment	
8	Outline syllabus		CO Mapping
	Unit 1	General Introduction	
	A	Definition, principles and scope of environmental science	CO1/CO6
	B	Water Resources, Land Resources, Food Resources	CO1/CO6

	C	Mineral Resources, Energy Resources, Forest Resources	CO1/CO6
	Unit 2	Atmosphere and meteorological parameters	
	A	Structure and composition of atmosphere	CO2/CO6
	B	Meteorological parameters: Pressure, Temperature, Precipitation, Humidity,	CO2/CO6
	C	Radiation, Wind speed and direction, Wind Rose	CO2/CO6
	Unit 3	Environmental Pollution (Cause, effects and control measures) and climate change	
	A	Air, water, Noise and Soil pollution and Case studies	CO3/CO6
	B	Solid waste management: Causes, effects and control measures of urban and industrial wastes.	CO3/CO6
	C	Concept of Global Warming, green house effect, ozone layer depletion, Kyoto, IPCC concerns	CO3/CO6
	Unit 4	Ecosystem and Biodiversity conservation	
	A	Structure and Function of ecosystem, Energy flow in ecosystem, food chain, food web, and ecological succession	CO4/CO6
	B	Hot spots, Endangered and endemic species of India, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions	CO4/CO6
	C	Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.	CO4/CO6
	Unit 5	Social Issues and the Environment	
	A	Concept of sustainable development, Water conservation	CO5/CO6
	B	Resettlement and rehabilitation of people; its problems and concerns, Case studies	CO5/CO6
	C	Population explosion and its consequences	CO5/CO6
	Mode of examination	Theory	
	Weightage Distribution	CA: 30% / MTE: 20% / ETE: 50%	
	Text book/s*	**1.** Joseph, Benny, "Environmental Studies", Tata Mcgraw Hill. **2.** .Howard S. Peavy, Donald R. Rowe, George Tchobanoglous. Environmental engineering Mc Graw-Hill, 1985	
	Other References		

CO and PO Mapping

CO1	Understand the principles and scope of environmental science
CO2	Knowledge about various types of natural resources and its conservation
CO3	Study about the structure and composition of atmosphere and factors affecting weather and climate

CO4	Study about pollution causes, effects and control and solid waste management and various policies to curb pollution problem
CO5	About ecosystem and biodiversity and various strategies for biodiversity conservation
CO6	Overall understanding of the concepts of various elements of environment and related phenomenon

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO112.1	1	1	1	1	1	1	2	1	-	1	1	1	-	1	-
CO112.2	1	2	2	1	-	1	2	-	-	1	1	-	-	1	-
CO112.3	1	2	2	1	-	2	2	-	-	1	2	-	-	2	2
CO112.4	1	2	2	1	-	2	2	-	-	1	2	-	-	2	2
CO112.5	1	2	2	1	1	2	1	2	-	1	2	-	-	2	1
CO112.6	1	2	2	2	1	2	2	1	-	1	2	1	-	2	1

School: SET		Batch : 2020- 2023	
Program: BCA		Current Academic Year:	
Branch:		Semester: 1	
1	Course Code	MTH136	
2	Course Title	Mathematics in Computer Applications	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Compulsory	
5	Course Objective	The objective of this course is to familiarize the prospective engineers with techniques in basic calculus and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.	
6	Course Outcomes	CO1: Explain the concept of differential calculus, illustrate the curvature and Maxima, minima and saddle point. (K2, K3, K4) CO2: Explain the basic concepts matrices and determinate, evaluate system of linear equation by using rank and inverse method. (K2, K3, K5) CO3: Explain the basic concept of sets, relation, functions, groups Rings and Field. (K2, K4) CO4: Discuss the basic of Vector spaces. (K1, K3) CO5: Describe and use the linear transformation and evaluate nullity and kernel. (K1, K2, K3, K5) CO6:Explain the concept of Eigen values and Eigen vectors; evaluate the diagonalization of matrices, explain the basic introduction of Inner product spaces.(K2, K3, K4, K5)	
7	Course Description	This course is an introduction to the fundamental of Mathematics. The primary objective of the course is to develop the basic understanding of differential and integral calculus, linear Algebra and Abstract Algebra.	
8	Outline syllabus: Mathematics in Computer Applications		CO Mapping
	Unit 1	Differential Calculus:	
	A	Successive differentiation, Leibritiz Theorem, Taylors theorem with Lagranges forms of remainders,	
	B	Expansion of a function of one variable in Taylors and Meclanrin's infinite series. Maxima and Minima of one variable, partial Derivatives, Euler's theorem, change of variables, total differentiation,	
	C	Errors and approximation. Taylors series in two	

		variables. Maxima and Minima of two or more variables			
	Unit 2	Integral Calculus:			
	A	Definite integral and its application for area, length and volume.			
	B	Multiple integrals. Change of order of integration.			
	C	Transformation of integral from Cartesian to polar. Applications in areas, volume and surfaces.			
	Unit 3	Differential Equation:			
	A	First degree and first order Differential equation			
	B	Higher order differential equation with constant coefficients.			
	C	Linear partial differential equation of first order P.D.E. of higher with constant coefficients.			
	Unit 4	LINEAR ALGEBRA:			
	A	Spaces and Subspaces, Basic and Dimension of Vector Spaces,			
	B	Linear Transformation,			
	C	Their Nullity and Rank.			
	Unit 5	MATRIX ALGEBRA:			
	A	Elementary Transformation, Inverse of a Matrix by Row Operation, Rank,			
	B	Solution of a System of Linear Simultaneous Equation by Matrix Methods,			
	C	Eigen Values and Eigen Vectors, Quadratic Forms.			
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002. 2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.			
	Other References	1. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005. 2. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008. 3. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010. 4. V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East–West press, Reprint 2005.			

COURSE OUTCOMES – PROGRAMME OUTCOMES MAPPING TABLE

PO and PSO mapping with level of strength for Course Name Mathematics in Computer Applications (MTH136)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
	Computing knowledge	Problem Analysis and Design of solutions:	Modern tool usage:	Technical Skill Development	Societal Concern:	Environment and Sustainability:	Ethics	Individual and team work:	Communication	Life-long learning:	Multimedia Applications	
CO1	3	-	-	3	-	-	-	2	2	3	-	-
CO2	3	3	-	3	-	-	-	3	-	2	-	-
CO3	3	3	3	3	-	-	-	3	-	2	-	-
CO4	2	2	2	3	-	-	-	2	-	-	-	-
CO5	2	2	2	3	-	-	-	-	-	2	-	-
CO6	2	3	3	3	2	2	2	3	3	3	2	3

TERM-II

Schools: SET		Batch : 2020-20	
		Current Academic Year: 2020-20	
		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 102		
	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
4. Max Students Size =80/Batch

CO	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
CO1					1	1	1	1	1			
CO2			1								1	
CO3										1		
CO4										1		

School: SET		Batch : 2020	
Program: BCA		Current Academic Year: 2020-21	
Branch:		Semester: II	
1	Course Code	BCA169	
2	Course Title	Data Structures & Algorithms	
3	Credits	4	
4	Contact Hours (L-T-P)	4-0-0	
	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: Explain the concepts of data structure, data type and ADT. CO2: Classify and Compare operations like traversing, insertion, deletion, searching etc. on various data structures. CO3:Create and Utilize approach for the application standard algorithms for searching and sorting. CO4: Compare relationship among data structure to solve various problems. CO5: Apply variousimplementation on data structure such as stacks, queues, trees and graphs to solve various computing problems. CO6: Test and propose 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, ADT, Data Structure – Definition, Data Structure –Operations, Applications and types.	CO1, CO2
	B	Definition, Representation of Linear Arrays in Memory,	CO1, CO2

		Types and implementation of Arrays: 1D, 2D & M-D Concept, Applications of Arrays, Address Calculation, Matrix Operations,			
	C	Sorting & Searching Algorithms-Bubble sort, Selection sort, Merge sort, linear and binary search.			CO1, CO2
	Unit 2	LINKED LIST			
	A	Concept of Linked List, Representation of linked List in memory, Memory Allocation, Garbage Collection, Overflow and Underflow			CO2, CO5
	B	Traversing a linked list, Searching a linked list, Insertion & Deletion in Linked List			CO2, CO5
	C	More types of linked list: Doubly Linked list, Header Linked List, Two way List and Circular linked list.			CO3
	Unit 3	STACKS, QUEUES			
	A	Concepts of Stack, Operation on Stack, Array Representation of Stack, Arithmetic Expression POLISH Notation			CO2, CO4
	B	Concepts of Queue, Operation on Queue, Representation of queues			CO2, CO4,
	C	Other types of queue: Priority Queues, Deque and Circular queue.			CO4, CO6
	Unit 4	TREES AND GRAPH			
	A	Trees: Terminologies, Binary tree, Binary tree Representation, Applications			CO2, CO5
	B	Binary Search Trees, Tree Traversals			CO2, CO5
	C	Graphs: Terminology, Types, Traversal			CO2, CO5
	Unit 5	Algorithm and It's Analysis			
	A	Introduction : Algorithms, Properties of Algorithm, Analyzing algorithms, Complexity of algorithms			CO5, CO6
	B	Growth of functions, Performance measurements, Asymptotic Notations and their properties, Mathematical analysis for Recursive and Non-recursive algorithms			CO5, CO6
	C	Recurrences relations, Methods to solve recurrence relation: Substitution method, Recursion tree method, Iteration Method, Master Method			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

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Define the concepts of data structure, data type and ADT.	PO1, PO3, PSO1
2.	CO2: Classify and Compare operations like traversing, insertion, deletion, searching etc. on various data structures.	PO1, PO2, PSO1
3.	CO3:Create and Utilize approach for the application standard algorithms for searching and sorting.	PO2, PO4, PO9, PSO2
4.	CO4: Compare relationship among data structure to solve various problems.	PO2, PO3, PO4,PO5 PO9, PSO1, PSO2
5.	CO5: Apply variousimplementation on data structure such as stacks, queues, trees and graphs to solve various computing problems.	PO2, PO3, PO9, PSO1, PSO2
6.	CO6: Test and propose data structure that efficiently model the information in a problem	PO3, PO4, PO10., PSO1, PSO2

PO and PSO mapping with level of strength for Course Data Structures & Algorithms

Course Code_ Course Name	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
Data Structures & Algorithms	CO1	2		3								3	
	CO2	3	2									2	
	CO3		3		2					3		3	
	CO4		3	2	2	1				3		3	3
	CO5		2	2						2		1	2
	CO6			1	2						2	3	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
	Data Structures & Algorithms	2.5	2.5	2	2	1				2.67	2	2.5	2.33

Strength of Correlation

1. Addressed to*Slight (Low=1) extent* *2.* Addressed to*Moderate (Medium=2) extent*

3. Addressed to*Substantial (High=3) extent*

School:		School of Engineering and technology	
Department		Department of Computer Science and Engineering	
Program:		BCA	
Branch:			
1	Course Code	BCA170	
2	Course Title	Discrete Structures	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Core	
5	Course Objective	This course provides a mathematical foundation for subsequent study in Computer Science, as well as developing the skills necessary to solve practical problems.	
6	Course Outcomes	After the completion of this course, students will be able to: CO-1. *Apply the* basic principles of sets and operations in sets. CO-2. *Classify* logical notation and determine if the argument is or is not valid. CO-3. *Construct* and prove models by using algebraic structures. CO-4. *Analyze* basic principles of Boolean algebra with mathematical description. CO-5. *Construct* Permutations and combinations in counting techniques and applications of Recurrence. CO-6. *Compose* computer programs in a formal mathematical manner.	
7	Course Description	The purpose of this course is to understand and use (abstract) discrete structures that are backbones of computer science. A basic understanding of discrete mathematical topics is fundamental for work in computer science. Many students of this course will find they have familiarity with some of the topics: for instance, truth tables, logical propositions, elements of set theory, as well as basic notions of functions and mathematical induction. In this course we will discover that logical propositions are the underlying model of discrete systems. From this modest beginning we develop algorithms and prove their efficacy. Topics include propositional and predicate logic, basic proof techniques, set algebra and Boolean algebra, recursion and induction and introductory combinatorics. The knowledge gained will be extremely useful in upper level of computer science classes.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Set Theory, Relations and Functions.	
	A	Set Theory: Introduction, Combination of sets, Multi sets, ordered pairs, Set Identities.	CO1, CO6
	B	Relations: Definition, Operations on relations, Properties of relations, Composite Relations, Equality of relations, Order of relations.	CO1, CO6
	C	Functions: Definition, Classification of functions, Operations on functions, Recursively defined functions.	CO1, CO6

	Unit 2	Logics and Mathematical Induction			
	A	Propositional Logic: Proposition, well formed formula, Truth tables, Tautology, Satisfiability, Contradiction,			CO2, CO6
	B	Algebra of proposition, Theory of Inference, Natural Deduction.			CO2, CO6
	C	Predicate Logic: First order predicate, well formed formula of predicate, quantifiers, Inference theory of predicate logic.			CO2, CO6
	Unit 3	Algebraic Structures			
	A	Semigroup, Monoid, Groups, Abelian Group, Cyclic Groups, Sub-Algebraic Structures and order			CO3, CO6
	B	Cosets , Lagrange's theorem, Normal Subgroups, Homomorphism's,			CO3, CO6
	C	Definition and elementary properties of Rings and Fields, Integers Modulo n.			CO3, CO6
	Unit 4	Lattices and Applications			
	A	Partial order sets: Definition, Partial order sets, Combination of partial order sets, Hasse diagram.			CO3, CO4, CO6
	B	Definition, Properties of lattices – Bounded, Complemented, Modular and Complete Lattice, Morphisms of lattices.			CO3, CO4, CO6
	C	Boolean Algebra: Introduction, Axioms and Theorems of Boolean algebra, Algebraic manipulation of Boolean expressions. Simplification of Boolean Functions, Karnaugh maps			CO3, CO4, CO6
	Unit 5	Number Theory and Recurrence Relation.			
	A	Natural Numbers: Introduction, Mathematical Induction, Variants of Induction, Induction with Nonzero Base cases.			CO5, CO6
	B	Combinatory: Introduction, Counting Techniques, Pigeonhole Principle			CO5, CO6
	C	Recurrence Relation & Generating function: Recursive definition of functions, Recursive algorithms, Method of solving recurrences.			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1) *1. C. L. Liu, Elements of Discrete Mathematics, second edition 1985, McGraw-Hill Book Company. Reprinted 2000.* 2) Jean Paul Trembley, R Manohar, "Discrete Mathematical Structures with Application to Computer Science", McGraw-Hill. 3) *K. H. Rosen, Discrete Mathematics and applications, fifth edition 2003, Tata McGraw Hill Publishing Company.*			
	Other References	1) *J .L. Mott, A. Kandel, T.P .Baker, Discrete Mathematics for Computer Scientists and Mathematicians, second edition 1986, Prentice Hall of India.*			

		2) *W.K. Grassmann and J.P.Trembnlay, Logic and Discrete Mathematics, A Computer Science*

PO and PSO mapping with level of strength Discrete Structures for BCA, CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: *Apply the* basic principles of sets and operations in sets.	PO1,PO4 ,PSO2
2.	CO2: *Classify* logical notation and determine if the argument is or is not valid.	PO3,PSO2
3.	CO3: *Construct* and prove models by using algebraic structures.	PO3,PO4,PSO3,PSO4
4.	CO4: *Analyze* basic principles of Boolean algebra with mathematical description.	PO1, PO4, PSO3
5.	CO5: *Construct* Permutations and combinations in counting techniques and applications of Recurrence.	PO1, PSO2
6	CO6: *Compose* computer programs in a formal mathematical manner.	PO3, PO4, PO5,PSO4,PSO5

PO and PSO mapping with level of strength OF BCA170_Discreate structure (CO-PO AND CO-PSO MAPPING)

	PO1:	PO2:	PO3:	PO4:	PO5:	PO6:	PO7:	PO8:	PO9:	PO10:	PSO1:	PSO2:
	Computing knowledge	Problem Analysis and Design of solutions	Modern tool usage	Technical Skill Development	Societal Concern	Environment and Sustainability	Ethics	Individual and team work	Communication	Life-long learning	Multimedia Applications	Application Development
CO1	3	3	2	1	1	1	1	2	1	3		2
CO2	3	3	2	2	1	1	1	2	1	3		2
CO3	3	3	1	2	1	1	1	2	1	2		3
CO4	3	2	1	1	1	1	1	2	1	2		2
CO5	3	3	2	2	1	1	1	2	1	3		3
CO6	2	2	2	2	1	1	1	2	1	3		3

Average of non-zeros entry in following table (should be auto calculated).

	PO1:	PO2:	PO3:	PO4:	PO5:	PO6:	PO7:	PO8:	PO9:	PO10:	PSO1:	PSO2:
	Computing knowledge	Problem Analysis and Design of solutions	Modern tool usage	Technical Skill Development	Societal Concern	Environment and Sustainability	Ethics	Individual and team work	Communication	Life-long learning	Multimedia Applications	Application Development
BCA170_Discreate structure	2.83	2.67	1.67	1.67	1.00	1.00	1.00	2.00	1.00	2.67		2.50

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School:		Batch : 2020	
Program: BCA		Current Academic Year: 2020-19	
Branch:		Semester: II	
1	Course Code	BCA171	
2	Course Title	Introduction to Operating System	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Non Elective	
5	Course Objective	4. Provide students with an overview of the application and requirements of Operating system 5. Gain insight into the challenges and limitations of resource management 6. Provide the students with practice on applying algorithms 7. Prepare students understand the principles of design of operating system 8. Enhance students skills to operate multi user multi-tasking operating system	
6	Course Outcomes	Students will be able to: CO1: To understand and implement algorithms in resource allocation and utilization. CO2: To Understand the strengths and weaknesses of the algorithms. CO3: To identify the challenges and apply suitable algorithms for them. CO4: To implement tools and utility of operating system. CO5: Analyze various memory management and virtual memory techniques CO6: To Understand file and disk management and analyzing them	
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	CO1, CO2,CO4

		Operations),			
	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,CO5
	B	Segmentation, Paged segmentation			CO3,CO5
	C	Virtual memory concept, demand paging, Page replacement algorithms(FCFS, Optimal, LRU)			CO1.CO5
	Unit 5	File and Disk Management			
	A	Disk structure, Disk scheduling (FCFS,SSTF, SCAN, LOOK,C-SCAN, C-LOOK).			CO2,CO3,CO6
	B	File Concept,File operations, File Directories			CO1,CO2,CO3,CO6
	C	Using process & file handling Linux commands.			CO1,CO2,CO3,CO6
	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	PO9, PO10,PO11

	system.	
5.	CO5: Analyze various memory management and virtual memory techniques.	PO1,PO2,PO8,PO9,PO10,PSO1
6.	CO6: To Understand file and disk management and analyzing them.	PO1,PO2,PO10,PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Introduction to operating system (Course Code BCA 171)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CSE	CO1	3	3	3	3	--	--	--	2	2	1	3	2
	CO2	3	2	3	3	--	--	--	2	2	2	2	3
	CO3	3	3	3	3	--	--	--	1	1	1	3	2
	CO4	2	2	2	2	1	--	--	2	3	3	2	2
	CO5	2	2	3	-	-	-	-	3	3	1	3	-
	CO6	3	2	-	-	-	-	-	-	-	2	2	2

School:		School of Engineering and technology	
Department		Department of Computer Science and Engineering	
Program:			
Branch:			
1	Course Code	BCA 362	
2	Course Title	Introduction to OOP using Java	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Core /Elective/Open Elective	
5	Course Objective	Understand the fundamentals of object-oriented concept in Java, defining classes, objects, invoking methods inheritance,interfaces and exception handling mechanisms.	
6	Course Outcomes	CO1: Describe the fundamental of object oriented concept in java. CO2: Compare and contrast different features of java. CO3: Develop programs using core concepts of java. CO4:Analyze Exception and Error in java programs CO5: Explain the concept of inheritance, polymorphism and interfaces. CO6: Design application of real world problem using Java.	
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	Procedural Languages, object based languages, object oriented languages, difference between programming paradigms, advantages of OOPs.	CO1,CO2
	B	Object oriented programming features: Abstraction, class, object, Encapsulation, data hiding, polymorphism, inheritance	CO2
	C	Java virtual machine, Byte Code, Architecture of JVM, Class Loader, Execution Engine, Garbage collection,	CO2
	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)	CO2

	B	Constants, Variables, Data Types, Operators, Expressions, Decision Making,	CO2
	C	Branching, Loops, command line argument	CO2
	Unit 3	Inroducing class & object	
	A	Arrays, Type conversion & casting, Input from keyboard, Classes, Objects, Methods	CO1,CO2,CO3
	B	Method overloading, Constructors, Constructors overloading, static keyword	CO1,CO2,CO3
	C	Introducing Access Control, String handling	CO1,CO2,CO3
	Unit 4	Inheritance & Polymorphism	
	A	Types of inheritance, Implementing Interface, Concept of multiple inheritances	CO5
	B	Use of this and super, Polymorphism, Overriding methods	CO5
	C	Final class, method and variable, Abstract class and method	CO5
	Unit 5	Exception and Multithreading	
	A	Introduction to Exception Handling, Introduction to try, catch, Finally	CO4,CO5,CO6
	B	throw and throws, Checked and Unchecked exceptions, User define exception	CO4,CO5,CO6
	C	Introduction to Multithreading: multithreading advantages and issues, Creating thread using Runnable interface and Thread class, Thread life cycle.	CO4,CO5,CO6
	Mode of examination	Theory/Jury/Practical/Viva	
	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:Describe the fundamental of object oriented concept in java.	PO3,PO10
2.	CO2: Compare and contrast different features of java.	PO3,PO10
3.	CO3: Develop programs using core concepts of java.	P01,PO2,PO3,PO4,PO10

4.	CO4:Analyze Exception and Error in java programs	PO3,PO10
5.	CO5: Explain the concept of inheritance ,polymorphism and interfaces.	PO3,PO10
6.	CO6:Design application of real world problem using Java.	PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO10,PSO1,PSO 2

PO and PSO mapping with level of strength for Course Name Introduction to OOP using Java (Course CodeBCA-362)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO2
Introduction to OOP using Java _BCA-362	CO1			2							2		
	CO2			2							2		
	CO3	2	3	2	2						2		
	CO4			2							2		
	CO5			2							2		
	CO6	2	3	2	3	3	2		3		2	1	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCA 362	Introduction to OOP using Java	2	3	2	2.5	3	2	0	3	0	2	1	2

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. AddSressed to *Substantial (High=3) extent*

School: SET		Batch: 2020-2022	
Program: BCA		Current Academic Year: 2020-19	
Branch: CSE		Semester:III	
1	Course Code	BCP171	
2	Course Title	Operating Systems Using Linux Lab	
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. 5. Analyze various utilities to structure the Linux Program 6. Implement the Linux utilities to successfully write a program	
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, CO6
		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			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1:- 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.	PO1,PO2,PO3,PO4,PSO1
2.	CO2:-To accomplish typical personal, office, technical, and software development tasks.	PO1, PO3, PO4, PSO2
3.	CO3:-To Analyze system performance and network activities. Effectively use software development tools including libraries, preprocessors, compilers, linkers, and make files.	PO1,PO2,PO3,PO4
4.	CO4:-Comprehend technical documentation, prepare simple readable user documentation and adhere to style guidelines.	PO9, PO10, PSO2
5.	CO5:-Analyze various utilities to structure the Linux Program	PO1,PO2,PO3,PO4, PO9, PO10, PSO2
6.	CO6:-Implement the Linux utilities to successfully write a program	PO3,PO4, PO9, PO10, PSO2

PO and PSO mapping with level of strength for Course Name BCP171

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

School:		School of Engineering and technology	
Department		Department of Computer Science and Engineering	
Program:		Bachelor of Computer Application	
Branch:		BCA	
1	Course Code	BCP362	
2	Course Title	Introduction to OOP using Java Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory/Elective	
5	Course Objective	To implement Java language syntax and semantics and concepts such as classes, objects, inheritance, polymorphism, packages and multithreading.	
6	Course Outcomes (must be 6 COs, following verbs given in Bloom's Taxonomy)	CO1: Installing, Writing and executing Java programs CO2: Understand and formulate the problems in basic programming constructs CO3: Applying OOP concepts to solve real world problems CO4: Implement inheritance and polymorphism features of Java CO5: Implementing multithreading to enhance efficiency and handle run time errors CO6: Develop Java programs for application development	
7	Course Description	Basic Object Oriented Programming (OOP) concepts including objects, classes, methods, parameter passing, information hiding, inheritance and polymorphism are discussed.	
8	Outline syllabus		CO Mapping
	Unit 1	Jdk installation and simple Java Programs	
		Installing jdk, setting path,Installation and uses of IDE, Writing simple Java,programs, program execution,JVM, byte code, platform independency	CO1
	Unit 2	Basic Java Programs	
		Programs on different datatypes, type casting, operators, Programs using if .. else, switch .. case statements, Programs using for, while, do .. while loop control structures, break and continue, command line arguments.	CO2,CO3
	Unit 3	Inroducing class & object	
		Programs to define classes, create objects, accessing members of a class through objects, method overloading.Programs to define constructors, initializing instance variables, constructor	CO2,CO3

		overloading.Programs on string handling			
	Unit 4	Inheritance & Polymorphism			
		Programs on single, multilevel, hierarchical inheritance,Programs to use super, method overriding,Programs to use final variables, methods and classes, use abstract classes and interfaces.			CO3,CO4,CO6
	Unit 5	Exception and Multithreading			
		Programs to use try.. catch.. finally for exception handling,Programs to throw user defined exceptions, uses of throws.Programs to create multiple threads by extending Thread class and implementing Runnable interface.			CO3,CO5,CO6
	Mode of examination	Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1.Schildt H, "The Complete Reference JAVA2", TMH			
	Other References	3. Balagurusamy E, "Programming in JAVA", TMH Professional Java Programming: BrettSpell, WROX Publication			

PO and PSO mapping with level of strength for Course Name Introduction to OOP using Java Lab (Course Code BCP362)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3
BCP362_ Introduction to OOP using Java Lab	CO1	1			2	2					2		2			
	CO2	2			2	2					2					
	CO3	2	3	3	3	2					2		2	2	3	
	CO4	3			3	2					2			2	2	
	CO5	3			3	2					2			2	2	
	CO6	3	3	3	3	2					2		3	3	3	

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCP 362	Introduction to OOP using Java Lab	2.5	3	3	2.5	3	0	0	0	0	2	2	2.5

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*

3. Addressed to *Substantial (High=3) extent*

List of Experiments

Unit No	S.No	Name of the Practical
1	1.1	Write a Java program to print 'Hello' on screen and then print your name on a separate line
	1.2	Write a Java program to print the sum (addition), multiply, subtract, divide and remainder of two numbers.
2	2.1	Write a Java program to accept a number and check the number is even or not. Prints 1 if the number is even or 0 if the number is odd.
	2.2	Write a Java program that accepts three integers from the user and return true if the second number is greater than first number and third number is greater than second number. If "abc" is true second number does not need to be greater than first number.
3	3.1	Write a Java program to find the maximum occurring character in a string
	3.2	Write a Java program to find first non repeating character in a string.
	3.3	Write a program in java to demonstrate method overloading
4	4.1	Write a program in java to demonstrate multilevel inheritance in java.
	4.2	Write a java program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.
5	5.1	Write a program that creates a user interface to perform integer division. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 and Num2 were not integers, the program would throw a Number Format Exception. If Num2 were zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.
	5.2	Write a java program that implements a multi-thread application that has three threads. First hread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number

School:	School of Engineering and technology	
Department	Department of Computer Science and Engineering	
Program:	B.Tech	
Branch:	Computer Science	
1	Course No.	HMM111
2	Course Title	Human Value and Ethics
3	Credits	2
4	Contact Hours (L-T-P)	(2-0-0)2
5	Course Objective	To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence
6	Course Outcomes	On a successful completion of this course students will be able to 1. Understand that the technical education without study of human values can generate more problems than solutions. 2. Define the principles and ideals, which help in making the judgement of what is more important. 3. See that 'I' and 'Body' are two realities, and most of their desires are related to 'I' and not body, while their efforts are mostly centered on the fulfilment of the needs of the body assuming that it will meet the needs of 'I' too. 4. Appreciate the importance of harmony in the self, family and the society for mutual fulfilment. 5. Understand the importance of harmony among human beings, other living beings and entire nature for universal equilibrium and mutual co-existence. 6. Know and practice the ethical approach in profession for continuous happiness and sustained prosperity.
7	Outline of syllabus:	
7.01	Unit A	The Need and Process for Value Education
7.02	Unit A Topic 1	The need, basic guidelines, content and process for Value Education
7.03	Unit A Topic 2	Concept of 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration; Continuous Happiness and Prosperity- A look at basic Human Aspirations
7.04	Unit A Topic 3	Right understanding, Relationship and Physical Facilities- the basic requirements for fulfilment of aspirations of every human being with their correct priority
7.05	Unit B	Understanding Harmony in the Human Being - Harmony in Myself
7.06	Unit B Topic 1	Human being as a co-existence of the sentient 'I' and the material 'Body'
7.07	Unit B Topic 2	The needs of Self ('I') and 'Body' ; Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
7.08	Unit B Topic 3	The characteristics and activities of 'I' and harmony in 'I' ; Understanding the harmony of I with the Body: Correct appraisal of Physical needs, meaning of Prosperity in detail
7.09	Unit C	Harmony in the Family and Society
7.10	Unit C Topic 1	Values in human-human relationship; Trust and Respect as the foundational values of relationship

7.11	Unit C Topic 2	Understanding the meaning of Trust; Difference between intention and competence; The meaning of Respect; Difference between respect and differentiation; the other salient values in relationship
7.12	Unit C Topic 3	Harmony in the society (society being an extension of family; Visualizing a universal harmonious order in society - from family to world family
7.13	Unit D	Harmony in the Nature and Existence
7.14	Unit D Topic 1	The harmony in the Nature
7.15	Unit D Topic 2	Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in nature
7.16	Unit D Topic 3	Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
7.17	Unit E	Competence in professional ethics
7.18	Unit E Topic 1	Ability to utilize the professional competence for augmenting universal human order
7.19	Unit E Topic 2	Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,
7.20	Unit E Topic 3	Ability to identify and develop appropriate technologies and management patterns for above production systems.
8	Course Evaluation	
8.1	Course work: 30 marks	
8.11	Attendance	None
8.12	Homework	4 assignments, no weight
8.13	Quizzes/Class Tests	Two
8.14	Projects	None
8.15	Presentations	None
8.16	Any other	None
8.2	MTE	one, 20 marks
8.3	End-term examination: 50 marks	
9.1	Text books	1. R.R Gaur, R Sangal, G P Bagaria, "A foundation course in Human Values and professional Ethics", Excel books, New Delhi
9.2	Other references	1. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. 2. A.N. Tripathy, 2003, Human Values, New Age International Publishers. 3. PL Dhar, RR Gaur, Science and Humanism, Commonwealth Purblishers.

Mapping of Outcomes vs. Topics

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO 3
HMM 111	CO1	1	1	1	1	2	1	2			2	3	1	1	3	
	CO2	1	3	2	2	1	3	1	1	2		3	3	2	2	1
	CO3		2	2	2		2	2		1		1		1	3	2
	CO4	1		1	2	3				2	3		2			1
	CO5		3		1	2	3	2	1		2	2	1	3	1	
	CO6	2		1			1			1	1				2	3

TERM-III

School: SET		Batch : 2020-19	
Program:		Current Academic Year: 2020-19	
Branch: CSE		Semester: III	
1	Course Code	ARP203	Course Name : Aptitude Reasoning and Business Communication Skills-Basic
2	Course Title	: Aptitude Reasoning and Business Communication Skills-Basic	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status		
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: *At the end of the session this activity will help to ascertain a student's skill and competency level which will lead to effective mapping of his skills and competencies and an an effective training need identification and training need analysis model can be drawn* CO2: *At the end of the session a student will have a heightened sense of self awareness, raised levels of self-esteem & self-effectiveness, will have developed a positive mental frame of mind helping a student become more evolved in his/her life .* CO3: *At the end of the session the program would have instilled positive thinking and professional ethics in students and reinforce positive attitude building* CO4: *At the end of the session a student would have learned how to build positive emotional competence in self and learn GOAL Setting and SMART Goals technique* CO5: *At the end of the session a student would have enhanced LSRWG and P (Listening Speaking Reading Writing Grammar and Pronunciation) | Verbal Abilities - 1* CO6: *At the end of the session a student would have Understanding of 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	*Know Yourself*: Core Competence. A very unique and interactive approach through an engaging questionnaire to ascertain a student's current skill level to design, architect and expose a student to the right syllabus as also to identify the correct TNI/TNA levels of the student.	*CO1*
	B	Techniques of Self Awareness | Self Esteem & Effectiveness| Building Positive Attitude | Building Emotional Competence	*CO2*
	C	Positive Thinking & Attitude Building | Goal Setting and SMART Goals – Milestone Mapping | Enhancing L S R W G and P (Listening Speaking Reading Writing Grammar and Pronunciation) | Verbal Abilities - 1	*CO3,CO4,CO5*

	Unit 2	Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical	
	A	Syllogism | Letter Series | Coding, Decoding , Ranking & Their Comparison Level-1	*CO6*
	B	Number Puzzles	*CO6*
	C	Selection Based On Given Conditions	*CO6*
	Unit 3	Quantitative Aptitude	*CO6*
	A	Number Systems Level 1 | Vedic Maths Level-1	*CO6*
	B	Percentage ,Ratio & Proportion | Mensuration - Area & Volume |Algebra	*CO6*
	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*	

Syllabus: BCA 265 Database management System

School: SET		Batch : 2020	
Program: BCA		Current Academic Year: 2020-20	
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: CO1: Explain the basics concepts of data base. CO2: Demonstrate the knowledge of databases to E-R modelling. CO3: Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respective data. CO4: Apply normalization techniques to reduce redundancy from the database. CO5: To appraise the basic issues of Transaction processing, Serializability& concurrency control CO6: Design & develop database for real life problems	
7	Course Description	This course introduces basic aspects of data bases	
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	
	C	Three Schema architecture of DBMS, Data Models ,Hierarchical, Network Data Modeling	
	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,CO6
	B	Relationship Types, Relationship Sets, Roles, and Structural Constraints, Weak Entity Types	

	C	Refining the ER Design for the COMPANY Database, ER Diagrams, Naming Conventions, and Design Issues.	
	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, loss less join decompositions	CO1,CO4
	B	Normalization first, second and third normal forms, Boyce Codd normal form(BCNF)	CO1,CO4
	C	Multi-valued dependencies, fourth normal forms	CO1,CO4
	Unit 5	TRANSACTION MANAGEMENT	
	A	Transaction processing system, schedule and recoverability, Testing of serializability,	CO1,CO5
	B	Serializability of schedules, Conflict & view serializable schedule,	CO1,CO5
	C	Recovery from transaction failures,, Concurrency Control, Two-Phase Locking Techniques for Concurrency Control	CO1,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(CO)	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	Understand the basics concepts of data base.	PO1,PO4,PO8,PO9,PO10
2.	Acquire the knowledge of databases to E-R modelling.	PO1, PO2, PO4, PO8,PO10
3.	Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respective data.	PO1, PO2, PO3,PO4,PO8,PO10
4.	Learn the basic concept of normalization & apply them to reduce redundancy from the database .	PO1,PO2,PO3,PO4,PO8
5	To appraise the basic issues of Transaction processing, Serializability& concurrency control	PO1,PO2,PO3,PO4,PO10
6	Design & develop database for real life problems	PO1,PO2,PO3,PO4,PO5,PO6,PO9,PO10,PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Database Management Systems (Course Code BCA 265)

COs	PO1 Computing knowledge	PO2 Problem Analysis and Design of solutions:	PO3 Modern tool usage:	PO4 Technical Skill Development	PO5 Societal Concern:	PO6 Environment and Sustainability:	PO7 Ethics	PO8 Individual and team work:	PO9 Communication	PO10 Life-long learning:	PSO1 Multimedia Applications	PSO2
CO1	3	-	-	3	-	-	-	2	2	3	-	-
CO2	3	3	-	3	-	-	-	3	-	2	-	-
CO3	3	3	3	3	-	-	-	3	-	2	-	-
CO4	2	2	2	3	-	-	-	2	-	-	-	-
CO5	2	2	2	3	-	-	-	-	-	2	-	-
CO6	2	3	3	3	2	2	2	3	3	3	2	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code/ Name	PO1	PO2	PO3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
CSE 249/ DBMS	2.5	2.6	2.5	3	2	2	2	2.6	2.5	2.4	2	3

Strength of Correlation:1. Addressed to *Slight (Low=1) extent 2.* Addressed to *Moderate (Medium=2) extent*

School:		School of Engineering and technology		
Department		Department of Computer Science and Engineering		
Program:		BCA		
Branch:				
1	Course Code	BCA272		
2	Course Title	Problem solving using Python Programming		
3	Credits	3		
4	Contact Hours (L-T-P)	3	0	0
	Course Status	Core /Elective/Open Elective		
5	Course Objective	The objective of this course is to: • Explain the basic syntax of Python Program • Explain various programming constructs –data types, decision structures, control structures in python • Know how to use in-built data structures in python – Lists, Tuples, Dictionary • Know how to use libraries for string manipulation and File handling Learn the fundamental principles of Object-Oriented Programming Using such knowledge small project can be made		
6	Course Outcomes	At the end of this course students will be able to: 1. Demonstrate the fundamentals of python 2. Analyze and implement the concept of python data structure 3. Design function for a problem using python programming 4. Formulate the understanding of file handling 5. Discuss and implement the OOPs concept 6. Create accurate logical solution of any given problem		
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, and Module concept.		
8	Outline syllabus			CO Mapping
	Unit 1	Introduction to Python		
	A	History, Features, Working with Python, Installing Python, basic syntax to write a program, The concept of data types		CO1

	B	Variables, Constants, Identifiers, keywords, Arithmetic and Logical operators and Boolean expressions. Debugging, comments in the program			CO1
	C	Conditional Statements : If, If-else, Nested if-else; Looping: For, While, Nested loops; Control Statements: Break, Continue, Pass			CO1
	Unit 2	Lists, Tuples and Dictionaries			
	A	Lists; Creation, Attributes, Accessing, Operations, Searching and sorting in Lists; Linear, Binary; Bubble, Selection, Insertion			
	B	Tuple; Accessing, operations, working with Tuples			
	C	Dictionaries; Notations, Accessing, Operations, Working with Dictionaries			
	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			
	B	Recursion, Writing recursive functions, Factorial Using recursion , Fibonacci series Using Recursion			
	C	String; Accessing, Manipulation /Operation, String methods, Slicing.			
	Unit 4	Module, File Handling & Exception Handling			
	A	Importing Module, Creating Module, Packages, Math and Random Module			
	B	Need of File Handling, Different modes of operation, Opening, Writing, Reading, Closing			
	C	Exception, Exception Handling, Try and Except clause, Finally clause,			
	Unit 5	Object Oriented Programming Concepts			
	A	Overview of OOP concepts, Class and objects, Attributes			
	B	Adding methods to a class, Passing an Object as Parameter to a method, Overloading; Method Overloading			
	C	Inheritance; Types of inheritance(single, Multiple, Multi-level)			
	Mode of examination	Theory/Jury/Practical/Viva			
	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.	Demonstrate the fundamentals of python	PO 1, PO2,PO3,PO4,PO6,PO7,PO10,PSO1,PSO2
2.	Analyze and implement the concept of python data structure	PO 1, PO2,PO3,PO4,PO6,PO7,PO10,PSO1,PSO2
3.	Design function for a problem using python programming	PO 1, PO2,PO3,PO4,PO5, ,PO6,PO7,PO10,PSO1,PSO2
4.	Formulate the understanding of file handling	PO 1, PO2,PO3,PO4,PO5,PO6,PO7,PO10,PSO1,PSO2
5.	Discuss and implement the OOPs concept	PO 1, PO2,PO3,PO4,PO5,PO6,PO7,PO10,PSO1,PSO2
6.	Create accurate logical solution of any given problem	PO 1, PO2,PO3,PO4,PO5,PO6,PO7,PO10,PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Problem solving using Python Programming

Course Code_ Course Name	CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
Problem solving using Python Programming	CO1	1	1	1	1	-	2	2	-	-	2	1	1
	CO2	2	1	1	1	-	2	2	-	-	2	1	2
	CO3	1	2	1	2	-	2	2	-	-	2	2	2
	CO4	2	2	3	2	2	2	2	-	-	2	2	2
	CO5	2	2	2	2	2	2	2	-	-	2	2	2
	CO6	3	3	3	2	2	2	2	--	-	2	3	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
	Problem solving using Python Programming	1.8	1.8	1.8	1.6	1	2	2	-	-	2	1.83	2

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School:		School of Engineering and technology		
Department		Department of Computer Science and Engineering		
Program:		BCA		
Branch:				
1	Course Code	BCA273		
2	Course Title	Electronic Commerce & Applications		
3	Credits	3		
4	Contact Hours (L-T-P)	3	0	0
	Course Status	Core /Elective/Open Elective		
5	Course Objective	Students will try to learn: 1. Understand the basic working principles of information systems and enterprises 2. Equipe 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: CO1: Demonstrate the fundamentals of a computer based information systems and enterprises. CO2: Infer and interpret the technologies associated with business information systems CO3: Identify and analyze e-commerce initiatives in various Business applications using case studies and relate the use of such applications using support systems in enterprises. CO4: Categorize the Decision Support system and Strategic system CO5: Discover the various security control measures in IT sector CO6: Develop better understanding about latest ecommerce trend.		
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
	B	Globalization and Information Technology		CO1

	C	Components of an Information System, Types of Information Systems	CO1
	Unit 2	Computer Hardware and Software	
	A	Computer Hardware – Trends in Computer Systems, Storage Trends and Trade Offs;	CO2
	B	Computer Software – Software Suites and Integrated Packages, Programming Packages	CO2
	C	Business Telecommunication – Networking the Enterprise, Managing Organizational Change	CO2
	Unit 3	e-commerce and Enterprise Collaboration	
	A	Foundations of eCommerce, Business-to-Consumer eCommerce	CO3, CO6
	B	Business-to-Business eCommerce, Online Transaction Processing,	CO3, CO6
	C	Enterprise Collaboration, Groupware for Enterprise Collaboration, (Case studies)	CO3, CO6
	Unit 4	Information Systems for Decision Support, Strategic Advantages	
	A	Introduction, Decision Support Systems (DSS), Executive Information Systems	CO4
	B	Competitive Strategy Concepts, Strategic roles of Information Systems	CO4
	C	Challenges of Strategic Information systems, Sustaining strategic success	CO4
	Unit 5	Management Security Challenges & Controls	
	A	Organization and Information Technology	CO5, CO6
	B	Security and Ethical Challenges: Information systems controls, its need, Audit information systems	CO5, CO6
	C	Ethical dimensions, Computer Crime, Societal solutions, you and ethical responsibility	CO5,CO6
	Mode of examination	Theory/Jury/Practical/Viva	
	Weightage Distribution	CA: 30% / MTE: 20% / ETE: 50%	
	Text book/s*	1. Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, E-Commerce: Fundamentals and Applications, John Wiley & Sons, 2003, ISBN : 9780471493037 2. James A O'Brien and George M Marakas, Management Information System, Tata McGraw Hill, 10th Edition, 2008, ISBN -13 : 978-1-25-902671-3, ISBN-10 : 1-25-902671-X	
	Other References	1. Kenneth C. Laudon, Jane P. Laudon, Management of Information Systems, Pearson, Dorling Kindersley(India) Pvt. Ltd, 12th edition, 2013, ISBN 9780132142854	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Demonstrate the fundamentals of a computer based information systems and enterprises.	PO1,PO2,PO4,PO5,PO7, PO10,PSO1,PSO2
2.	CO2: Infer and interpret the technologies associated with business information systems	PO1, PO2,PO3,PO4,PO5, PO7,PO10,PSO1,PSO2
3.	CO3: Identify and analyze e-commerce initiatives in various Business applications using case studies and relate the use of such applications using support systems in enterprises.	PO1, PO2, PO3,PO4,PO5,PO7, PO10,PSO1,PSO2
4.	CO4: Categorize the Decision Support system and Strategic system	PO1, PO2,PO4,PO5,PO7, PO10,PSO1,PSO2
5.	CO5: Discover the various security control measures in IT sector	PO1, PO2, PO3,PO4, PO5, PO7, PO10,PSO1, PSO2
6.	CO6: Develop better understanding about latest ecommerce trend	PO1, PO2, PO3,PO4, PO5, PO7, PO10,PSO1, PSO2

PO and PSO mapping with level of strength for Course Name Electronic Commerce & Applications

Course Code_ Course Name	CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
Electronic Commerce & Applications	CO1	1	1	-	1	1		1	-	-	2	1	2
	CO2	2	1	2	2	2		2	-	-	1	2	1
	CO3	2	2	2	2	2		2	-	-	2	2	1
	CO4	2	1	-	1	1		2	-	-	1	2	1
	CO5	2	2	1	2	2		3	-	-	3	2	1
	CO6	2	2	2	1	2		2	-	-	2	2	1

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO 1	PSO 2
	Electronic Commerce & Applications	1.6	1.5	1.2	1.5	1.7	-	2			1.8	1.8	1.2

Strength of Correlation

School: SET		Batch: 2020-2023	
Program: B.Tech		Current Academic Year: 2020-2020	
Branch:CSE		Semester: IV	
1	Course Code	BCP 265	
2	Course Title	Database Management System 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: Understand the concept of SQL commands in DBMS CO2: Create SQL SELECT statements that retrieve any required data CO3: Perform operations using Data Manipulation Language statements like Insert, Update and Delete CO4: Manipulate your data to modify and summaries your results for reporting CO5: Apply Grouping Clauses on various tuples & relations of database CO6: Develop project based on various SQL commands.	
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	CO2,CO3
	Unit 3	DML commands and Aggregate functions	
		Introduction about the INSERT, SELECT , UPDATE & DELETE commands.	CO3,CO4
	Unit 4	Practical based on Grouping Clauses GROUP BY ORDER BY & GROUP BY HAVING	
		Briefly explain Group by, order by ,having clauses with examples. Aggregate function: sum, avg, count, max, min	CO5
	Unit 5	Practical based on Sub- queries, JOINS	
		Related example of Sub- queries, Joins and related examples,Views,Trigger	CO5,CO6
	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.*			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Understand the concept of SQL commands in DBMS.	PO1,PO3,PO4,PO8,PO9,PO10,PSO2
2.	CO2: Create SQL SELECT statements that retrieve any required data.	PO1,PO2,PO3,PO4,PO8,PO9,PO10,PSO2
3.	CO3: Perform operations using Data Manipulation Language statements like Insert, Update and Delete.	PO1,PO2,PO3,PO4,PO8,PO9,PO10,PSO2
4.	CO4: Manipulate your data to modify and summaries your results for reporting.	PO1,PO2,PO3,PO4,PO8,PO9,PO10,PSO2
5	CO5: Apply Grouping Clauses on various tuples & relations of database	PO1,PO2,PO3,PO4,PO8,PO9,PO10, PSO2
6	CO6: Develop project based on various SQL commands.	PO1,PO2,PO3,PO4,PO5, PO7,PO8,PO9,PO10, PSO2

PO and PSO mapping with level of strength for Course Name BCP265_Database Management Systems lAB

COs	PO1 Computing knowledge	PO2 Problem Analysis and Design of solutions:	PO3 Modern tool usage:	PO4 Technical Skill Development	PO5 Societal Concern:	PO6 Environment and Sustainability:	PO7 Ethics	PO8 Individual and team work:	PO9 Communication	PO10 Life-long learning:	PSO1 Multimedia Applications	PSO2
CO1	3	-	3	2	-	-	-	2	2	2	-	2
CO2	3	3	3	2	-	-	-	3	2	2	-	2
CO3	3	3	3	2	-	-	-	3	2	2	-	2
CO4	3	3	3	3	-	-	-	3	2	2	-	2
CO5	3	3	3	2	-	-	-	3	2	2	-	3

CO6	3	3	3	2	2	-	2	3	2	2	-	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code/ Name	PO 1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO 8	PO 9	PO0	PSO 1	PSO 2
BCP265/ DBMS	3	3	3	2.2	2	-	2	2.8	2	2	-	2.3

Strength of Correlation:1. Addressed to *Slight (Low=1) extent 2.* Addressed to *Moderate (Medium=2) extent*

School:		School of Engineering and technology	
Department		Department of Computer Science and Engineering	
Program:		BCA	
Branch:			
1	Course Code	BCP272	
2	Course Title	Problem solving using Python Programming Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	The objective of this course is to: • Explain the basic syntax of Python Program • Explain various programming constructs –data types, decision structures, control structures in python • Know how to use in-built data structures in python – Lists, Tuples, Dictionary • Know how to use libraries for string manipulation and File handling Learn the fundamental principles of Object-Oriented Programming • Using such knowledge small project can be made	
6	Course Outcomes	By the end of this course you will be able to: CO1.Demonstrate the environment of python CO2.Develop the program on list, tuple , dictionary etc CO3.Construct program using the concept of function CO4.Apply the Object Oriented Skills in Python CO5.Design a program in order to create package CO6.Build programming skills in core Python.	
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, and Module concept.	
8	Outline syllabus		CO Mapping
	Unit 1	Practical based on to explore about the Spyder environment.	
		WAP to create a simple calculator using different	

		operators. WAP to create a calculator using if-elif statement. Write a program to find the largest number in a list.	
	Unit 2	Practical related to –list,dictionary	
		Write a program to find the second largest number in a list. Write a program to put even and odd elements in a list into two different lists.	
	Unit 3	Practical related to --functions	
		Write a program to calculate the number of upper case letters and lower case letters in a string. Write a program to check if a string is a pangram or not.	
	Unit 4	. Practical related to –Object oriented prog	
		Write a program to implement polymorphism Write a program to calculate the number of upper case letters and lower case letters in a string	
	Unit 5	Practical related to --packages	
		Write a program to use the function of math and random module. Write a program to plot data using Matplotlib package.	
	Mode of examination	Jury/Practical/Viva	
	Weightage Distribution	CA / MTE / ETE 60% / 0% / 40%	
	Text book/s*	-	
	Other References		

PO and PSO mapping with level of strength for Problem solving using Python Programming Lab

Course Code_ Course Name	CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
Problem solving using Python Programming Lab	CO1	1	1	1	1	-	2	2	-	-	2	1	1
	CO2	2	1	1	1	-	2	2	-	-	2	1	1
	CO3	1	2	1	2	-	2	2	-	-	2	1	2
	CO4	2	2	3	2	2	2	2	-	-	2	2	2
	CO5	2	2	2	2	2	2	2	-	-	2	2	2
	CO6	3	3	3	2	2	2	2	--	-	2	3	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
	Problem solving using Python Programming Lab	1.8	1.8	1.8	1.6	1	2	2	-	-	2	1.6	1.83

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

FILENAME: ORGANIZATION BEHAVIOUR

1	Course number	HMM303
2	Course Title	Organizational Behaviour
3	Credits	3
4	Contact Hours (L-T-P)	3-0-0
5	Course Objective	To enable the students understand the importance of human element in organization and to provide the student with a conceptual framework based upon behavioral science research, for understanding human work behavior in the organizational setting.
6	Course Outcomes	1. Describe the importance of human element in the organization. 2. Understand the importance of the study of the discipline of Organizational Behavior. 3. To understand how the knowledge about differences in personality make up would help a manager better perceive the human behavior at work. 4. To justify the concept of learning and attitude and to assess the significance of the concept of motivation, which attempt to explain the causes of human behavior. 5. To list the characteristics that high achievers prefer in a job. 6. To contrast between leadership and management and to examine the relationship that activities have with successful and effective leaders. 7. To evaluate the conditions under which teams are preferred over individuals and to list the strengths and weaknesses of group decision. 8. To analyze the importance of power and political perspective and to understand the importance of effectively managing cultural diversity. 9. To rate the reasons why employees as well as the organization resist change and how this change could be introduced in the organizations. 10. To estimate the importance of Organizational Development and its various intervention strategies. 11. To appraise the concept of Knowledge management and to judge the role of Emotional Intelligence in Business Organization. 12. To outline the conflict process and to understand various styles of managing conflict and to explore causes and

			remedies for Stress.
7	Outline syllabus:		
7.01	HMM303.A	Unit A	Introduction
7.02	HMM303.A1	Unit A Topic 1	Concept, nature, conceptual foundations and importance of OB, Models of OB, Challenges and Opportunities; Theoretical framework.
7.03	HMM303.A2	Unit A Topic 2	Personality: Determinants, traits, types and Theories
7.04	HMM303.A3	Unit A Topic 3	Learning: Concept and theories of learning. Attitude: Concept, Attitude formation, Importance
7.05	HMM303.B	Unit B	Motivation Concepts
7.06	HMM303.B1	Unit B Topic 1	Concept, Early and Contemporary theories
7.07	HMM303.B2	Unit B Topic 2	Motivation: From Concepts to Application
7.08	HMM303.B3	Unit B Topic 3	Importance and theories of leadership, Trait, Behavioural styles; Models
7.09	HMM303.C	Unit C	Group Behaviour
7.10	HMM303.C1	Unit C Topic 1	Theories of Group formation; Formal organizations and Informal groups and their interaction
7.11	HMM303.C2	Unit C Topic 2	Importance of teams, Formation of teams, Team work, Managing interpersonal relationship at work
7.12	HMM303.C3	Unit C Topic 3	Power and Politics-An Introduction; Sources of Power in Organizations-Interpersonal Sources, Organizational Sources; Organizational Politics; Ethics of Power and Politics organizational climate, organizational culture, organizational effectiveness
7.13	HMM303.D	Unit D	Organizational Dynamics
7.14	HMM303.D1	Unit D Topic 1	Concept, Managing resistance to change, Kurt Levin's Theory of Change, Managing across cultures.
7.15	HMM303.D2	Unit D Topic 2	Organizational Development (OD); Basic's of OD Assumptions; OD Interventions strategies.
7.16	HMM303.D3	Unit D Topic 3	Knowledge management and Emotional Intelligence in Business Organisation
7.17	HMM303.E	Unit E	Conflict and Stress Management
7.18	HMM303.E1	Unit E Topic 1	Understanding Stress and its Consequences, Sources of Stress, Management of stress.
7.19	HMM303.E2	Unit E Topic 2	Conflict Management: Sources of conflict, types
7.20	HMM303.E3	Unit E Topic 3	Process and resolution of conflict.
8	Course Evaluation		
8.1	Course work: 30%		

8.11	Attendance	None
8.12	Homework	Three best out of four assignments ; 20 marks
8.13	Quizzes	Two 30 minute surprise quizzes : 10 marks
8.14	Projects	None
8.15	Presentations	None
8.16	Any other	None
8.2	MTE	One, 20%
8.3	End-term examination: 50%	
9	References	
9.1	Text book	• Robbins Stephen P. - Organizational Behavior, Pearson Education, 13th Edition
9.2	other references	1. Newstrom, John W. - Organizational Behavior: Human Behavior at Work (Tata Mc Graw Hill, 12th Edition) 2. Luthans, Fred - Organizational Behavior (Tata McGraw Hill,10th edition)

Mapping of Outcomes vs. Topics
FILE NAME : ORGNIZATIONAL BEHAVIOUR

Outcome no. → Syllabus topic↓	1	2	3	4	5	6	7	8	9	10	12
HMM303.A	X										
HMM303.A1	X	X									
HMM303.A2		X									
HMM303.A3			X								
HMM303.B			X								
HMM303.B1				X							
HMM303.B2				X							
HMM303.B3					X						
HMM303.C					X	X					
HMM303.C1							X				
HMM303.C2							X				
HMM303.C3								X			
HMM303.D								X			
HMM303.D1									X		
HMM303.D2									X	X	
HMM303.D3										X	
HMM303.E											X
HMM303.E1											X
HMM303.E2											X
HMM303.E3											X

TERM-VI

School: SET		Batch : 2020-19	
Program:		Current Academic Year: 2020-19	
Branch: CSE		Semester: IV	
1	Course Code	ARP204	Course Name : Aptitude Reasoning and Business Communication Skills-Intermediate
2	Course Title	Aptitude Reasoning and Business Communication Skills-Intermediate	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status		
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: *At the end of the session a student would have learned what is VMOSA (Vision, Mission, Values and Ethics) and Communication Process. This would help students understand and interpret the deeper meaning of life.* CO2: *At the end of the session a student would have learned Communication Styles and flexing and 4 social styles of communication which will lead to effective and meaningful communication process along with Listening Styles & Listening Skills* CO3: *At the end of the session a student would have learned the Art of giving feedback and probing skills that will help in improving peer to peer and business communication by giving meaningful feedbacks and probing skills to understand, assess and evaluate real life situations better* CO4: *At the end of the session a student would have learned business writing skills and non-verbal communication process to make an impression in written communication process in office or otherwise coupled with positive body language and non-verbal communication* CO5: *At the end of the session a student would have learned MTI (Mother Tongue Influence) Reduction attributes that will help to eliminate the influence of mother tongue in one's speech leading to meaningful communication levels and proficiencies.* CO6: *At the end of the 2nd Level proficiency program in Quant & Aptitude Reasoning abilities a student will be able to coherently reason real life situations, will have more pronounced aptitudinal abilities that will help a student deal with real life situations more effectively*	
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	CO1

		communication – PRIDE Model	
	B	Different styles of communication & style flexing (Based on the 4 social styles-Analytical, Driving, Expressive, Amiable) | Importance of Listening & practice of Active Listening | The Art of Giving Feedbacks| Feedback Skills | Asking fact finding questions- Probing Skills	CO3,CO2
	C	Email Etiquette | Business Writing Skills| Telephone Etiquette Skills (Telephone Handling Skills) | Non Verbal Communication-Kinesics, Proxemics, Paralanguage | MTI Reduction Program | Verbal Abilities - 2	CO4, CO5
	Unit 2	Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical	
	A	Coding Decoding , Ranking & Their Comparison Level-2	CO6
	B	Series, Blood Relations & Number Puzzle	CO6
	Unit 3	Quantitative Aptitude	
	A	Number System Level 2	CO6
	B	Vedic Maths Level-2 | Probability | Permutation & Combination	CO6
	C	Percentage, Profit & Loss ,Partnership, Simple Interest & Compound Interest	CO6
	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:		School of Engineering and technology	
Department		Department of Computer Science and Engineering	
Program:		BCA	
Branch:		-	
1	Course Code	BCA013	
2	Course Title	BCA013_Information Security and Cyber Laws	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status		
5	Course Objective	Introduce to Information Security theories, techniques & applications that are often required.	
6	Course Outcomes	On successful completion of this module students will be able to: CO1: Demonstrate basic concepts of information security &Apply different symmetric and asymmetric key ciphers CO2: Apply basic mathematical methods of modular arithmetic. CO3: Illustrate types and objectives of virus CO4: Evaluate the different type of intrusion detection and firewall design principles. CO5: Apply the principles in real life application. CO6: Distinguish between correct or incorrect data practices.	
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,CO5, CO6
	B	encryption methods, cryptography, cryptanalysis & steganography	CO1,CO2, CO5
	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,CO2
	B	Mono-alphabetic substitution cipher:- Caesar cipher, additive and multiplicative cipher	CO1,CO2
	C	Polyalphabetic substitution cipher- playfair cipher, hill cipher, Transposition cipher- rail fence cipher, column cipher	CO1,CO2, CO6
	Unit 3	Public key cryptosystem & Authentication	
	A	Public key cryptosystem, authentication , application , symmetric vs asymmetric cryptosystem	CO1,CO2
	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, CO5, CO6
	B	Phases of virus and worm propagation			CO3, CO5, CO6
	C	Types of virus , worms, Attacks –Hoax , backdoor, brute force, denial of service, distributed denial of service, spoofing , sniffing, replay, traffic analysis			CO3,CO6
	Unit 5	System Security			
	A	Intruders, intrusion detection , introduction detection system, password management			CO4, CO5, CO6
	B	Anomaly based intrusion detection system , rule based intrusion detection system			CO4, CO5, CO6
	C	Firewalls- firewall design principles, firewall types			CO4, CO5, CO6
	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: Demonstrate basic concepts of information security &Apply different symmetric and asymmetric key ciphers	PO1, PO2, PO4, PO5, PO7, PO8, PO9, PO10, PSO2
2.	CO2: Apply basic mathematical methods of modular arithmetic.	PO1, PO2, PO3, PO4, PO6, PO10, PSO2
3.	CO3: Illustrate types and objectives of virus	PO1, PO4, PO5, PO7, PO8 PO10, PSO2
4.	CO4: Evaluate the different type of intrusion detection and firewall design principles.	PO1, PO2, PO3, PO5, PO7 PO10, PSO2,
5.	CO5: Apply the principles in real life application.	PO1, PO2, PO5, PO7,PO8, PO9,PO10,PSO2
6.	CO6: Distinguish between correct or incorrect data practices.	PO1, PO2, PO3, PO6,PO8, PO9, PO10, PSO2

PO and PSO mapping with level of strength for Course Name BCA013_Information Security and Cyber Laws

CSE	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO2
	CO1	3	2		3	3		3	3	3	3	2
	CO2	2	3	3	3		3				3	3
	CO3	2	3			2		3	2		3	3
	CO4	2	3	3		2		3			3	3
	CO5	2	2			3		3	3	2	2	3
	CO6	3	2	3			3		3	2	2	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO2
	BCA013_Information Security and Cyber Laws	2.3	2.5	3	3	2.5	3	3	2.75	2.3	2.6	2.6

Strength of Correlation

1. Addressed to*Slight (Low=1)extent 2.* Addressed to*Moderate (Medium=2) extent*
3. Addressed to*Substantial (High=3) extent*

2.1 Template A1: Syllabus for Theory Courses (SAMPLE)

School:		School of Engineering and technology	
Department		Department of Computer Science and Engineering	
Program:		BCA	
Branch:			
1	Course Code	BCA274	
2	Course Title	BCA274_Web Designing and its Application	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core /Elective/Open Elective	
5	Course Objective	To develop skills in analyzing the usability of a web and understand fundamentals of tools and technology of web design.	
6	Course Outcomes	CO1: Define the basic terminology of web Application CO2: Demonstrate telnet server and login remotely using putty. CO3: Identify SMTP components and its working. CO4: Analyze FTP server for sharing files over network and establish session between FTP client and server. CO5: Determine and discuss the security risk of a Web application CO6: Elaborate the usage of different web technologies in real life.	
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, website, internet browsers, Hypertext, Web server	CO1
	B	Locating resource on internet- URI, URL, URN, ISP, Gateways	CO1
	C	Basic features of HTTP, Working of HTTP, HTTP response code, social networks, search engines, Video Conferencing, e-Commerce, m-Commerce.	CO1
	Unit 2	Web Architecture	
	A	Web Architecture: Server, Type of server, database server, mail server, web server	CO1
	B	Components of web, usage of Web, client-server architecture, Domain Name System	CO1
	C	Type of DNS servers, Example of DNS query and response, Wildcards, Negative response caching, Zone maintenance and transfers	CO1
	Unit 3	Email and Telnet	
	A	Mail structure, Composition of mail, component of Email,	CO2,CO3

		Working of email			
	B	Concept of remote login, remote Login methods, Setting environment for putty, login to remote system using putty			CO2,CO3
	C	SMTP-components ,working of SMTP,SMTP protocol stack, SMTP headers, SMTP forwarding, SMTP relays, interoperation, how SMTP uses DNS			CO2,CO3
	Unit 4	FTP			
	A	FTP: FTP protocol, Usage of FTP, anonymous ftp, Setting FileZilla server and client			CO4
	B	FTP commands: Access control commands, Transfer Parameter Commands, FTP Service Commands, FTP command arguments			CO4
	C	FTP replies, Reply Codes by Function Groups, Numeric Order List of Reply Codes, sequencing of commands and replies			CO4
	Unit 5	Security			
	A	Security: Security requirements, confidentiality, authenticity, integrity, plain text, cipher text			CO5,CO6
	B	Models of security, Security threats, types of threats, Steganography			CO5,CO6
	C	Cryptography, Symmetric Cryptography, Asymmetric Cryptography, ceaser Cipher, Playfair algorithm, RSA Algorithm			CO5,CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Douglas Comer "The Internet Book - Pearson Education", Asia			
	Other References	4. Douglas E. Comer "Internetworking with TCP/IP", Volume-I, PHI. 5. P.K. Sinha, "Introduction of Basic Computer"			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Define the basic terminology of web Application	PO1,PO3,PO5,PO10
2.	CO2: Demonstrate telnet server and login remotely using putty.	PO1,PO4,PO10
3.	CO3: Identify SMTP components and its working.	PO1,PO4,PO10
4.	CO4: Analyze FTP server for sharing files over network and establish session between ftp client and server.	PO1,PO4,PO10
5.	CO5: Determine and discuss the security risk of a Web application	PO1,PO3,PO5,PO10
6.	CO6: Elaborate the usage of different web technologies in real life.	PO1,PO2,PO3,PO4,PO5,PO10,PS01,PS02

PO and PSO mapping with level of strength for Course Name BCA274_Web Designing and its Application

Course Code_ Course Name	CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
BCA274_Web Designing and its Application	CO1	1		2		2					2		
	CO2	1			2						2		
	CO3	1			2						2		
	CO4	1			2						2		
	CO5	1		2		2					2		3
	CO6	1	1	2	2	2					2	1	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCA264	Web and Its Application	1	1	2	2	2	0	0	0	0	2	1	2.5

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School: SET		Batch :2020 onwards	
Program: BCA		Current Academic Year: 2020-21	
Branch:---		Semester:4	
1	Course Code	BCA276 | Course Name: BCA	
2	Course Title	Introduction to Computer Network	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	UG	
5	Course Objective	The students will be introduced to the basic concepts and fundamentals of computer networks along with the study of individual layers of reference model.	
6	Course Outcomes	Students will be able to: CO1: Classify the basic network infrastructure to learn the overall function of networking systems and transmission mediums. CO2: Demonstrate and differentiate types of networks & working of all layers of the OSI Reference Model and TCP/IP model . CO3: Apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission CO4: Illustrate the network layer and transport layer including IP Addressing, routing , TCP and UDP services. CO5: Explain the functionality of application layer. CO6: Outline the cryptography and network security.	
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
	B	Connecting devices-Hub, Amplifier, Repeater, Router, Switch, Gateway, Modem, Multiplexers	CO1
	C	Transmission Media- Coaxial cables, twisted pair cables- Unshielded, shielded, Modes of Transmission-Simplex, half duplex and Full duplex	CO1
	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, CO2
	C	Types of networks- LAN, MAN, WAN, Broadcast, Point to Point, Peer to peer Networks	CO1,CO2
	Unit 3	Data Link Layer	
	A	Framing , Errors in communication, Types of Error-Single Bit	CO3

		error, Burst error			
	B	Flow Control- simplex protocol and stop and Wait protocol			CO2,CO3
	C	Random Access- Aloha, CSMA			CO2,CO3
	Unit 4	Network Layer& Transport Layer			
	A	IPV4 addressing basics and Header format			CO4
	B	Transport layer Basics, Process to Process delivery, TCP services and header format			CO4
	C	UDP: services, features, header format			CO4
	Unit 5	Application Layer			
	A	DNS namespace, distribution of namespace, DNS in internet, resolution			CO5
	B	Email Architecture, services and Features Network Security: Definition of -symmetric, Asymmetric Cryptography			CO5, CO6
	C	Digital signature, Message Digest			CO6
	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: Classify the basic network infrastructure to learn the overall function of networking systems and transmission mediums.	PO1, PO2, PO3,PO4 PSO2
2.	CO2: Demonstrate and differentiate types of networks & working of all layers of the OSI Reference Model and TCP/IP model .	PO1, PO2, PO3,PO4 PSO2
3.	CO3: Apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission	PO1, PO2, PO3,PO4 PSO2
4	CO4: Illustrate the network layer and transport layer including IP Addressing, routing , TCP and UDP services.	PO1, PO2, PO3,PO4 PSO2
5	CO5: Explain the functionality of application layer.	PO1, PO2, PO3,PO4 PSO2
6.	CO6: Outline the cryptography and network security.	PO1, PO2, PO3,PO4 PSO2

PO and PSO mapping with level of strength for Course Name BCA276_Introduction to Computer Network

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
BCA	CO1	3	2	2	2	--	--	--	--	--	--	--	2
	CO2	3	2	2	2	---	---	--	---	---	---	---	2
	CO3	3	2	2	2	---	---	--	---	---	---	---	2
	CO4	3	2	2	2	---	---	--	---	---	---	---	2
	CO5	3	2	2	2	--	--	--	--	--	--	--	2
	CO6	3	2	2	2	--	--	--	--	--	--	--	2
AVG.		3	2	2	2		--	--	--	--	--	--	2

School:		School of Engineering and technology		
Department		Department of Computer Science and Engineering		
Program:		BCA		
Branch:		CSE		
1	Course Code	BCA 314		
2	Course Title	Essentials of Digital Marketing		
3	Credits	3		
4	Contact Hours (L-T-P)	3	0	0
	Course Status	Departmental Elective		
5	Course Objective	The objectives of this Course are : 1. Today's marketer has to be aware of the digital Market interventions and this course has been designed keeping in mind the requirement of industry on one end and competence enhancement on the other. 2. At the end of this course you will be equipped with the skill to understand and initiate digital marketing.		
6	Course Outcomes	After Successful completion of this course the student will be able to: CO1: infer digital marketing practices, inclination of digital consumers and their behaviors. CO2: discover various search engine optimization techniques for digital marketing analysis. CO3: determine the value of integrated marketing campaigns across SEO, Paid Search, Social, Mobile, Email, Display Media, Marketing Analytics. CO4: develop understanding of the latest digital practices for social media marketing and promotions CO5: distinguish among the different technology used in Digital Marketing CO6: construct insights on building organizational competency by way of digital marketing practices and cost considerations.		
7	Course Description	The primary objective of this module is to examine and explore the role and importance of digital marketing in today's rapidly changing business environment. It also focuses on how digital marketing can be utilized by organizations and how its effectiveness can be measured.		
8	Outline syllabus			CO Mapping

	Unit 1	Introduction to Digital Marketing			
	A	What is digital marketing			CO1
	B	Aligning Internet with Business Objectives			
	C	User Behaviour & Navigation			
	Unit 2	Search Engine Optimisation			
	A	Stakeholders in Search			CO2
	B	O n & off-page Optimisation			
	C	Meta Tags, Layout, Content updates Inbound Links & Link Building			
	Unit 3	Web Site Analytics			
	A	Goal Configuration &Funnels			CO3
	B	Intelligence Reporting			
	C	Conversions, Bounce Rate, Traffic Sources, Scheduling			
	Unit 4	Social Media Marketing			
	A	What is Social Media Marketing?			CO4,CO6
	B	Overview of Facebook, Twitter, LinkedIn, Blogging, Youtube and Flickr			
	C	Building Brand Awareness Using Social Media			
	Unit 5	Digital Marketing Strategy			
	A	Understanding strategy			CO5,CO6
	B	Email Marketing , Affiliate marketing Mobile Marketing ,			
	C	Display Advertising			
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Digital Marketing: Global Strategies from the World's Leading Experts Jerry Wind , Vijay Mahajan			
	Other References	1. The Essentials of Digital Marketing Kathryn Waite and Rodrigo Perez-Vega			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1. infer digital marketing practices, inclination of digital consumers and their behaviors.	PO1,PO2,PO7,PO10 PSO1,PSO2
2.	CO2. : discover various search engine optimization techniques for digital marketing analysis.	PO1,PO2,PO3,PO4,PO7,PO10, PSO1,PSO2
3.	CO3. determine the value of integrated marketing campaigns across SEO, Paid Search, Social, Mobile, Email, Display Media, Marketing Analytics.	PO1,PO2,PO3,PO4,PO7,PO10, PSO1,PSO2
4.	CO4. develop understanding of the latest digital practices for social media marketing and promotions	PO1,PO2,PO3,PO4,PO7,PO10, PSO1,PSO2
5.	CO5. distinguish among the different technology used in Digital Marketing	PO1,PO2, PO4,PO7,PO10, PSO1,PSO2
6.	CO6. construct insights on building organizational competency by way of digital marketing practices and cost considerations.	PO1,PO2,PO3,PO4,PO7,PO10, PSO1,PSO2

PO and PSO mapping with level of strength for Essentials of Digital Marketing (Course Code BCA 314)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCA 314_ Essentials of Digital Marketing	CO1	1	2					1			2	2	2
	CO2	2	2	2	2			1			2	2	2
	CO3	2	2	2	2			2			2	3	3
	CO4	1	2	1	1			2			2	3	3
	CO5	1	1		1			1			2	2	1
	CO6	1	2	1	1			1			2	2	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCA 314	Essentials of Digital Marketing	1.5	1.8	1	1.2			1.4			2	2.4	2.1

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

.School:		School of Engineering and technology	
Department		Department of Computer Science and Engineering	
Program:		BCA	
Branch:			
1	Course Code	BCP-274	
2	Course Title	Introduction to Computer Network Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory/Elective	
5	Course Objective	The students will be introduced to the basic concepts and fundamentals of computer networks along with the study of individual layers of reference model.	
6	Course Outcomes	Students will be able to: CO1: Explain the basic concepts of computer network. CO2: Illustrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model CO3: Analyze fundamental issues driving network design including error control, IP addressing, access control, flow and congestion control CO4: Compare working of various routing algorithms CO5: Test various network security algorithms CO6: Examine various cryptographic Algorithms	
7	Course Description	To familiarize with the basic taxonomy and terminology of computer networking area.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	A	Introduction to basic Linux networking commands. (Commands like ipconfig, getmac, tracert, pathping, arp, ping, netstat, finger etc.)	CO1
	B	Study of different types of Network cables and Practically implement the cross-wired cable and straight through cable using clamping tool.	CO1
	C	Install and configure Network Devices: HUB, Switch and Routers.	CO1
	Unit 2	Reference Models	
	A	Connect the computers in Local Area Network	CO1,CO2
	B	Configure Host IP, Subnet Mask and Default Gateway in a System in LAN (TCP/IP Configuration).	CO1, CO2
	C	Establish Peer to Peer network connection using two systems using Switch and Router in a LAN.	CO1,CO2
	Unit 3	Data Link Layer	
	A	Configure Internet connection and use IPCONFIG, PING / Tracer and Net stat utilities to debug the network issues.	CO3
	B	Transfer files between systems in LAN using FTP	CO2,CO3

		Configuration, install Print server in a LAN and share the printer in a network.	
	C	Configure a Network topology-1& 2 using packet tracer software	CO2,CO3
	Unit 4	Network Layer& Transport Layer	
	A	Implement bit stuffing and de-stuffing.	CO4
	B	Write a Program to simulate Distance vector routing.	CO4
	C	Write a program to simulate the stop- and-wait protocol.	CO4
	Unit 5	Application Layer	
	A	Write a program to implement DES for encryption.	CO5
	B	Using RSA algorithm encrypts a text data and decrypts the same.	CO5, CO6
	C	Open Ended Project	CO6
	Mode of examination	Jury/Practical/Viva	
	Weightage Distribution	CA / MTE / ETE	
		60% / 0% / 40%	
	Text book/s*	Tanenbaum, A.S." Computer Networks", 4th Edition, PHI	
	Other References	1. Forouzan, B.., "Communication Networks", TMH, Latest Edition 2. 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: Explain the basic concepts of computer network.	PO1, PO2, PO3, PO10, PSO2
2.	CO2: Illustrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model	PO1,PO2, PO4,PO6,PO10,PSO2
3.	CO3: Analyze fundamental issues driving network design including error control, IP addressing, access control, flow and congestion control	PO1,PO2,PO3,PO5,PO8,PO10 ,PSO2
4.	CO4: Compare working of various routing algorithms	PO1,PO2, PO4, PO7,PO9,PO10,PSO2
5.	CO5: Test various network security algorithms	PO1,PO2,PO3,PO5,PO6,PO8, PO10,PSO2
6.	CO6: Examine various cryptographic Algorithms	PO1,PO2, PO4,PO7, PO9,PO10,PSO2

PO and PSO mapping with level of strength for Course Name Introduction to Computer Network Lab

Course Code_ Course Name	CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
Introduction to Computer Network Lab	CO1	2	2	2							3		3
	CO2	3	3		3		2				3		2
	CO3	2	3	3		3			3		3		3
	CO4	3	3		3			3		2	3		3
	CO5	3	2	2		3	3		3		3		2
	CO6	3	3		3			3		3	3		2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO 1	PSO2
BCP274	Basics of Computer Networks Lab	2.6	2.6	1.1	1.6	1	.8	1	1	.8	3		2.5

Strength of Correlation

1. Addressed to*Slight (Low=1) extent* *2.* Addressed to*Moderate (Medium=2) extent*
3. Addressed to*Substantial (High=3) extent*

School: SET		Batch:			
Program: BTECH		Current Academic Year:			
Branch:CSE		Semester:			
1	Course Code	BCP276			
2	Course Title	Web Designing and its Application Lab			
3	Credits	1			
4	Contact Hours (L-T-P)	0-0-2			
	Course Status				
5	Course Objective	The objective of this course is to provide a foundation of technologies and technical skills in web development. Based upon the development of a web, this course provides an insight of computer and networking technologies, and hands on experience in web programming.			
6	Course Outcomes (same as theory course)	CO1: Develop the HTML programs CO2: Use Html5 features for web page development CO3: Design the web page using CSS3 CO4: Develop xml programs CO5: Apply validation on user data access. CO6: Develop a website using html5, csss, xml, javascript			
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					CO Mapping
	Unit 1	Introduction			
		Program related to Html			CO1
	Unit 2	HTML5			
		Program realated to html5			CO3
	Unit 3	CSS			
		Program related to CSS			CO3
	Unit 4	XML			
		Programs related to xml			CO2
	Unit 5	Java Script			
		Program related to javascript			CO5,CO6
	Mode of examination	Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	-			

	Other References		

PO and PSO mapping with level of strength for Course Name Web Designing and its Application Lab (Course Code BCP276)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3
Web Designing and its Application Lab	CO1			2		2				3			2			
	CO2			2		2				3						
	CO3			2		2				3			2	2	3	
	CO4			2		2				3						
	CO5			2		2				3						
	CO6	3	3	3		2	3	2		3		2	3	3	3	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
	Web Designing and its Application Lab	3	3	2.16		2	3	2		3		2	2.33	2.5	3	2

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School:		School of Engineering and technology	
Department		Department of Computer Science and Engineering	
Program:		B Sc	
Branch:		CS & IT	
1	Course Code	BCO011	
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 and with practice on applying data coding solutions • Prepare students for research in the area of data encoding and compression related applications	
6	Course Outcomes	On successful completion of this module students will be able to: CO1: demonstrate mathematical preliminaries and lossy and lossless compression. CO2: apply the simple lossless encoding techniques. CO3: illustrate the fundamentals of information theory CO4: apply various lossless compression standards with image and video compression. CO5: illustrate the concept of various algorithms for compressing image and video CO6: apply the techniques Data Encoding and Compression in real life application	
7	Course Description	This course introduces concept 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, CO6
	B	Lossy and Lossless compression	CO1, CO6
	C	Application of compression	CO1, CO6
	Unit 2	Simple lossless encoding	
	A	Run length encoding Huffman coding	CO2, CO6
	B	LZW coding, Run length encoding,	CO2, CO6
	C	Arithmetic coding	CO2, CO6
	Unit 3	Fundamentals of Information Theory	
	A	Concepts of entropy, probability models	CO3, CO6
	B	Markova models, Fundamentals of coding theory,	CO3, CO6
	C	Algorithmic information theory & Minimum description	CO3, CO6
	Unit 4	Lossless Compression standards	

	A	zip, gzip,			CO4, CO6
	B	bzip, unix compress			CO4, CO6
	C	GIF, JBIG			CO4, CO6
	Unit 5	Image & Video compression			
	A	Basis functions and transforms from an intuitive point			CO5, CO6
	B	JPEG, MPEG, Vector Quantization			CO5, CO6
	C	case study of WinZip, WinRar			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Introduction to Data Compression, 3rd Edition, Khalid Sayood, Morgan Kauffman			
	Other References	Internet			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: demonstrate mathematical preliminaries and lossy and lossless compression.	PO1, PO2, PO3, PO4, PO6, PO10, PSO2
2.	CO2: apply the simple lossless encoding techniques.	PO1, PO2, PO5, PO7,PO8, PO9,PO10, PSO1, PSO2
3.	CO3: illustrate the fundamentals of information theory	PO1, PO4, PO5, PO7, PO8 PO10, PSO1,PSO2
4.	CO4: apply various lossless compression standards with image and video compression.	PO1, PO2, PO5, PO7,PO8, PO9,PO10, PSO1, PSO2
5.	CO5: illustrate the concept of various algorithms for compressing image and video	PO1, PO4, PO5, PO7, PO8 PO10, PSO1, PSO2
6.	CO6: apply the techniques Data Encoding and Compression in real life application	PO1, PO2, PO5, PO7,PO8, PO9,PO10, PSO1, PSO2

PO and PSO mapping with level of strength for Course Name Data encoding and compression (Course Code BCO011)

BCO011 Data encoding and compression	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
	CO1	2	3	3	3	-	3	-	-	-	3	-	3
	CO2	2	2	-	-	3	-	3	3	2	2	2	2
	CO3	2	3	-	-	2	-	3	2	-	3	3	3
	CO4	2	2	-	-	3	-	3	3	2	2	2	3
	CO5	2	3	-	-	2	-	3	2	-	3	1	1
	CO6	2	2	-	-	3	-	3	1	2	2	2	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PSO1	PSO 2
BCO011	Data encoding and compression	2	2.5	3	3	2.6	3	3	2.2	2	2.5	2	2.3

School: SET		Batch : 2020	
Program:BCA		Current Academic Year: 2020-20	
Branch:CS/IT		Semester:2	
1	Course Code	BCO012 | Course Name: Graph Theory	
2	Course Title	Graph Theory	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	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: Define basics of types of graphs and trees and its applications in the society. CO2: Understand and demonstrate the basic concepts of graphs, connected and disconnected graphs. CO3: Interpret the fundamentals and representations of graphs and trees and to relate them with the use in computer science applications. CO4: Apply graph-theoretic algorithms to solve the real time problems using minimal spanning trees etc. CO5: Discover the advanced properties and concepts of graphs such as cut-sets and circuits in graph CO6: Examine a graph using matrices to cater their application in real world.	
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, CO3
	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	CO2, CO3

		of trees			
	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 spanning tree of a graph, algorithms to find spanning trees in a weighted graph (Kruskal& Prim)			CO3, CO4
	Unit 4	Cut-Sets			
	A	Cut-Set, Some Properties of Cut-Set, All Cut-Sets in a graph, concept of planar graph			CO5
	B	Fundamental Circuits & Cut-Sets, Connectivity and separability.			CO5
	C	Planar graphs, detection of planar graphs, Eulers formula.			CO5, CO6
	Unit 5	Matrix representation of graphs			
	A	Directed graphs, types of directed graphs.			CO1, CO2, CO6
	B	Matrix representation of graph, incidence matrix A(G), sub matrices of A(G), Rank of A(G),			CO5, CO6
	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: Define basics of types of graphs and trees and its applications in the society.	PO1, PO2, PSO1
2.	CO2: Understand and demonstrate the basic concepts of graphs, connected and disconnected graphs.	PO1, PSO1, PSO2
3.	CO3: Interpret the fundamentals and representations of graphs and trees and to relate them with the use in computer science	PO1, PO2, PSO2

	applications.	
4.	CO4: Apply graph-theoretic algorithms to solve the real time problems using minimal spanning trees etc.	PO3, PO4, PSO2, PSO3
5	CO5: Discover the advanced properties and concepts of graphs such as cut-sets and circuits in graph	PO1, PO2, PO3, PO4, PSO1
6	CO6: Examine a graph using matrices to cater their application in real world.	PO1, PO2, PSO1

PO and PSO mapping with level of strength for Course Name Graph Theory(Course Code BCO 012)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	3	3	2	2	3	2	-	-	1	1	2	1
CO2	3	3	2	3	2	2	-	-	1	1	2	1
CO3	3	2	2	3	2	1	-	-	1	1	2	2
CO4	3	2	2	3	3	2	-	-	1	1	2	2
CO5	3	2	2	3	2	2	-	-	2	1	1	2
Co6	3	2	2	3	3	2	-	-	1	1	1	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCO012	Graph Theory	3	2.3	2	2.8	2.5	1.83	-	-	1.17	1	1.67	1.67

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

TERM-V

School: SET		Batch : 2020		
Program: BCA		Current Academic Year: 2020-20		
Branch: CS/IT		Semester: V		
1	Course Code	BCA 021	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	Architecture of Client Server Computing , 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, Different platforms of OS,Introduction to 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	CO1,CO2,CO3
	C	UNIX workstation, x-terminals,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	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,PO3,PSO1
2.	CO2: To understand the client server components	PO1, PO2, PO3, PO4, PSO1
3.	CO3: To identify the application area of client server computing	PO1,PO2,PO4, PSO1 PSO3
4.	CO4: To know how to develop client server network and data storage is used in client server architecture.	PO1, PO2,PO3,PO5 PSO1
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.	PO2, PO4, PO5, 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, PSO1, PSO2

PO and PSO mapping with level of strength for Course Name Client-Server Computing (Course Code BCA 021)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3
Client-Server Computing_BCA 021	CO1	2	3	1										1		
	CO2	2	2	2	3									2		
	CO3	2	3		2									1		3
	CO4	3	1	2		2								2		
	CO5		2		1	2									2	
	CO6	2	3	1	2									2	3	

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
		2	2.33	1	1.33	.66								1.33	0.83	0.5

2.1 BCA 268 Introduction to Software Engineering

School:		School of Engineering and technology		
Department		Department of Computer Science and Engineering		
Program:		BCA		
Branch:		Computer Science and Engineering		
1	Course Code	BCA268		
2	Course Title	Introduction to Software Engineering		
3	Credits	3		
4	Contact Hours (L-T-P)	3-0-0		
	Course Status	Core /Elective/Open Elective		
5	Course Objective	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.		
6	Course Outcomes	Students will be able to: CO1: Compare various software development life cycle models CO2: Apply requirement engineering techniques to develop SRS for a project. CO3: Classify various design techniques CO4: Categorize testing strategies for a software system CO5: Explain quality and maintenance concepts CO6: Create and deliver quality software as an individual or as part of a multidisciplinary team.		
7	Course Description	This course covers the fundamentals of software engineering, including understanding system requirements, finding appropriate engineering compromises, effective methods of design, testing, maintenance and quality.		
8	Outline syllabus			CO Mapping
	Unit 1	Software engineering and Process model		
	A	Definition, Significance challenges and Software Myths in software engineering, Software Components, Software Characteristics, Software Crisis, Software applications		CO1
	B	Software Development Methodologies: Waterfall model, prototyping model, Incremental model		CO1
	C	Spiral model, V model, RAD model, Agility, Extreme Programming (XP)		CO1
	Unit 2	Requirement Engineering		
	A	Requirement Elicitation: Interviews, Brain Storming Sessions, Feasibility study		CO2
	B	Functional & Non Functional Requirements, Known Requirements, Unknown Requirements, Undreamt Requirement		CO2
	C	Requirement Documentation: Characteristics of SRS, Document SRS according to IEEE standards		CO2

	Unit 3	Software Design			
	A	System Design: System Design, Problem Partitioning, Functional vs. Object- Oriented approach , Top-Down and Bottom-Up design			CO3
	B	design concepts: Abstraction, Modularity , Software Architecture, Low level design, Design structure chart, pseudocode, Information Hiding, Data Flow diagrams			CO3
	C	decision table, Cohesion and Coupling measures and types			CO3
	Unit 4	Software Testing			
	A	Fundamental of testing: Objectives, principles, Terminologies: Error, Mistake, Bug, Fault and Failure			CO4
	B	Levels of testing: Unit Testing, Integration Testing, System Testing, Acceptance Testing: Alpha & Beta Testing, Integration techniques			CO4,CO6
	C	White Box Testing, Black Box Testing, Verification and Validation, Debugging			CO4,CO6
	Unit 5	Software Maintenance and Quality			
	A	Introduction to Maintenance, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance			CO5,CO6
	B	Quality Concepts: Quality, Quality Control, Cost of Quality, Software Quality Assurance , SQA plan			CO5,CO6
	C	The ISO 9000 Quality Standards, Capability Maturity Model, CASE Tools			CO5,CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	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. Jalote, Pankaj, “Software Engineering”New Delhi: Narosa (Latest Ed.) 2. Schaum’s Series, “Software Engineering” TMH			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Compare various software development life cycle models	PO1,PO2,PO5,PO8,PO9,PSO2
2.	CO2: Apply requirement engineering techniques to develop SRS for a project.	PO1,PO2,PO4,PO5,PO8,PO9,PSO2
3.	CO3: Classify various design techniques	PO1,PO2,PO4,PO5,PO8,PO9,PSO2
4.	CO4: Categorize testing strategies for a software system	PO1,PO2,PO4,PO5,PO8,PO9,PSO2
5.	CO5: Explain quality and maintenance concepts	PO1,PO2,PO4,PO5,PO8,PO9,PSO2
6.	CO6: Create and deliver quality software as an individual or as part of a multidisciplinary team.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10, PSO2

PO and PSO mapping with level of strength for Course Name Introduction to Software Engineering (Course Code BCA 268)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO2
	CO1	3	2	-	-	2	-	-	3	3	-	-	2
	CO2	3	3	-	2	3	-	-	3	3	-	-	2
	CO3	3	3	-	1	3	-	-	3	3	-	-	2
	CO4	3	3	-	2	2	-	-	3	3	-	-	2
	CO5	3	3	-	1	2	-	-	3	3	-	-	2
BCA268_Introduction to Software Engineering	CO6	3	3	2	2	2	2	2	3	3	3	-	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCA268	Introduction to Software Engineering	3	2.8	2	1.6	2.3	2	2	3	3	3	-	2

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School: SET		Batch : 2020	
Program: BCA		Current Academic Year: 2020-20	
Branch: -CS/IT		Semester: VI	
1	Course Code	BCA371	Course Name: BCA
2	Course Title	Introduction to Cloud Computing	
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	Understanding of Cloud Computing risk issues and Security Challenges. CO1. Define the basics of cloud and recall the computer Science concepts CO2. Classify and describe the architecture and taxonomy of Cloud Computing, including virtualization and distributed system CO3. Apply and Manage Service, applications and Workflow to use the cloud in file systems, applications and simulations. CO4. Categorize and Characterize risk, performance and governance in cloud computing. Examine the design of tasks and data in the cloud in respect of privacy and security.. CO5. Evaluate the importance of cloud using monitoring and management of services for performance improvement and Compliances implementations as per demand. CO6. Elaborate the design concept and formulate to develop the understanding of cloud service providers as AWS, MS Azure, Google Cloud. Demonstrate the use of Map-Reduce and cloud services.	
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,	CO1, CO2
	B	Understanding of Cloud Architecture: Infrastructure, Platform,, Communication Protocols, Applications,	CO1, CO2
	C	Understanding Services: SaaS, PaaS, IaaS	CO1, CO2

	Unit 2	Understanding Abstraction and Virtualization	
	A	Abstract features of cloud: On Demand, Load Balancing, AutoScaling, Availability, Elasticity the Google Cloud,	CO1, CO2
	B	Hypervisor, Virtual machine and its types, Virtual Appliances	CO1, CO2
	C	Storage in the Cloud, Block and File Storage, Google File System.	CO1, CO2
	Unit 3	Cloud Computing with the Titans	
	A	Google Web Services: Google app Engine, Google Web Toolkit, Compute Engine	CO1,CO2,CO3
	B	Amazon: Amazon Elastic Cloud Computing, Amazon Simple Storage System, AWS CDN	CO1,CO2,CO3
	C	MS Azure: Azure VM , SQL Server on Virtual Machines, Azure SQL Database	CO1,CO2,CO3
	Unit 4	Cloud Computing Risk Issues	
	A	The CIA Triad: Confidentiality, Integrity, And Availability, SLA Management in Cloud Computing	CO1,CO2,CO4
	B	Common Threats and Vulnerability: Logon Abuse, Inappropriate System Use, Eavesdropping, Denial-of-service (DoS) Attack, Session Hijacking Attack.	CO1,CO2,CO4
	C	Cloud Service Provider (CSP) Risks: Back Door, Spoofing, Replay Attack, Social Engineering Attack, Dumpster Diving, Trojan Horse and Malware.	CO1,CO2,CO4
	Unit 5	Cloud Computing Security Challenges	
	A	Security Policy Implementation,	CO1,CO2,CO4
	B	Policy Types: Senior Management Statement of Policy, Regulatory Policies,	CO1,CO2,CO4
	C	Advisory Policies, And Informative Policies.	CO1,CO2,CO4
	Mode of examination	Theory	
	Weightage Distribution	CA	MTE
		30%	20%
	Text book/s* Other References	1. CLOUD COMPUTING Principles and Paradigms, Edited by Rajkumar Buyya, Jam 2. Barrie Sosinsky "*Cloud Computing (Bible)"*,Wiley 3. Anthony T.Velte, Toby J. Velte, Robert Elsenpeter"Cloud Computing: A Practical Approach" TATA McGRAW-HILL Edition. 4. 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.	Define the basics of cloud and recall the computer Science concepts	PO1,PO2, PSO1, PSO2
2.	Classify and describe the architecture and taxonomy of Cloud Computing, including virtualization and distributed system	PO1, PO3, PO4, PSO1, PSO2
3.	Apply and Manage Service, applications and Workflow to use the cloud in file systems, applications and simulations.	PO1,PO2,PO3,PO4, PSO1, PSO2, PSO3
4.	Categorize and Characterize risk, performance and governance in cloud computing. Examine the design of tasks and data in the cloud in respect of privacy and security.	PO1, PO2, PO5, PSO1, PSO2
5.	Evaluate the importance of cloud using monitoring and management of services for performance improvement and Compliances implementations as per demand.	PO1, PO2,PO3, PO5, PSO1
6.	Elaborate the design concept and formulate to develop the understanding of cloud service providers as AWS, MS Azure, Google Cloud. Demonstrate the use of Map-Reduce and cloud services.	PO1, PO2,PO3, PO4, PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Introduction to Cloud (Course Code BCA371)

Course Code_ Course Name	CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BCA371_Introduction to Cloud	CO1	2	3											1	2	
	CO2	2	2		3									1	2	
	CO3	2	2	3	1									2	2	3
	CO4	3	1			2								3	1	
	CO5	2	2	3		2								2		
	CO6	2	3	1	2									2	1	

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
		2.16	2.16	1.16	1	.66								1.83	1.33	0.5

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School: SET		Batch : 2020	
Program: BCA		Current Academic Year: 2020-20	
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: CO1: Define the basic concepts of PHP. CO2: Understand how server-side programming works on the web CO3: Apply PHP script to handle HTML forms CO4: Discover PHP programs that use various PHP library functions, and that manipulate files and directories. CO5: Appraise and solve various database tasks using the PHP language CO6: 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,CO2
	B	PHP statement terminator and case insensitivity, Embedding PHP in HTML	CO1,CO2
	C	Comments, Variables, Assigning value to a variable, Constants, Managing Variables, Understanding variable scope, Global Variables, Static Variables	CO1,CO2
	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,CO2,CO6
	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,CO2,CO6

	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,CO2,CO4
	Unit 3	Array and Form Handling	
	A	Array: single, multi dimensional, numeric array, associative array	CO6
	B	Accessing form elements using GET and POST, Assigning value to form elements	CO3,CO6
	C	Form validation: validation, required, validate url, dealing with uploaded file, error handling	CO3,CO6
	Unit 4	File Handling & Session Management	
	A	Opening files in different modes, handling file open error	CO4,CO6
	B	File Operation: Reading & writing data on web page from file, deleting file, renaming file	CO4,CO6
	C	Session Management: introduction, creation, destroying and login session management	CO4,CO6
	Unit 5	PHP Database Connectivity	
	A	SQL Basic query: create, insert, select, delete, update, truncate, drop	CO5,CO6
	B	Introduction to database, database connectivity	CO5,CO6
	C	Retrieving records, retrieving fields from record, closing connection	CO5,CO6
	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: Define the basic concepts of PHP.	PO1,PO2,PO3,PO4,PO5,PO8,PO10
2.	CO2: Understand how server-side programming works on the web	PO3,PO4,PO10,PS02
3.	CO3: Apply PHP script to handle HTML forms	PO3,PO4,PO8,PO10
4.	CO4: Discover PHP programs that use various PHP library functions, and that manipulate files and directories.	PO3,PO4,PO10
5.	CO5: Appraise and solve various database tasks using the PHP language	PO3,PO4,PO8,PO10,PSO2
6.	CO6: Develop Websites for Small business and organization or for individual	PO1,PO2,PO3,PO4,PO5,PO8,PO10,PSO1,PSO2

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	PSO1	PSO2
CSE	CO1	2	2	2	2	2			3		2		
	CO2			2	1						2		1
	CO3			2	1				2		2		
	CO4			2	1						2		
	CO5			2	1				1		2		2
	CO6	2	2	2	3	3	1		3		3	3	2

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School: SET		Batch : 2020 onwards	
Program: B.Sc.		Current Academic Year: 2020-21	
Branch:CS & IT		Semester: V	
1	Course Code	BCO022 | Course Name: B.Sc.	
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	This course provides an introduction to the fundamentals of distributed computer systems with Various issues and challenges.	
6	Course Outcomes	Students will be able to: CO1: Identify the core concepts of distributed systems. CO2:Examine how existing systems have applied the concepts of distributed systems in designing large system. CO3: Demonstrate the various synchronization algorithm. CO4: Apply these concepts to develop distributed transactions in large systems. CO5: Compare the different methods for concurrency protocol. CO6: Illustrate the security protocols in distributed systems in order to relate better with real world systems.	
7	Course Description	This course introduces the concepts of distributed operating system, algorithms and design issues and challenges in Distributed system, identify the problems, and choose the relevant models and algorithms to apply.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Distributed System	
	A	Introduction: definition, characteristics and challenges of distributed systems,	CO1, CO2
	B	architectural models (client-server)Time: Physical and logical time, event ordering,	CO1, CO2
	C	clock synchronization, message delivery ordering	CO1, CO3
	Unit 2	Synchronization	
	A	Limitation of Distributed system	CO2, CO3
	B	absence of global clock, shared memory,	CO2, CO3
	C	Logical clocks ,Lamport's& vectors logical clocks.	CO2, CO3
	Unit 3	Distributed Algorithm	
	A	classification of Agreement Problem, Byzantine agreement problem,	CO4

	B	Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem,			CO4
	C	Application of Agreement problem, Atomic Commit in Distributed Database system.			CO4
	Unit 4	Distributed Transactions			
	A	Transactions and Concurrency Control: Transactions, Nested transactions,			CO4,CO5
	B	Locks, Optimistic Concurrency control, Timestamp ordering,			CO4,CO5
	C	Comparison of methods for concurrency control.			CO4,CO5
	Unit 5	Security			
	A	Security protocol in distributed system			CO5,CO6
	B	main threats and techniques for ensuring security (secure channels & firewalls			CO5,CO6
	C	Fault tolerance and availability			CO5,CO6
	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: Identify the core concepts of distributed systems.	PO1, PO2, PO3,PO4 PSO2
2.	CO2:Examine how existing systems have applied the concepts of distributed systems in designing large system.	PO1, PO2, PO3,PO4 PSO2
3.	CO3: Demonstrate the various synchronization algorithm	PO1, PO2, PO3,PO4 PSO2
4.	CO4: Apply these concepts to develop distributed transactions in large systems.	PO1, PO2, PO3,PO4 PSO2
5.	CO5: Compare the different methods for concurrency protocol.	PO1, PO2, PO3,PO4 PSO2
6.	CO6: Illustrate the security protocols in distributed systems in order to relate better with real world systems.	PO1, PO2, PO3,PO4 PSO2

PO and PSO mapping with level of strength for Course Name Introduction to Distributed System (BCO022)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
B.Sc.	CO1	3	2	2	2	--	--	--	--	--	--	--	2
	CO2	3	2	2	2	---	---	--	---	---	---	---	2
	CO3	3	2	2	2	---	---	--	---	---	---	---	2
	CO4	3	2	2	2	---	---	--	---	---	---	---	2
	CO5	3	2	2	2	--	--	--	--	--	--	--	2
	CO6	3	2	2	2	--	--	--	--	--	--	--	2
AVG.		3	2	2	2		--	--	--	--	--	--	2

COMPUTER GRAPHICS

School: SET		Batch : 2020 onwards	
Program: BCA (MM)		Current Academic Year:	
Branch: CSE		Semester: II	
1	Course Code	BCO031 | Course Name: Computer Graphics	
2	Course Title	Computer Graphics	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	core	
5	Course Objective	The main objective of this module is to introduce to the students the concepts of computer graphics. It starts with an overview of interactive computer graphics, two-dimensional system and mapping, then it presents the most important drawing algorithm, two-dimensional transformation; Clipping and an introduction to 3-D graphics.	
6	Course Outcomes	Students will be able to: CO1: *Illustrate* the applications and techniques of Computer Graphics and current trends CO2: *Design* various object to create various application. CO3: *Select* methods for the representation and transformation of graphical images and pictures. CO4: *Describe* the fundamentals of 2D and 3D CO5: *Apply* 2D and 3D transformations, projection and viewing contrast CO6: *Examine* various animation types and algorithmic concepts to apply the animated effects.	
7	Course Description	Computer Graphics 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.	
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,CO3
	C	Frame buffer and display file, Interactive input devices	CO1, CO2, CO3
	Unit 2	Raster Algorithms	
	A	Line drawing algorithms -- DDA and Bresenham's algorithm	CO1, CO2, CO3,CO6
	B	Circle generation algorithm—Midpoint & Bresenham’s algorithm, ellipses and other curves generation	CO1, CO2, CO3,CO6
	C	Area filling-Inside and Outside test, Scan line	CO1, CO2, CO3,CO6

		algorithm, aliasing techniques			
	Unit 3	Two-dimensional Transformation			
	A	Basic transformations-Translation, rotation			CO1,CO2,CO3,CO4,CO5
	B	scaling and reflection, coordinate system			CO3,CO4,CO5
	C	windowing and clipping-point, line and polygon clipping, Segments			CO3,CO4,CO5
	Unit 4	Three-dimensional Transformation			
	A	Basic transformations-Translation, rotation, scaling and reflection			CO1, CO2,CO3,CO4,CO5
	B	Parallel & Perspective Projection, Types of Parallel & Perspective Projection			CO3,CO4,CO5
	C	3-d clipping, segments			CO3,CO4,CO5
	Unit 5	Hidden surface removal Algorithm and Animation			
	A	Z-Buffer, Painter's Algorithm, Wornock's Algorithm, Scan line Algorithm.			CO1,CO2,CO4,CO5
	B	Introduction to Animation, Principles of Animation			CO1,CO2,CO4,CO5,CO6
	C	Types of Animation: 2D animation, 3D animation., Typography Animation, Clay animation, Sand Animation, Flip book Animation			CO1, CO2, 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.	Illustrate the applications and techniques of Computer Graphics and current trends	PO1, PO2, PO3, PO4,PO5, PO6, PO9, PO10,PSO1,PSO2
2.	Design various object to create various application.	PO1, PO2, PO3,PO4, PO8, PO9, PO10, PSO1,PSO2
3.	Select methods for the representation and transformation of graphical images and pictures.	PO1,PO2,PO3,PO5, PO7,PO8,PO10, PSO1,PSO2,
4.	Describe the fundamentals of 2D and 3D	PO1, PO2, PO3, PO4,PO5,PO10

5.	Apply 2D and 3D transformations, projection and viewing contrast	PO1, PO2, PO3, PO4, PO5,PO6,PO7,PO8, PO9, PO10,PSO1,PSO2
6.	Examine various animation types and algorithmic concepts to apply the animated effects	PO1, PO2, PO3, PO4, PO6,PO7,PO8, PO9, PO10,PSO1,PSO2

PO and PSO mapping with level of strength for Computer Graphics (Course Code BCO031)

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	3	3	2	2	2	3	-	-	2	3	2	2
CO2	3	3	3	3	-	-	-	3	2	3	3	3
CO3	2	2	3	-	3	-	3	3	-	3	3	3
CO4	3	3	3	2	1	-	-	3	3	3	3	3
CO5	2	2	3	3	3	3	3	3	3	3	3	3
CO6	3	3	3	2	-	3	3	2	2	2	3	3
	2.6	2.6	2.8	2	1.5	1.5	1.5	2.3	2	2.8	2.8	2.8

Multimedia & Animation

School: SET		Batch : 2020 onwards	
Program: BCA		Current Academic Year: 2020	
Branch: CS/IT		Semester: V	
1	Course Code	BCO032	
2	Course Title	BCO032_Multimedia & Animation	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Elective	
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: *Illustrate* the concepts Multimedia, Multimedia Hardware and Software. CO2: *Discover* different approaches in Multimedia and Animation. CO3: *Analyse* The concept of 2D and 3D animation. CO4: *Apply* Audio, and Video Production Techniques to an Animation Project. CO5: *Choose* layout and designing principles for animation. CO6: *Demonstrate* the use of digitized sound, video control, and scanned images	
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 Multimedia	
	A	What is multimedia, Components of multimedia, usage of multimedia, design principles of multimedia, Multimedia hardware and Multimedia software	CO1, CO2
	B	Multimedia operating system: Concepts of Operating system, Types of Multimedia Operating system	CO1, CO2
	C	Multimedia communication systems and types	CO1, CO2
	Unit 2	Image and Video	
	A	Image: Creation of image (BMP & vector), image colour models, Image file format, Image compression.	CO1,CO2, CO6

	B	Video: video broadcast standard (PAL, NTSC), shooting and editing video.	CO1,CO2, CO4,CO6
	C	Video file formats. Video tips, video compression: MPEG standards.	CO1,CO2, CO4,CO6
	Unit 3	Animation	
	A	Principle of Animation. Animation techniques: cell animation, computer animation.	CO2,CO3, CO5
	B	Kinematics, morphing, anti-aliasing, animation files formats.	CO2, CO5
	C	Different animation packages: Acrobat Photoshop, flash.	CO2, CO5
	Unit 4	2D Animation	
	A	Introduction to 2D animation: Drawing concept, Colour theory & basics, Incorporating sound into 2D animation	CO2, CO3, CO4, CO6
	B	Drawing concept and colour theory & basics, Incorporating sound into 2D animation	CO2, CO3, CO4, CO6
	C	Introduction to 3D Animation: Techniques of 3D animation, Create, Edit and working with 3D Animation Graph	CO2, CO3, CO4, CO6
	Unit 5	Layout & Designing	
	A	Basic of sketching still and assignment of basic drawing, composition of basic elements.	CO1, CO2, CO5
	B	Work in different media, such as drawing, collage and painting	CO1, CO2, CO5, CO6
	C	Pixel and resolution: vector and bitmap Graphics.	CO1, CO2, CO5, CO6
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE	
		30% / 20% / 50%	
	Text book/s*	1. Multimedia Making It Work-by Tay Vaughan, Tata Mcgrwa Hills. 2. Multimedia Systems: John F, Koegel Buford Pearson.	
	Other References	1. Multimedia In Action-James E Shuman-Vikas Publishing House 2. Multimedia basic-Volumes-1 Technology.	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	*Illustrate* the concepts Multimedia, Multimedia Hardware and Software.	PO1, PO2, PO3, PO4, PO10, PSO1,PSO2
2.	*Discover* different approaches in Multimedia and Animation.	PO1, PO2, PO3, PO4,PO5,

		PO6, PO7,PO10, PSO1, PSO2
3.	*Analyse:* The concept of 2D and 3D animation.	PO1, PO2, PO3, PO4, PO5, PO6,PO8, PSO1,PSO2
4.	*Apply* Audio, and Video Production Techniques to an Animation Project.	PO1, PO2, PO3, PO4,PO6,PO7, PO8, PO9, PO10, PSO1, PSO2
5.	*Choose* layout and designing principles for animation.	PO1, PO2,PO3, PO4, PO5, PO6, PO7,PO8, PO9, PSO1,PSO2
6.	*Demonstrate* the use of digitized sound, video control, and scanned images	PO1, PO2, PO3, PO4, PO5, PO6,PO7, PO9, PSO1,PSO2

PO and PSO mapping with level of strength for BCO032_Multimedia & Animation

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	3	1	1	1	-	-	-	-	-	3	1	1
CO2	3	1	2	2	1	3	2	-	-	3	3	1
CO3	2	2	2	3	3	1	-	2	-	-	3	2
CO4	2	3	3	3	3	2	2	2	3	2	3	3
CO5	2	2	3	1	3	1	3	3	3	2	3	1
CO6	2	3	3	1	2	3	3	-	3	-	3	1
	2.33	2	2.33	1.83	2	1.66	1.66	1.16	1.5	1.66	2.66	1.5

School: SET		Batch:			
Program: BTECH		Current Academic Year:			
Branch:CSE		Semester:			
1	Course Code	BCP 372			
2	Course Title	Introduction to PHP Lab			
3	Credits	1			
4	Contact Hours (L-T-P)	0-0-2			
	Course Status				
5	Course Objective	This course introduces the open source Web scripting language PHP and helps in building dynamic Web applications. It defines the Semantics and syntax of the PHP language			
6	Course Outcomes (same as theory course)	CO1: Define regular expressions including modifiers and operators. CO2: Demonstrate PHP programs that use various PHP library functions CO3: Develop PHP scripts to handle HTML forms. CO4: Analyze and solve various database tasks using the PHP language. CO5: Determine the PHP script to validate form data. CO6: Solve common Web application tasks by writing PHP programs.			
7	Course Description	This course discusses the practical problems that PHP solves. It helps in developing server-side cross-platform HTML-embedded scripts to implement dynamic Web pages that interact with databases and files.			
8					CO Mapping
	Unit 1	PHP Basics			
		Program related to Basics of PHP			CO1
	Unit 2	Operators, Control Structures and Functions in PHP			
		Program related to Operators, Control Structures and Functions in PHP			CO2
	Unit 3	Array and Form Handling			
		Program related to Array and form handling in PHP			CO3,CO5
	Unit 4	File Handling & Session Management			
		Program related to file handling and session management in PHP			CO2
	Unit 5	PHP Database Connectivity			
		Program related to Database connectivity in PHP			CO4,CO6
	Mode of examination	Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	Peter MacIntyre, Rasmus Lerdorf, Kevin Tatroe,"Programming PHP", O'Reilly Publication			
	Other References	3. Steven Holzner, "Php: The Complete Reference", TMH publication 4. 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: Define regular expressions including modifiers and operators.	PO1,PO2,PO3,PO4,PO10
2.	CO2: Demonstrate PHP programs that use various PHP library functions	PO1,PO2,PO3,PO4,PO10
3.	CO3: Develop PHP scripts to handle HTML forms.	PO1,PO3,PO4,PO8,PO10,PSO1
4.	CO4: Analyze and solve various database tasks using the PHP language.	PO1,PO3,PO4,PO8,PO10
5.	CO5: Determine the PHP script to validate form data.	PO3,PO4,PO8,PO10,PSO1
6.	CO6: Solve common Web application tasks by writing PHP programs.	PO1,PO2,PO3,PO4,PO5,PO8,PO10,PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Introduction to PHP Lab (Course Code BCP372)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCP372 _ Introduction to PHP Lab	CO1	2	2	2	2						2		
	CO2	2	2	2	2						2		
	CO3	1		2	2				1		2	2	
	CO4	1		2	3				1		2		
	CO5			2	2				1		2	2	
	CO6	2	1	2	3	3			3		3	3	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCP372	Introduction to PHP lab	1.6	1.67	2	2.3	3	0	0	1.5	0	2.67	2.3	2

List of Experiments

- Write a PHP program to print a message.
- Write a PHP program to find a square of a number.
- Write a PHP program to swap two numbers without using 3rd variable.
- Write a PHP program to find the area of rectangle, square, circle using predefined value.
- Write a PHP program to find factorial of a number
- Write a PHP program to print Fibonacci series upto 17.
- Write a PHP program to implement calculator.
- Write a PHP program to find the smallest number from an array.
- Write a PHP program to arrange the numbers in ascending order.
- Write a PHP program to make a login form and check the input using another PHP page.
- Write a PHP program to find the sum of all elements in a multidimensional array using for loop.
- Write a PHP program to validate a form input.
- Write a PHP program of file handling (reading a file line by line until end of file
- Write a PHP program for uploading a file in PHP.
- Write a program to read input data, from table and display all these information in tabular form on output screen.

TERM-VI

School: SET		Batch : 2020 onwards	
Program: B.Tech.		Current Academic Year: 2020	
Branch: CSE		Semester:	
1	Course Code	BCA043	Course Name- Introduction to AIML
2	Course Title	Introduction to AIML	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core	
5	Course Objective	The course objective to provide a foundation in artificial intelligence techniques for planning, with an overview of the wide spectrum of different problems and approaches, including their underlying theory and their applications	
6	Course Outcomes	After Successful completion of this course the student will be able to: CO1-*Demonstrate:* fundamental understanding of artificial intelligence (AI) CO2- *Illustrate:* various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models CO3- *Apply:* Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning CO4- *Analyze:* Mathematical models and apply them to a range of AI problems CO5-*Choose:* AI planning technology for projects in different application domains CO6- *Compare:* performance of different learning algorithms	
7	Course Description	This course will offer skill development in the use of software to develop storyboards and 2-dimentional animation including creating, importing and sequencing media elements to create multi-media presentations. Emphasis will be on conceptualization, creativity, and visual aesthetics.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	A	Foundation of AI, Goals of AI, History and AI course line,	CO1, CO2
	B	Introduction to Intelligent Agents; Environment; Structure of Agent,	CO1, CO2
	C	AI Solutions Vs Conventional Solutions; a philosophical approach; a practical approach.	CO1, CO2
	Unit 2	PROBLEM SOLVING AGENTS	
	A	Problem solving using Search Techniques; Problems; Solutions; Optimality,	CO1, CO2, CO3
	B	Informed Search Strategies; Greedy Best-First; A* Search; Heuristic Functions,	CO1, CO2, CO3

	C	Uninformed Search Strategies; BFS; DFS; DLS; UCS; IDFS; BDS. Local Search algorithms: Hill Climbing, genetic Algorithms.			CO1, CO2, CO3
	Unit 3	KNOWLEDGE & REASONING			
	A	Knowledge-Based Agents; clause form, First-Order Logic; Syntax-Semantics in FOL;			CO1, CO2, CO3, CO4
	B	Representation revisited, ; Simple usage; Inference Procedure; Inference in FOL;			CO1, CO2, CO3, CO4
	C	Forward Chaining; Backward Chaining; Resolution			CO1, CO2, CO3, CO4
	Unit 4	LEARNING			
	A	Common Sense Vs Learning; Components; Representations; Forms of learning, Feedback, Learning Types: Supervised; Unsupervised;			CO3, CO4, CO5
	B	Reinforcement Learnings, Decision trees,			CO3, CO4, CO5
	C	Artificial Neural Networks: Introduction, types of networks; Single Layer and Multi-Layer n/w.			CO3, CO4, CO5
	Unit 5	PLANNING AND APPLICATIONS			
	A	Introduction and Planning in Context State-Space Search: Heuristic Search and STRIPS Plan-Space Search and HTN Planning Graph plan and Advanced Heuristics Plan Execution and Applications			CO4,CO5, CO6
	B	Robotics – Hardware; Vision; Navigation based case studies,			CO4,CO5, CO6
	C	Water jug problem and similar case studies			CO4,CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	ARTIFICIAL INTELLIGENCE - SIE by RICH, McGraw Hill			
	Other References	Russell, S., & Norvig, P. Artificial intelligence: a modern approach. Third Edition. Pearson new international edition. 2014.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	*Demonstrate:* fundamental understanding of artificial intelligence (AI)	PO1, PO2, PO6, PO9, PO10
2.	*Illustrate:* various applications of AI techniques in intelligent	PO1, PO2, PO3, PO4, PO5,

	agents, expert systems, artificial neural networks and other machine learning models	PO7, PO10
3.	*Apply:* Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8
4.	*Analyze:* Mathematical models and apply them to a range of AI problems	PO1, PO2, PO3, PO4, PO8, PO9, PO10
5.	*Choose:* AI planning technology for projects in different application domains	PO1, PO2, PO3, PO8, PO9, PO10
6.	*Compare:* performance of different learning algorithms	PO1, PO2,PO3, PO4, PO5, PO6, PO7

PO and PSO mapping with level of strength for Introduction to AIML (Course Code BCA043)

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	3	3	-	-	-	2	-	-	3	3	2	2
CO2	3	3	3	3	3	-	3	-	-	3	2	1
CO3	2	2	3	3	3	3	3	3	-	-	1	2
CO4	2	2	3	3	-	-	-	3	3	3	2	3
CO5	2	2	3	-	-	-	-	3	3	3	1	1
CO6	2	3	2	3	3	3	3	-	-	-	2	1
	2.4	2.5	2.3	2	1.5	1.4	1.5	1.5	1.5	2	1.7	1.7

School:		School of Engineering and technology		
Department		Department of Computer Science and Engineering		
Program:		BSc		
Branch:		CS/IT		
1	Course Code	BCO051		
2	Course Title	System Analysis and Design		
3	Credits	3		
4	Contact Hours (L-T-P)	3-0-0		
	Course Status	Core /Elective/Open Elective		
5	Course Objective	This course aims to introduce techniques of system used by analysts, designers to manage projects, analyze and document systems, design new systems and implement their plans.		
6	Course Outcomes	Student will be able to CO1: Explain what systems are and how they are developed. CO2: Outline different information systems and role of system analyst CO3: Analyze system planning and information gathering techniques CO4: Compare various tools for system design and development CO5: Select appropriate maintenance and security measures for error free system CO6: Solve business problems through analyzing the requirements of information systems and designing such systems by applying analysis and design techniques.		
7	Course Description	This module introduces the students to the concepts and skills of system analysis and design. It includes coverage of Types of system, role of system analysts, Tools for system development , Implementation, maintenance and system security.		
8	Outline syllabus			CO Mapping
	Unit 1	Basic Concept of Systems		
	A	Definition and Concepts; Elements of a System: Input, Output Processor, Control, Feedback, Environment, Boundaries and Interface; Characteristics of a System		CO1
	B	Types of systems -Physical and Abstract System, Open and Closed Systems, Man-made Systems; Information and its categories		CO1
	C	System Development and its various phases, approaches to improve the system development		CO1
	Unit 2	Information system and its documentation		
	A	Information systems : TPS, OAS, MIS, DSS, ESS		CO2

	B	Role and need of system analyst, System Analyst as an agent of change.	CO2
	C	System documentation: Types of documentation and their importance.	CO2
	Unit 3	System Planning and Information Gathering	
	A	Initial Investigations, Identification of user needs, Project Identification and Selection; Needs of Information Gathering, Determination of requirements,	CO3,CO6
	B	Information gathering tools: interviews, group communication, questionnaires, presentations and site visits.	CO3,CO6
	C	Feasibility study, Types of feasibility study, Cost-Benefit Analysis: Tools and Techniques.	CO3,CO6
	Unit 4	Tools for system development	
	A	Data Flow Diagram (DFD), Logical and Physical DFDs, Developing DFD	CO4,CO6
	B	System Flowcharts and Structured charts, Structured English, Decision trees and Decision tables	CO4,CO6
	C	System Design Module specifications, Module Coupling and cohesion, Top-down and bottom-up design	CO4,CO6
	Unit 5	Implementation and Maintenance	
	A	Input and Output Input design: Input data, Input media and devices; Output design; Form Design: Classification of forms, Requirements of Form design	CO5,CO6
	B	Need of System Testing, Types of System Testing, Quality Assurance, Maintenance activities and issues	CO5,CO6
	C	Security Threats, Risk Analysis, Control measures, System Audit, Disaster Recovery Planning	CO5,CO6
	Mode of examination	Theory/Jury/Practical/Viva	
	Weightage Distribution	CA / MTE / ETE	
		30% / 20% / 50%	
	Text book/s*	Elias M. Awad, System Analysis & Design, Galgotia.	
	Other References	Perry Edwards: System Analysis & design Mc Graw Hill	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Explain what systems are and how they are developed.	PO1,PO2,PO4,PO7,PO9,PO10 ,PSO2
2.	CO2: Outline different information systems and role of system analyst	PO1,PO2,PO3,PO4,PO7,PO8,PO9,PO10 ,PSO2
3.	CO3: Analyze system planning and	PO1,PO2,PO4,PO7,PO8,PO9,PO10,

	information gathering techniques	PSO1,PSO2
4.	CO4: Compare various tools for system design and development	PO1,PO2,PO3,PO4,PO7,PO8,PO9,PO10 ,PSO2
5.	CO5: Select appropriate maintenance and security measures for error free system	PO1,PO2,PO3,PO4,PO7,PO8,PO9,PO10 ,PSO2
6.	CO6: Solve business problems through analyzing the requirements of information systems and designing such systems by applying analysis and design techniques.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8, PO9,PO10,PSO1,PSO2

PO and PSO mapping with level of strength for Course Name System Analysis and Design(Course Code BCO051)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCO051_ System Analysis and Design	CO1	1	2	-	1	-	-	1	-	1	2	-	3
	CO2	2	3	1	1	-	-	2	2	3	3	2	3
	CO3	2	3	-	1	-	-	2	2	3	3	2	3
	CO4	2	3	3	1	-	-	2	2	3	3	2	3
	CO5	2	3	1	1	-	-	2	2	3	3	2	3
	CO6	3	3	3	1	3	3	3	3	3	3	3	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	P O 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
BCO51	System Analysis and Design												

School: SET		Batch : 2020 onwards	
Program: B.Tech.		Current Academic Year: 2020	
Branch: CSE		Semester: IV	
1	Course Code	BCA014	Course Name- Digital Audio and Computer Music
2	Course Title	Digital Audio and Computer Music	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core	
5	Course Objective	Computer music is the application of computing technology in music composition, to help human composers create new music or to have computers independently create music, such as with algorithmic composition programs. It includes the theory and application of new and existing computer software technologies and basic aspects of music, such as sound synthesis, digital signal processing, sound design, sonic diffusion, acoustics, and psychoacoustics. The main objective of "digital audio effects" is to provide a synthesis of what can be done in the digital processing of sounds, and its application to music. It is intended to collect transformations of sounds in the form of computer algorithms and sound examples resulting from these transformations.	
6	Course Outcomes	After Successful completion of this course the student will be able to: CO1-*Define:* Fundamentals of Digital audio file formats CO2- *Illustrate:* the software tools CO3- *Apply:* IO streams, Interpolation and Oscillators CO4- *Analyze:* the Filtering and spatialization CO5- *Explain:* the resynthesis used in audio CO6- *Discuss:* Planning and Animation	
7	Course Description	This course will offer skill development in the use of Computer music and digital audio allows convenient manipulation, storage, transmission, and retrieval of an audio signal. Unlike analog audio, in which making copies of recording results in generation loss and degradation of signal quality, digital audio allows an infinite number of copies to be made without any degradation of signal quality.	
8	Outline syllabus		CO Mapping
	Unit 1	Fundamentals of digital audio works	
	A	Files, chunk, chunk types, Audio file formats: compressed, lossless, lossy.	CO1, CO2
	B	Visual Programming language: Max/Msp Interface for music and multi media	CO1, CO2

	C	MIDI (Musical Instrument Digital Interface): History, Applications, Devices and controllers with examples, Interface and design issues in audio and music software, File formats			CO1, CO2
	Unit 2	I/O synthesis			
	A	Managing I/O streams: byte streams, character streams, buffered streams, formatting and scanning			CO1, CO2, CO3, CO5
	B	Synthesis: Definition, types of synthesis: Additive synthesis and wavetable synthesis, FM and subtractive synthesis.			CO1, CO2, CO3, CO5
	C	Sampling synthesis, Granular synthesis with uses and applications			CO1, CO2, CO3, CO5
	Unit 3	Interpolation and Oscillators			
	A	Interpolation methods: linear, cosine, cubic, hermite, 3D linear, 3D hermite.			CO2, CO3
	B	Control functions and low-frequency oscillators for frequency and amplitude modulation			CO2, CO3
	C	Windows and envelopes in the time domain			CO2, CO3
	Unit 4	Filtering, Planning and spatialization			
	A	Delay, flanging, chorusing, reverberation, and other delay-based processing techniques			CO4, CO6
	B	Filtering: Low pass and high pass filtering, convolution: linear and circular.			CO4, CO6
	C	Panning, localization, and spatialization: Amptitude planning and Binaural processing			CO4, CO6
	Unit 5	Resynthesis and Animation			
	A	Fourier analysis and Resynthesis, cross-synthesis, and time compression/expansion			CO5, CO6
	B	Amplitude compression, expansion and multi rate method			CO5, CO6
	C	Understand basic hierarchy and object linking and Animation			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Fundamentals of Digital Audio (Computer Music & Digital Audio Series) by Alan P. Kefauver			

	Other References	Foundations of Computer Music Curtis Roads, John Strawn

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	*Define:* Fundamentals of Digital audio file formats	PO1, PO2, PO3, PO8, PO9, PO10
2.	*Illustrate:* the software and synthesis	PO1, PO2, PO4, PO5, PO7, PO10
3.	*Apply:* IO streams, Interpolation and Oscillators	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8
4.	*Analyze:* the Filtering and spatialization	PO1, PO2, PO3, PO4, PO8, PO9, PO10
5.	*Explain:* the resynthesis used in audio	PO1, PO2, PO3, PO8, PO9, PO10
6.	*Discuss:* Planning and Animation	PO1, PO2,PO3, PO4, PO5, PO6, PO7

PO and PSO mapping with level of strength for Digital Audio and Computer Music (Course Code BCA---)

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	3	3	3	-	-	2	-	-	3	3	2	2
CO2	3	3	-	3	3	-	3	-	-	3	2	1
CO3	2	2	3	3	3	3	3	3	-	-	1	2
CO4	2	2	3	3	-	-	-	3	3	3	2	3
CO5	2	2	3	-	-	-	-	3	3	3	1	1
CO6	2	3	2	3	3	3	3	-	-	-	2	1
	2.4	2.5	2.3	2	1.5	1.4	1.5	1.5	1.5	2	1.7	1.7

School:		School of Engineering and technology			
Department		Department of Computer Science and Engineering			
Program:		BCA (MM)			
Branch:					
1	Course Code	BCA034	Term V		
2	Course Title	Audio-Video Broadcasting Systems			
3	Credits	3			
4	Contact Hours (L-T-P)	3	0	0	
	Course Status				
5	Course Objective	The objective of this course are: 1. Get concept, working principle and its application in various types of modern electronic system. 2. knowledge acquired by students will help them to become familiar with designing concepts and troubleshooting of audio and video systems.			
6	Course Outcomes	After Successful completion of this course the student will be able to: 1. *Outline* the basic of audio and video terminologies and devices 2. *Develop* an understanding of human vision characteristics and video modulation. 3. *Identify* importance of sound and video systems including importance of compression. 4. *Analyze* various video broadcasting standards. 5. *Discover* various existing digital Broadcasting Standards and systems. 6. *Examine* the working of advanced Display technologies.			
7	Course Description	The knowledge acquired by students will help them to become familiar with designing concepts and troubleshooting of audio and video systems. The low cost video systems, cameras have brought video revolution in the field of home entertainment, education, training, advertising and electronic newsgathering. Dramatic developments in flat panel display, reduction in the cost of image scanning system, LCD display and integrated subsystems has affected our communication capabilities and life-style in broad sense. It is taken care to include these latest developments in the present syllabus.			
8	Outline syllabus				CO Mapping
	Unit 1	Audio Engineering			
	A	Characteristics Of Sound, Microphones And Loudspeakers, Magnetic Recording And Reproduction			CO1,CO2

	B	Noise Distortion And High Fidelity, Stereo Tape Recording And Reproduction			CO1,CO2
	C	CD and DVD Stereo Control, Public Address System(Audio Power Amplifiers), Surround Sound System			CO1,CO3
	Unit 2	Vision Characteristics, Scanning System And Analog Video			
	A	Introduction To Basic Television Systems, Characteristics Of Human Eye, Brightness, Perception, Persistence Of Vision Scanning			CO1, CO2,CO3
	B	Aspect Ratio, Flicker, The Keel Factor, Resolution Horizontal And Vertical Resolution, Video Bandwidth, Interlaced Scanning, Composite Video Signal Video Siganl Components			CO2,CO4
	C	Video Modulation, Vestigal Side Band Signal, Sound Modulation And Inter-Carrier System, Reception Of Vestigal Side Band Signal, Television Broadcast Channels And Standards			CO2,CO3
	Unit 3	Sound and Audio Technology			
	A	Psychoacoustics: frequency and amplitude sensitivity of hearing, music and noise, stereo effects, masking;			CO3, CO4
	B	Frequency domain compression of analog signal, digitization of audio signal: sampling and coding, digital audio signal processing			CO3,CO4
	C	architecture of sound card, electronic music and synthesizer, MIDI: Interface, protocol and data format.			CO3,CO4, CO5
	Unit 4	Video Technology and Digital video standards:			
	A	Analog video principles and broadcast standards,			CO4,CO5
	B	CCD Camera, recording formats and standard; digital video principles TV cards, frame grabber principles, IDTV and HDTV principles			CO1,CO4,CO5
	C	Digitizing Video, Chroma Subsampling, Basics of Video Compression (MPEG-x, H.26x), Digital VTR, Non-Linear Editing, 4:3 Vs 16:9 for Digital Video			CO4,CO5
	Unit 5	Digital Broadcasting Standards and systems			
	A	DAB, CCTV			CO5,CO6
	B	DVB-S, DVB- C, DVB-T			CO4,CO5,CO6
	C	HD radio, DTH.			CO5,CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1.Modern Television Practice(Fourth revised edition) - R.R.Gulati , New Age International Publishers. 2. Audio and Video Systems(Second Edition) - R.G.Gupta, McGraw Hill Education Limited.			

		3. Audio Engineering, Know it all series, Newnes Press	
	Other References	Essential Guide to Digital Video - John Watkinson, Snell & Wilcox Inc. Publication.	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1. *Understand* the working of advanced Display technologies.	PO1,PO2, PO3, PO4, PO6, PO10, PSO1,.PSO2
2.	CO2. *Develop* an understanding of human vision characteristics and video modulation.	PO1, PO2, PO3, PO4, PO7, PO8, PO10, PSO1, PSO2
3.	CO3:*Identify* importance of sound and video systems including importance of compression.	PO1, PO2, PO3, PO4 ,PO10, PSO1, PSO2
4.	CO4: *Analyze* various video broadcasting standards	PO1,PO2, PO4,PO10, PSO1,PSO2
5.	CO5: *Discover* various existing digital Broadcasting Standards and systems	PO1, PO2,PO3,PO4,PO10,PSO1, PSO2
6.	CO6: *Examine* the working of advanced Display technologies.	PO1,PO2, PO3, PO10, PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Audio-Video Broadcasting Systems (BCA034)

	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
Audio-Video Broadcasting Systems	CO1	1	1	2	2	-	2	-	-	-	2	2	2
	CO2	2	3	2	2	-	-	2	2	-	2	2	2
	CO3	2	3	3	1	-	-	-	-	-	1	2	3
	CO4	2	2	-	3	-	-	-	-	-	1	2	1
	CO5	3	3	2	1	2	-	-	-	-	1	2	3
	CO6	2	3	2	1	-	2	2	-	-	2	2	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
	Audio-Video Broadcasting Systems	2.0	2.5	1.8	1.7	0.3	0.7	0.7	0.3	0.0	1.5	2.0	2.2

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*

3. Addressed to *Substantial (High=3) extent*

Syllabus for Multimedia Security

School:		School of Engineering and technology		
Department		Department of Computer Science and Engineering		
Program:		BCA		
Branch:				
1	Course Code		Term: V	
2	Course Title	Multimedia Security		
3	Credits	3		
4	Contact Hours (L-T-P)	3	0	0
	Course Status			
5	Course Objective	Multimedia applications have (nearly) become part of everyday life through devices and tools such as cell phones, iPods, game interfaces such as Kinect and search engines. Multimedia information poses several challenges for software as well as hardware aspects. The primary reasons are their binary content, bulky sizes, and real-time requirements The objective of the course on multimedia systems course is to understand how different media data (such as text, audio, images, video, and 3D graphics) can be stored, queried, and delivered.		
6	Course Outcomes	After Successful completion of this course the student will be able to: *CO1: Outline* the requirement DRM framework and its architecture. *CO2: Analyze* different fingerprinting techniques along with its usage in the various security measures. *CO3: Compare* different existing encryption techniques such as AES, Huffman tree mutation, LKH etc. *CO4: Classify* different content authentication techniques based on its usage. *CO5: Discover* existing privacy preserving protocols in multimedia systems and security technologies. *CO6: Survey* algorithms, theories and tools developed in research and market of multimedia security issues, including digital rights management, copyright protection and authenticity verification		
7	Course Description	This course will cover selected topics in multimedia security and privacy, including techniques for steganography (literally "hidden writing"), steganalysis (detetion of steganography), digital watermarking, multimedia forensics, and format-compliant encryption. Applications include evading censorship, detecting or preventing unauthorized copying, and protecting privacy online. Students will complete well-defined programming assignments as well as an open-ended, independent final project.		
8	Outline syllabus			CO Mapping

	Unit 1	Digital rights management (DRM) framework	
	A	Requirements of a DRM system,Architectures	CO1, CO2
	B	Dimensions to content protection: Tracing (fingerprinting), authentication	CO1, CO2
	C	Key management and access control.	CO1, CO3
	Unit 2	Multimedia fingerprinting	
	A	Fingerprinting basics, Marking assumption, Collusion attack,Frame proof and anti-collusion codes	CO2,CO6
	B	Combining fingerprint modulation with coding: Introduction to coded fingerprint modulation, Semi-fragile fingerprinting; Multicast fingerprinting problem: Bandwidth security tradeoff	CO2, CO4
	C	Efficient security architectures: WHIM, Watercasting, Chameleon cipher; Joint fingerprinting and decryption (JFD)framework; Fingercasting.	CO2, CO3
	Unit 3	Multimedia encryption	
	A	Traditional symmetric key ciphers, Shannon's principles of confusion and diffusion; Overview of Advanced Encryption Standard (AES); Block and stream ciphers; Information theoretic secrecy;	CO3,CO6
	B	Multimedia encryption: Concept of layering, Multimedia compression technologies and standards; Principles for selective encryption; Image and Video encryption schemes: Chaotic maps, Transform domain encryption, Huffman tree mutation; Streaming media encryption: Scalable video protection	CO3, CO4,CO5
	C	Key management and distribution schemes: Key management for IP Multimedia: Public key methods, Key distribution by data embedding; Key exchange in multicast groups: Key refresh problem, Logical Key Hierarchy (LKH); Key distribution for fine grained access control.	CO3, CO4
	Unit 4	Content authentication techniques	
	A	Data authentication, One way hash functions, Message authentication codes (MACs);	CO4,CO6
	B	Multimedia authentication: Perceptual hashes; Parameterization; Watermarking based authentication: Notion of semi-fragility, Construction and design of semi-fragile watermarks	CO4, CO5,CO6
	C	Example: Principles of video authentication: Scalability issues, packet loss, post-processing.	CO5, CO6
	Unit 5	Privacy preserving protocols	
	A	Zero knowledge protocols, Anonymous fingerprinting	CO4,CO5,CO6
	B	Public key watermarking	CO5, CO6
	C	Non-perfect secret sharing constructions for anonymous fingerprinting with shared access control.	CO5, CO6
	Mode of	Theory	

	examination				
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. W. Zeng, H. Yu and C. Lin, Multimedia Security Technologies for Digital Rights Management, Elsevier, UK, 2006. 2. K. Karthik and D. Hatzinakos, Multimedia Encoding for Access Control With Traitor Tracing: Balancing Secrecy, Privacy and Traceability, VDM Verlag, ISBN: 978-3-8364-3638-0, Germany, 2008. 3. B. Furht and D. Kirovski (Eds.), Multimedia Security Handbook, CRC press, U.S., 2005			
	Other References	B. Schneier, Applied Cryptography: Protocols, Algorithms and Source Code in C, 2nd EdITION, Wiley India, 2007 (Reprint).			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1. Outline the requirement DRM framework and its architecture.	PO1,PO2,PO7, PO10, PSO1,.PSO2
2.	CO2. Analyze different fingerprinting techniques along with its usage in the various security measures.	PO1, PO2, PO3, PO7,PO10, PSO1, PSO2
3.	CO3. Compare different existing encryption techniques such as AES, Huffman tree mutation, LKH etc.	PO1, PO2, PO3, PO4,PO7,PO10, PSO1, PSO2
4.	CO4. Classify different content authentication techniques based on its usage	PO1,PO2, PO4,PO7,PO10, PSO1,PSO2
5.	CO5. Discover existing privacy preserving protocols in multimedia systems and security technologies.	PO1, PO2,PO3,PO4,PO7,PO10,PSO1, PSO2
6.	CO6. Survey algorithms, theories and tools developed in research and market of multimedia security issues, including digital rights management, copyright protection and authenticity verification	PO1,PO2, PO3,PO7, PO10, PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Multimedia Security

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
Multimedia Security	CO1	1	1	-	-	-	-	2	-	-	2	2	2
	CO2	2	3	2	-	-	-	2	-	-	2	2	2
	CO3	2	3	3	3	-	-	2	-	-	1	2	3
	CO4	2	2	-	3	-		3	-	-	1	2	1
	CO5	3	3	2	1	-	-	3	-		1	2	3
	CO6	2	3	2	2	-	-	3	-	-	2	2	2

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
	Multimedia Security	2.0	2.5	1.5	1.5	0.0	0.0	2.5	0.0	0.0	1.5	2.0	2.2

Average of non-zeros entry in following table (should be auto calculated).

VISUAL PROGRAMMING WITH VB

School: SET		Batch : 2020 onwards	
Program: BCA (MM)		Current Academic Year:	
Branch: CSE		Semester: II	
1	Course Code	BCA269	Course Name: VISUAL PROGRAMMING WITH VB
2	Course Title	VISUAL PROGRAMMING WITH VB	
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 develop and improve skills of students in object-oriented analysis, design, programming, and testing. Learn to use the VB IDE, .NET CLR, CLS, and class libraries to develop Windows desktop applications. Learn the Visual Basic syntax, program structure, properties, modules, collections, XML data, mu lti-tier applications with the event-driven programming model. Windows Forms, common controls, design-view, code view, class diagram view.	
6	Course Outcomes	CO1: *Develop* the fundamental concepts of object-oriented programming techniques. CO2: *Apply* modern IDE to visually and programmatically implement programs. CO3: *Analyse* the event-driven model and its interaction with the modern multitasking operating system CO4: *Design* and implement applications using an object-oriented methodology CO5: *Apply* decision and conditional statement in programming. CO6: *Make use of* debugging and testing tools available in Visual Studio.	
7	Course Description	This course provides a thorough introduction to the use of Visual Basic. The course introduces the Visual Basic Integrated Development Environment (IDE) and its wealth of development tools.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Visual Basic	
	A	Introduction Graphical User Interface (GUI), Programming Language, Procedural, Object Oriented, Event Driven)	CO1,CO2
	B	The Visual Basic Environment: tool box, menu bar, tool bar	CO1, CO2
	C	How to use VB complier to compile / debug and run the programs.	CO1, CO2
	Unit 2	Introduction to VB Controls	
	A	Textboxes, Frames, Check Boxes , Option Buttons, Images, Setting a Border & Styles,	CO1, CO2
	B	The Shape Control, The line Control, Working with	CO1, CO2,

		multiple controls and their properties,			CO3
	C	Designing the User Interface, Keyboard access, tab controls, Default & Cancel property, Coding for controls.			CO2, CO3, CO4
	Unit 3	Variables, Constants, and Calculations			
	A	Variables, Variables Public, Private, Static, Constants, Data Types,			CO1, CO2, CO4
	B	Naming rules/conventions, Constants, Named & intrinsic, Declaring variables, Scope of variables			CO1,CO2, CO4
	C	Val Function, Arithmetic Operations, Formatting Data			CO1, CO2
	Unit 4	Decision & Conditions			
	A	If Statement, If-then-else Statement, Comparing Strings,			CO1, CO2, CO5
	B	Compound Conditions(And, Or, Not), Nested If Statements, Case Structure ,Using If statements with Option Buttons & Check Boxes,			CO1, CO4, CO5
	C	Displaying Message in Message Box, Testing whether Input is valid or not , Apply test conditions. Using Call Statement to call a procedure.			CO1, CO4, CO5
	Unit 5	List Boxes, Combo Boxes, Sub-Procedures and Sub-functions			
	A	List Boxes & Combo Boxes, Filling the List using Property window / AddItem Method, Clear Method, List box Properties, Removing an item from a list, List Box/ Combo Box,			CO2, CO3, CO6
	B	Do/Loops, For/Next Loops, Using MsgBox Function, Using String Function, Printing to printer using Print Method,			CO2, CO3, CO6
	C	Creating a new sub-procedure, Passing Variables to Procedures, Passing Argument ByVal or ByRef, Writing a Function Procedure,			CO2, CO3, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	VB.NET: Programmer's Cookbook, by Matthew MacDonald, Microsoft Press.			
	Other References	“Programming in Visual Basic” by McBride “Programming in Visual Basic 6.0 with Working Model CD-ROM” by Julia Case Bradley and Anita Millspaugh			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Develop the fundamental concepts of object-oriented programming techniques.	PO1, PO2, PO4, PO6, PSO1, PSO2
2.	CO2: Apply modern IDE to visually and programmatically implement programs.	PO1, PO2, PO3, PO4, PO5, PO7, PO8, PO10, PSO1, PSO2
3.	CO3: Analyze the event-driven model and its interaction with the modern multitasking operating system	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO10, PSO1, PSO2
4.	CO4:Design and implement applications using an object-oriented methodology	PO1, PO2, PO4, PO8, PO9, PO10, PSO1, PSO2
5	CO5: Apply decision and conditional statement in programming.	PO1, PO2, PO3, PO5, PO9, PSO1, PSO2
6	CO6: Make use of debugging and testing tools available in Visual Studio	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8, PO10, PSO1, PSO2

PO and PSO mapping with level of strength

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	2	2	-	1	-	2	-	-		-	3	2
CO2	1	3	3	2	2	-	1	2	-	3	2	1
CO3	2	1	2	1	1	3	-	1	-	2	2	1
CO4	1	2	-	3	-	-	-	2	2	1	2	3
CO5	2	2	2	-	1	-	-	-	1	-	1	2
CO6	2	3	2	3	2	2	2	2	-	2	1	1
	1.7	2.2	2.3	2.0	1.5	2.3	1.5	1.8	1.5	2.0	1.8	1.7

Fundamentals of creative multimedia

School: SET		Batch : 2020 onwards	
Program: BCA (MM)		Current Academic Year: 2020	
Branch: CSE		Semester: II	
1	Course Code	BCA270	Course Name: Fundamentals of creative multimedia
2	Course Title	Fundamentals of creative multimedia	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	core	
5	Course Objective	This course aims to introduce the fundamental elements of multimedia. The emphasis will be on learning the representations, perceptions and applications of multimedia. Software skills and hands on work on digital media will also be emphasized.	
6	Course Outcomes	1. *Define: Fundamentals of Multimedia with software tools.* 2. *Demonstrate*: effective use of various font types 3. *Apply* theories and principles to multimedia design 4. *Design: Design* and creation of interactive multimedia-based applications 5. *Compare:* the factors that affect quality imaging 6. *Analyze*: the parameters that affect the quality of audio, video and animation	
7	Course Description	The aim of the syllabus is to provide orientation as regard to uses of Multimedia. Practical Assignments may be handled using Multimedia tools, such as Flash, Dreamweaver, Photoshop etc. or any other open source multimedia tools.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Multimedia.	
	A	What is multimedia, Components of multimedia, usage of multimedia, design principles	CO1, CO3
	B	Identify multimedia equipment, Hyper Media, WWW and internet, Web and Internet multimedia applications,	CO1, CO3
	C	Transition from conventional media to digital media: Modern approaches, Virtual reality, Educational benefit of multimedia	CO1, CO3, CO4

	Unit 2	Computer Fonts and Hypertext	
	A	Usage of text in Multimedia, Families and faces of fonts,	CO1, CO2, CO3
	B	Outline fonts, bitmap fonts International character sets and hypertext,	CO2, CO3
	C	Digital fonts techniques: history, OCR (optical character recognition)	CO2, CO3
	Unit 3	Audio fundamentals and representations	
	A	Digitization of sound, frequency and bandwidth, decibel system, data rate	CO1, CO3, CO4, CO6
	B	Audio file format, Sound synthesis, MIDI, wavetable, Compression and transmission of audio on Internet,	CO1, CO3, CO4, CO6
	C	Adding sound to your multimedia project, Audio software and hardware.	CO1, CO3, CO4, CO6
	Unit 4	Image fundamentals and representations.	
	A	Colour Science , Colour, Colour Models, Colour palettes, Dithering, 2D Graphics,	C01,CO2,CO3, CO4, CO5
	B	Image Compression and File Formats :GIF, JPEG, JPEG 2000, PNG, TIFF, EXIF, PS, PDF, Basic Image Processing [Can Use Photoshop],	C01,CO3, CO4, CO5
	C	Use of image editing software, White balance correction, Dynamic range correction, Gamma correction, Photo Retouching.	C01,CO3, CO4, CO5
	Unit 5	Video and Animation	
	A	Video Basics , How Video Works, Broadcast Video Standards, Analog video, Digital video, Video Recording and Tape formats, Shooting and Editing Video (Use Adobe Premier for editing),.	C01,CO2,CO3, CO4, CO6
	B	Video Compression and File Formats. Video compression based on motion compensation,	C01,CO2,CO3, CO4, CO6
	C	MPEG-1, MPEG-2, MPEG-4,	C01,CO2,CO3, CO4,

		MPEG-7, MPEG-21, Animation: Cell Animation, Computer Animation, Morphing			CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Fundamentals of Multimedia by Ze-Nian Li & Mark S. Drew. 2004.			
	Other References				

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	*Define: Fundamentals of Multimedia with software tools.*	PO1, PO2, PO3, PO4,PO10, PSO1, PSO2
2.	*Demonstrate*: effective use of various font types	PO1,PO2,PO3,PO4,PO5,PO6,PO7, PO9,PO10,PSO1,PSO2
3.	*Apply* theories and principles to multimedia design	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8,PO10,PSO1, PSO2
4.	*Design: Design* and creation of interactive multimedia-based applications	PO1, PO2,PO3, PO4, PO5, PO6, PO7,PO8, PO9, PO10,PSO1,PSO2
5.	*Compare:* the factors that affect quality imaging	PO1, PO2, PO3, PO8, PO9, PO10, PSO1, PSO2
6.	*Analyze*: the parameters that affect the quality of audio, video and animation	PO1, PO2,PO3, PO4, PO5, PO6, PO7,PO10 PSO1, PSO2

PO and PSO mapping with level of strength for Computer Modeling and Animation (Course Code CSP103)

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	3	1	2	2	-	-	-	-	-	3	2	2
CO2	3	3	3	3	2	2	3	-	2	3	3	2
CO3	2	3	3	2	3	3	3	3	-	3	2	2
CO4	2	2	3	2	3	2	-	3	3	3	3	3
CO5	2	2	3	2	-	-	-	3	3	3	3	1
CO6	2	3	3	3	1	3	3	-	-	2	2	1
	2.33	2.33	2.83	2.33	2.25	2.50	3.00	3.00	2.67	2.83	2.50	1.83

School: SET		Batch : 2020 onwards	
Program: B.Tech.		Current Academic Year: 2020	
Branch: CSE		Semester: III	
1	Course Code	BCA271	Course Name- Computer Modelling and Animation
2	Course Title	COMPUTER MODELLING AND ANIMATION	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core	
5	Course Objective	Computer modelling and Animation produce a 3D digital representation of any object with animation. In this 3D objects can be generated automatically or created manually by deforming the mesh, or otherwise manipulating vertices. These models are used for a variety of mediums including video games, movies, architecture, illustration, engineering, and commercial advertising which produce digital objects.	
6	Course Outcomes	After Successful completion of this course the student will be able to: CO1-*Define:* Fundamentals of Modelling and Animation CO2- *Illustrate:* Different techniques to create objects CO3- *Apply:* Rendering and animation CO4- *Analyze:* the objects using modifiers in Animation CO5- *Measure:* the objects in animation CO6- *Choose:* The appropriate techniques for designing Animation	
7	Course Description	This course will offer skill development in the use of software to develop storyboards and 2-dimentional animation including creating, importing and sequencing media elements to create multi-media presentations. Emphasis will be on conceptualization, creativity, and visual aesthetics.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	A	Terminology: The Graphical User Interface, Screen, Interface Input, The 3D Window, Window Modes Layers,	CO1, CO2
	B	Creating and Editing Objects: Importing objects, Working with Basic Meshes, Placing Objects in the Scene, Edit Mode and Object Mode, Scaling Objects, Precision Manipulation, Mesh Types, Cursor Placement, Moving Objects, Rotating Objects, The Transformation Widget, Selecting Vertices, Edges, and Faces, Mesh Vertex Editing, Edit Mode Selection Options, Creating Vertices,	CO1, CO2
	C	Center Points, Object Display, Smooth and Flat Shading Options, Proportional Vertex Editing, Extruding Shapes, Creating Ground, Inset Faces, Edge Loop Selection, Joining and Separating Meshes, Object Groups, Deleting Vertices,	CO1, CO2

		Edges, or Faces, Adding Faces, Spin and Spin Duplicate, Modifiers, The Knife Tool, Bezier Curves and Circles, Sculpt Mode, Extruding a Cup, Extruding a Trough Method 1	
	Unit 2	Usig Materials, Textures and lighting	
	A	Materials: Introduction to Materials, Material Settings, Material Buttons, Material Colors, Adding a New Material, The Preview Tab, The Diffuse Tab, The Specular Tab, The Hardness Value, Ramp Shaders, Halo Settings, Transparency and Reflection, Vertex Painting, Materials and the GUI, The Outliner Window, Multiple Material Slots	CO1, CO2, CO3
	B	Textures : Assigning Texture Color, Introduction to Textures, Material Textures, Texture Display in the 3D Window, Texture Mapping, Displacement Mapping, Texture Surface Displacement, UV Mapping, Selective UV Texture Mapping, Unwrapping with Seams, Texture Paint	CO1, CO2, CO3
	C	Lighting and Cameras: Texture as Background, Image as Background, Image as Template, Lighting Types and Settings, Lamp Settings, Cameras, Camera Settings Options, Camera Switching, Camera Tracking	CO1, CO2, CO3
	Unit 3	Rendering and Animation	
	A	Rendering and Ray Tracing: Rendering an Image or Movie, Rendering a JPEG Image, Rendering a Movie File, Playback, More Movie File Rendering, Video Codecs, Making a Movie, Ray Tracing, Cycles Ray Trace Rendering	CO1, CO2, CO3, CO4
	B	Animation Basics: Introduction to Animation, Moving, Rotating, and Scaling, Viewing Your Animation, The Graph Editor Window, Editing the Curve, Other Types of Curves, Modifying Curves, Automatic Key Framing, Rotation Explained, Rotation Using F Curves, Animating Other, Features, Keying Sets, Vertex Animation, Animation Following Curves, Displacement Sound Animation Control	CO1, CO2, CO3, CO4
	C	3D Text: Introduction to 3D Text, Creating 3D Text in Blender, The Object Data Button “F”, Creating Text on a Curve, Converting Text to a Mesh Object	CO1, CO2, CO3, CO4

	Unit 4	Nurbs, Modefiers and Particle system			
	A	Nurbs and Metashapes : Using Nurbs, Creating a Lofted Tunnel, Metashapes, Contents, Converting Text to a Curve, Elefont 3D Text.			CO3, CO4, CO5
	B	Modifiers: Introduction to Modifiers, Modifier Stacks, Modifiers for Modifying, Modifiers for Generating, Modifiers for Deforming, Modifiers for Simulating			CO3, CO4, CO5
	C	Particle Systems: Overview, Setting Up the Default Particle System, Particle Settings and Material Influence, The Particles Panel, Starting a Particle System, Material Influence on Particles, Particle Interaction, Wind Force, Sample Particle Settings, Keyed Particle Systems, Boids Particle Systems, Hair Particle Systems, The Assignment Tab, Fluid Particles			CO3, CO4, CO5
	Unit 5	Armatures and Smoke simulation			
	A	Armatures: Adding an Armature, Single Bone Armatures, Armature Display Types, Multibone Armatures			CO4,CO5, CO6
	B	Deforming a Mesh Object, Armature Modifiers, Humanoid Armatures, Disconnected Bones, Vertex Groups or Field of Influence, Inverse Kinematics, Shape Key and Action Editors, IK Constraint			CO4,CO5, CO6
	C	Smoke Simulation: Smoke Generation, Creating Smoke from Scratch, Create a Domain, Smoke from a Mesh Object, Flow Object, Rendering, Domain Settings for Rendering, Material Buttons, Smoke Generation Settings, Using Particles, Fire, Color Ramp			CO4,CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	The Complete Guide to Blender Graphics: Computer Modeling & Animation, Fifth Edition Book by John M. Blain			
	Other References	Modeling and Animation Using Blender: Blender 2.80: The Rise of Eevee by Ezra Thess Mendoza Guevarra			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) &

		Program Specific Outcomes (PSO)
1.	*Define:* Fundamentals of Modelling and Animation	PO1, PO2, PO6, PO9, PO10
2.	*Illustrate:* Different techniques to create objects	PO1, PO2, PO3, PO4, PO5, PO7, PO10
3.	*Apply:* Rendering and animation	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8
4.	*Analyze:* the objects using modifiers in Animation	PO1, PO2, PO3, PO4, PO8, PO9, PO10
5.	*Measure:* the objects in animation	PO1, PO2, PO3, PO8, PO9, PO10
6.	*Choose:* The appropriate techniques for designing Animation	PO1, PO2,PO3, PO4, PO5, PO6, PO7

PO and PSO mapping with level of strength for Computer Modeling and Animation (Course Code BCA271)

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	3	3	-	-	-	2	-	-	3	3	2	2
CO2	3	3	3	3	3	-	3	-	-	3	2	1
CO3	2	2	3	3	3	3	3	3	-	-	1	2
CO4	2	2	3	3	-	-	-	3	3	3	2	3
CO5	2	2	3	-	-	-	-	3	3	3	1	1
CO6	2	3	2	3	3	3	3	-	-	-	2	1
	2.4	2.5	2.3	2	1.5	1.4	1.5	1.5	1.5	2	1.7	1.7

School: SET		Batch : 2020 onwards	
Program: BCA		Current Academic Year: 2020	
Branch: CSE		Semester: II	
1	Course Code	BCP269	
2	Course Title	VISUAL PROGRAMMING WITH VB LAB	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	core	
5	Course Objective	The main goal of the course is to enable the students to create applications with Visual Basic that utilize multi-tier application design strategy for maintainability and reusability. The hands on exercises are focused on solving commonly encountered real world problems. Students will learn to build effective user interfaces with Visual Basic controls, forms, and other GUI components.	
6	Course Outcomes	Students will be able to have thorough Understanding of: CO1: *Design* formulate, and construct applications using visual programming. CO2: *Integrate* variables and constants into calculations in VB. CO3: *Analyze* and construct efficient and effective algorithms and translate to appropriate control structures in visual basic. CO4: *Apply* software development tools including libraries, compilers, and editors. CO5: *Develop* a Graphical User Interface (GUI) based on problem description CO6: *Illustrate* the capability to use the debugging and testing tools available in Visual basic.	
7	Course Description	The course introduces the Visual Basic Integrated Development Environment (IDE) and its wealth of development tools. Students will learn to build effective user interfaces with Visual Basic controls, forms, and other GUI components.	
8	Outline syllabus		CO Mapping
	1	Understand fundamental concepts of windows API's, and find out their relationship with MFC classes	CO1, CO2
	2	Acquainted with the concept of essential classes in a typical (Document- view architecture) and their relationship with each other.	CO1, CO2, CO3
	3	Use VB complier to compile / debug and run the programs.	CO1, CO2
	4	Write a program for creating Textboxes, Frames, Check Boxes , Option Buttons, Images, Setting a Border & Styles,	CO1, CO2,
	5	Write a program for creating Shape Control, The line Control, Working with multiple controls and their properties,	CO2, CO3, CO4
	6	Designing the User Interface, Keyboard access, tab controls, Default & Cancel property, Coding for controls.	CO3, CO4, CO5
	7	Write a program for creating to implement Variables: Public, Private, Static	CO3, CO4, CO5

	8	Write a program for creating to demonstrate naming rules/conventions, Constants, Named & intrinsic.			CO3, CO4, CO5
	9	Write a program for creating to show Arithmetic Operations.			CO2, CO4, CO5
	10	Create and Validate Login Form.			CO5, CO6
	11	Application using ASP.NET that uses validation controls			CO3, CO5
	12	Application with ADO.NET to perform Insert, Delete, Update and Select Operations			CO4, CO6
	13	Create an application in VC++ that shows how menu items can be grayed, disabled and appended at run time			CO5, CO6
	14	Design a simple calculator to perform addition, subtraction, multiplication and division function for the calculation			CO5, CO6
	15	A simple case study any application using form validation, conditional statements etc.			CO4, CO5, CO6,
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*				
	Reference Books	1. Interactive Computer Graphics A Top-Down Approach with OpenGL, Edward Angel, Pearson, 2. Malay K. Pakhira, Computer Graphics, Multimedia and Animation, PHI			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Design, formulate, and construct applications using visual programming.	PO1, PO2, PO3, PO4, PO5, PO7, PO8, PO10, PSO1, PSO2
2.	CO2: Integrate variables and constants into calculations in VB.	PO1, PO2, PO3, PO4, PO10, PSO1, PSO2
3.	CO3: Analyze and construct efficient and effective algorithms and translate to appropriate control structures in visual basic.	PO1, PO2, PO3, PO4, PO5, PO10, PSO1, PSO2
4.	CO4: Apply software development tools including libraries, compilers, and editors.	PO1, PO2, PO4, PO5, PO6, PO8, PO10, PSO1, PSO2
5	CO5: Develop a Graphical User Interface (GUI) based on problem description	PO1, PO2, PO5, PO6, PO8, PO9, PO10, PSO1, PSO2
6	CO6: Illustrate the capability to use the debugging and testing tools available in Visual basic	PO1, PO2, PO10, PSO1, PSO2

PO and PSO mapping with level of strength

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	2	3	2	1	2	-	1	1		2	3	2
CO2	1	3	3	2	-	-	-	-	-	3	2	1
CO3	2	1	2	1	1	-	-	-	-	1	2	1
CO4	1	2	-	3	1	1	-	2	-	1	2	3
CO5	2	2	-	-	2	2	-	2	2	1	3	2
CO6	3	3	2	2	-	-	-	-	-	2	1	3
	1.8	2.3	2.3	1.8	1.5	1.5	1.0	1.7	2.0	1.7	2.2	2.0

Fundamentals of creative multimedia

School: SET		Batch : 2020 onwards	
Program: BCA (MM)		Current Academic Year: 2020	
Branch: Computer Network		Semester:	
1	Course Code	BCP270	Course Name: Fundamentals of creative multimedia lab
2	Course Title	Fundamentals of creative multimedia lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	core	
5	Course Objective	This course aims to introduce the fundamental elements of multimedia. The emphasis will be on learning the representations, perceptions and applications of multimedia. Software skills and hands on work on digital media will also be emphasized.	
6	Course Outcomes	7. *Identify* the basic tools and components of a multimedia project. 8. *Demonstrate* effective use of different types of font. 9. *Design* and creation of interactive multimedia-based applications 10. *Illustrate* the use of audio and visual effect in images or animation 11. *Apply* basic elements and principles of photo editing software to achieve a great photo effect by applying effects like color, shadows, alteration of backgrounds. 12. *Create* different shapes using animation editing software.	
7	Course Description	The aim of the syllabus is to provide orientation as regard to uses of Multimedia. Practical Assignments may be handled using Multimedia tools, such as Flash, Dreamweaver, Photoshop etc. or any other open source multimedia tools.	
8	Outline syllabus		CO Mapping
	1	Design a document with different styles of font, Plenty of headings and sub headings and List.	CO1, CO2
	2	Write a program to justify a text entered by the user on both left and right hand side	CO1, CO2
	3	Design a Visiting Card containing at least one graphic and text information.	CO1, CO2, CO3, CO5
	4	Write a program to play “wave” or “midi” format sound files	CO1,CO3, CO4
	5	Write a program by which we can split mpeg video into smaller pieces for the purpose of sending it over the web or by small capacity floppy diskettes and then joining them at the destination.	CO1,CO3, CO4,CO5

	6	Image Editing and Manipulation - Basic Operations on image using any image editing software, Creating gif animated images, Image optimization			CO1, CO3, CO5
	7	Using photo editing software, make three copies of .jpeg picture. On one of these pictures, adjust the brightness and contrast, so that it gives an elegant look. On the second picture, change it to grayscale and the third is the original one			CO1,CO3, CO5, CO6
	8	Using photo editing software, Mask the background image given through your name.			CO1,CO3, CO5
	9	You are given a picture of a garden as background. Extract the image of a butterfly from another picture and organize it on the background. Use photo editing software.			CO1, CO3, CO5, CO6
	10	Using animation software, highlight a neatly formatted text by a spotlight from left to right.			CO1, CO2,CO3, CO5, CO6
	11	Using animation software show the gradual conversion of a square to a circle.			CO1,CO3, CO5, CO6
	12	Using animation software, highlight a neatly formatted text by a spotlight from left to right			CO3, CO5, CO6
	13	Create an animation to indicate a ball bouncing on steps.			CO1,CO3, CO5, CO6
	14	Using animation software draw the fan blades and to give proper animation.			CO1,CO3, CO5, CO6
	15	Using animation software, show the effect of a Virtual Drumbeat with suitable audio and visual effects			CO3, CO5, CO6
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Fundamentals of Multimedia by Ze-Nian Li & Mark S. Drew. 2004.			
	Other References				

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	*Identify* the basic tools and components of a multimedia project.	PO1,PO2, PO3, PO4,PO10 PSO1, PSO2

2.	*Demonstrate* effective use of different types of font.	PO1, PO2, PO3, PO4,PO5, PO6, PO10, PSO1, PSO2
3.	*Design* and creation of interactive multimedia-based applications	PO1,PO2, PO3, PO4, PO5,PO6, PO7,PO8,PO9, PO10, PSO1, PSO2
4.	*Illustrate* the use of audio and visual effect in images or animation	PO1, PO2,PO3, PO4, PO5, PO6, PO7,PO8,PO9,PSO1, PSO2
5.	*Apply* basic elements and principles of photo editing software to achieve a great photo effect by applying effects like color, shadows, alteration of backgrounds.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8,PSO1,PSO2
6.	*Create* different shapes using animation editing software.	PO1, PO2,PO3,PO4, PO5, PO9,PSO1, PSO2

PO and PSO mapping with level of strength for Fundamentals of creative Multimedia (Course Code BCP270)

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	3	1	2	2	-	-	-	-	-	2	2	2
CO2	3	2	3	2	1	2	-	-	-	2	3	2
CO3	3	2	3	3	2	3	3	3	3	2	2	2
CO4	3	2	3	3	2	2	3	3	3	2	3	3
CO5	3	2	3	3	2	2	3	3	-	2	3	2
CO6	3	3	3	3	1	2	-	-	3	2	2	2
	3	2	2.8	2.6	1.6	2.2	3	3	3	2	2.5	2.1

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School: SET		Batch :	
Program: BCA		Current Academic Year: 19-20	
Branch: BCA		Semester:6th Sem	
1	Course Code	BCP394	
2	Course Title	Project -2(BCA)	
3	Credits	9	
4	Contact Hours (L-T-P)		
	Course Status	Compulsory/Elective	
5	Course Objective	The objective of this course is to provide a platform to students to demonstrate their practical and theoretical skills gained during their entire program.	
6	Course Outcomes	Students will able to: CO1: Analyze a given problem and define its requirements and specifications appropriate to its solution. CO2: Design the problem solution as per the requirement analysis done. CO3: Fabricate and implement the solution by using various programming languages like C, C++, VB. Net, and Java Construct etc. CO4: Apply techniques of software verification and validation of project successfully. CO5: Take part in different teams and develop various application using latest technologies and tools. CO6: Effectively elaborate and communicate the project work in written and oral forms using appropriate supportive technologies.	
7	Course Description	This project work is to develop a solution to a problem by using the software engineering principles and practices. Students will define a project problem, do requirements analysis, systems design, software development, apply testing strategies and do documentation with an overall emphasis on the development of a robust, efficient and reliable software systems	
8	Outline syllabus		CO Achievement
	Unit 1	Analysis of problem	CO1
		Problem Definition, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any	
	Unit 2	Design	CO2
		Develop a work flow or block diagram for the proposed system / software, Design algorithms for the proposed problem.	
	Unit 3	Implementation	CO3
		Implementation of work under the guidance of a faculty member and obtain the appropriate results.	

	Unit 4	Development			CO4,CO5
		Demonstrate and execute Project with the team. Test the project modules.			
	Unit 5	Finalisation			CO5,CO6
		Report should include Abstract, Hardware / Software Requirement, Problem Statement, Design/Algorithm, Implementation Detail & Test Reports. References if any. The presentation, report, work done during the term supported by the documentation, forms the basis of assessment.			
	Mode of examination	Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	-			
	Other References				

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO)
1.	CO1: Identify and formulate problem statement with systematic approach.	PO1,PO2,PO4,PO5,PO7,PSO1,PSO2
2.	CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others.	PO5,PO7,PO8,PO9,PSO1, PSO2
3.	CO3: Design the problem solution as per the problem statement framed.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PSO1,PSO2
4.	CO4: Explain the characteristics, architecture of database approach, describe the components of the project.	PO1,PO2,PO3,PO4 PSO1,PSO2
5.	CO5: Fabricate and implement the solution by using different object oriented concepts like encapsulation, polymorphism etc.	PO1,PO2,PO3,PO4 PSO1,PSO2
6.	CO6: Develop a glory of the need to engage in life-long learning.	PO1,PO2,PO3,PO4,PO5 ,PO10,PSO1,PSO2

CO/PO Mapping (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low												
Cos	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	2	2		1	1		1				1	2
CO2					2		1	3	3		1	1
CO3	1	2	1	1	1	1	1				1	2

CO4	1	1	1	1							1	1
CO5	1	3	1	1							1	2
CO6	1	1	1	1	1					3	1	2
Avg PO attained	1	1.5	0.666667	0.833333	0.833333	0.166667	0.5	0.5	0.5	0.5	1	1.666667