

**DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,  
Chhatrapati Sambhajnagar.**



**CIRCULAR /SU/CM/NEP-UG/50/2023**

It is hereby inform to all concerned that, on the recommendation of the Dean, Faculty of Commerce & Management; **the Academic Council at its meeting held on 30.11.2023 has accepted the following subject wise Curriculum of National Education Policy-2020** Under the Faculty of Commerce & Management.

Sr.No	UG Subject wise Curriculum	Semester
01	B.Com	Ist & IInd
02	B.Com. E-Commerce	Ist & IInd
03	BBA	Ist & IInd
04	BCA	Ist & IInd

**This is effective from the Academic Year 2024-25 and Onwards as per appended herewith.**

All concerned are requested to note the contents of this circular and bring notice to the students, teachers and staff for their information and necessary action.

University Campus,  
Aurangabad-431 004.

REF.NO. SU/UGSYLL/2024-25/18935-44

Date:- 13-12-2023.

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*Deputy Registrar,  
Academic Section  
Syllabus unit.*

**Copy forwarded with compliments to :-**

- 1] **The Principals, all concerned affiliated Colleges, Dr. Babasaheb Ambedkar Marathwada University.**
- 2] **The Director, University Network & Information Centre, UNIC, with a request to upload this Circular on University Website.**

**Copy to :-**

- 1] The Director, Board of Examination & Evaluation,
- 2] **The Section Officer, [ B.Com. Unit ] Examination Branch,**
- 3] The Section officer, [Eligibility Unit],
- 4] **The Programmer [Computer Unit-1] Examinations,**
- 5] **The Programmer [Computer Unit-2] Examinations,**
- 6] The In-charge, [E-Suvidha Kendra], Rajarshi Shahu Maharaj Pariksha Dhavan, Dr. Babasaheb Ambekar Marathwada University.
- 7] The Public Relation Officer,
- 8] The Record Keeper.

**DR. BABASAHEB AMBEDKAR  
MARATHWADA UNIVERSITY,  
AURANGABAD.**



Curriculum of  
**BCA HONORS**  
**BACHELOR OF COMPUTER APPLICATION**  
**I TO IIND SEMESTER**

APPLICABLE FOR AFFILIATED COLLEGES

under NEP 2020

*[ Effective from the Academic Year 2024-25 & onwards ]*

**Dr. Babasaheb Ambedkar Marathwada University,  
Chhatrapati Sambhajinagar.**

***Faculty of Commerce & Management***

**Bachelors of Computer Application (BCA)  
(Honours) -04 Years PROGRAM**



**Program Structure  
As per NEP- 2020  
( Applicable For All Affiliated Colleges )**

*[Handwritten signatures]*

**Dr. Babasaheb Ambedkar Marathwada University, Aurangabad**  
**Faculty of Management Science**  
**Curriculum Structure**  
**Bachelor of Computer Applications (BCA) Honours**  
**Academic Year 2023-2024**

**Semester -I**

Course Type	Course Code	Course Title	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
<b>DSC : Discipline Specific Core</b>								
DSC -1	BCA101T	Computer Fundamentals	45 (03/per week)	02	50	30	20	20
DSC -2	BCA102T	Operating System	45 (03/per week)	02	50	30	20	20
DSC 1&2	BCA103P	Lab based on CF & OS	45 (03/per week)	02	50	30	20	20
<b>GE : Generic Elective ( Choose any one )</b>								
GE /OE-1	BCA104T	A  Digital Electronics	45 (03/per week)	02	50	30	20	20
		B  Principles of Marketing	45 (03/per week)	02	50	30	20	20
		C  Fundamentals of Accounting	45 (03/per week)	02	50	30	20	20
<b>OE : Open Elective ( Choose any one )</b>								
GE /OE-1	BCA105T	A  Web Development Technology	45 (03/per week)	02	50	30	20	20
		B  Programming Methodology	45 (03/per week)	02	50	30	20	20
		C  Internet Technology	45 (03/per week)	02	50	30	20	20
<b>VSC : Vocational Skill Course ( Choose any one )</b>								
VSC1	BCA106P	A  Ms-Office	45 (03/per week)	02	50	30	20	20
		B  Unix	45 (03/per week)	02	50	30	20	20
		C  Linux	45 (03/per week)	02	50	30	20	20
<b>SEC : Skill Enhancement Course ( Choose any one )</b>								
SEC-1	BCA107P	A  MS-Power BI	45 (03/per week)	02	50	30	20	20
		B  Web Development Technology using HTML Lab	45 (03/per week)	02	50	30	20	20
		C  Introduction to Tally	45 (03/per week)	02	50	30	20	20
<b>AEC : Ability Enhancement Course ( Choose any one )</b>								
AEC1	BCA108T	English	45 (03/per week)	02	50	30	20	20

VEC : Value Education Course ( Choose any one )								
VEC1	BCA109T	Indian Constitution	45 (03/per week)	02	50	30	20	20
IKS : Indian Knowledge System ( Choose any one )								
IKS	BCA110P	Preservation of Himroo Weaving Design Patterns of Paithani /Historical Heritage / Study of Regional Language / History of Marathwada / Khadi Gramudyog /International Trade in Ancient India	45 (03/per week)	02	50	--	50	20
CC : Co-curricular Course								
CCI	BCA111P	Health & Wellness	45 (03/per week)	02	50	--	50	20
				22	550			

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**Academic Year 2023-2024**

**Semester -II**

Course Type	Course Code	Course Title	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
<b>DSC : Discipline Specific Core</b>								
<b>DSC-3</b>	BCA201T	DBMS	45 (03/per week)	02	50	30	20	20
<b>DSC -4</b>	BCA202T	C programming	45 (03/per week)	02	50	30	20	20
<b>DSC 3&amp;4</b>	BCA203P	Lab based on DBMS & C programming	45 (03/per week)	02	50	30	20	20
<b>Minor</b>								
<b>M1</b>	BCA204T	Discrete Mathematics	45 (03/per week)	02	50	30	20	20
<b>GE : Generic Elective ( Choose any one )</b>								
<b>GE/OE-3</b>	BCA205T	A  Basics of Electronics	45 (03/per week)	02	50	30	20	20
		B  Business Organisation	45 (03/per week)	02	50	30	20	20
		C  Fundamentals of Banking	45 (03/per week)	02	50	30	20	20
<b>OE C]: Open Elective ( Choose any one )</b>								
<b>GE/OE-4</b>	BCA206T	A  Advance Web Development Technology	45 (03/per week)	02	50	30	20	20
		B  System Analysis & Design	45 (03/per week)	02	50	30	20	20
		C  Digital Marketing	45 (03/per week)	02	50	30	20	20
<b>VSC : Vocational Skill Course ( Choose any one )</b>								
<b>VSC2</b>	BCA207P	A  Basic of Electronics Lab	45 (03/per week)	02	50	30	20	20
		B  Data Analysis Using MS-Excel	45 (03/per week)	02	50	30	20	20
		C  Analysis of Balance Sheet	45 (03/per week)	02	50	30	20	20
<b>SEC : Skill Enhancement Course ( Choose any one )</b>								
<b>SEC2</b>	BCA208P	A  Advance Web Development Technology Lab	45 (03/per week)	02	50	30	20	20
		B  System Analysis & Design -Lab	45 (03/per week)	02	50	30	20	20

		C Digital Marketing -Lab	45 (03/per week)	02	50	30	20	20
<b>AEC : Ability Enhancement Course ( Choose any one – Modern Indian Language )</b>								
<b>AEC2</b>	BCA209T	Hindi / Marathi / Urdu / Arabic / Sanskrit /Pali	45 (03/per week)	02	50	30	20	20
<b>VEC : Value Education Course</b>								
<b>VEC2</b>	BCA210T	Environment Studies	45 (03/per week)	02	50	30	20	20
<b>BCA204T CC : Co-curricular Course ( Choose any one )</b>								
<b>CC2</b>	BCA211P	A  Yoga Education	45 (03/per week)	02	50	--	50	20
		B  Sports & Fitness	45 (03/per week)	02	50	--	50	20
				<b>22</b>	<b>550</b>			

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**Semester -III**

Course Type	Course Code	Course Title	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination				
					Max Marks	UA	IA	Min Marks	
<b>DSC : Discipline Specific Core</b>									
DSC-5	BCA301T	Data Structure using C	45 (03/per week)	02	50	30	20	20	
	BCA302P	Data Structure using C-Lab	45 (03/per week)	02	50	30	20	20	
DSC-6	BCA303T	Advance Database Management	45 (03/per week)	02	50	30	20	20	
	BCA304P	Advance Database Management	45 (03/per week)	02	50	30	20	20	
<b>Minor</b>									
M2	BCA305T	Statistics	45 (03/per week)	02	50	30	20	20	
	BCA306T	Mathematics	45 (03/per week)	02	50	30	20	20	
<b>GE / OE : Generic Elective / Open Elective ( Choose any one )</b>									
GE/OE -5	BCA307T	A] Computer Networking	45 (03/per week)	02	50	30	20	20	
		B] Microcontroller	45 (03/per week)	02	50	30	20	20	
		C] Computer Hardware	45 (03/per week)	02	50	30	20	20	
	<b>Select any one Lab with respect to selection of any one GE / OE from the above</b>								
	BCA308P	A] Computer Networking -Lab	45 (03/per week)	02	50	30	20	20	
		B] Microcontroller-Lab	45 (03/per week)	02	50	30	20	20	
C] Computer Hardware-Lab		45 (03/per week)	02	50	30	20	20		
<b>VSC : Vocational Skill Course ( Choose any one )</b>									
VSC-3	BCA309P	A] JavaScript Lab	45 (03/per week)	02	50	30	20	20	
		B] Oracle Lab	45 (03/per week)	02	50	30	20	20	
		C] Web services using XML Lab	45 (03/per week)	02	50	30	20	20	
<b>AEC : Ability Enhancement Course ( Choose any one – Modern Indian Languages )</b>									
AEC3	BCA310T	Hindi / Marathi / Urdu / Arabic / Sanskrit / Pali	45 (03/per week)	02	50	30	20	20	
<b>FP : Field Project</b>									



<b>FPI</b>	BCA311P	Field Project	45 (03/per week)	02	50	--	50	20
<b>OR ( Select either FPI or CC3)</b>								
<b>CC : Co-curriculum Course</b>								
<b>CC3</b>	BCA311P	Cultural Activity / NSS / NCC	45 (03/per week)	02	50	--	50	20
				<b>22</b>	<b>550</b>			

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**Semester -IV**

Course Type	Course Code	Course Title	Total Lectures (Teaching Lectures /week))	Credits	Scheme of Examination				
					Max Marks	UA	IA	Min Marks	
<b>DSC : Discipline Specific Core</b>									
DSC-7	BCA401T	OOPs using C++	45 (03/per week)	02	50	30	20	20	
	BCA402P	OOPs using C++ - Lab	45 (03/per week)	02	50	30	20	20	
DSC-8	BCA403T	ASP.Net	45 (03/per week)	02	50	30	20	20	
	BCA404P	ASP.Net -Lab	45 (03/per week)	02	50	30	20	20	
<b>Minor</b>									
M3	BCA405T	Python	45 (03/per week)	02	50	30	20	20	
	BCA406P	Python - Lab	45 (03/per week)	02	50	30	20	20	
<b>GE/OE : Generic Elective / Open Elective ( Choose any one )</b>									
GE4/OE4	BCA407T	A  SPSS	45 (03/per week)	02	50	30	20	20	
		B  Creativity & Innovation	45 (03/per week)	02	50	30	20	20	
		C  Cyber Security	45 (03/per week)	02	50	30	20	20	
	<b>Select any one Lab with respect to selection of any one GE / OE from the above</b>								
	BCA408P	A  SPSS - Lab	45 (03/per week)	02	50	30	20	20	
		B  Creativity & Innovation -Practical	45 (03/per week)	02	50	30	20	20	
C  Cyber Security - Lab		45 (03/per week)	02	50	30	20	20		
<b>SEC : Skill Enhancement Course ( Choose any one )</b>									
SEC-3	BCA409T	A  Quantitative Aptitude	45 (03/per week)	02	50	30	20	20	
		B  Business Communication	45 (03/per week)	02	50	30	20	20	
		C  Life Skills	45 (03/per week)	02	50	30	20	20	
<b>AEC : Ability Enhancement Course ( Choose any one )</b>									
AEC4	BCA410T	Modern Indian Languages. Choose	45 (03/per week)	02	50	30	20	20	

		any one from available Indian Language Hindi / Marathi / Urdu / Arabic / Sanskrit / Pali						
<b>CEP : Community Engagement Project or Co-curriculum Course</b>								
<b>CEP</b>	BCA411T	Community Engagement Project	45 (03/per week)	02	50	--	50	20
<b>OR (Select either CEP or CC4)</b>								
<b>CC4</b>	BCA411T	NSS / NCC/ Fine / Applied / Visual / Performing Arts	45 (03/per week)	02	50	--	50	20
				<b>22</b>	<b>550</b>			

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**Semester -V**

Course Type	Course Code	Course Title	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination				
					Max Marks	UA	IA	Min Marks	
<b>DSC : Discipline Specific Core</b>									
DSC-9	BCA501T	Java Programming	45 (03/per week)	02	50	30	20	20	
	BCA502P	Java Programming - Lab	45 (03/per week)	02	50	30	20	20	
DSC-10	BCA503T	Software Engineering	45 (03/per week)	01	50	30	20	20	
	BCA504P	Software Engineering -Lab	45 (03/per week)	01	50	30	20	20	
<b>DSE : Discipline Specific Elective</b>									
DSE-1	BCA505T	A] Advance Java	45 (03/per week)	01	50	30	20	20	
		B] C#	45 (03/per week)	01	50	30	20	20	
		C] Web Development using PHP	45 (03/per week)	01	50	30	20	20	
	<b>Select any one Lab with respect to selection of any one DSE from the above</b>								
	BCA506P	A] Advance Java -Lab	45 (03/per week)	01	50	30	20	20	
		B] C#-Lab	45 (03/per week)	01	50	30	20	20	
		C] Web Development using PHP-Lab	45 (03/per week)	01	50	30	20	20	
<b>Minor</b>									
M5	BCA507T	Android	45 (03/per week)	02	50	30	20	20	
	BCA508P	Android-Lab	45 (03/per week)	02	50	30	20	20	
<b>VSC : Vocational Skill Course ( Choose any one )</b>									
VSC-4	BCA509T	A] Sensors Technology	45 (03/per week)	02	50	30	20	20	
		B] Entrepreneurship	45 (03/per week)	02	50	30	20	20	
		C] Image Processing	45 (03/per week)	02	50	30	20	20	
	<b>Select any one Lab with respect to selection of any one VSC from the above</b>								
BCA510P	A] Sensors Technology -Lab	45 (03/per week)	02	50	30	20	20		
	B] Entrepreneurship - Lab	45 (03/per week)	02	50	30	20	20		

		C  Image Processing-Lab	45 (03/per week)	02	50	30	20	20
<b>FP : Field Project</b>								
<b>FP2</b>	BCA511P	Field Project	45 (03/per week)	02	50	--	50	20
<b>OR ( Select either FP2 or CEP)</b>								
<b>CEP</b>	BCA511P	Community Engagement Project	45 (03/per week)	02	50	--	50	20
				<b>22</b>	<b>550</b>			

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**Academic Year 2023-2024**

**Semester -VI**

Course Type	Course Code	Course Title	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination				
					Max Marks	UA	IA	Min Marks	
<b>DSC : Discipline Specific Core</b>									
<b>DSC-11</b>	BCA601T	Internet of Things (IoT)	45 (03/per week)	02	50	30	20	20	
	BCA602P	Internet of Things (IoT) - Lab	45 (03/per week)	02	50	30	20	20	
<b>DSC-12</b>	BCA603T	Software Testing	45 (03/per week)	01	50	30	20	20	
	BCA604P	Software Testing - Lab	45 (03/per week)	01	50	30	20	20	
<b>DSC-13</b>	BCA605T	Software Project Management(SPM)	45 (03/per week)	01	50	30	20	20	
<b>DSE : Discipline Specific Elective ( Choose any one )</b>									
<b>DSE-2</b>	BCA606T	A  Java Server Page (JSP)	45 (03/per week)	01	50	30	20	20	
		B  Geographic information System(GIS)	45 (03/per week)	01	50	30	20	20	
		C  Data Warehousing & Data Mining	45 (03/per week)	01	50	30	20	20	
	<b>Select any one Lab with respect to selection of any one DSE from the above</b>								
	BCA607P	A  Java Server Page (JSP) -Lab	45 (03/per week)	01	50	30	20	20	
		B  Geographic information System(GIS) -Lab	45 (03/per week)	01	50	30	20	20	
		C  Data Warehousing & Data Mining -Lab	45 (03/per week)	01	50	30	20	20	
<b>Minor</b>									
<b>M5</b>	BCA608T	Android Application Development	45 (03/per week)	02	50	30	20	20	
	BCA609P	Android Application Development - Lab	45 (03/per week)	02	50	30	20	20	
<b>OJT : On Job Training</b>									
<b>OJT -1</b>	BCA610P	On Job Training -I	90 (06/per week)	04	100	60	40	40	
				<b>22</b>	<b>550</b>				

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**Academic Year 2023-2024**

**Semester -VII**

Course Type	Course Code	Course Title	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
<b>DSC : Discipline Specific Core</b>								
DSC-14	BCA701T	Cloud Computing	45 (03/per week)	02	50	30	20	20
	BCA702P	Cloud Computing-Lab	45 (03/per week)	02	50	30	20	20
DSC-15	BCA703T	Artificial Intelligence	45 (03/per week)	01	50	30	20	20
	BCA704P	Artificial Intelligence-Lab	45 (03/per week)	01	50	30	20	20
DSC-16	BCA705T	Design and Analysis of Algorithms	45 (03/per week)	02	50	30	20	20
	BCA706P	Design and Analysis of Algorithms-Lab	45 (03/per week)	02	50	30	20	20
DSC-17	BCA707T	Theory of Computation	45 (03/per week)	02	50	30	20	20
<b>DSE : Discipline Specific Elective ( Choose any one )</b>								
DSE-3	BCA708T	A] Hibernate	45 (03/per week)	02	50	30	20	20
		B] Multimedia	45 (03/per week)	02	50	30	20	20
		C] E-Commerce	45 (03/per week)	02	50	30	20	20
	<b>Select any one Lab with respect to selection of any one DSE from the above</b>							
	BCA709P	A] Hibernate -Lab	45 (03/per week)	02	50	30	20	20
		B] Multimedia - Lab	45 (03/per week)	02	50	30	20	20
C] E-Commerce - Lab		45 (03/per week)	02	50	30	20	20	
<b>Minor</b>								
M6	BCA710T	Research Methodology	45 (03/per week)	02	50	30	20	20
	BCA711P	Research Methodology -Lab	45 (03/per week)	02	50	30	20	20
				<b>22</b>	<b>550</b>			

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**Academic Year 2023-2024**

**Semester -VIII**

Course Type	Course Code	Course Title	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination				
					Max Marks	UA	IA	Min Marks	
<b>DSC : Discipline Specific Core</b>									
DSC-18	BCA801T	Block Chain Technology	45 (03/per week)	02	50	30	20	20	
	BCA802P	Block Chain Technology -Lab	45 (03/per week)	02	50	30	20	20	
DSC-19	BCA803T	Data Science using Python	45 (03/per week)	02	50	30	20	20	
	BCA804P	Data Science using Python-Lab	45 (03/per week)	02	50	30	20	20	
DSC-20	BCA805T	Big Data	45 (03/per week)	02	50	30	20	20	
	BCA806P	Big Data-Lab	45 (03/per week)	02	50	30	20	20	
DSC-21	BCA807T	Principles of Management	45 (03/per week)	02	50	30	20	20	
<b>DSE : Discipline Specific Elective ( Choose any one )</b>									
DSE-4	BCA808T	A  Amazon Web Service (AWS)	45 (03/per week)	02	50	30	20	20	
		B  Machine Learning	45 (03/per week)	02	50	30	20	20	
		C  R-programming	45 (03/per week)	02	50	30	20	20	
	<b>Select any one Lab with respect to selection of any one DSE from the above</b>								
	BCA809P	A  Amazon Web Service (AWS) -Lab	45 (03/per week)	02	50	30	20	20	
		B  Machine Learning - Lab	45 (03/per week)	02	50	30	20	20	
		C  R-programming - Lab	45 (03/per week)	02	50	30	20	20	
<b>OJT : On Job Training</b>									
OJT-2	BCA810T	On Job Training -3	90 (06/per week)	04	100	60	40	40	
				<b>22</b>	<b>550</b>				



**Dr. Babasaheb Ambedkar Marathwada University Aurangabad**  
**Bachelor of Computer Application (BCA)- Honours**  
**Syllabus**  
**Academic Year 2023-24**  
**Semester - I**

**Discipline Specific Core (DSC)**

<b>Subject Title</b>	<b>Computer Fundamentals</b>		
<b>Subject Ref. No.</b>	BCA101T	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b>			
<i>The main objective of this course to provide basic knowledge of Computer hardware , software, input/output devices, memory , introduction to network</i>			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	Converse in basic computer terminology		
<b>CO-2</b>	Formulate opinions about the impact of computers on society		
<b>CO-3</b>	Possess the knowledge of basic hardware peripherals		
<b>CO-4</b>	Know the basics of programming and networking		

<b>Pre Requisite</b>		<b>Number of Lecture</b>
<b>Unit - I</b>	<b>Introduction to Computer:</b> Computer Characteristics, Concept of Hardware, Software , Evolution of computer and Generations, Types of Computer – Analog and Digital computers, Hybrid Computers, General Purpose and Special Purpose Computer, Limitations of Computer Applications of Computer in Various Fields. <b>Structure and Working of Computer:</b> Functional Block Diagram of Computer. CPU, ALU, Memory Unit, Bus Structure of Digital Computer – Address, Data and Control Bus. <b>Input / Output Devices:</b>	<b>26</b>

	Input Device – Keyboard, Mouse, Scanner, MICR, OMR. Output Devices – VDU, Printers – Dot Matrix, Daisy-wheel, Inkjet, Laser, Line Printers and Plotters. <b>Computer Memory</b> : Memory Concept, Memory Cell, Memory Organization, Semiconductor Memory – RAM, ROM, PROM, EPROM, Secondary Storage Devices – Magnetic Tape, Magnetic Disk (Floppy Disk and Hard Disk.), Compact Disk.	
<b>Unit - II</b>	<b>Computer Language and Software:</b> Algorithm, Flowcharts, Machine Language, Assembly Language, High Level Language, Assembler, Compiler, Interpreter. Characteristics of Good Language. Software – System and Application Software with examples. <b>Networking:</b> Concept, Basic Elements of a Communication System, Data Transmission Media, Topologies, LAN, MAN, WAN, Internet	<b>19</b>
		<b>Total - 45 Lecture</b>
<b>Text Books</b>	1. Introduction to Computers by Peter Norton, McGraw Hill 2. Introduction to Computers by Balagurusamy, McGraw Hill	
<b>Additional Reference Books</b>	1. Modern Digital Electronics by R. P. Jain, 3 <sup>rd</sup> Edition, McGraw Hill 2. Digital Design and Computer Organisation by Dr. N. S. Gill and J. B. Dixit, University Science Press 3. Digital Principles and Applications by Malvino and Leach, McGraw Hill	

<b>Subject Title</b>	<b>Operating System</b>		
<b>Subject Ref. No.</b>	<b>BCA102T</b>	<b>No. of Credits</b>	<b>2</b>
		<b>No. of Periods / Week</b>	<b>45/3</b>
		<b>Assignments / Sessional</b>	<b>20</b>
		<b>Semester Examination</b>	<b>30</b>

### Course Objectives

*The main objective of this course to provide role & basic operations of operating system, memory management & types of Operating System*

### Course Outcomes (COs)

At the end of the course, students will be able to:

<b>CO-1</b>	Understand the main components and Structure of Operating System& their functions.
<b>CO-2</b>	Analyze various ways of Process Management& CPU Scheduling Algorithms.
<b>CO-3</b>	Evaluate various device and resources like Memory, Time and CPU Management techniques in distributed systems.
<b>CO-4</b>	Apply different methods for Preventing Deadlocks in a Computer System.
<b>CO-5</b>	Execute basic operations over the UNIX operating system.

<b>Pre Requisite</b>		<b>Number of Lecture</b>
<b>Unit - I</b>	Introduction: What Operating Systems do, Computer system organization, Computer system architecture, Operating system structure? System Structure: Operating system services, User operating system interface, System Calls, Types of System Calls, Overview of UNIX Operating System, Basic features of Unix operating System. Process Concept: Process Concept, Process Scheduling, Operation on Process. Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms.	<b>18</b>
<b>Unit - II</b>	Synchronization: Background, The critical section problem. Semaphores: Usage, Implementation, Deadlocks and Starvation, Classic problems of synchronization. Deadlocks: Deadlock Characterization,	<b>27</b>

	Deadlock Prevention. Memory Management: Background, Basic hardware, Address Binding, Swapping, Contiguous memory allocation, Paging: Basic Method, Hardware Support, Protection, and Memory Management in UNIX. Files and Directories in UNIX, File Structure, File System Implementation of Operating System Functions, File permission, Basic Operation on Files.	
		<b>Total - 45 Lecture</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. Operating system Concepts: Abraham Silberschatz, Peter B. Galvin, Greg Gagne, 8th Edition, Wiley.</li> <li>2. Unix and shell Programming by B.M Harwani, OXFORD University Press.</li> </ol>	
<b>Additional Reference Books</b>	<ol style="list-style-type: none"> <li>1. Principles of Operating Systems by Naresh Chauhan, OXFORD University Press .</li> <li>2. Unix Concept and application- Sumitabhadas</li> <li>3. Unix Shell Programming-YashwantKanetkar</li> </ol>	

<b>Subject Title</b>	<b>Computer Fundamentals &amp; OS - LAB</b>		
<b>Subject Ref. No.</b>	BCA103P	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

### Course Objectives

The main objectives of this course are to understand the basic application of Computer Software's

### Course Outcomes (COs)

At the end of the course, students will be able to:

<b>CO-1</b>	Understand the basis applications of Computer Software
<b>CO-2</b>	Study the basic components of Computer system
<b>CO-3</b>	Learn browsing & searching
<b>CO-4</b>	Establish virtual communication using various online platforms
<b>CO-5</b>	Understand the main components and Structure of Operating System & their functions.
<b>CO-6</b>	Analyze various ways of Process Management & CPU Scheduling Algorithms.
<b>CO-7</b>	Evaluate various device and resources like Memory, Time and CPU Management techniques in distributed systems.
<b>CO-8</b>	Apply different methods for Preventing Deadlocks in a Computer System.

### Section - A

#### *List of Practical's*

- 1) Making report of Configuration of computer in Lab
- 2) Study different ports of CPU & connect different devices.
- 3) Connecting Internet using wire & wireless.
- 4) Installation & configuration of windows 7/8/10
- 5) Creating user in windows & configure
- 6) Browsing & Surfing on internet
- 7) Creating email address, sending receiving mail etc.

- 8) Practical Based on remote desktop on platform
- 9) Online meeting using zoom, google meet, skype etc.
- 10) Google form
- 11) Accessing network, identifying computer name & sharing drive & folder
- 12) Google Classroom

## Section - B

- 1) Experiments on DOS : Perform these commands internal commands, DIR,TYPE,DEL,ERASE,MD,CD,COPY,RMDIR,VER,DATE,TIME,PAT H,CLS,RMDIR,VER,DATE,TIME,PATH,CLS,BREAK, SET,EXIT.
- 2) Experiments on linux 2. Perform an experiment to install any rpm or debian linux distribution with emphasis on drive partitioning. , Install rpm and deb packages, Perform these commands in linux- chmod, su , chown, chgrp ,ls, mkdir, pwd, date, who, find, uname, wc, ifconfig. , Create, open , edit, view file in linux.
- 3) Experiments of Windows : Mycomputer, properties , Folder , files , sub-folder, create folder, copy, rename, delete, recycle bin, tool bar , menu bar,
- 4) Control Panel, components of control panel, command line,

*Generic Elective / Open Elective*  
*Select any one from BCA104T ( A) to BCA104T ( C)*

<b>Subject Title</b>	<b>Digital Electronics</b>		
<b>Subject Ref. No.</b>	BCA104T ( A)	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b>			
The main objective of this course is To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	Examine the structure of number systems and perform the conversion among different number systems		
<b>CO-2</b>	Became familiar with the digital signal, positive and negative logic, Boolean algebra, logic gates, logical variables, the truth table,		
<b>CO-3</b>	Illustrate reduction of logical expressions using Boolean algebra, k-map and tabulation method and implement the functions using logic gates		
<b>CO-4</b>	realize combinational circuits for given application		

<b>Pre Requisite</b>	There is no prerequisites for attending this course	<b>No of Lecture</b>
<b>Unit – I</b>	<p><b>Number Systems</b>            Analogue versus Digital ,Number Systems , Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, 1's Complement &amp; 2's Complement subtraction, Conversion Binary - Decimal, Octal-Decimal, Hexadecimal-Decimal, Decimal-Binary, Decimal-Octal, Decimal-Hexadecimal, Binary - Octal, Octal - Binary, Hex - Binary, Binary - Hex, Hex - Octal and Octal - Hex.</p> <p><b>Binary Codes &amp; Digital Arithmetic</b>            Binary Coded Decimal (BCD), BCD-to-Binary, Binary-to-BCD Conversion, ASCII code, Basic Rules of Binary Addition and Subtraction, Binary Addition, Multiplication, Subtraction Using 1's &amp; 2's Complement, Binary Division.</p> <p><b>Logic Gates &amp; Boolean Algebra</b></p>	<b>20</b>

	<p>Positive and Negative, Truth Table, Logic Gates, OR Gate, AND Gate, NOT Gate, EXCLUSIVE-OR Gate, NAND Gate, NOR Gate, EXCLUSIVE-NOR Gate, Universal Gates. Introduction to Boolean Algebra, Postulates of Boolean Algebra, Theorems of Boolean Algebra,</p> <p><b>Simplification Techniques</b></p> <p>Sum-of-Products Boolean Expressions, Product-of-Sums Expressions, <math>\Sigma</math> and Pi Nomenclature, Karnaugh Map Method, Construction of a Karnaugh Map, K Map for 2, 3 &amp; 4 variables, rolling &amp; Overlapping, Don't care condition</p>	
<b>Unit – II</b>	<p><b>Arithmetic Circuits</b></p> <p>Combinational Circuits, Implementing Combinational Logic, Arithmetic Circuits Basic Building Blocks , Half-Adder, Full Adder , Half-Subtractor , Full Subtractor , Adder -Subtractor, Arithmetic Logic Unit (ALU).</p> <p><b>Flip-Flops</b></p> <p>Flip-Flop, Clocked R-S Flip-Flop, J-K Flip-Flop, Master–Slave Flip-Flops, J-K Flip-Flop with PRESET and CLEAR Inputs, Toggle Flip-Flop, D Flip-Flop, D Flip-Flop.</p> <p><b>Multiplexers and Demultiplexers</b></p> <p>Multiplexer, Inside the Multiplexer, Implementing Boolean Functions with Multiplexers, Encoders, Demultiplexers and Decoders, Implementing Boolean Functions with Decoders, 3-to-8 line decoder.</p> <p><b>Counters and Registers</b></p> <p>Ripple (Asynchronous) Counter, Synchronous Counter , Modulus of a Counter, UP/DOWN Counters , Decade and BCD Counters , Shift Register, Serial-In Serial-Out Shift Register , Serial-In Parallel-Out Shift Register, Parallel-In Serial-Out Shift Register, Parallel-In Parallel-Out Shift Register.</p>	25
	<b>Total – Lecture</b>	45
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1) Digital Electronics Principles, Devices and Applications By Anil K. Maini , John Wiley &amp; Sons, Ltd</li> <li>2) Digital Electronics &amp; Micro- Computer R.K Gaur Dhanpat Rai Publication</li> <li>3) Modern Digital Electronics By R.P Jain MC Graw Hill Publication</li> </ol>	
<b>Additional Reference Books</b>	Digital Fundamentals by Thomas L. Floyd , Pearson Education Limited	



<b>Subject Title</b>	<b>Principles of Marketing</b>										
<b>Subject Ref. No.</b>	BCA104T ( B)	<b>No. of Credits</b>	2								
		<b>No. of Periods / Week</b>	45 /3								
		<b>Assignments / Sessional</b>	20								
		<b>Semester Examination</b>	30								
<p><b>Course Objectives</b> To understand the nuances of Marketing in the present scenario</p> <p><b>Course Outcomes (COs)</b> At the end of the course, students will be able to:</p> <table border="1" style="width: 100%;"> <tr> <td><b>CO-1</b></td> <td>Gain the solid foundation in the field of Marketing and its concepts</td> </tr> <tr> <td><b>CO-2</b></td> <td>Develops an understanding about the role and significance of branding</td> </tr> <tr> <td><b>CO-3</b></td> <td>Understands the Channel Distribution Management</td> </tr> <tr> <td><b>CO-4</b></td> <td>Enable to make a comparative perspective on Industry specifics Marketing strategies</td> </tr> </table>				<b>CO-1</b>	Gain the solid foundation in the field of Marketing and its concepts	<b>CO-2</b>	Develops an understanding about the role and significance of branding	<b>CO-3</b>	Understands the Channel Distribution Management	<b>CO-4</b>	Enable to make a comparative perspective on Industry specifics Marketing strategies
<b>CO-1</b>	Gain the solid foundation in the field of Marketing and its concepts										
<b>CO-2</b>	Develops an understanding about the role and significance of branding										
<b>CO-3</b>	Understands the Channel Distribution Management										
<b>CO-4</b>	Enable to make a comparative perspective on Industry specifics Marketing strategies										

		<b>Number of Lecture</b>
<b>Unit – I</b>	Nature ,concept and scope of Marketing ,Importance of Marketing in Business, Marketing Mix (4Ps) ,Product life cycle Difference between Sales & Marketing. Basic knowledge related to Brand Awareness Brand Recognition: Brand Recall Top-of-Mind Awareness (TOMA): Brand Familiarity Brand Identity: Brand Association Brand Image: rand Equity: Word-of-Mouth (WOM) Marketing Brand Ambassadors or Influencers	<b>20</b>
<b>Unit – II</b>	Basic of Marketing channel. Criteria of selection of Distribution ( Distributors Exclusive – inclusive . wholesalers, Retailers , Organized Retailers E commerce- Platforms. Basic Industry knowledge from Marketing perspective example ( FMCG , Consumer electronics & Durables , Automotive: Healthcare and Pharmaceuticals, Financial Services Hospitality and Tourism: Agriculture and Agribusiness. Importance of Basic Market Research & Market Intelligence, Types of Marketing research. Basics of Advertising	<b>25</b>
	<b>Total Marks</b>	<b>45</b>

<b>Text Books</b>	<p>What is Marketing: marketing management for beginners: Step-by-step guide to the principles of marketing with focus on customer value, marketing strategy, market research, branding and marketing mix by Varun Sharma (Author)</p> <p>Marketing 4.0: Moving from Traditional to Digital" by Philip Kotler, Hermawan Kartajaya, and Iwan Setiawan (Wiley India).</p> <p>Marketing Management: A Value-Creation Process" by M. Govindarajan and S. Natarajan (Prentice-Hall of India).</p>	
<b>Additional Reference Books</b>	<p>Marketing Management: A Value-Creation Process" by M. Govindarajan and S. Natarajan (Prentice-Hall of India).</p> <p>Indian Social Media: A Boom for Business by Rishi Rathod (Notion Press).</p>	

<b>Subject Title</b>	<b>Fundamentals Of Accounting</b>		
<b>Subject Ref. No.</b>	BCA104T ( C )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b>			
The main objective of this course to maintain Systematic tracking of financial transactions .			
1)	To understand the basic underlying concepts, principles and conventions of accounting.		
2)	CO2: To identify the rules of debit and credit in accounting.		
3)	CO3: To get an overview of the regulatory framework of accounting in India.		
4)	CO4: To prepare trading, profit & loss and balance sheet of a firm.		
5)	CO5: To comprehend the concept of depreciation and different methods to treat depreciation in accounting.		

<b>Pre Requisite</b>		<b>Number of Lecture</b>
<b>Unit - I</b>	Basic understanding of terms and meanings used in Accounting and Financial practices.  Purpose of Accounting and its. Place in Business, Limitations, Relationship with other Financial Areas. Advantages & Importance.  Basic Accounting Concepts and conventions: Money Measurement Concept, Entity Concept, Going Concern Concept, Cost Concept, Dual Aspect Concept, Accrual Concept, Conservatism, Materiality Concept, Consistency concept, and accounting conventions.  Accounting Structure: Process of Accounting Journal, Ledger and Trial Balance Errors & their rectification based on Double Entry Book-Keeping System.	<b>27</b>
<b>Unit - II</b>	Bank Reconciliation statement, Preparation of Financial Statements: Form and Preparation of Income Statement and Statement of Financial Position, Adjustments.  Accounting for Deprecation and its importance in decision making-Fixed Instalment Methods & Reducing Balance Methods and preparation of final	<b>18</b>

	accounts of Joint stock companies and overview of Indian and International accounting standards.	
	<b>Total Lectures</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. Jain SP and Narang KL, Fundamentals of accounting, Kalyani Publishers, 7th edition, 2012</li> <li>2. B.S. Raman, Fundamentals of accounting, United publishers, Mangalore.</li> <li>3. Reddy Appannaiah Srinivasa, Fundamentals of accounting, Himalay Publishing House, First Edition, 2004, Mumbai.</li> <li>4. Shukla M.C., T.S. Grewal and S.C. Gupta, – Advanced Accounts, Vol- I, Chand &amp;sons, New Delhi.</li> <li>5. Gupta R.L., and M. Radhaswamy , Advanced Accountancy Vol I, Sultan Chand &amp;Sons, New Delhi.</li> </ol>	
<b>Additional Reference Books</b>	<ol style="list-style-type: none"> <li>1. Jain S.P and Narang K.L, Fundamentals of accounting, Kalyani Publishers, 2001, New Delhi.</li> <li>2. S.K. Paul, Accounting Practices; Central education publishing house,1992, Calcutta.</li> <li>3. S. Anil kumar, V. Rajesh kumar, B. Mariyappa, Fundamentals of Accounting, Himalaya Publishing House, Fifth edition 2010.</li> </ol>	

**Open Elective(s) :**  
**Select any one from BCA105T - (A) to BCA105T - (C)**

<b>Subject Title</b>	<b>Web Development Technology using HTML</b>		
<b>Subject Ref. No.</b>	BCA105T - (A)	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b> <b>The main objective of this course to learn different tags of HTML, design different client side forms of web side which helps to create static webpage</b>			
<b>Course Outcomes (COs)</b> At the end of the course, students will be able to:			
<b>CO-1</b>	Implement different HTML tags.		
<b>CO-2</b>	Design WebPages using basic HTML tags & forms.		
<b>CO-3</b>	Understand Fundamentals of Internet, Web page.		
<b>Prerequisite</b>	No prerequisite knowledge required.		<b>No. of Lectures</b>
<b>Unit I</b>	<b>Internet Basics</b> -Introduction to Internet, Internet Services, WWW, Working of Internet, Internet Connection Concepts, Introduction to Internet, Concepts, Web page: static, Dynamic, Active. Scripting languages: Server side, Client Side. Web site development Phases, Web: Designing, Development and Publishing, HTTP, URL registration, browsers, search engines, Web server, Proxy servers. <b>Introduction of HTML</b> Basic principles involved in developing a web site , Planning process, rules of web designing, Designing navigation bar , Page design, Home Page Layout, Concept. <b>HTML Elements</b> Introduction To HTML, Common HTML, Tags Physical & Logical, Some basic tags like <body> , changing background color of page, text color etc., Text formatting tags, <p> , <hr> tags, Ordered &		27

	Unordered Lists Tags, Inserting image, Links: text, image links, image mapping , Tables.	
<b>Unit II</b>	<b>HTML &amp; Form Handling</b> Frame, Form Introduction with text box, text area, buttons, List box, radio, checkbox, HTML input attributes, methods, Unicode Transformation Format (UTF), linking webpages. <b>HTML 5</b> Introduction , form elements – date, dateTime, email, number, range, tel, color, URL, datetimelocal, month , week, time, placeholder attribute, autofocus attribute, required attributes . HTML audio , video	18
	<b>Total - Lecture</b>	<b>45</b>
<b>Text Books</b>	<ul style="list-style-type: none"> <li>• HTML, DHTML, JavaScript, Perl &amp; CGI Ivan Bayross</li> <li>• HTML &amp; CSS : The Complete reference, Fifth Edition By Thomas Powell</li> </ul>	
<b>Reference books</b>	<ul style="list-style-type: none"> <li>• Html, Xhtml, And Css Bible (English) 5th Edition (paperback) by Schafer, Steven</li> <li>• HEAD FIRST HTML AND CSS, 2/ED (UPDATED FOR HTML) by ROBSON</li> <li>• Beginning HTML and CSS (English) (Paperback) by Rob Larsen</li> <li>• Learn to Code HTML and CSS (English) (Paperback) by Howe</li> <li>• Head First HTML5 Programming by Elisabeth Freeman and Eric Freeman</li> </ul>	
<b>Web references</b>	<ol style="list-style-type: none"> <li>1. <a href="http://www.w3school.com">www.w3school.com</a></li> <li>2. <a href="http://www.tutorialpoint.com">www.tutorialpoint.com</a></li> </ol>	

<b>Subject Title</b>	<b>Programming Methodology</b>		
<b>Subject Ref. No.</b>	BCA105T ( B)	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

**Course Objectives**

The main objectives of this course is to Learn to find the formulation of any problem, Understand the logic for writing the complex program, different approaches to write programming techniques, Hands on practice to write algorithm and draw flowcharts

**Course Outcomes (COs)**

At the end of the course, students will be able to:

<b>CO-1</b>	be able to apply problem-solving knowledge and skills to write small, well-documented, effective C programs
<b>CO-2</b>	be able to manually trace through a program to identify logical errors;
<b>CO-3</b>	develop a simple mental model of how a program is executed

<b>Prerequisite</b>	No prerequisite knowledge required.	<b>No. of Lectures</b>
<b>Unit I</b>	Introduction to programming, classification of computer languages, Languages translators – Assembler, compiler, interpreter), linkers, characteristics of good programming language, Factors for selecting a language, subprogram, purpose of program planning. Algorithm, flowchart, Pseudo code, control structure (sequence, selection , Iteration ), testing & debugging . Definition of program and programmer, Programming Techniques, Programming approaches: Types of programming methodologies, Procedural Programming, Functional Programming, Structural Programming, Modular Designing, Logical Programming -Top Down Designing, Bottom Up Designing, Object Oriented Programming.	18

<b>Unit II</b>	<p><b>Algorithm:</b> Definition, Characteristics, Advantages and disadvantages, Pseudo code or Structured English, Algorithm, basic features and properties of algorithm. Types of Algorithms , how to write algorithm of any program, examples of Algorithms , Input/Output Statements and Operators , Decision Making statements, Iterative statements,</p> <p><b>Flowchart</b> , concept &amp; defining , Principles of flowcharting , symbols used in Flowchart with its applications, technique to draw flowchart for any program, examples of flowchart. Converting algorithms to flowcharts.</p>	27
	<b>Total - Lecture</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. Fundamentals of Computer V. Rajaraman</li> <li>2. Programming Logic and Design, Comprehensive By Joyce Farrell</li> <li>3. Problem Solving and Program Design in C, J. R. Hanly and E. B. Koffinan, Pearson, 2015.</li> </ol>	
<b>Reference books</b>	<ol style="list-style-type: none"> <li>1. Programming Methodology (Monographs in Computer Science) Hardcover – 2 by Annabelle Melver (Editor), Carroll Morgan (Editor)</li> <li>2. <b>Functional Programming For Dummies</b>, Author: John Paul Mueller Add to Wishlist</li> </ol>	
<b>Web references</b>	<ol style="list-style-type: none"> <li>1. <a href="https://www.tutorialspoint.com/programming_methodologies/programming_methodologies_introduction.htm">https://www.tutorialspoint.com/programming_methodologies/programming_methodologies_introduction.htm</a>.</li> </ol>	



<b>Subject Title</b>	<b>Internet Technology</b>		
<b>Subject Ref. No.</b>	BCA105T - ( C )	<b>No. of Credits</b>	<b>2</b>
		<b>No. of Periods / Week</b>	<b>45 /3</b>
		<b>Assignments / Sessional</b>	<b>20</b>
		<b>Semester Examination</b>	<b>30</b>
<b>Course Objectives</b>			
The main objective of this course is to provide the conceptual and technological developments in the field of Internet, Emphasis on comprehensive knowledge of Internet, its applications, TCP/IP protocols widely deployed to provide Internet connectivity worldwide, TCP/IP protocols widely deployed to provide Internet connectivity worldwide			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	Review the current topics in Internet technologies.		
<b>CO-2</b>	Describe the basic concepts for network implementation		
<b>CO-3</b>	Learn the basic working scheme of the Internet and World Wide Web		
<b>CO-4</b>	Figure out the various security hazards on the Internet and need of security measures		

<b>Pre Requisite</b>	There is no prerequisites for attending this course	<b>No of Lecture</b>
<b>Unit – I</b>	<p><b>Introduction to Internet</b> What is Internet, Evolution and History of Internet, Growth of Internet, Owners of Internet, Internet Services, How does the Internet Work, Anatomy of Internet, Internet Addressing, Internet vs. Intranet, Impact of Internet, and Governance on Internet.</p> <p><b>WWW &amp; Web Browser</b> WWW, Evolution of Web, Basic Elements of WWW, Web Browsers, Search Engines, Search Criteria</p> <p><b>Internet Connectivity</b> Getting Connected, Different Types of Connections, Levels of Internet Connectivity, Internet Service Provider, and Internet Accounts by ISP.</p> <p><b>Internet Tools and Multimedia</b> Current Trends on Internet, Interactivity Tools, Multimedia and Animation</p>	<b>18</b>
<b>Unit – II</b>	<p><b>E-Mail &amp; Remote Login</b> E-Mail Basics, E-Mail System, E-Mail Protocols, E-Mail Addresses, Structure of an E-Mail Message, E-mail Clients &amp; Servers, Mailing List, E-Mail Security, Introduction to Remote Login, Introduction to Telnet, File Transfer Protocol</p> <p><b>Computer Networks</b></p>	<b>27</b>

	<p>Computer Networks, Network Components, Network Topologies, Types of Network Architecture, Networks, Medium of Communication, Network Security.</p> <p><b>Internet Technology and Protocol</b>  ISO-OSI Reference Model, TCP/IP Protocol Suit, Data Transmission, Switching, Routers &amp; Gateways, Network Protocols</p> <p><b>Internet and Web Security</b>  Overview of Internet Security, Aspects and Need of Security, E-Mail Threats and Secure E-Mail , Web Security and Privacy Concepts , Firewall , Cryptography , Digital Signatures , Proxy Server , Authentication, Authorization and Access Control , Copyright Issues , Virus , Internet Security and Management Concepts.</p>	
	<b>Total - Lecture</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1) Vineeta Srivastava, Alok Singhal, K K Bhutani, Internet Technology and Web Design Tata McGraw Hill Education Private Limited.</li> <li>2) Greenlaw R; Hepp E, Fundamentals of Internet and WWW, 2nd Edition, Tata McGraw-Hill, 2007.</li> </ol>	
<b>Additional Reference Books</b>	<ol style="list-style-type: none"> <li>1) Comer D, The Internet Book, Pearson Education, 2009.</li> </ol>	

### Vocational Skill Course (VSC)

**Select any one from BCA106P - ( A ) to BCA106P - ( C )**

<b>Subject Title</b>	<b>MS-office</b>		
<b>Subject Ref. No.</b>	BCA106P - ( A )	<b>No. of Credits</b>	<b>2</b>
		<b>No. of Periods / Week</b>	<b>45 /3</b>
		<b>Assignments / Sessional</b>	<b>20</b>
		<b>Semester Examination</b>	<b>30</b>
<b>Course Objectives</b>			
<b>The main objective of this course to learn office work with different applications such as Ms-word, MS-excel and Power Point</b>			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	Able to perform documentation and presenting skills.		
<b>CO-2</b>	Proficient in using Windows, Word Processing Applications, Spreadsheet Applications, and Presentation Graphics Applications		
<b>CO-3</b>	Create different types of tables / graphs / charts		
<b>CO-4</b>	Analyze the data using different mathematical formulas		

<b>Pre Requisite</b>	There is no prerequisites for attending this course	<b>No of Lecture</b>
<b>Unit – I</b>	<p>Create and Manage Documents, Insert Text and Paragraphs , Find and replace text , Cut, copy and paste text , Replace text by using AutoCorrect , Insert special characters , Format Text and Paragraphs , Apply font formatting , Apply formatting by using Format Painter , Set line and paragraph spacing and indentation ,Clear formatting , Apply a text highlight color to text selections , Apply built-in styles to text , Change text to WordArt , all menu functions .</p> <p>Create a Table : Convert text to tables , Convert tables to text , Create a table by specifying rows and columns , Apply table styles , Modify a Table , Sort table data , Configure cell margins and spacing ,Merge and split cells ,Resize tables, rows, and columns , Split tables , Configure a repeating row header</p>	<b>17</b>

<b>Unit – II</b>	<p>Spreadsheet basics , Creating, editing, saving and printing spreadsheets , Working with functions &amp; formulas , Modifying worksheets with color &amp; auto formats , Graphically representing data : Charts &amp; Graphs,</p> <p>Speeding data entry : Using Data Forms , Analyzing data : Data Menu, Subtotal, Filtering Data ,Formatting worksheets , Securing &amp; Protecting spreadsheets, home menu, inset menu, sheet copy, rename, preparing table in excel.</p> <p>Electronic Slide Presentation, Slide Formatting, Theme &amp; Slide Layout, SmartArt Charts &amp; Graphics, Adding Animation Effects, Giving Effects &amp; Transitions to Slides, Creating Professional Slide Presentations, Setting up a Slide Show &amp; Giving Timings, Adding Music to Presentations, Compiling Videos of Presentations , Sharing &amp; Saving Different Formats of Presentations, Linking Word &amp; Excel</p>	<b>28</b>
	<b>Total Lecture</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. Master Book Of Computer: Learn MS Office,Basic Computer,MS Excel,Excel Formulas,Tally, HTML Kindle Edition , by Mangesh Bhuvad</li> <li>2. Mastering MS Office (English, Paperback, Kumar Bittu)</li> </ol>	
<b>Additional Reference Books</b>	<ol style="list-style-type: none"> <li>1. Microsoft Office 2010 Introductory, Gary B. Shelly, Misty E. Vermaat</li> <li>2. Jodi Davenport, Critch Greaves, Michael Groh and Eruce Hall berg, Inside Microsoft Office Professional , 1994, New Riders Publications.</li> <li>3. CloriaMadumere, 3 – IN – 1 Microsoft Word, Powerpoint and Excel 2010, First Edition 2016, Create space Independent Publishing Platform.</li> </ol>	
<b>Website</b>	<ol style="list-style-type: none"> <li>1. <a href="https://www.javatpoint.com/ms-word-tutorial">https://www.javatpoint.com/ms-word-tutorial</a></li> <li>2. <a href="https://www.udemy.com/course/get-started-with-microsoft-word/">https://www.udemy.com/course/get-started-with-microsoft-word/</a></li> </ol>	

<b>Subject Title</b>	UNIX		
<b>Subject Ref. No.</b>	BCA106P - ( B )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

#### Course Objectives

The main objective of this course to provide basic understanding of an Operating system which helps to operate different concepts such as process & threads and working commands of Unix Operating System

#### Course Outcomes (COs)

At the end of the course, students will be able to:

<b>CO-1</b>	Provide a basic understanding of the UNIX Operating System
<b>CO-2</b>	<p>1. Develop the skills and comprehension required to perform basic UNIX operations including:</p> <ul style="list-style-type: none"> <li>a. Basic command line interface (CLI) activities</li> <li>b. Basic CLI Utilities</li> <li>c. Knowledge of the concepts and usage of the file system commands</li> <li>d. Knowledge of the concepts and usage of text editors to create and maintain files</li> <li>e. Knowledge of the concepts and usage of the BASH shell</li> <li>f. Knowledge of the concepts and usage of Network configuration using the CLI</li> </ul>
<b>CO-3</b>	High-level understand what is an operating system and the role it plays
<b>CO-4</b>	A high-level understanding of the structure of operating systems, applications, and the relationship between them.
<b>CO-5</b>	Some knowledge of the services provided by operating systems. • Exposure to some details of major OS concepts.

<b>Pre Requisite</b>	None	<b>Number of Lecture</b>
<b>Unit – I</b>	<p><b>INTRODUCTION TO UNIX OS :</b></p> <p>Definition , Function &amp; types of Unix OS ,History , System Organization (Kernel and Shell),System Call ,Difference between CLI OS &amp; GUI OS, Windows v/s Unix, Importance of Unix Kernel, Concept of Open-Source Software.</p> <p><b>UNIX ARCHITECTURE :</b></p>	27

	<p>Unix Components/Architecture. Features of Unix. The UNIX Environment and UNIX Structure, Posix and Single Unix specification. General features of Unix commands/ command structure. Command arguments and options. Basic Unix commands such as echo, printf, ls, who, date, passwd, cal, Combining commands. Meaning of Internal and external commands. The typecommand: knowing the type of a command and locating it. The root login. Becoming the superuser: su command.</p> <p><b>Unix files:</b></p> <p>Naming files. Basic file types/categories. Organization of files. Hidden files. Standard directories. Parent child relationship. Reaching required files- the PATH variable, manipulating the PATH, Relative and absolute pathnames. Directory commands – pwd, cd, mkdir, rmdir commands. The dot (.) and double dots (..) notations to represent present and parent directories and their usage in relative path names. File related commands – cat, mv, rm, cp, wc and od commands.</p>	
<b>Unit – II</b>	<p><b>File attributes and permissions:</b></p> <p>The ls command with options. Changing file permissions: the relative and absolute permissions changing methods. Recursively changing file permissions. Directory permissions.</p> <p><b>Shell programming:</b></p> <p>Wild Card, Pipe. Basic and Extended regular expressions. The grep, egrep. Typical examples involving different regular expressions. Ordinary and environment variables. Command line arguments. Logical operators for conditional execution. The test command and its shortcut. The if, while, for and case control statements. The set and shift commands and handling positional parameters. The here ( &lt;&lt; ) document and trap command. Simple shell program examples.</p>	<b>18</b>
	<b>Total</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. UNIX: The Textbook, Third Edition Hardcover , by Syed Mansoor Sarwar (Author), Robert M. Koretsky (Author)</li> <li>2. LINUX &amp; UNIX Programming Tools: A Primer for Software Developers by Syed Mansoor Sarwar (Author), Khaled H. Al-Saqabi (Author)</li> </ol>	

**Additional  
Reference  
Books**

1. Shell Programming in Unix, Linux and OS X Paperback – 20 December 2016 by Stephen G. Kochan (Author), Patrick Wood (Author)

<b>Subject Title</b>	<b>Linux</b>		
<b>Subject Ref. No.</b>	<b>BCA106P - ( C )</b>	<b>No. of Credits</b>	<b>2</b>
		<b>No. of Periods / Week</b>	<b>45/3</b>
		<b>Assignments / Sessional</b>	<b>20</b>
		<b>Semester Examination</b>	<b>30</b>
<b>Course Objectives</b>			
The main objective of this course is to understand the basic set of commands, utilities , library function and system calls			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	Understanding the basic set of commands and utilities in Linux/UNIX systems.		
<b>CO-2</b>	Learn the important Linux library functions and system calls		
<b>CO-3</b>	Implement basic Linux tools. Configure the Linux environment.		
<b>CO-4</b>	Learn the process of Server Installation & Python Installation		

<b>Pre Requisite</b>	Operating System Concepts, Windows Platform	<b>Number of Lecture</b>
<b>Unit – I</b>	<b>Introduction:</b> Basic Linux System Concepts, GNU, Free Software, and Open Source Software, Open Source Software Licenses. Distributions of Linux O.S, Installing Ubuntu, The GNOME Desktop, Linux Commands	<b>22</b>
<b>Unit – II</b>	<b>Managing the basics:</b> User Administration, Linux File-System Administration, File Permissions, and Networking Management. <b>Software Installation:</b> The Package Management, Vi/Vim Editor, Regular Expressions. Open SSH Server, VNC Server, and Installation of Python.	<b>23</b>
<b>Total Marks</b>		<b>45</b>
<b>Text Books</b>	1. “Ubuntu Server Guide” by UBUNTU LTD. 2. “Introduction to Linux”, A Hands on Guide by Machtelt Garrels 3. “GNU/Linux Advanced Administration”, by Josep Jorba Esteve and Remo Suppi Boldrito	



**Skill Enhancement Course (SEC)**  
**Select any one from BCA107P – ( A ) to BCA107P – ( C )**

<b>Subject Title</b>	MS Power BI		
<b>Subject Ref. No.</b>	BCA107P – ( A )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b>			
The main objectives of this course to learn concepts of Power BI which helps to build data models in Business Intelligences and create reports of analysis			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	Installation and launch power bi desktop, Removing Power BI Desktop, Running Power BI Desktop		
<b>CO-2</b>	Import Data from Diverse Sources, Creating Dashboards and Report, Power BI Desktop Files		
<b>CO-3</b>	Transforming Datasets, Data Cleansing, Data Mashup		
<b>CO-4</b>	Adding Measures to the Data Model, creating a Data Model.		

<b>Pre Requisite</b>	There is no prerequisites for attending this course	<b>No of Lecture</b>
<b>Unit – I</b>	<p><b>Introducing Power BI</b></p> <p>Install and launch power bi desktop, Removing Power BI Desktop, Running Power BI Desktop, Getting started with Power BI, Uploading data to Power BI, Introducing natural-language queries, Introducing Quick Insights, Introduction to reports, Introducing Visual Interactions, Decorating the report, Saving the report, Pinning a report, Refreshing the budget workbook, Filtering a report.</p> <p><b>Sharing the dashboard.</b></p> <p>Inviting a user to see a dashboard, Inviting users outside your organization, creating a group workspace in Power BI, Turning on sharing with Microsoft One Drive for Business, Viewing reports and dashboards on mobile devices.</p>	<b>20</b>
<b>Unit – II</b>	<p><b>Data refresh</b></p> <p>Introducing data refresh, Introducing the Power BI refresh architecture, Introducing Power BI Desktop, Publishing to Power BI, Installing the Power BI Personal Gateway, Configuring automatic refresh</p>	<b>25</b>

	<p><b>Power BI Desktop</b></p> <p>Connecting to a database, loading from multiple sources, Using Query Editor, Hiding or removing tables, Handling seasonality and sorting months.</p> <p><b>Getting data from services and content packs</b></p> <p>Consuming a service content pack, creating a custom dataset from a service, creating a content pack for your organization, consuming an organizational content pack, updating an organizational content pack.</p> <p>Loading individual tables, Implementing measures, Creating calculated columns, Improving the report by using measures, Integrating budget information, Reallocating the budget.</p>	
	<b>Total Lecture</b>	<b>45</b>
<b>Text Books</b>	1) Introducing Microsoft Power BI - Alberto Ferrari and Marco Russo	
<b>Reference Books</b>	2) Pro Power BI Desktop- Adam Aspin	

<b>Subject Title</b>	<b>Web Development Technology using HTML LAB</b>		
<b>Subject Ref. No.</b>	BCA107P – ( B )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

### Course Objectives

The main objective of this course to learn hands on practical of HTML tags which helps to create static webpage

### Course Outcomes (COs)

At the end of the course, students will be able to:

<b>CO-1</b>	Implement different HTML tags.
<b>CO-2</b>	Design WebPages using basic HTML tags & forms.
<b>CO-3</b>	Understand Fundamentals of Internet, Web page.

<b>Prerequisite</b>	No prerequisite knowledge required.	<b>No. of Lectures</b>
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1. Write HTML programs to demonstrate following :

- Bold - Italics -underline
- Font – Times new roman - Font size – 24 - Font color – red
- Paragraph - Strikethrough -Left align sentence
- Right align sentence -Center align sentence
- Page with yellow background - New line -Horizontal line
- All headings -Moving text

2. Write HTML code to display following lists:

1. Fruits

- Apple
- Mango
- banana

2. Cold -drinks

- Sprite
- Thumps –up
- Coke

- this
- is

1. the
2. unordered
  - ordered
  - list

3. example

#### Nesting lists

- i. item 1
  - ◊ sub item 1
  - ◊ sub item 2
    - a. sub item 1
    - b. sub item 2
- ii. item 2
  1. sub item 1
    - sub item 1
    - sub item 2
  2. sub item 2
- iii. item 3

4. of

- HTML.

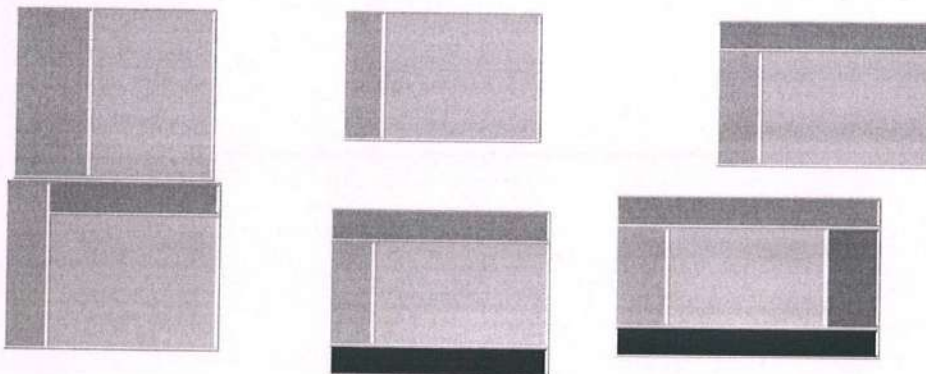
3. Write an HTML code that will display an image on webpage.
4. Write an HTML code that will display link, on click navigate to another webpage.
5. Write an HTML code that will use image as a link , on click to that image navigate to another webpage.
6. Write an HTML code that will divide image into different shapes (image mapping), on click to that image hot spot navigate to another webpage. ( use shapes like rectangle, circle etc.)
7. Write an HTML code that will display following Table formats : (insert suitable row & column content)

1.

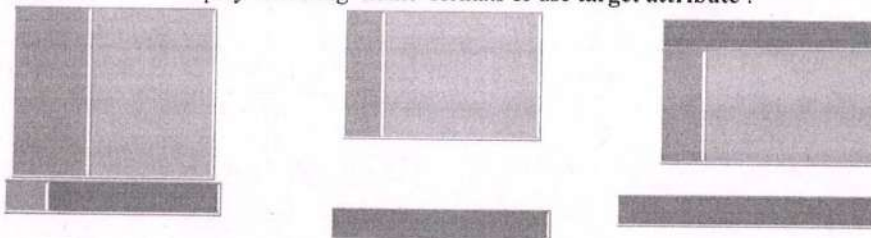

2.

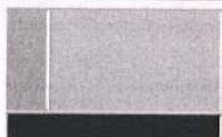

3.


8. Write an HTML code that will display following frame formats :



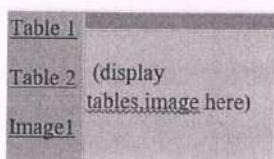
9. Write an HTML code that will display following frame formats & use **target** attribute :





10. Write an HTML code that will display a **Registration** form on a webpage. (Use text box, text area, buttons, list box, radio, checkbox).
11. Write an HTML code that will display a **feedback** form on a webpage.(Use suitable form elements).
12. Design an HTML form that will **accept student information** from webpage (Use suitable form elements).
13. Design an HTML form that will use all HTML5 controls.

19. write an HTML code for displaying following: When user clicks on Table 1, Table 2, display following





<b>Text Books</b>	<ul style="list-style-type: none"> <li>• HTML, DHTML, JavaScript, Perl &amp; CGI Ivan Bayross</li> <li>• HTML &amp; CSS : The Complete reference, Fifth Edition By Thomas Powell</li> </ul>
<b>Reference books</b>	<ul style="list-style-type: none"> <li>• <u>Html, Xhtml, And Css Bible (English) 5th Edition (paperback)</u> by Schafer, Steven</li> <li>• <u>HEAD FIRST HTML AND CSS, 2/ED (UPDATED FOR HTML)</u> by ROBSON</li> <li>• <u>Beginning HTML and CSS (English) (Paperback)</u> by Rob Larsen</li> <li>• <u>Learn to Code HTML and CSS (English) (Paperback)</u> by Howe</li> <li>• <u>Head First HTML5 Programming</u> by Elisabeth Freeman and Eric Freeman</li> </ul>
<b>Web references</b>	<ol style="list-style-type: none"> <li>3. <a href="http://www.w3school.com">www.w3school.com</a></li> <li>4. <a href="http://www.tutorialpoint.com">www.tutorialpoint.com</a></li> </ol>

<b>Subject Title</b>	<b>Introduction to Tally</b>		
<b>Subject Ref. No.</b>	BCA107P – ( C )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

**Course Objectives**

The main objectives of this course is to understand the concepts of computerized accounting , perform financial transactions , generate financial reports and prepare GST compliance using Tally

**Course Outcomes (COs)**

At the end of the course, students will be able to:

<b>CO-1</b>	Understand the fundamentals of Computerised Accounting
<b>CO-2</b>	Use Tally to create and maintain company data
<b>CO-3</b>	Record Financial Transactions and generate Reports in Tally
<b>CO-4</b>	Use Tally for GST Compliances and other functions

<b>Pre Requisite</b>		<b>Number of Lecture</b>
	None	
<b>Unit – I</b>	<b>Introduction to Computerised Accounting</b> Accounting Softwares, Customised & Prepackaged, Codification & Classification. <b>Accounting in Tally</b> Creation of company, setting up chart of accounts, creating inventory masters <b>Accounting Records in Tally</b> Creating vouchers, posting transactions, and generating invoices and other financial reports	<b>25</b>
<b>Unit – II</b>	<b>GST Compliance in Tally Prime</b> Creating GST masters, registering for GST, and filing GST returns. <b>Other functionalities of Tally</b> Payroll and other HR functions of Tally, Credit & Cashflow Management, Forecasting & Budgeting using Tally.	<b>20</b>
	<b>Total Lectures</b>	<b>45</b>
<b>Text Books</b>	1. Asok K Nadhani, “Mastering Tally PRIME”, BPB Publications	
<b>Additional Reference Books</b>	1. Tally Prime User Guide 2. Tally Prime GST Guide 3. Tally Prime for Beginners	

## Ability Enhancement Course (AEC) – AEC-1

<b>Subject Title</b>	<b>English</b>		
<b>Subject Ref. No.</b>	BCA108T	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b>			
This course is designed to build upon students' Grammatical command on English Language in order to enhance their receptive and productive skills.			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	The Students will be developed in both productive and receptive skills		
<b>CO-2</b>	They will be able to produce syntactically, Grammatically correct sentences.		
<b>CO-3</b>	They will be able to reason and develop themselves both in traditional and electronic sources.		
<b>CO-4</b>	The learner's community will be able to use their applied knowledge in computer Application learning and research		
<b>CO-5</b>	The Learner's Community will be able to write text in an appropriate style, write Complex reports, letters and present a case with an effective logical structure and will review any professional pr literary work of art and will develop knowledge about computer assisted language learning and its application.		
<b>Pre Requisite</b>			<b>Number of Lecture</b>
<b>Unit – I</b>	English as Global Language British English and American English Grammar- definitions, types, characteristics, Merits and limitations. Elements of Grammar Sentence elements Parts of Speech Stative and Dynamic verbs Modal Auxilliaris		<b>12</b>
<b>Unit – II</b>	Nouns, Pronouns, and basic noun phrase Noun classes, Determiners, Reference and articles Number, Gender, the Genitive, Pronouns, Tenses, Mood , Aspect Adjective and Adverbs, prepositions and prepositional phrases- place relations, time relations, The simple sentence- Negation, Question and commands, Sentence connection. Active/ passive voice, Academic v/s Imaginative, Direct and Indirect Speech, Formal and Informal Letters and Application.		<b>18</b>

	Appropriate usage of punctuation, apostrophe, commas, semi-colon, hyphen.	
	<p><b>Particles</b></p> <ol style="list-style-type: none"> <li>1. Cursive Writings – Daily one page</li> <li>2. Letter Writing- official and unofficial</li> <li>3. Writing of email, writing of formal Application</li> <li>4. Reading Prose Lesson Reading Poems Reading Fiction Reading Drama</li> <li>5. Seminar Presentation:</li> <li>6. Peer Discussion</li> <li>7. Peer interaction based on task activity</li> <li>8. How to appear for Interview</li> <li>9. Appropriate usage of pauses, ellipsis, and Discourse items while speaking.</li> <li>10. Developing Listening Skills</li> <li>11. Listening to audio- lingual acids</li> <li>12. Listening- social, political, historical and scientific speech</li> <li>13. Power point Presentation not less than 10 slides along with self introduction.</li> </ol>	<b>15</b>
	<b>Total</b>	<b>45</b>
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Quirk, R. and S. Green Baum. A University Grammar of English Language. Harlow: Pearson education limited, 1973.</li> <li>2. Quirk, Randolph A Student's Grammar of the English Language. Harlow: Pearson education Limited. 1990.</li> <li>3. Crystal, David. A Rediscover Grammar with David crystal. London: Longman. 1996. 4. Leech, Geoffrey and Jan. Svartvik. A Commutative English Grammar. Pearson education ltd. 1994.</li> </ol>	
<b>Additional Books</b>	<ol style="list-style-type: none"> <li>1. Marlinet A; Thompson, A Practical English Grammar. Delhi: Oxford University Press. 1986.</li> <li>2. Leach, Geoffrey and Svartvik Jan. A Communicative Grammar of English. Second edition Singapore: Singapore Publishers, 1994.</li> <li>3. Angela Downing and Philip Locke A University course in English Grammar. London and New York. Routledge 2002.</li> </ol>	



**Value Education Course (VEC-1) – VEC**

<b>Subject Title</b>	<b>Constitution of India</b>		
<b>Subject Ref. No.</b>	BCA109T	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

**As per University Syllabus**

## Indian Knowledge System ( IKS )

Subject Title	IKS		
Subject Ref. No.	BCA110P	No. of Credits	2
		No. of Periods / Week	45 /3
		Assignments / Sessional	20
		Semester Examination	30

**As per University Syllabus**

### Co-Curricular Course ( CC ) – CC-1

<b>Subject Title</b>	:	<b>Health &amp; Wellness</b>			
<b>Subject Ref. No.</b>	:	BCA111P	<b>No. of Credits</b>	:	2
			<b>No. of Periods / Week</b>	:	45/3
			<b>Assignments / Sessional</b>	:	--
			<b>Semester Examination</b>	:	50
<p><b>Course Objective (COs)</b> To acquaint students with fundamentals of Health &amp; Wellness critical in inclusive development of the human being as a whole.</p> <p><b>Course Outcomes (COs)</b> At the end of the course, students will be able to:</p>					
1)		Understand the meaning, definitions, dimensions, and scope of health, fitness and wellness			
2)		Gain Insights into the causes of illness and the management of those ill-health through proper knowledge			
3)		Gain knowledge about the nutrition, components of nutrition and their impact on health.			
<b>Pre Requisite</b>	:	Basic awareness of Business Organisation.			<b>Number of Lecture</b>
<b>Unit – I</b>	:	<p><b>INTRODUCTION</b> Meaning, Definition, Aims, Objectives &amp; Dimensions of Health and Wellness. Principles of Health Education. Factors affecting Health and Wellness. Health Agencies: World Health Organization (WHO) United Nation Educational Scientific &amp; Cultural Organization (UNESCO) Integrated Child Development Services (ICDS) Ministry of Health &amp; Family Welfare (MHFW)</p> <p><b>NUTRITION AND WEIGHT MANAGEMENT</b> Meaning, Definition and Importance of Nutrition, Food and effect of malnutrition on health, Mid-Day Meal. Basic Nutrients (Protein, Carbohydrate, Fat, Vitamins, Mineral &amp; Water), Phytonutrients, Fibrous Food. Diet, Balance Diet, Athletic Diet, Factors affecting Diet. Obesity – Concept, Problems, Causes, Prevention, Assessment and procedure of weight Management.</p>			<b>18</b>
<b>Unit – II</b>	:	<p><b>HYGIENE, PERSONAL HYGIENE, MENTAL HYGIENE &amp; COMMUNITY HYGIENE</b> Meaning, Concept and types of Hygiene. Importance of Hygiene for healthy life, desirable hygienic habits and Importance of rest, sleep &amp; exercise. Personal Hygiene: - Care of Skin, Eye, Teeth, Ear, Nail, Nose and Hair. Mental Hygiene, its importance and its practice procedure.</p>			<b>27</b>

	<p><b>HEALTH PROBLEMS IN INDIA</b>  Causes, Prevention and Control of Communicable Diseases:  Malaria, Dengue, Corona virus.  Causes, Prevention and Control Non-Communicable Diseases:  Thalassemia, Asthma, Arthritis.  Postural Deformities: Causes and corrective exercise of  Kyphosis, Lordosis, Scoliosis, Knock Knees, Bow leg and Flat  foot. Problems associated with postural deformities  Life Style Disease (Diabetes, Hypertensions, Stroke) and Stress  Management.  <b>MANAGEMENT OF HEALTH ISSUES</b>  Substance Abuse (Drug, Cigarette, Alcohol), De- addiction,  Counselling &amp; Rehabilitation.  Types of Physical Fitness &amp; Health Benefits. Postural  Deformities &amp; Corrective Measures.  Spirituality &amp; Mental Health. Role of Yoga, Asanas &amp;  Meditation in maintaining health &amp; Wellness.  Role of Sleep in maintenance of physical &amp; mental health.</p>		
	<b>Total Lecture</b>		<b>45</b>
<b>Reference Books:</b>	<p>1. Turner, C.E. et al. School Health and Health Education,  National Library of Australia. 2.  2. Thakur, S. Krira Chikitsa, Paschimbanga Rajya Pustak  Parishad.  3. Nutrition Encyclopaedia, edited by Delores C.S. James, The  Gale Group, Inc.  4. Ghosh, B.N. A Treaties of Hygiene and Public Health,  Scientific Publishing Co., Kolkata.</p>		

**Dr. Babasaheb Ambedkar Marathwada University Aurangabad**  
**Bachelor of Computer Application (BCA)- Honours**  
**Syllabus**  
**Academic Year 2023-24**  
**Semester - II**

<b>Subject Title</b>	<b>Database Management System</b>		
<b>Subject Ref. No.</b>	BCA201T	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

**Course Objectives**

The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS

**Course Outcomes (COs)**

At the end of the course, students will be able to:

<b>CO-1</b>	Understand the basic principles of database management systems.
<b>CO-2</b>	Draw Entity-Relationship diagrams to represent simple database application scenarios
<b>CO-3</b>	Write SQL queries for a given context in relational database. .
<b>CO-4</b>	Implement normalization , views and ACID properties on database

<b>Pre Requisite</b>		<b>Number of Lecture</b>
	Basics of Computer Fundamentals and OS	
<b>Unit – I</b>	<p><b>Introduction to Databases and Transactions:</b> What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management, <b>Data Models</b> : The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction.</p> <p><b>Database Design, ER-Diagram and Unified Modeling Language</b> : Database design and ER Model : overview, ER-Model, Constraints, ER-Diagrams, ERD Issues, weak entity sets, Codd's rules, Relational Schemas, Introduction to UML Relational database model: Logical view of data, keys, integrity rules. <b>Relational Database design:</b> features of good</p>	<b>29</b>

	<p>relational database design, atomic domain and Normalization (1NF, 2NF, 3NF, BCNF).</p> <p><b>Relational algebra</b> : introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison. <b>Calculus</b>: Tuple relational calculus, Domain relational Calculus, calculus vs algebra, computational capabilities.</p>	
<b>Unit – II</b>	<p>Constraints, Views and SQL : What is constraints, types of constrains, Integrity constraints, <b>Views</b>: Introduction to views, data independence, security, updates on views, comparison between tables and views. <b>SQL</b>: data definition, aggregate function, Null Values, nested sub queries, Joined relations. Triggers.</p> <p><b>Transaction management and Concurrency control</b>: Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, optimistic methods, database recovery management.</p>	<b>16</b>
	<b>Total Lectures</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", fifth Edition McGraw-Hill ,</li> <li>2. Raghu Ramakrishnan and Johannes Gehrke, Database Management Systems (3/e), McGraw Hill, 2003</li> </ol>	
<b>Additional Reference Books</b>	<ol style="list-style-type: none"> <li>3. Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning</li> </ol>	
<b>Websites</b>	<ol style="list-style-type: none"> <li>4. <a href="https://www.javatpoint.com/dbms-tutorial">https://www.javatpoint.com/dbms-tutorial</a></li> <li>5. <a href="https://www.tutorialspoint.com/dbms/index.htm">https://www.tutorialspoint.com/dbms/index.htm</a></li> <li>6. <a href="https://www.guru99.com/dbms-tutorial.html">https://www.guru99.com/dbms-tutorial.html</a></li> </ol>	

<b>Subject Title</b>	<b>C Programming</b>		
<b>Subject Ref. No.</b>	BCA202T	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b>			
The main objective of this course is to understand the concept of programming coding which helps to enhance the thinking ability to solve complex problem through programming languages			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	Understand the concept of programming with constant & variables used in C programming		
<b>CO-2</b>	Learn the implementation of loop, conditional statement to build programming logic		
<b>CO-3</b>	Be able to use homogeneous & heterogeneous to write complex programming		
<b>CO-4</b>	Understand & learn Input/output streams using File handling		

<b>Pre Requisite</b>	Basics of Computer Fundamentals and OS	<b>Num ber of Lectu re</b>
<b>Unit – I</b>	C is a Structured Language, Compiler Vs Interpreters, The Form of a C Program, Library & Linking, Compilation & Execution of C Program <b>Variables, Data Types, Operator &amp; Expression</b> : Character Set, C Token, Identifier & Keyword, Constant, Integer, Floating Point, Character, String, Enumeration , Data Types in C, Data Declaration & Definition, Operator & Expression, Arithmetic, Relational, Logical, Increment & Decrement, Bitwise, Assignment, Conditional ,2.8 Precedence & Associativity of Operators. <b>Console I/O</b> : Introduction, Character input & Output, String Input & Output, Formatted Input/Output (scanf/printf) sprintf & sscanf. <b>Control Statement</b> : Introduction, Selection Statements If, Nested if, if-else-if, The? Alternative, The Conditional Expression, switch, Nested switch, Iteration Statements , for loop, while loop, do-while loop , Jump Statements goto & label, break & continue, exit() function. <b>Storage Class &amp; Scope</b> : Meaning of Terms, Scope -	<b>23</b>

	Block scope & file scope, Storage Classes, Automatic Storage, Extern Storage, Static, Storage, Register Storage, <b>Bitwise Operator</b> : Introduction, Applications Masking, Internal Representation of Date, Bit Fields	
<b>Unit – II</b>	<p><b>Function</b> : Introduction, Arguments &amp; local variables, Returning Function Results by reference &amp; Call by value, Recursion <b>Array &amp; String</b> : Single Dimension Arrays , Accessing array elements, Initializing an array, Multidimensional Arrays, Initializing the arrays, Memory Representation Accessing array elements, Passing Single Dimension array to Function, Array &amp; Pointer, Array of Pointer, String Manipulation Functions.</p> <p><b>Pointers</b> : Introduction, Memory Organization, The basics of Pointer, The Pointer operator, Application of Pointer, Pointer Expression Declaration of Pointer, Initializing Pointer, De-referencing Pointer, Pointer Arithmetic, Precedence of &amp; , * operators, Pointer to Pointer.</p> <p><b>Structure, Union, Enumeration &amp; typedef</b> : Structures Declaration and Initializing Structure, Accessing Structure members, Structure Assignments, Arrays of Structure, Passing Structure to function, Structure Pointer, Unions. <b>File handling</b>: Introduction, Defining &amp; Opening a File, Closing a File, Input/Output Operations on Files, Error Handling During I/O Operation, Random Access To Files, <b>Command Line Arguments</b>.</p>	22
	<b>Total Lectures</b>	<b>45</b>
<b>Text Books</b>	C : The Complete Reference : Herbert Schildt , Programming in ANCI C : Balgurusamy, Graphics under C : Yashwant Kanetkar , Let us C : Yashwant Kanetkar	
<b>Additional Reference Books</b>	Programming with C : Bryon Gottfried, Graphics Under C : Y. Kanetkar Let us C Solutions : Y.P. Kanetkar, 3. Spirit Of “C” : Moolish Kooper.	



<b>Subject Title</b>	<b>Database Management System &amp; C programming- LAB</b>		
<b>Subject Ref. No.</b>	BCA203P	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

### Course Objectives

The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS

### Course Outcomes (COs)

At the end of the course, students will be able to:

<b>CO-1</b>	Understand the basic principles of database management systems.
<b>CO-2</b>	Draw Entity-Relationship diagrams to represent simple database application scenarios
<b>CO-3</b>	Write SQL queries for a given context in relational database. .
<b>CO-4</b>	Implement normalization , views and ACID properties on database
<b>CO-5</b>	Understand the concept of programming with constant & variables used in C programming
<b>CO-6</b>	Learn the implementation of loop, conditional statement to build programming logic
<b>CO-7</b>	Be able to use homogeneous & heterogeneous to write complex programming
<b>CO-7</b>	Understand & learn Input/output streams using File handling

<b>Pre Requisite</b>	Basics of Computer Fundamentals, operating system & DBMS theory concepts
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### Section – A

S.No	Name of the Experiment
1.	Implementation of DDL commands of SQL with suitable examples <ul style="list-style-type: none"> <li>• Create table</li> <li>• Alter table</li> <li>• Drop Table</li> </ul>

2.	Implementation of DML commands of SQL with suitable examples <ul style="list-style-type: none"> <li>• Insert</li> <li>• Update</li> <li>• Delete</li> </ul>
3.	Implementation of different types of function with suitable examples <ul style="list-style-type: none"> <li>• Number function</li> <li>• Aggregate Function</li> <li>• Character Function</li> <li>• Conversion Function</li> <li>• Date Function</li> </ul>
4.	Implementation of different types of operators in SQL <ul style="list-style-type: none"> <li>• Arithmetic Operators</li> <li>• Logical Operators</li> <li>• Comparison Operator</li> <li>• Special Operator</li> <li>• Set Operation</li> </ul>
5.	Implementation of different types of Joins <ul style="list-style-type: none"> <li>• Inner Join</li> <li>• Outer Join</li> <li>• Natural Join etc..</li> </ul>
6.	Study and Implementation of <ul style="list-style-type: none"> <li>• Group By &amp; having clause</li> <li>• Order by clause</li> <li>• Indexing</li> </ul>
7.	Study & Implementation of <ul style="list-style-type: none"> <li>• Sub queries</li> <li>• Views</li> </ul>
8.	Study & Implementation of different types of constraints.
9.	Study & Implementation of Database Backup & Recovery commands. Study & Implementation of Rollback, Commit, Savepoint.
10.	<ul style="list-style-type: none"> <li>• Creating Database /Table Space</li> <li>• Managing Users: Create User, Delete User</li> <li>• Managing roles:-Grant, Revoke.</li> </ul>
11.	Study & Implementation of PL/SQL.
12.	Study & Implementation of SQL Triggers.

**Section – B**

**Assignment No 1** : Write a program to find Area, Perimeter of Square & Rectangle.

- Assignment No 2** : Write a program to enter any year and check whether it is leap year or not
- Assignment No 3** : Write a Program on string and numbers
- Assignment No 4** : Write a Program to find greater among five using conditional operator
- Assignment No 5** : Write a Program to find odd and even numbers between 1 to 100 using go to statement.
- Assignment No 6** : Write a program to find max. Among 3 nos.
- Assignment No 7** : Write a program to enter any numbers and find the factorial of that number  
Write a program to enter any number and find it is prime number or not
- Assignment No 8** : Write a program, to enter any number and find it is an Armstrong Number or not
- Assignment No 9** : Write a program to print Floyd's Triangle  
Write a program to print Fibonacci Series with lower and upper limit
- Assignment No 10** : Write a program to make inter conversion of Decimal, Binary & Hexadecimal no.
- Assignment No 11** : Write a program to find LCM & GCD of numbers
- Assignment No 12** : Write a program to Insert & Delete an element at given location in array.  
Write a program to Transpose of matrices
- Assignment No 13** : Write a program to find the Multiplication of matrices  
Write a program to Display upper & lower diagonal of matrices
- Assignment No 14** : Array of Structure e.g. student result, Employee pay slip , Phone b  
Write a program to perform all arithmetic operations on two numbers using pointer
- Assignment No 15** : Programs on following concepts  
Function with no parameter & no return values  
Function with parameter & return values
- Assignment No 16** : Function with parameter & no return values  
Function with call by reference
- Assignment No 17** : Recursion function e.g. sum of digit, reverse of digit, Fibonacci series , factorial on given number
- Assignment No 18** : String manipulation function e.g. string copy, concatenation, compare, stringlength, reverse string
- Assignment No 19** : Five Programs on Loop within loop and on specific output
- Assignment No 20** : Five program on loop within loop and on specific output
- Assignment No 21** : File handling e.g. Read / Write file, copy file, merging file and Random access of file  
Write a program to store number of sentences in backend file
- Assignment No 22** : Write a program to enter 40 numbers and separate odd and even numbers from them and display the contents of odd and even file
- Assignment No 23** : Write a program to store the record in data.dbf file with following details  
Empcode, name, designation, basic salary , net salary using binary file
- Assignment No 24** : Using command line argument  
Program to copy content of one file to another
- Assignment No 25** : Sort numbers from file  
Read & write data using fprintf() and scanf() function

<b>Subject Title</b>	<b>Discrete Mathematics</b>		
<b>Subject Ref. No.</b>	BCA204T	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

### Course Objectives

The main objectives of the course are to Introduce concepts of mathematical logic for analyzing propositions and proving theorems, use sets for solving applied problems, and use the properties of set operations algebraically, Work with relations and investigate their properties, Investigate functions as relations and their properties, Introduce basic concepts of graphs, digraphs and trees and learn permutation & combinations

### Course Outcomes (COs)

At the end of the course, students will be able to:

<b>CO-1</b>	Understand a working knowledge of mathematics and its use in computer applications.
<b>CO-2</b>	Understand the basic concepts of determinant, matrices and applications of logical notation.
<b>CO-3</b>	Understand the concepts and signification of sets, relations, functions and graph theory.
<b>CO-4</b>	Identify and apply properties of combinatorial structures and basic counting principle.

<b>Pre Requisite</b>	<b>Basic knowledge of Mathematics and Algebra</b>	<b>Number of Lectures</b>
<b>Unit - I</b>	<b>Mathematical logic</b> Propositions, logical connectives, statement forms, truth tables, tautologies and equivalence of statement forms. <b>Determinant</b> Solution of determinant of order 2 and 3 and also Cramer's Rule <b>Matrices</b> Definition, types, operations, Adjoint and inverse of a matrix. <b>Set Theory</b> Definition, types, combination of sets, Venn-diagram and algebraic properties of sets operations	<b>20</b>
<b>Unit - II</b>	<b>Graph Theory</b> Basic terminology, simple and multiple graph, weighted graph, labelled graph, matrix representation of graph (adjacency and incidence matrix), some important graphs (directed graph, null graph, complete graph and regular graph). <b>Relations and Functions</b>	<b>25</b>

	<p>Definition, product sets, basic concepts of relation, sets arising from relation, the matrix of relation, Digraphs, paths in relations and digraphs</p> <p>Definition of Function, classification of functions, types of functions, Some special functions useful in computer applications.</p> <p><b>Permutations and Combinations</b></p> <p>Factorial notation, fundamental principle of counting, definition of permutation, problems of permutations when all objects are distinct and not distinct, circular permutation, definition of combination and problems of combinations.</p>	
	<b>Total Lecture</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. Swapan kumar Sarkar," A text book of Discrete Mathematics" s.chand and company Ltd, New Delhi, 2007</li> <li>2. C.L.Liu, "Elements of Discrete Mathematics" McGraw-Hill Inc,1985.</li> <li>3. Kolman.B,Robert-C.Busby and Sharon Ross "Discrete Mathematical Structures for Computer Science" Prentice-Hall of India, 1998.</li> </ol>	
<b>Additional Reference Books</b>	<ol style="list-style-type: none"> <li>4. Kenneth H.Rosen " Discrete Mathematics and its Applications" Tata McGraw-Hill Publishers, 2007.</li> <li>5. Tremblay and Manohar, "Discrete Mathematical Structures with Applications to Computer Science" Prentice-Hall of India, 1997.</li> <li>6. J.L. Mott, A.Kandel, T.P.Baker "Discrete Mathematics for Computer Scientists and Mathematicians" Prentice-Hall of India, 2<sup>nd</sup> Edition.</li> </ol>	

**Generic Elective / Open Elective**  
**Select any one from GE/OE-2 BCA205T – (A) to BCA205T – (C)**

<b>Subject Title</b>	<b>Basics of Electronics</b>		
<b>Subject Ref. No.</b>	BCA205T – (A)	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b>			
The main objectives of this course is to understand the basic characteristics of Electronic Components such as semiconductors, transistors, DC power and Multi-meter			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	Able to understand the I-V characteristics of various semiconductor diodes.		
<b>CO-2</b>	Able to understand input/output characteristics of transistors.		
<b>CO-3</b>	Able to distinguish between unregulated & regulated power supply and its significance		
<b>CO-4</b>	Able to demonstrate the use of multi-meter		

<b>Pre Requisite</b>	<b>There is no prerequisites for attending this course</b>	<b>No of Lecture</b>
<b>Unit – I</b>	<p><b>Fundamentals of electronics</b>                      Conductor insulators and semiconductors, Current, Voltage, Resistance, Capacitance, Inductor, ohms law, Kirchhoff's law, Direct current, Alternating Current, Series and Parallel Circuits of resistance and capacitors, Transformer, Measuring DC/AC Voltages, Measuring resistance</p> <p><b>Diode</b>                      P-N Junction Diode Construction and types of P-N junction diodes, Potential barrier, and biasing, V-I characteristics of a P-N junction diode, Diode current equation Static and dynamic resistance of a diode, Power and current ratings of a diode Applications of a diode, Zener Diode Performance/operation, Applications of Zener diode.</p> <p><b>Bipolar Junction Transistor (BJT)</b></p>	<b>18</b>

	Introduction, Advantages and disadvantages, Transistor types Construction and Working, Junction field effect transistor,	
<b>Unit-II</b>	<p><b>Rectifiers</b> Half-wave rectifier, Full-wave rectifier, Ripple factor, Filters, Regulated Power Supply Ordinary power supply, Regulated power supply, Voltage regulators, Zener diode voltage regulator, Transistor series voltage regulator.</p> <p><b>Basics of power supplies</b> Introduction, DC voltage ripple regulation, electronic power supply, Cells and batteries primary or secondary, Battery design, lead acid batteries, lithium cells, Ni-MH, mobile phone batteries, batteries for UPS, batteries for emergency power, precautions, testing of batteries, solar cell.</p> <p><b>Relay and Sensors</b> Introduction, Classification of relay, principle of electromechanical relay, application of relay Introduction to sensor, sensor working, Types of sensor, application of sensors</p>	27
	<b>Total Lectures</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. Principles of electronics by V.K. Mehta &amp; Rohit Mehta (Multicolour revised edition) S. Chand &amp; Company.</li> <li>2. Electronic principles, A.P. Malvino, Tata Mc. Graw Hill, Pub. Co.Ltd., (Third edition).</li> </ol>	
<b>Additional Reference Books</b>	<ol style="list-style-type: none"> <li>1. Basic electronics (solid state) by B.L. Theraja, (multicolor illustrative edition), S.Chand &amp; Company Ltd., Ram Nagar, New Delhi.</li> <li>2. Basic electronics by Bernard Grob, Glencoe,(8 th Edn) Mc. Graw Hill Pub., Company.</li> </ol>	

Subject Title	Business Organization		
Subject Ref. No.	BCA205T – ( B )	No. of Credits	2
		No. of Periods / Week	45/3
		Assignments / Sessional	20
		Semester Examination	30
<b>Course Objectives</b>			
The main objective of this course to make acquaint students with fundamentals of business organization and management systems as a body of knowledge and To impart to the students an understanding of business concepts with a view to prepare them to face challenge of managing business in the new era.			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
1)	Demonstrate a critical understanding of Business Organisation.		
2)	Understand modern business practices, forms, procedures and functioning of various business organizations.		
3)	Understand the basic concepts in commerce, trade and industry.		
Pre Requisite	Basic awareness of Business Organisation.		Number of Lecture
<b>Unit – I</b>	<p><b>Introduction to Business:</b> Business – Concept, nature and scope, business as a system, business objectives, business and environment interface, distinction between business, commerce and trade, Business ethics, social responsibilities of Business.</p> <p><b>Business Enterprises:</b> Forms of Business Organisation: Sole Proprietorship, Partnership firm, Joint Stock Company, One Person Company, Cooperative society; Limited Liability Partnership; Multinational Corporations; Choice of Form of Organisation; Business Combination: Need and Objectives, Forms: Mergers, Takeovers and Acquisitions.</p> <p><b>Business Environment:</b> Meaning and significance of Business environment, Internal and external environment, Dimensions of Business Environment; Uncertainty and business; Environmental Analysis and Diagnosis, Environment scanning techniques: SWOT and ETOP.</p>		21
<b>Unit – II</b>	<b>Entrepreneurship: Founding the Business:</b>		24



	<p>Entrepreneur-Entrepreneurship-Enterprise; entrepreneurial ideas and opportunities in the contemporary business environment; Process of entrepreneurship; Forms of entrepreneurship; Skill India, Start-up India, Make in India, Globalisation.</p> <p><b>Contemporary Issues of Business Organisations :</b>  Emerging Issues and Challenges; Innovation in Organisational Design; Learning Organisations, Workforce Diversity, Franchising, Outsourcing, and E-commerce; Government and business interface; Sustainability; Digitalisation and Technological innovations.</p>	
	<b>Total Lecture</b>	<b>45</b>
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>5. S.A. Sherlekar, Modern Business Organization and Management, Himalaya Publishing House.</li> <li>6. Y.K. Bhushan, Fundamentals Of Business Organization &amp; Management, S.Chand Publications.</li> <li>7. Basu, C. R., Business Organization and Management, Tata Mcgraw Hill, Publishing House, New Delhi</li> <li>8. Vasishth, Neeru, Business Organisation, Taxmann, New Delhi</li> </ol>	

<b>Subject Title</b>	<b>Fundamentals of Banking</b>		
<b>Subject Ref. No.</b>	BCA205T – ( C )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

#### Course Objectives

The main objectives this course is to enable the students in developing an understanding about the banking perspectives' and to acquaint students with the knowledge about various aspects of banking regulations

#### Course Outcomes (COs)

At the end of the course, students will be able to:

1)	Demonstrate a critical understanding of the Fundamentals of Banking.
2)	Understand the nuances of Relationship Management In Banking Sector.
3)	Enable students to gain insights about types of Banking Instruments.
4)	Prepare students for future trends in Banking Sector.

<b>Pre Requisite</b>		<b>Number of Lecture</b>
	Basic awareness of Banking Sector.	
<b>Unit – I</b>	<p><b>Introduction:</b> Meaning &amp; Origin of the word Bank- Evolution of Banking in India- Banking System, Structure, Types of Banks in India- Functions of Commercial Banks- RBI Regulations &amp; Control of Commercial Banks.</p> <p><b>Banker &amp; Customer Relationship:</b> Banker &amp; Customer: Meaning, General &amp; Special Relationship – Types of Customers &amp; Account Holders: Procedure &amp; Practice in opening &amp; conducting of Individual, Minor, Joint ,Partnership Firms, Joint Stock Company ' Trust, Clubs, Associations &amp; Joint Hindu Family Accounts- KYC Norms.</p> <p><b>Negotiable Instruments:</b> Introduction- Meaning &amp; Definition- Kinds &amp; Features –Endorsements- Meaning, Essentials &amp; Kinds of Endorsement.</p>	22
<b>Unit – II</b>	<p><b>Paying Banker &amp; Collecting Banker:</b> Paying Banker: Meaning, Precautions, Statutory Protection to the Paying Banker- Dishonour of Cheques: Grounds &amp; Consequences of Dishonour Collecting Banker: Meaning, Duties, Responsibilities &amp; Statutory Protection to Collecting Banker.</p>	23

	<p><b>Negotiable Instruments:</b> Introduction- Meaning &amp; Definition- Kinds &amp; Features –Endorsements- Meaning, Essentials &amp; Kinds of Endorsement.</p> <p><b>Principles of Bank Lending:</b> Types of Bank Lending: Loans, Cash Credit, Overdraft, Bills Purchased, Bills Discounted, Letters of Credit etc- Modes of creating Charge- Mortgage, Pledge, Lien &amp; Hypothecation- Types of Securities- Bad Loans- Sound Principles of Bank Lending.</p>	
	<b>Total Lecture</b>	<b>45</b>
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>1. Banking Theory: Law &amp; Practice, KPM Sundaram &amp; VL Varshney</li> <li>2. Banking Theory: Law &amp; Practice, B.Santhanam, Margam Publications</li> <li>3. Introduction to Banking, Vijaya Raghavan</li> <li>4. Indian financial System, M.Y. Khan</li> </ol>	

**OPEN Elective**  
**Select any one from BCA205T – ( A ) to BCA205T – ( C )**

<b>Subject Title</b>	<b>Advance Web Development Technology</b>		
<b>Subject Ref. No.</b>	BCA206T - ( A )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<p><b>Course Outcomes (COs)</b>            At the end of the course, students will be able to:</p>			
<b>CO-1</b>	Understand the different types of CSS.		
<b>CO-2</b>	Apply CSS to different HTML elements.		
<b>CO-3</b>	Write code using JavaScript with HTML.		
<b>CO-4</b>	Write program for form validation.		
<b>Pre Requisite</b>	Basic knowledge of HTML tags.		<b>Number of Lecture</b>
<b>Unit – I</b>	<b>Basics of CSS</b> Introduction To Style sheet, types of style sheets- Inline, External, Embedded CSS, text formatting properties, CSS Border, margin properties, Positioning Use of classes in CSS, color properties, use of <div>&<span>. <b>Advance CSS</b> Styling Backgrounds • Styling Text • Styling Fonts • Styling Links • Styling Lists • Styling Tables CSS Box Model • CSS Border • CSS Outline • CSS Margin • CSS Padding • CSS Dimension • CSS Display • CSS Positioning • CSS Floating • CSS Navigation Bar • CSS Image Gallery • CSS Image Opacity • CSS Align		<b>23</b>
<b>Unit – II</b>	<b>CSS3</b> CSS3 Introduction • Borders • border-radius • Border Images • Backgrounds • Background Size • background-origin • Text Effects • text-shadow • box-shadow • Text • text-overflow • word-wrap • word-break •		<b>22</b>

	<p>Fonts Transforms • 2D Transforms • 3D Transforms Transitions • transition-delay • transition-duration • transition-property • transition-timing-function.</p> <p><b>JavaScript Fundamentals-</b> Intro to script, types, intro of JavaScript, JavaScript identifiers, operators, control &amp; Looping structure, Intro of Array, Array with methods, Math, String, Date Objects with methods User defined &amp; Predefined functions, DOM objects, Window Navigator, History, Location.</p> <p><b>Event handling &amp; Validations on Forms – JavaScript</b> Handling Events on Button, Textbox, radio button, checkbox, drop down box, text area etc. Form Validation – numeric, alphanumeric, alphabets and any combination of these.</p>	
	<b>Total Lecture</b>	<b>45</b>
<b>Text Books</b>	<ul style="list-style-type: none"> <li>• HTML, DHTML, JavaScript, Perl &amp; CGI Ivan Bayross</li> <li>• HTML &amp; CSS : The Complete reference, Fifth Edition By Thomas Powell</li> </ul>	
<b>Additional Reference Books</b>	<ul style="list-style-type: none"> <li>• Html, Xhtml, And CSS Bible (English) 5th Edition (paperback) by Schafer, Steven</li> <li>• HEAD FIRST HTML AND CSS, 2/ED (UPDATED FOR HTML) by ROBSON</li> <li>• Beginning HTML and CSS (English) (Paperback) by Rob Larsen</li> <li>• Learn to Code HTML and CSS (English) (Paperback) by Howe</li> <li>• Javascript Bible (English) 7th Edition by Danny Goodman Michael, Morrison Paul Novitski Tia GustaffRayl</li> <li>• Javascript Programming: Pushing the Limits (English) 1st Edition By (2013)Jon Raasch</li> <li>• Head First JavaScript (2007) By michael Morrison</li> <li>• JavaScript: The Definitive Guide (2011) by Flanagan, David</li> <li>• Introducing HTML5 - Bruce Lawson, Remy Sharp</li> </ul>	
<b>Web References</b>	<ol style="list-style-type: none"> <li>1. www.w3school.com</li> <li>2. www.tutorialpoint.com</li> </ol>	

<b>Subject Title</b>	<b>System Analysis &amp; Design</b>		
<b>Subject Ref. No.</b>	BCA206T - ( B )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

**Course Objectives**

To prepare the students to develop the skills necessary to handle software projects. To make the students aware of the importance of software engineering principles in designing software projects

**Course Outcomes (COs)**

At the end of the course, students will be able to:

<b>CO-1</b>	Understand the important of the stages in the software life cycle
<b>CO-2</b>	Understand the various process models
<b>CO-3</b>	Be able to design software by applying the software engineering principles
<b>CO-4</b>	Learn the concepts of Software Design and software Engineering

<b>Pre Requisite</b>		<b>Number of Lecture</b>
	None	
<b>Unit – I</b>	<p><b>Introduction to System and Approaches to System development</b> : Introduction to System: System, Information System, Types of Information System , Approaches to System development: Software Development Life cycle, Software Development Models :Waterfall model, Iterative Model, RAD model, Incremental model, Spiral model.</p> <p><b>Project management and Planning</b> : Project management Concepts: The management Spectrum: People, The Problem, The Process Software Project Planning: Project planning objectives, Software Scope, Resources, Software Project estimation, The Make-Buy decision, software risks.</p>	<b>18</b>
<b>Unit – II</b>	<p>Analysis Concepts, Principles and Modeling : Analysis Concepts and Principles: Requirement Analysis, Communication techniques: Initiating the Process, Facilitated Application Specification techniques, Quality Function development. <b>Analysis Principles:</b></p>	<b>27</b>

	<p>The Information Domain, Modelling, Partitioning, Software Requirement Specification.</p> <p>Analysis Modeling: Data Modeling: Data objects, Attributes and relationships, cardinality and modality. Data flow diagrams, Entity-Relationship Diagrams, The Data Dictionary.</p> <p>Design Concepts &amp; Principles: Software Design and software Engineering, the design process, the design principles, Design Concepts: Abstraction, Refinement, Modularity, Software architecture, Control hierarchy, Structural Partitioning, Data Structure, Software procedure, Information Hiding.</p> <p>Effective Modular design: Functional independence, Cohesion, Coupling. User Interface Design: the Golden rules, User Interface and Design Process, Interface analysis</p>	
	<b>Total Lectures</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1) Software Engineering – A Practitioners approach, Fourth Edition, Roger S. Pressman, MGH.</li> <li>2) An Integrated Approach to Software Engineering, Second Edition, Pankaj Jalote.</li> </ol>	
<b>Additional Reference Books</b>	<ol style="list-style-type: none"> <li>1) “System Analysis and Design” by Dennis, Wixon and Roth – John Wiley</li> </ol>	

<b>Subject Title</b>	<b>Digital Marketing</b>		
<b>Subject Ref. No.</b>	BCA206T - ( C )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

#### Course Objectives

- To develop Knowledge of digital marketing tools, and platforms.
- To enable students to analyze the digital marketing environment.
- To equip students with the skills and competencies to measure and evaluate the performance and impact of digital marketing activities using various metrics and analytics tools.
- To expose students to the ethical and social issues related to digital marketing,

#### Course Outcomes (COs)

At the end of the course, students will be able to:

<b>CO-1</b>	- Gain solid foundation in the principles and practices of digital marketing.
<b>CO-2</b>	-Can use various digital tools and platforms to create, manage, and optimize effective digital marketing campaigns.
<b>CO-3</b>	- You will develop critical thinking, creativity, and problem-solving skills that will help you design and implement innovative digital marketing campaigns
<b>CO-4</b>	- You will acquire professional skills and competencies that will enhance your employability and career prospects.
<b>CO-5</b>	Opportunity to work on real-world projects and case studies that will give you hands-on experience and exposure.
<b>CO-6</b>	- You will complete International Certifications from Google and Hub spot.

<b>Pre Requisite</b>	Student should have fundamental knowledge of Marketing & IT	<b>Number of Lecture</b>
<b>Unit – I</b>	<b>Introduction to Digital Marketing</b> Digital Marketing Introduction, Marketing Management Fundamentals, Benefits and Challenges of Digital Marketing, Comparison with Offline Marketing, what is Domain and Hosting, Facebook Page, Instagram Business Profile.  <b>Search Engine Optimization</b>	<b>20</b>



	Keyword Research, Google My Business, Google Search Console, Google Analytics, Content Marketing, Copywriting, Understanding Different types of Infographics & Its Sizes for Digital Marketing.	
<b>Unit – II</b>	<p><b>Social Media Marketing</b> Email Marketing, Social Media Marketing- Facebook &amp; Instagram Ads &amp; its formats, Google Ads, LinkedIn Marketing, Use of Hashtags, Social Media Algorithms.</p> <p><b>Mobile Marketing</b> Mobile Marketing, WhatsApp marketing, Online Reputation Management, Affiliate Marketing, Freelancing, SMM Panel Management, Need of Payment Gateway.</p> <p><b>How to Be Professional Online</b> Professional E-mail &amp; E-mail etiquette. Result oriented goal setting. Time Management, writing effective Resume, Basic of Customer Service, Story Telling -Talking about yourself.</p>	<b>30</b>
	<b>Total Lectures</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. Richar Gay , Alan Charlesworth, and Rita Esen, Online Marketing a Customer –led approach , Oxford University Press ,2007</li> <li>2. DrAkshayK.Nayak and Dr.AvinashChiranjeev, INTERNET MARKETING,JnanadaPrakashan(P&amp;D),New Delhi, 2010</li> <li>3. R Prasad ,Digital Marketing –Concepts and Experiences,ICFAI Press, Andhra Pradesh ,2002</li> <li>4. Pramod M Mantravadi ,E-Marketing,The Emerging trends,,ICFAI Press, Andhra Pradesh ,2002.</li> <li>5. Archana Mehta and S Sreedari ,Online Retailing A New Paradigm,,ICFAIPress,Andhrapradesh ,www.books.iupindia.org, 2008</li> <li>6. Advertising on Instagram: <a href="https://business.instagram.com/advertising">https://business.instagram.com/advertising</a></li> <li>7. Facebook Ads Community : <a href="https://www.facebook.com/business/ads/">https://www.facebook.com/business/ads/</a></li> <li>8. LinkedIn Marketing Solutions: <a href="https://business.linkedin.com/marketing-solutions">https://business.linkedin.com/marketing-solutions</a></li> <li>9. Google Ads India: <a href="https://ads.google.com/">https://ads.google.com/</a></li> </ol>	

**Vocational Skill Course (VSC)**  
**Select any one from BCA207P ( A ) to BCA207P ( C )**

<b>Subject Title</b>	<b>Basics of Electronics Lab</b>		
<b>Subject Ref. No.</b>	BCA207P ( A )	<b>No. of Credits</b>	2
		<b>No. of practical / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

**Practical**

- 1) Study of electronic instruments: Voltmeter, Ammeter, and Multimeter
- 2) Identification & Testing of electronic components: Resistors, Capacitors, Inductors, transformers, diodes & transistors.
- 3) Determination of the value of given resistors by using the color code method & verification of it by the multimeter.
- 4) Determination of the value of the resistor in series & Parallel.
- 5) Study of P-N junction diode characteristics
- 6) Study of LED & Photo diode characteristics.
- 7) Study of Zener diode characteristics
- 8) Study of Common-Emitter transistor characteristics.
- 9) Construction of Full wave rectifier.
- 10) Study of IC regulator 78XX & 79XX series.
- 11) Make a Relay switch circuit.
- 12) Design & Construction of Regulated IC 5V DC Power Supply

<b>Subject Title</b>	<b>Data Analysis Using MS-Excel Lab</b>		
<b>Subject Ref. No.</b>	BCA207P ( B )	<b>No. of Credits</b>	2
		<b>No. of practical / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

### Practical

- 1) Calculate grades in Excel
- 2) Calculate bonus in Excel
- 3) Calculate bill in amount in Excel
- 4) Calculate Result and Grade
- 5) Calculate Income Tax Surcharge and Total Tax.
- 6) Filter the worksheet to show.
- 7) Calculate Total Marks.
- 8) Prepare scenarios where.
- 9) Obtain the solution for the cost price.

<b>Subject Title</b>	<b>Analysis of Balance Sheet</b>		
<b>Subject Ref. No.</b>	BCA207P ( C )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45 / 3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b>			
The main objectives of this course is to introduce students to the basic concepts of balance sheet analysis, to provide students with the tools to use ratio analysis, to help students identify trends in company's financial statements, to communicate the results of the analysis to others			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	Understand the basic concepts of balance sheet analysis		
<b>CO-2</b>	Use ratio analysis to compare company's financial performance		
<b>CO-3</b>	Identify trends in a company's financial statements		
<b>CO-4</b>	Communicate the results of the analysis to others		

<b>Pre Requisite</b>		<b>Number of Lecture</b>
	None	
<b>Unit – I</b>	<b>Introduction to Balance Sheet Analysis</b> What is a Balance Sheet?, the different types of assets & liabilities, how to read a balance sheet.  <b>Ratio Analysis</b> What are ratios?, how to use ratios to analyse a company's financial health, common ratios used in balance sheet analysis	<b>25</b>
<b>Unit – II</b>	<b>Trend Analysis</b> How to identify trends in a company's financial statement, what to look for when analysing trends.  <b>Horizontal and Vertical Analysis</b>	<b>20</b>

	Horizontal Analysis, Vertical Analysis, Comparison of Horizontal Analysis of different companies, Comparison of Vertical Analysis of different companies. <b>Communicating the results of analysis</b> Communication of the results of Balance Sheet analysis, importance of clear and concise communication	
	<b>Total Lectures</b>	<b>45</b>
<b>Text Books</b>	1. Gupta, S., & Gupta, A. (2022). Financial statement analysis (4th ed.). McGraw-Hill Education (India)	
<b>Additional Reference Books</b>	1. Muddanna, R. A. K. (2022). Financial statement analysis. Pearson India Education Services. 2. Jain, V. K. (2021). Balance sheet analysis. Himalaya Publishing House. 3. Kothari, S. P. (2022). Financial statement analysis (6th ed.). Wiley India.	

**Skill Enhancement Course (SEC)**

**Select any one from BCA208P – ( A ) to BCA208P – ( C )**

<b>Subject Title</b>	<b>Advance Web Development Technology LAB</b>		
<b>Subject Ref. No.</b>	BCA208P – ( A )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

**Course Objectives**

The main objective of this course is to get hands of all HTML tags, CSS, JavaScripts and Validation which helps to design effective Web Pages

**Course Outcomes (COs)**

At the end of the course, students will be able to:

<b>CO-1</b>	Understand the different types of CSS.
<b>CO-2</b>	Apply CSS to different HTML elements.
<b>CO-3</b>	Write code using JavaScript with HTML.
<b>CO-4</b>	Write program for form validation.

14. Write an HTML code using **Inline stylesheet** for displaying sentences with
  - a. font : Times new roman
  - b. font size: 18
  - c. color : red
  - d. bold , italics
  
15. Write an HTML code using **Embeddedstylesheet** for displaying sentences with
  - a. font : Times new roman
  - b. font size: 18
  - c. color : red
  - d. bold , italics
  
16. Write program to demonstrate the embedded stylesheet using *class*.
  
17. Write an HTML code using **External stylesheet** for displaying sentences with
  - a. font : Times new roman
  - b. font size: 18
  - c. color : red
  - d. bold , italics
  
18. Write programs using embedded stylesheet for following :*(don't write tags)*

CSS Selectors	CSS Backgrounds
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<ul style="list-style-type: none"> <li>• The element selector (for particular tag only)</li> <li>• The class selector (for all elements)</li> <li>• The class selector (for only &lt;p&gt; elements)</li> </ul>	<ul style="list-style-type: none"> <li>• Set the background color of a page</li> <li>• Set the background color of different elements</li> <li>• Set an image as the background of a page</li> </ul>
<p><b>CSS Text</b></p> <ul style="list-style-type: none"> <li>• Set the text color of different elements</li> <li>• Align the text</li> <li>• Remove the line under links</li> <li>• Decorate the text (strikethrough,underline)</li> <li>• Control the letters in a text (capital , uppercase , lowercase)</li> <li>• Specify the space between characters</li> <li>• Specify the space between lines</li> </ul>	<p><b>CSS Fonts</b></p> <ul style="list-style-type: none"> <li>• Set the font of a text</li> <li>• Set the size of the font</li> </ul>
<p><b>CSS Links</b></p> <ul style="list-style-type: none"> <li>• Add different colors to visited/unvisited links</li> <li>• Use of text-decoration on links</li> <li>• Specify a background color for links</li> </ul>	<p><b>CSS Lists</b></p> <ul style="list-style-type: none"> <li>• All the different list item markers in lists</li> <li>• Set an image as the list-item marker</li> </ul>
<p><b>CSS Tables</b></p> <ul style="list-style-type: none"> <li>• Specify a black border for table, th, and td elements</li> <li>• Specify the width and height of a table</li> <li>• Set the horizontal alignment of content (text-align)</li> <li>• Set the vertical alignment of content (vertical-align)</li> <li>• Specify the padding for th and td elements</li> <li>• Specify the color of the table borders</li> </ul>	<p><b>CSS Border</b></p> <ul style="list-style-type: none"> <li>• Set the color of the four borders</li> <li>• Set the color of the top border</li> <li>• Set the color of the bottom border</li> <li>• Set the color of the left border</li> <li>• Set the color of the right border</li> </ul>
<p><b>CSS Margin</b></p> <ul style="list-style-type: none"> <li>• Specify margins for an element</li> <li>• The margin shorthand property</li> <li>• Set the bottom margin of a text using a percent value</li> </ul>	<p><b>CSS Padding</b></p> <ul style="list-style-type: none"> <li>• Set the left padding of an element</li> <li>• Set the right padding of an element</li> <li>• Set the top padding of an element</li> <li>• Set the bottom padding of an element</li> </ul>

## JAVASCRIPT

1. Write a JavaScript code that will display different images as per selection of user selection. (Use radio buttons).
2. Write JavaScript code that will accept two numbers from user & on click of buttons (add, mul, sub, div) display appropriate result in the third textbox.
3. Write JavaScript code that will make sure that user must enter values in all the fields if user fails to do so then display appropriate error message to user.( Take suitable fields for Registration form – cover all the elements)
4. Write JavaScript code that will place textbox & drop down box on webpage , accept input from textbox & accept a digit from 1-10 from drop-down as per selection display alert message as many times as value selected from dropdown box & message will be the input of the textbox.
5. write a HTML code that will display a textbox & a drop down box , accept the string from user in textbox & a number (1-9)from drop down box , display the string as many times as the number selected by user on webpage. (using **JavaScript**)
6. Write an HTML code that will accept numbers from user until user enters 0 from prompt box & display the message “You have entered...*number*...” On the webpage for every number. (using **JavaScript**)
7. Write a program using **HTML 5** that will use number, email, range, date.
8. Write a HTML code that will display a textarea on webpage to accept a paragraph from user. Using JavaScript display the total count of words present in the paragraph.

9. Write a HTML code that will display a textarea on webpage to accept a paragraph from user. Using JavaScript display the total count of word 'sachin' present in the paragraph.
10. Write a HTML code that will display a textarea on webpage to accept a paragraph from user. Using JavaScript replace the every occurrences of word 'sachin' with 'ramesh' present in the paragraph.
11. Write a HTML code that will display a textarea on webpage to accept a paragraph from user. On click of button Using JavaScript display first 5 and last 5 word with red color , times new roman font , size – 24 using embedded stylesheet.
12. Write a HTML code that will display a textarea on webpage to accept a paragraph from user. On click of button Using JavaScript display first 5 word with red color , times new roman font , size – 24 using external stylesheet on webpage.



<b>Subject Title</b>	<b>System Analysis &amp; Design LAB</b>		
<b>Subject Ref. No.</b>	BCA208P – ( B )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

**Course Objectives**

At the end of the course, students will be able to:

To prepare the students to develop the skills necessary to develop different diagrams. To make the students aware of the importance of software engineering principles in designing software projects

**Course Outcomes (COs)**

At the end of the course, students will be able to:

1)	To develop standard SRS document
2)	To study different models used in Software Development
3)	To study different types of Diagram used in Software Development
4)	Develop different Diagrams for given software

1. Develop a problem statement.
2. Develop an IEEE standard SRS document.
3. Discuss the tool to draw different types of diagram throughout the analysis & design.
4. Develop Data Flow Diagrams
5. Identify Usecases and develop Usecase model
6. Develop Activity Diagram
7. Develop State Diagram
8. Develop Sequence Diagram
9. Develop Collaboration Diagram
10. Develop Entity Relationship Diagram
11. Develop Usecases, Sequence diagram and Activity Diagram for Event management system
12. Develop Usecases, Sequence diagram and Activity Diagram for Payroll management system
13. Develop DFD, ERD and Usecases, for Student Feedback System
14. Develop DFD, ERD and Usecases, for Inventory Management System
15. Develop DFD, ERD, Usecases, Sequence diagram and Activity Diagram for Attendance Management System

<b>Subject Title</b>	<b>Digital Marketing LAB</b>		
<b>Subject Ref. No.</b>	BCA208P – (C)	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30

#### Course Objectives

Course Objectives:

- To develop Knowledge of digital marketing tools, and platforms.
- To enable students to analyze the digital marketing environment.
- To equip students with the skills and competencies to measure and evaluate the performance and impact of digital marketing activities using various metrics and analytics tools.
- To expose students to the ethical and social issues related to digital marketing,

#### Course Outcomes (COs)

At the end of the course, students will be able to:

<b>CO-1</b>	- Gain solid foundation in the principles and practices of digital marketing.
<b>CO-2</b>	-Can use various digital tools and platforms to create, manage, and optimize effective digital marketing campaigns.
<b>CO-3</b>	- You will develop critical thinking, creativity, and problem-solving skills that will help you design and implement innovative digital marketing campaigns
<b>CO-4</b>	- You will acquire professional skills and competencies that will enhance your employability and career prospects.
<b>CO-5</b>	Opportunity to work on real-world projects and case studies that will give you hands-on experience and exposure.
<b>CO-6</b>	- You will complete International Certifications from Google and Hub spot.

<b>1)</b>	Hands on experience on Digital marketing Trends and Best practices : Google advance search, Google alerts, Google trends, Stastical Analysis Tool eg Stastia Products, services and updates, Performance of the page
<b>2)</b>	How to conduct keyword research and analysis for SEO? How to optimize it for local SEO and Performance ,Google Business : Create and Manage small Business
<b>3)</b>	How to use various social media Marketing platforms LinkedIn to connect with the audience and promote a brand?

4)	How to create a content marketing strategy and plan? How to create engaging and relevant content for different stages of the buyer's journey? How to distribute and promote content through various channels (Email, Social Media,SEO,etc)
5)	E-commerce Marketing ,ONDC, Amazon and flip kart What is e-commerce marketing and why is it important? What are the features and types of e-commerce platforms (Shopify, Woo Commerce, Magento, etc.)?
<b>Text Books</b>	10. Richar Gay , Alan Charlesworth, and Rita Esen,Online Marketing a Customer –led approach , Oxford University Press ,2007 11. Dr. Akshay K.Nayak and Dr. Avinash Chiranjeev, INTERNET MARKETING,JnanadaPrakashan(P&D),New Delhi, 2010 R Prasad ,Digital Marketing –Concepts and Experiences,ICFAI Press, Andhra Pradesh ,2002
<b>Additio nal Referen ce Books</b>	1. Pramod M Mantravadi , E-Marketing, The Emerging trends,, ICFAI Press, Andhra Pradesh ,2002. 12. Archana Mehta and S Sreedari, Online Retailing A New Paradigm, ICFAIPress, Andhrapradesh,www.books.iupindia.org, 2008

## Ability Enhancement Course - AEC

Choose any one from basket / pool

<b>Subject Title</b>	Hindi / Marathi / Urdu / Arabic / Sanskrit /Pali		
<b>Subject Ref. No.</b>	BCA209T	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3

## Value Education Course (VEC-2) – VEC

<b>Subject Title</b>	<b>Environmental Studies</b>		
<b>Subject Ref. No.</b>	BCA210T	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45 /3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b>			
<p>The main objectives of the course are , to learn the scope of Environmental Studies, Community ecology and the interdisciplinary nature of environmental issues, sources of Natural resources its classification, concepts, and natural resources of India, values of biodiversity and conservation, environmental pollution, Sustainable Development on environment and health.</p>			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
1)	To appreciate the scope of Environmental Studies, Community ecology and the interdisciplinary nature of environmental issues.		
2)	To have a basic knowledge of Natural resources its classification, concepts, and natural resources of India.		
3)	The course designed to gain knowledge on values of biodiversity and conservation on global, national, and local scales.		
4)	To study about sources and effects of environmental pollution like air, water, soil, thermal, marine, nuclear and noise.		
5)	CO5: To understand the concerns related to Sustainable Development on environment and health.		

<b>Pre Requisite</b>	Basic understanding of environment, ecosystem and surroundings. Observation skills.	<b>Number of Lectures</b>
<b>Unit – I</b>	Introduction to environmental studies, Multidisciplinary nature of environmental studies; Scope and importance; the need for environmental education. Concept of sustainability and sustainable development. Ecosystems, food chains, food webs and function of ecosystem. Energy flow in an ecosystem, nutrient cycle and ecological succession. Ecological Interactions. Case studies of the following ecosystems: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) etc.	<b>25</b>

	Biodiversity and Conservation; a. Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots; b. India as a mega-biodiversity nation; Endangered and endemic species of India; c. Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity; d. Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context; e. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.	
<b>Unit – II</b>	<p>Environmental Pollution and Global Environmental Issues – a. Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution. b. Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture c. Nuclear hazards and human health risks (Chernobyl, 3 mile Island, Daiichi-Fukushima) d. Solid waste management: Control measures of urban and industrial waste, special reference e-waste, Biomedical waste. e. Pollution Tragedies.</p> <p>Natural Resources: Renewable and Non-renewable Resources. A. Land resources and land-use change; Land degradation, soil erosion and desertification. B. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. C. Disaster management: floods, earthquake, cyclones and landslides. Resettlement and rehabilitation of project affected persons; case studies. Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international &amp; inter-state). D. Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.</p>	<b>20</b>
	<b>Total Lecture</b>	<b>45</b>
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. Basu, M. and Xavier, S., Fundamentals of Environmental Studies, Cambridge University Press, 2016.</li> <li>2. Mitra, A. K and Chakraborty, R., Introduction to Environmental Studies, Book Syndicate, 2016.</li> <li>3. Enger, E. and Smith, B., Environmental Science: A Study of Inter-relationships, Publisher: McGraw-Hill Higher Education; 12th edition, 2010.</li> <li>4. Basu, R.N, Environment, University of Calcutta, 2000.</li> <li>5. Gadgil, M., &amp; Guha, R. 1993. This Fissured Land: An Ecological History of India Univ. of California Press.</li> </ol>	
<b>Additional Reference Books</b>	<ol style="list-style-type: none"> <li>1. Odum, E.P., Odum, H.T. &amp; Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.</li> <li>2. Pepper, I.L., Gerba, C.P. &amp; Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.</li> <li>3. Agrawal, KM, Sikdar, PK and Deb, SC, A Text book of Environment, Macmillan Publication, 2002.</li> <li>4. Richard T Wright, Environmental Science: Towards a Sustainable Future, Prentice-Hall Inc., 2008.</li> </ol>	

## Co-curriculum Courses

<b>Subject Title</b>	Yoga Education		
<b>Subject Ref. No.</b>	BCA211P ( A )	<b>No. of Credits</b>	2
		<b>No. of Periods / Week</b>	45/3
		<b>Assignments / Sessional</b>	20
		<b>Semester Examination</b>	30
<b>Course Objectives</b>			
The main objective of this course is to achieve physical, mental, emotional and spiritual wellbeing for attainment of higher level of consciousness.			
<b>Course Outcomes (COs)</b>			
At the end of the course, students will be able to:			
<b>CO-1</b>	Improve physical & mental flexibility		
<b>CO-2</b>	Demonstrate the ability to perform yoga movements in various combination and forms.		
<b>CO-3</b>	Understand and apply the knowledge of basic sequencing, and effective group management.		
<b>CO-4</b>			
<b>Pre Requisite</b>	No Pre-requisite		<b>Number of Lecture</b>
<b>Unit – I</b>	Sukshma vyayama, Suryanamaskara, Introduction to Breathing Techniques . Standing Asanas: Vrukshasana , Tadasana, Trikonasana, Veer Bhadrasana, hasta padasana		<b>20</b>
<b>Unit – II</b>	Sitting Asanas: Sukhasana, Padmāsana, Swastikasana, Pashchhimmottasna, Gomukhasana, Vajrasana , Siddhasana. Supine lying Asanas: Ardhalasana, Viparit Karni, SARvangasana, Halasana, Naukasana, Matsyasana, Shavasana. Prone Lying Asanas: Shalabhasana, Bhujangasana, Makarasana, Dhanurasana,		<b>20</b>
	<b>Total Lectures</b>		<b>45</b>
<b>Text Books</b>	1. Sri Ananda : The Complete book of Yoga, Orient Course Backs, Delhi, 2003. 2. Basavaraddi, I.V. & others : SHATKARMA: A Comprehensive description about Cleansing Process, MDNIY New Delhi, 2009		

	3. Joshi, K.S. : Yogic Pranayama, Oriental Paperback, New Delhi, 2009 4. Dr. Nagendra H R : Pranayama, The Art & Science, Swami Vivekananda Yoga Prakashan, Bangalore, 2005	
<b>Additional Reference Books</b>	1. Basavaraddi, I.V. & others : SHATKARMA: A Comprehensive description about Cleansing Process, MDNIY New Delhi, 2009 2. Joshi, K.S. : Yogic Pranayama, Oriental Paperback, New Delhi, 2009 3. Swami Kuvalyananda : Pranayama, Kaivalyadhama, Lonavla, 2010 4. Swami Rama: Science of Breath, A Practical Guide, The Himalayan International Institute, Pennselvenia, 1998 Swami Niranjananand Saraswati: Prana, Pranayama & Pranvidya, Yoga Publications Trust, Munger, Bihar, 2005	



<b>Subject Title</b>	<b>Sport &amp; Fitness</b>		
<b>Subject Ref. No.</b>	<b>BCA211P ( B )</b>	<b>No. of Credits</b>	<b>2</b>
		<b>No. of Periods / Week</b>	<b>45/3</b>
		<b>Assignments / Sessional</b>	<b>20</b>

**As per University Syllabus**