Bachelor of Computer Applications (BCA)

Affiliated to Thiruvalluvar University

PROGRAMME HANDBOOK

CURRICULUM AND SYLLABUS UNDER CBCS

WITH EFFECT FROM 2017-2018

JUNE 2018

DON BOSCO COLLEGE (CO-ED)

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PROGRAM OVERVIEW

Bachelor in Computer Application (BCA) is one of the most popular programs among the students who want to make their career in IT (Information Technology) field. The duration of the program is three years and divided into six semesters. It comprises subjects like database, networking, data structure, core programming languages like 'C', 'C++' and 'Java'. This program provides numerous opportunities to the students who are interested in the field of Computer Applications and desire to work in IT and/or IT enabled industries. It prepares students with the required knowledge to proceed for higher studies such as MCA, M.Sc. (IT), M.Sc (Computer Science), MBA and likewise.

UNIVERSITY REGULATIONS - DEFINITIONS

PROGRAM - "Programme" means a course of study leading to the award of a degree in a discipline.

PROGRAM DURATION - It shall extend over a period of three years comprising of six semesters with two semesters in one academic year.

COURSE - "Course" refers to a paper / practical / subject offered under the degree programme. Each Course is to be designed with lectures / tutorials/Laboratory or field work / seminar / practical training / Assignments / Term paper or Report writing etc., to meet effective tea**c**hing and learning needs.

CREDITS - The weightage given to each course of study (subject) by the experts of the Board of Studies concerned. The total minimum credits, required for completing a UG program is 140.

CHOICE BASED - All Undergraduate Programmes offered by Thiruvalluvar University are under Choice Based Credit System. This is to enhance the quality and mobility of the students within and between the Universities in the country and abroad.

ELIGIBILITY FOR ADMISSION - Candidate seeking admission to the first year of the UG Degree Course should have passed the Higher Secondary Course Examination (Academic or Vocational) Conducted by the Govt. of Tamil Nadu with Mathematics as a subject or any other Examination accepted as equivalent thereto by the Syndicate subject to such other conditions as may be prescribed.

PATTERN OF STUDY

The pattern of study for all UG Programs in Thiruvalluvar University consists of the following:

PART-I: Tamil or any one of the following modern/classical languages i.e. Telugu, Kannada, Malayalam, Hindi, Sanskrit, French, German, Arabic & Urdu.
The subject is offered during the **first two semesters** with one examination at the end of each semester (2 courses: 2 x 4 = 8 credits).

PART-II: English - The subject shall be offered during the **first two semesters** with one examination at the end of each semester (2 courses: 2 x 4 = 8 credits).

PART-III

(i) Core Subjects - Core papers including practicals wherever applicable are offered as prescribed in the scheme of examination, by the Board of Studies of respective subject. There are 13 Core papers, 8 core practical papers, 4 allied and 3 electives constituting 80 credits for theory and 22 for practicals.

(ii) Allied Subjects - Allied papers including practicals wherever applicable are offered as prescribed in the scheme of Examination by the Boards of Studies of different subjects. There shall be 4 papers, **one each** in I, II, III and IV semester, for all UG Courses except for Science courses with practicals. For all the 4 semesters, the total number of credits for Allied courses shall be 20 only.

(iii) Electives Courses - Three elective courses with (3x3=) 9 credits are to be offered one in the V Semester and two in the VI Semester. Elective subjects are selected from the list of electives prescribed by the Board of Studies concerned, as given below. Colleges can choose any one of the papers, given below, as an elective for a particular

semester whether 5th semester or 6th semester. Elective paper for a particular semester once chosen by a particular college, should not be changed without getting prior permission and approval of the University.

PART-IV

i) Basic Tamil / Advanced Tamil (OR) Non-major Elective - Those who have not studied Tamil upto XII std and taken a non-Tamil language under Part-I shall take Tamil comprising of two courses with 2 credits each (2x2=4 credits). The course content of which shall be equivalent to that prescribed for the 6th standard by the Board of Secondary Education and they shall be offered in the **third and fourth semesters**. (OR)

b. Those who have studied Tamil upto XII std and taken a non-Tamil language under Part-I shall take Advanced Tamil comprising of two courses with 2 credits each (2x2=4 credits) in the **third and fourth semesters**. (OR) c. Others who do not come under the above a/b categories can choose the offered **non-major electives** comprising of two courses with (2x2=) 4 credits, in the **third and fourth semesters**.

ii) Skill Based Subjects All the UG Programmes shall offer four courses of **skill based subjects one each** in III, IV, V & VI semester with 3 credits each (4x3= 12 credits) for which examination shall be conducted at the end of the respective semesters.

iii) Foundation Courses - There are 3 Foundation Courses offered.

1. Environmental Studies - offered in 1st Semester, under Part IV of the programme.
2.Value Education - offered in 2nd Semester under Part IV of the programme.
3.Soft Skill - offered in 2nd Semester under Part IV of the programme

(a) Environmental Studies - All UG Programmes shall offer a course in Environmental Studies subject and it shall be offered in the **first semester as** one paper with 2 credits. Examination shall be conducted at the end of the first semester.

(b) Value Education - All UG Programmes shall offer a course in "Value Education" and it shall be offered in the **second semester as** one paper with 2 credits. Examination shall be conducted at the end of second semester.

(c) Soft Skill - All the UG Programmes shall offer a course in "Soft Skill" subject and it shall be offered in the **Second Semester by the Department of English**, as one paper with 1 credit. Examination shall be conducted at the end of the 2nd semester.

The assessment for the course in **Part IV** namely (i)(a) alone, shall be only through CIA and not through external (University) examination for the total marks prescribed.

The assessment for the courses in **Part IV** namely (i)(b) & (i)(c) and (ii), (iii)(a), (iii)(b) and (iii)(c), shall be through CIA as well as external (University) examination for the total marks prescribed.

PART V

Extension Activities - Proper relevant records shall be maintained by the respective departments and if necessary it may be verified by the university authority at any time. The extension activities shall be conducted outside the regular working hours of the college. The mark sheet shall carry the gradation relevant to the marks awarded to the candidates. This grading shall be incorporated in the mark sheet to be issued at the end of the semester for which students shall pay the fee for one theory paper.

The marks shall be sent to the Controller of Examinations before the commencement of the final semester examinations.

Marks to be awarded as follows:

1. 20% of marks for Regularity of attendance.
2.60% of marks for Active Participation in classes/camps/games/special Camps/Programmes in the college/ District / State/ University activities.
3. 10% of marks for Exemplary awards/Certificates/Prizes
4. 10% of marks for Other Social components such as Blood Donations, Fine Arts, etc

PASSING MINIMUM

1.A candidate shall be declared to have passed the whole examination, if the candidate passes in all the theory papers and practicals wherever prescribed as per the scheme of examinations by earning 140 credits in Part I, II, III, IV and V. He / She shall also fulfill the extension activity prescribed by earning 1 credit to qualify for the degree.

2.A candidate should get **not less than 40% in the University (external)** Examination, compulsorily, in any course of Part I, II, III& IV papers. Also the candidate who secures **not less than** 40% marks in the external as well as internal (CIA) examinations put together in any course of Part I, II, III & IV shall be declared to have successfully passed the examination in the subject in theory as well as Practicals.

DISTRIBUTION

Table - 1(A): The following are the distribution of marks for external and internal for University (external) examination and continuous internal assessment and passing minimum marks for **theory papers of UG Programmes**.

UNI. EXAM TOTAL (ESE)	PASSINGMINIMUM FOR UNI.EXAM	CIA TOTAL	PASSING MINIMUM FOR CIA	TOTAL MARKS ALLOTTED	PASSING MINIMUM (UNI.EXAM+CIA)
75	30	25	0	100	40

Note: ESE - End Semester Examination

Table - 1(B): The following are the Distribution of marks for Continuous Internal Assessment in the theory papers of UG Programmes.

S.No.	For Theory - UG courses	Distribution of Marks	
		Assignments	**Tests**
1	Assignment-1 (First 2 Units of the Syllabus)	10	-
2	Test-1 (First 2 Units of the Syllabus for 1 Hour duration)	-	50
3	Assignment-2 (3^{rd}& 4^{th} Units of the Syllabus)	10	
4	Test-2 (First 4 Units of the Syllabus for 2 Hours duration)	-	50
5	Assignment-2 (5^{th} Unit of the Syllabus)	10	-
6	Test-3 (Entire Syllabus for 3 Hours duration)	-	100
	TOTAL MARKS	30	200
	Marks to be converted to	5	20
	Total Maximum Marks for CIA	25	

Table – 2(A): The following are the distribution of marks for University (external) examinations and continuous internal assessments and passing minimum marks for the **practical courses of UG Programmes**.

UNI. EXAM TOTAL (ESE)	PASSING MINIMUM FOR UNI.EXAM	CIA TOTAL	PASSING MINIMUM FOR CIA	TOTAL MARKS ALLOTTED	PASSING MINIMUM (UNI.EXAM+CIA)
75	30	25	0	100	40

Table – 2(B): The following are the distribution of marks for the Continuous Internal Assessment in UG practical courses.

S.No.	For Practical - UG courses	Distribution of Marks	
		Assignments	**Tests**
1	Regular maintenance of the Observation note book-1 (Up to the end of I-Semester)	10	-
2	Test-1 (Up to the end of I-Semester for 2 Hours duration)	-	25

3	Regular maintenance of the Observation note book-2 (Up to the end of II-Semester)	10	
4	Test-2 (Up to the end of II-Semester for 2 Hours duration)	-	25
5	Regular maintenance & proper completion of the Record note book	10	-
6	Test-3 (Entire Syllabus following University examination pattern)	-	25
	TOTAL MARKS	30	75
	Marks to be converted to	10	15
	Total Maximum Marks for CIA	25	

QUESTION PAPER PATTERN

The following question paper patterns shall be followed for CBCS pattern syllabi for the candidates admitted from the academic year 2017-2018 onwards.

External Maximum 75 Marks – wherever applicable (Ext.75 + Int.25 = Total. 100)

Section A	Very short answer questions	10X 2=20	10 questions – 2 from each unit
Section B	Short answer questions of either / or type (like 1a (or) 1b)	5X5=25	5 questions – 1 from each unit
Section C	Essay-type questions / Problem (Answer any 3 out of 5)	3X10=30	5 questions – 1 from each unit

NOTE: In Section "C" one of the questions shall be application oriented or a problem, wherever applicable.

GRADING

Once the marks of the CIA and end-semester examinations for each of the course are available, they shall be added. The mark thus obtained shall then be converted to the relevant letter grade, grade point as per the details given below:

Conversion of Marks to Grade Points and Letter Grade (Performance in a Course/Paper)

RANGE OF MARKS	GRADE POINTS	LETTER GRADE	DESCRIPTION
90-100	**9.0-10.0**	**O**	Outstanding
80-89	**8.0-8.9**	**D+**	Distinction
75-79	**7.5-7.9**	**D**	
70-74	**7.0-7.4**	**A+**	First Class
60-69	**6.0-6.9**	**A**	
50-59	**5.0-5.9**	**B**	Second Class
40-49	**4.0-4.9**	**C**	Third Class
00-39	**0.0**	**U**	Re-appear
Absent	**0.0**	**AAA**	Absent

PROGRAMME STRUCTURE

#	SEM	PART	CT	COURSE CATEGORY	HW	CR	CODE	TITLE

1	1	I	T	Language	6	4	BLT10	Tamil I
2		II	T	English	6	4	BLE10	English I
3		III	T	Core	6	6	BCA11	Digital Logic and Programming in C
4		III	T	Allied	7	4	BAMA15B	Mathematical Foundations I
5		III	P	Core	3	2	BPCA13	Programming in C Lab
6		IV	T	Environment Studies	2	2	BES10	Environmental Studies
7	2	I	T	Language	6	4	BLT20	Tamil II
8		II	T	English	4	4	BLE20	English II
9		III	T	Core	6	6	BCA21	C++ and Data Structure
10		III	T	Allied	7	6	BAMA25B	Mathematical Foundation II
11		IV	T	Value Education	2	2	BGA20	Value Education
12		IV	T	Soft Skill	2	1	BSS20	Soft Skill
13		III	P	Core	3	2	BPCA23	C++ and Data Structures Lab
14	3	III	T	Core	5	3	BCA31	Java Programming
15		III	T	Core	4	4	BCA32	E-Commerce
16		III	T	Core	5	4	BCA33	Resource Management Techniques
17		IV	T	Skill	3	3	BSCA34	Design and Analysis of Algorithms
18		III	P	Core	4	3	BPCA36	Java Programming Lab
19		III	T	Allied	7	4	BACM15C	Financial Accounting I
		IV	T	NME ***	2	2	BNEN35	Language Skills and Communication I
21	4	III	T	Core	5	3	BCA41	Database Management Systems
22		III	T	Core	4	4	BCA42	Enterprise Resource Planning
23		III	T	Core	5	4	BCA43	Decision Support System
24		III	P	Core	4	3	BPCA46	RDBMS Lab
25		IV	T	Skill	3	3	BSCA44	Computer Organization and Architecture
26		III	T	Allied	7	6	BACM25C	Financial Accounting II
		IV	T	NME ***	2	2	BNEN45	Language Skills and Communication II
28	5	III	T	Core	6	3	BCA51	Mobile Application Development
29		III	T	Core	6	3	BCA52	Operating System
30		III	T	Core	4	2	BCA53	Data Communication and Network

31		III	P	Core	4	3	BPCA56	Mobile Application Development Lab
32		III	P	Core	4	3	BPCA57	Operating System Lab
33		III	T	Elective 1 ****	3	3	BECA54A	Data Mining
							BECA54B	Computer Graphics
							BECA54C	Information Security
34		IV	T	Skill	3	3	BSCA55	Software Engineering
35	6	III	T	Core	7	5	BCA61	Cloud Computing
36		III	T	Core	6	4	BCA62	Open Source Programming
37		III	T	Elective2	3	3	BECA63A	Software Testing
							BECA63B	Mobile Computing
							BECA63C	Microprocessors and its applications
38		III	T	Elective3	3	3	BECA64A	Internet of Things
							BECA64B	System Software
							BECA64C	Multimedia Systems
39		IV	T	Skill	3	3	BSCA65	ASP .NET
40		III	P	Core	4	3	BPCA66	ASP .NET Lab
41		III	P	Core	4	3	BPCA67	Open Source Programming Lab
42		V	F W	Extension Activities	0	1	BEA60	Extension Activities

INTERNAL MARK : 25 EXTERNAL MARK : 75 FOR EXTENSION ACTIVITIES : EXTERNAL MARK : 100

Note: T-Theory, P-Practical, FW-Field Work

Part	Subject	Papers	Credit	Total Credits	Marks	Total Marks
I	Languages	2	4	8	100	200
II	English	2	4	8	100	200
III	Allied(Odd Semester)	2	4	8	100+100	200
	Allied(Even Semester)	2	6+6	12	100+100	200
	Electives	3	3	9	100	900
	Core	13	(3-6)	51	100	1300
	Core Practical	8	(2-3)	22	100	800
IV	Environmental Science	1	2	2	100	100
	Soft Skill	1	1	1	100	100

	Value Education	1	2	2	100	100
	Languages & Others/NME	2	2	4	100	200
	Skill Based	4	3	12	100	400
V	Extension	1	1	1	100	100
	Total	42		140		4200

***** NON-MAJOR ELECTIVES (Semesters 3 & 4)**

SEM	PART	CODE	TITLE	TYPE	HRS	CREDIT
3	**IV**	BNBA37	Management Concepts	T	**2**	**2**
		BNCP37	Elements of Accountancy	T		
		BNMA34	Basic Mathematics	T		
		BNEN35	Language Skills and Communication I	T		
4	**IV**	BNCP46	Advertising and Salesmanship	T		
		BNMA44	Foundation Mathematics for Competitive Examination	T		
		BNEN45	Language Skills and Communication II	T		
		BNBA47	Training and Development	T		

LIST OF ELECTIVE PAPERS

Semester 5 - Paper 1		
A	BECA54A	Data Mining
B	BECA54B	Computer Graphics
C	BECA54C	Information Security
Semester 6 - Paper 2		
A	BECA63A	Software Testing
B	BECA63B	Mobile Computing
C	BECA63C	Microprocessors and its applications
Semester 6 - Paper 3		
A	BECA64A	Internet of Things
B	BECA64B	System Software
C	BECA64C	Multimedia Systems

PROGRAM EDUCATION OBJECTIVES (PEO)

OB1: EDUCATION - The graduate will be able to continue higher studies in the field of Computer Science / Applications

OB2: TECHNOLOGY - The graduate will be able to understand, analyze and develop software applications and become skilled software professionals adopting cutting-edge technologies.

OB3: RESEARCH - The graduate will be able to involve in research and development to propose computing models or solution with innovation.

OB4: ETHICAL AND PROFESSIONAL GROWTH - The graduate will be able to articulating one's own value system and live by the values in life and in one's profession

PROGRAM OUTCOMES (PO)

1. **Problem Solving:**Ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve problems related to Technology, Life and Career.
2. **Individual and Team work:** Ability to work effectively as a member and leader in a team, preferably in any setting.
3. **Communication skills:** Ability to communicate within the profession and with society at large. Such abilities include reading, writing, speaking, listening, the ability to comprehend and write effective reports and documents.
4. **Professionalism:** Understand the professional ethics and apply the same for public and the public interest.
5. **Ethics and equity:** Ability to apply ethics, accountability, and equity in all dealings.

6. **Life-long learning:** Ability to identify and to address one's educational needs in the changing world in ways sufficient to maintain one's competence and to allow him/her to contribute to the advancement of selected domains.

PROGRAM SPECIFIC OUTCOMES (PSO)

The student will have the abilities to

7. Understand the ***principles and working of computer systems***. Students can assess the hardware and software aspects of computer systems.
8. Apply mathematical principles ***to solve real world problems*** using appropriate data structures and suitable algorithms.
9. Understand, analyze, design and develop ***computer programs*** using C, C++, Java and upcoming popular technologies.
10. Apply ***process and life cycle of software engineering*** to develop software.
11. Model and design the ***database*** for any computer system.
12. Analyze and appreciate ***computing systems*** such as mobile, cloud, decision support, data mining, operating system, IoT, Networks, Information Security and related topics.

MAPPING OF INSTITUTION OBJECTIVES WITH PEOs

COLLEGE / PROGRAMME	EDUCATION	TECHNOLOGY	RESEARCH	ETHICAL AND PROFESSIONAL
OB1 : EDUCATION	√	√	√	√
OB2 : RESEARCH			√	
OB3 : EMPLOYABILITY		√	√	√
OB4 : COMM.SERVICE				√

MAPPING PEOs WITH POs / PSOs

PEO	PO1	PO2	PO3	PO4	PO5	PO6	PSO 7	PSO8	PSO9	PSO 10	PSO 11	PSO 12
1: EDUCATION	√	√	√			√	√	√	√	√	√	√
2: TECHNOLOGY	√					√	√		√		√	√
3: RESEARCH	√	√		√		√		√			√	√
4: ETHICAL AND PROFESSIONAL		√		√	√	√				√		√

MAPPING COURSE OUTCOMES WITH POs / PSOs

SEM	COURSE CODE	COURSE	PO1	PO2	PO3	PO4	PO5	PO6	PSO7	PSO8	PSO 9	PSO 10	PSO 11	PSO 12
1	BLT10	TAMIL I	√	√	√	√	√	√						
	BLE10	ENGLISH I	√	√	√	√	√	√						
	BCA11	DIGITAL LOGIC AND	√	√	√	√	√	√	√	√	√		√	√

		C PROGRAMMING												
	BES10	ENVIRONMENTAL STUDIES	√	√	√	√	√	√						
	BAMA15B	MATHEMATICS FOUNDATION I	√	√	√	√	√	√		√	√			√
	BPCA13	C PROGRAMMING LAB	√	√	√	√	√	√	√	√	√		√	√
2	BLT20	TAMIL II	√	√	√	√	√	√						
	BLE20	ENGLISH II	√	√	√	√	√	√						
	BCA21	C++ AND DATA STRUCTURES	√	√	√	√	√	√	√	√	√	√	√	√
	BSS20	SOFT SKILLS	√	√	√	√	√	√						
	BGA20	VALUE EDUCATION	√	√	√	√	√	√						
	BPCA23	C++ AND DATA STRUCTURES LAB	√	√	√	√	√	√	√	√	√	√	√	√
	BAMA25B	MATHEMATICS FOUNDATION II	√	√	√	√	√	√		√	√			√
3	BCA31	JAVA PROGRAMMING	√	√	√	√	√	√	√	√	√	√	√	√
	BCA32	E-COMMERCE	√	√	√	√	√	√					√	√
	BCA33	RESOURCE MANAGEMENT TECHNIQUES	√	√	√	√	√	√		√	√			√
	BSCA34	DESIGN AND ANALYSIS OF ALGORITHMS	√	√	√	√	√	√		√	√		√	√
	BNEN35	LANGUAGE SKILLS AND COMMUNICATION	√	√	√	√	√	√						
	BACM15C	FINANCIAL ACCOUNTING I	√	√	√	√	√	√					√	
	BPCA36	JAVA LAB	√	√	√	√	√	√	√	√	√	√	√	√
4	BCA41	DATABASE MANAGEMENT SYSTEM	√	√	√	√	√	√			√	√	√	√
	BCA42	ENTERPRISE RESOURCE MANAGEMENT	√	√	√	√	√	√					√	√
	BCA43	DECISION SUPPORT SYSTEM	√	√	√	√	√	√				√	√	√
	BSCA44	COMPUTER ORGANIZATION AND ARCHITECTURE	√	√	√	√	√	√	√	√	√	√	√	√
	BACM25C	FINANCIAL ACCOUNTING II	√	√	√	√	√	√					√	√
	BPCA46	RDBMS LAB	√	√	√	√	√	√	√	√	√	√	√	√
5	BCA51	MOBILE APPLICATION AND	√	√	√	√	√	√				√	√	√

		DEVELOPMENT												
	BCA52	OPERATING SYSTEM	√	√	√	√	√	√	√	√	√	√	√	√
	BCA53	DATA COMMUNICATION AND NETWORKING	√	√	√	√	√	√	√	√				√
	BECA54A	DATA MINING	√	√	√	√	√	√	√	√	√	√	√	√
	BECA54B	COMPUTER GRAPHICS	√	√	√	√	√	√	√	√	√	√	√	√
	BECA54C	INFORMATION SECURITY	√	√	√	√	√	√	√	√	√	√	√	√
	BPCA56	MOBILE APPLICATION DEVELOPMENT LAB	√	√	√	√	√	√	√	√	√	√	√	√
	BPCA57	OPERATING SYSTEM LAB	√	√	√	√	√	√	√	√	√	√	√	√
6	BCA61	CLOUD COMPUTING	√	√	√	√	√	√	√	√	√	√	√	√
	BCA62	OPEN SOURCE PROGRAMMING	√	√	√	√	√	√				√	√	√
	BECA63A	SOFTWARE TESTING	√	√	√	√	√	√		√		√	√	√
	BECA63B	MOBILE COMPUTING	√	√	√	√	√	√	√	√	√	√	√	√
	BECA63C	MICROPROCESSOR	√	√	√	√	√	√	√					√
	BECA64A	INTERNET OF THINGS	√	√	√	√	√	√	√			√	√	√
	BECA64B	SYSTEM SOFTWARE	√	√	√	√	√	√	√			√	√	√
	BECA64C	MULTIMEDIA SYSTEMS	√	√	√	√	√	√	√			√	√	√
	BSCA65	ASP.NET	√	√	√	√	√	√		√	√	√	√	√
	BPCA66	OPEN SOURCE PROGRAMMING LAB	√	√	√	√	√	√	√	√	√	√	√	√
	BPCA67	ASP.NET LAB	√	√	√	√	√	√		√	√	√	√	√
	BEA60	EXTENSION ACTIVITIES	√	√	√	√	√	√						

SEM I	LANGUAGE	Lecture	Practical	Credit
BLT10	TAMIL I	6	0	4

Nehf;fk;

jkpopd; GJf;ftpijfs; cs;slf;fpa gilg;gpyf;fpaq;fis ,g;ghlk; mwpKfk; nra;fpwJ

jkpo; ,yf;fpaj;jpy; Njh;njLf;fg;gl;l kpf Kf;fpakhd nra;Al;fs;> ftpijfs;> fijfs;.

ciueil Mfpatw;iwf;nfhz;L ,g;ghlk; fl;likf;fg;gl;Ls;sJ. khzhf;fhpd; ,yf;fpaj; Njliy cUthf;FtJk;>

jw;rhh;Gila mwpitNkk;gLj;JtJk; ,g;ghlj;jpd; Nehf;fkhFk;.

1. khzth;fs; ftpij fw;gjpd; thapyhf mth;fs; ftpij vOj fw;Wf;nfhs;fpwhh;fs;
2. ciueil fw;gjpd; thapyhf thrpf;ff; fw;Wf;nfhs;fpwhh;fs;
3. ehlfk; thrpg;gjpdhy; khzth;fs; kdk; nkhop nka; %ykhf jq;fs; jpwd;fis ntspg;gLfpd;wdh;
4. rpWfij gbg;gjpdhy; khzth;fs; thrpf;Fk; gof;fj;jpid ngWfpd;whh;fs;
5. nkhopj;jpwd; gapw;rp ngWtjpd; %ykhf khzth;fs; nkhopia gpioapd;wp NgrTk; vOjTk; fw;Wf;nfhs;fpwhh;fs;.

myF 1. ghujp>ghujpjhrd;>ftpkzp>fz;zjhrd;>mwpTkjp>ituKj;J>K.Nkj;jh nr. md;dfhKmg;Jy; uFkhd; ftpijfs;

khzth;fspilNaftpijgbf;Fk; Mh;tKk;>ftpijvOJk; jpwidAk; tsh;;j;jspd; %yk; mth;fs; ftpijgilf;Fk; Mw;wiyntspg;gLj;Jfpwhh;fs;.

myF 2. cs;Szh;Tfdthfntspg;gLfpwJ–vk;.v];. Cja%h;j;jp>tPo;e;jMykuk;> -fy;fp>VohtJmwpT– nt. ,iwad;G

khzth;fSf;FfUj;Jf;fisvspjpy; nrhy;Ytjw;Nfw;wvOj;JtbtNkciueilahFk;.

myF 3. ehlfk; khq;fy;ag;gpr;ir–b.vd;. Rfp>Rg;gpukzpak;>rhgk; tpNkhrdk;> -K. ,uhkrhkp

kdjpd; ntspg;ghL ,ay; MfTk; nkhopapd; ,dpik ,irahfTk; nka;apd; mofpanraw;ghLehlfkhfTk; kyUk; fhz;NghiunghpJk; fth;tJehlffiyvd;gjidkhzth;fs; czh;j;Jfpwhh;fs;

myF 4. rpWfijtisahjgidfs; - ,uh. ee;jNfhghy;>xUrpW ,ir–tz;zjhrd;

kdpjDilatho;tpd; rpWgFjpiafUthff;nfhz;Ljq;fspd; fw;gidj; jpwDld; rpWfijvOjgofpf;nfhs;fpwhh;fs;.

myF 5. nkhopj;jpwd; mfuthpirg;gLj;jy;> z-d-e> y-s-o> u-w NtWghLmwpjy;>jd; tptuf; Fwpg;Gjahhpj;jy;>fiyr; nrhy;yhf;fk;>xw;Wg;gpio>njhlh;g;gpio>ePf;fpvOJjy;.

nkhopj;jpwdpd; %yk; khzth;fs; mfuthpirapy; vOjTk; gpioapy;yhky; vOjTk; nrhw;fSf;FnghUs;fisczuTk; nkhopj;jpwd; gapw;rpcjTfpwJ.

SEM I	GENERAL ENGLISH	Lecture	Practical	Credit
BLE 10	**ENGLISH I**	**6**	**0**	**4**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Make use of new words in the appropriate context.
2. Appreciate the basic elements of poetry
3. Narrate a story on their own
4. Identify the elements of a One-Act Play
5. Form new sentences using new words, antonyms and synonyms, engage in new dialogues, write letters (formal & informal) and write short paragraphs.

SYLLABUS

UNIT 1 - PROSE 1. My greatest Olympic Prize - JesseOwens 2. The Tree Speaks –Rajagopalachari C 3. Snake in the Garden – R.K.Narayan 4. Futurology - Aldous Huxley

UNIT 2 - POETRY 1. The River – Parthasarathy 2. Ode to Nightingale – John Keats 3. “O Captain, My Captain Walt Whitman 4. Paper Boat – Rabindranath Tagore

UNIT 3 - SHORT STORY AND ONE ACT PLAY 1. A Day’s Wait – Ernest Miller Hemingway 2. Little Girls Wiser Than Men – Tolstoy – One act play 3. The Bishop’s Candlesticks – MormanMckinnel

UNIT 4 - GRAMMAR AND COMPOSITION 1. Correct usage of Words 2. Vocabulary – Synonyms & Antonyms 3. Abbreviations 4. English for Excellence – Parts of Speech -Modern Avenue 5. Functional English: Creative Writing - College Grammar Letter of Application

UNIT 5 - COMMUNICATION SKILLS 1. Listening Conversation – (i) Agreeing and Disagreeing. (ii) Seeking and giving permission (iii) Greetings (iv) Introducing Oneself to other

REFERENCES

NIL

SEM I	CORE THEORY	Lecture	Practical	Credit
BCA11	**DIGITAL LOGIC AND C PROGRAMMING**	**6**	**0**	**4**

LEARNING OBJECTIVES

Provide basic knowledge on Digital Electronics to understand the working principles of Digital computers and to develop programming skills using C language.

After completing this course, the students will be able to

1. Represent and convert numbers from one format to another and perform subtraction using complements
2. Simplify circuits using Boolean laws and Karnaugh Map
3. Design logical circuits such as adders, subtractor, counter, register etc. and explain their working
4. Design an algorithmic solution for a given problem using C language
5. Develop a solution for any digital problem using functions.
6. Write C programs using the concepts of solve problems arrays, structures, unions, files and pointers

SYLLABUS

UNIT 1 - Number systems and Boolean Algebra

Number Systems -Decimal, Binary, Octal, Hexadecimal and their interconversions, - Binary Arithmetic -1's complement, 2's complement and 9's complement. Binary codes - BCD, Excess-3, Gray code. **Boolean Algebra:** Boolean Laws - Simplification of Boolean Functions - Logic gates and Truth Table – Universal Gates (NAND and NOR) - The K-map method up to five variables, don't care conditions, POS & SOP forms.

UNIT 2 - Combinational and Sequential Circuits

Combinational Logic: Half/Full adder / subtractor, code conversion, Multiplexers, DE multiplexers, encoders, decoders, Combinational design using MUX & DEMUX. BCD adder, magnitude comparator. **Sequential logic:** Flip flops (RS, Clocked RS, D, JK, JK Master Slave)-Counters & types Synchronous and Asynchronous counters- Registers, Shift registers and their types.

UNIT 3 - C Basics and Control constructs

C fundamentals- Operators- Constants- Expression – Library functions- Decision making and branching- Switch- FOR, WHILE, DO WHILE loops- Continue- break

UNIT 4 - Arrays, Functions and Structures

Arrays-Multidimensional arrays- User defined functions- Call by Value and Reference-Recursion- Storage classes- Structures and Union – Self-referential structures

UNIT 5 - Pointers and Files

Pointers- Pointer operations and Arithmetic- File management in C: File opening and closing- - I/O operations on files - Error handling during I/O operations - Random access to files - Command line arguments

REFERENCES

1. Morris Mono M. "**Digital Logic and Computer Design**", PHI Latest Pub. Ed. (Unit I and 2)
2. Reema Thareja, **"Programming in C",** Oxford University Press
3. Albert Paul Malvino, Donald P Leach, **Digital principles and applications**TMH,1996.
4. Balagurusamy "Programming in C" TMH

SEM I	ENVIRONMENTAL STUDIES	Lecture	Practical	Credit
BES10	**ENVIRONMENTAL STUDIES**	**2**	**0**	**2**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Explain the various natural resources and the impact of man-made fertilizers on the environment.
2. Describe the Ecosystem, Biodiversity and its Conservation.
3. Explain the Environmental Pollution and Management
4. Analyze the Social Issues concerning Human Population such as Environmental ethics, health and the role of IT on the environment and human health
5. Visit and study a simple local ecosystem and prepare a FIELD WORK Report.

SYLLABUS

UNIT 1 - INTRODUCTION TO ENVIRONMENTAL SCIENCES: NATURAL RESOURCES:

Environmental Sciences - Relevance - Significance - Public awareness – Forest resources - Water resources - Mineral resources - Food resources – conflicts over resource sharing - Exploitation - Land use pattern - Environmental impact - fertilizer - Pesticide Problems - case studies.

UNIT 2 - ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION:

Ecosystem - concept - structure and function - producers, consumers and decomposers - Food chain - Food web - Ecological pyramids - Energy flow - Forest, Grassland, desert and aquatic ecosystem.

Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) and local levels - Hotspots, threats to biodiversity - conservation of biodiversity - Insitu&Exsitu.

UNIT 3 - ENVIRONMENTAL POLLUTION AND MANAGEMENT

Environmental Pollution - Causes - Effects and control measures of Air, Water, Marine, soil, solid waste, Thermal, Nuclear pollution and Disaster Management - Floods, Earthquake, Cyclone and Landslides. Role of individuals in prevention of pollution - pollution case studies.

UNIT 4 - SOCIAL ISSUES - HUMAN POPULATION

Urban issues - Energy - water conservation - Environmental Ethics – Global warming - Resettlement and Rehabilitation issues - Environmental legislations - Environmental Production Act. 1986 - Air, Water, Wildlife and forest conservation Act - Population growth and Explosion - Human rights and Value Education - Environmental Health - HIV/AIDS - Role of IT in Environment and Human Health - Women and child welfare - Public awareness – Case studies.

UNIT 5 - FIELD WORK

Visit to a local area / local polluted site / local simple ecosystem – Report submission

REFERENCES

1. Kumarasamy, K., A.Alagappa Moses And M.Vasanthy, “Environmental Studies”, Bharathidasan University Pub, 1, Trichy, 2004
2. Rajamannar, “Environmental Studies”, Evr College Pub, Trichy, 2004.
3. Kalavathy.S, Environmental Studies, Bishop Heber College Pub., Trichy, 2004

SEM I	CORE PRACTICAL	Lecture	Practical	Credit
BPCA13	**C PROGRAMMING LAB**	**0**	**3**	**3**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Demonstrate the features of Linux Environment and create, compile, run C programs using the same
2. Analyze the given problem, write algorithm and convert into flow chart
3. Write simple programs using basic concepts in C
4. Develop C programs using functions, arrays, structures, file etc.,

SYLLABUS

1. Summation of Series: Sin(x) (Compare with built in functions)
2. Summation of Series Cos(x) (Compare with built in functions)
3. Counting the no. of vowels, consonants, words, white spaces in a line of text
4. Reverse a string & check for palindrome without built in string function
5. nPr, nCr in a single program using function
6. Matrix Addison, subtraction and multiplication
7. Linear Search of a number in an array
8. Sorting an array in ascending and descending order
9. Finding maximum and minimum of list of numbers
10. Call by value and call by reference of functions
11. Employee pay bill using structure
12. Preparing an EB bill using file

REFERENCES

NIL

SEM I	ALLIED I	Lecture	Practical	Credit
BAMA15B	MATHEMATICS FOUNDATION I	7	0	4

LEARNING OBJECTIVES

To Acquire knowledge on the basic concepts of Logical operators, set theory and Set operation, Relations and Functions, Binary operation, Binary algebra, Permutations and Combinations, Differentiation, Straight lines, Pair of Straight lines in the field of Computer application.

After completing this course, the students will be able to

1. Explain the fundamental concepts from the Logical operators.
2. Appreciate the validity of arguments (Proposition).
3. Demonstrate accurate and efficient use of set theoretical techniques.
4. Determine the Relations and Functions.
5. Interpret the concepts of the Binary Operations and Boolean algebra.
6. Solve problem in permutations combinations.
7. Analyze problems in Differentiation.
8. Distinguish Straight-line equation from angle, point and slope.

SYLLABUS

UNIT 1 - SYMBOLIC LOGIC Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi-conditional operators, converse, Inverse, Contra Positive, logically equivalent, tautology and contradiction. Arguments and validity of arguments.

UNIT 2 - SET THEORY Sets, set operations, Venn diagram, Properties of sets, number of elements in a set, Cartesian product, relations & functions, Relations: Equivalence relation. Equivalence class, Partially and Totally Ordered sets, Functions: Types of Functions, Composition of Functions.

UNIT 3 - BINARY OPERATIONS Types of Binary Operations: Commutative, Associative, Distributive and identity, Boolean algebra: simple properties. Permutations and Combinations.

UNIT 4 - DIFFERENTIATION

Simple problems using standard limits,

Lt	x^n-a^n, lt	sinx, lt	tanxlt	e^x-1, lt	$(1+1/n)^n$, lt (1+n) 1/n
X	x-a x	x x	x x 0 x n		n 0

Differentiation, successive differentiation, Leibnitz theorem, partial differentiation, Applications

of differentiation, Tangent and normal, angle between two curves.

UNIT 5 - TWO-DIMENSIONAL ANALYTICAL GEOMETRY Straight Lines - Pair Straight Lines

REFERENCES

1. P.R. Vittal, "**Mathematical Foundations**", Maragham Publication, Chennai.
2. U. Rizwan, "**Mathematical Foundation**", SciTech, Chennai
3. V.Sundaram& Others, "**Discrete Mathematical Foundation - A.P.Publication**", sirkali.
4. P.Duraipandian& Others, "**Analytical Geometry 2 Dimension**", Emerald publication 1992

SEM II	LANGUAGE	**Lecture**	**Practical**	**Credit**
BLT20	**TAMIL II**	**6**	**0**	**4**

Nehf;fk;

khzth;fs; tho;f;ifapy; mwnewpAld; tho;tjw;Fk; kdij xUKfgLj;Jtjw;Fk; gf;jp ,yf;fpaq;fSk; rpw;wpyf;fpaq;fSk; khzth;fSf;F gad;gLfpwJ.

gf;jp ,yf;fpaj;jpd; thapyhf Guhzq;fspd; Kf;fpaj;Jtj;ijAk; nja;tq;fspd; ngUikfisAk; khzth;fs; mwpe;Jf;nfhs;fpwhh;fs;.

flTsh;fisAk; murh;fisAk; Nguhpyf;fpaq;fs; Ngrpa fhyq;fspy; rpw;wpyf;fpaq;fs; vspa kf;fspd; tho;f;if Kiwia gw;wpNgRfpwJ vd;gij khzth;fs; mwpe;Jf;nfhs;fpwhh;fs;.

1. khzth;fs; tho;f;ifapy; mwk;> xOf;fk; rhh;e;j nray;ghLfspy; jq;fis ,izj;Jf;nfhs;tjw;F gf;jp khh;f;fk; Jizg; Ghpfpd;wj.

2. khzth;fs; ehad;khh;fis fw;gjpdhy; rptDila ngUikfis mwpe;Jf;nfhs;fpd;wdh;.

3. khzth;fs; Mo;thh;fis gbg;gjdhy; jpUkhy; ngUikfis njhpe;Jf;nfhs;fpd;wdh;.

4. khzth;fs; rpw;wpyf;fpaq;fis thrpg;gjpdhy; 96 tifahd rpw;wpyf;fpaq;fisg; gw;wp Ghpe;Jf;nfhs;fpd;wdh;.

nkhopj;jpwd; gapw;rp ngWtjpd; thapyhf khzth;fs; nghJf;fl;Liufs; vOJtjw;Fg; gapw;rpg;ngWfpwhh;fs;

myF 1 - m. jpUQhdrk;ge;jh; - Njthuk;>jpUtPopkpoiy–khzpf;fthrfh; - jpUthrfk;>jpU%yh; - jpUke;jpuk;

khzth;fs; jkpo; ,yf;fpaj;jpy; mbahh;fspd; jkpo;g;gw;iwAk; irtj;jpUKiwfs; gd;dpnuz;LFwpj;Jk; mwpe;Jf;nfhs;fpwhh;fs;

myF 2 - Mz;lhs; - jpUg;ghit–njhz;lubg; nghbaho;thh; - jpUg;gs;spnaOr;rp>FyNrfuho;thh; - ngUkhs; jpUnkhop

ehyhapujpt;agpuge;jj;jpy; Mo;thh;fspd; tho;f;iftuyhw;iwnjhpe;Jf;nfhs;tJld; tho;f;ifapy; gpd;gw;wTk; nra;thh;fs;.

myF 3 - jkpo;tpLJ}J – 69>90 fz;zpfs;>jpUf;fapyhaQhdcyh– 1>10 fz;zpfs; tiu>jQ;irthzd; Nfhit– 1>5 ghly;fs; tiu

rq;f ,yf;fpaq;fspd; jdpg;ghly;fshftUfpd;wrpw;wpyf;fpaq;fiskhzth;fs; gpioapd;wpvOjTk; gbf;fTk; nra;thh;fs;.

myF 4 - ,uhkypq;fmbfs; - jpUtUl;gh>vr;.V. fpU\;zg;gps;is - ,ul;rz;aahj;jphpfk;>Fzq;Fb k];jhd;rhfpG– k];jhd; rhfpGghly;fs;>Kj;njhs;shapuk; - 9>ghly;fs; kl;Lk;.

khzth;fs; rka ,yf;fpaq;fs; Fwpj;Jmwpe;Jf;nfhs;tJld; mjd; fijahly;fisnrhy;yTk; vOjTk; gofpf;nfhs;fpwhh;fs;.

myF 5 - Neh;fhzy;>nghJf;fl;Liufs;>

khzth;fs; fbjk; vOjTk; Neh;fhziyg; gw;wpAk; njhpe;Jf;nfhs;Sjy;.

SEM II	GENERAL ENGLISH	**Lecture**	**Practical**	**Credit**
BLE20	**ENGLISH II**	**2**	**0**	**2**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Identify the characteristics of prose through intensive reading of various texts
2. Analyze and interpret the poetical devices and critique the themes intended in the poems.
3. Identify the elements of short story and One-Act play
4. Apply the basic sentence structures and other grammatical elements in writing
5. Demonstrate basic communication skills required for professional scenario.

SYLLABUS

UNIT 1 - PROSE1. Ant and Grasshopper - Somerset Maugham 2. Early Influences - A.P.J. Abdul Kalam 3. Forgetting – Robert Lynd 4. The Unity of Indian Culture – Humayun Kabir

UNIT 2 - POETRY 1. The Soul's Prayer. - Sarojini Naidu 2. The Lotus - Toru Dutt 3. Nutting – William Wordsworth 4. Ozymandias - P.B.Shelley

UNIT 3 - SHORT STORY AND ONE ACT PLAY 4. The Doll's House - Katherine Mansfield 5. Karma - Kushwant Singh One Act Play 6. Hijack -Charles Wills

UNIT 4 - Vocabulary 6. Functional Grammar 7. Functional English

UNIT 5 - COMMUNICATION SKILLS 8. Making Request 9. Offering Help 10. Inviting Someone 11. Asking Permission

REFERENCES

NIL

SEM II	CORE THEORY	Lecture	Practical	Credit
BCA21	**C++ AND DATA STRUCTURES**	**6**	**0**	**6**

LEARNING OBJECTIVES

To develop Object oriented programming skills using C++ and to introduce data structure concepts

After completing this course, the students will be able to

1. Develop simple programs using C++
2. Analyze a given problem, identify its members and methods and convert the same to a class diagram.
3. Apply OOP concepts for real world problems and develop solutions using C++ language
4. Apply appropriate data structures for solving specific problems.
5. Design and develop C++ programs for any data structures to perform basic operations.

SYLLABUS

UNIT 1 - Object Oriented Concepts and C++: C++ Fundamentals - Operators, Expressions and Control Structures: If, If. Else, Switch Repetitive Statements- for, while, do. While - Input and Output in C++ manipulators-manipulators with parameters. - Pointers and arrays

UNIT 2 - Functions and Classes Functions in C++ - Main Function - Function Prototyping –Parameters Passing in Functions - Values Return by Functions - inline Functions - Function Overloading.
Classes and Objects; Constructors and Destructors; and Operator Overloading - Type of Constructors

UNIT 3 - Inheritance, Polymorphism & Files Inheritance: Single Inheritance - Multilevel inheritance – Multiple inheritance – Hierarchical Inheritance - Hybrid Inheritance - Polymorphism - Working with File: Classes for File Stream Operations - Opening and Closing a File - End-of-File Detection - Updating a File Error Handling during File Operations.

UNIT 4 - Fundamental Data Structures Definition of a Data structure - primitive and composite Data Types, Stacks (Array) Operations –Linked Stack-Operations- Applications of Stack (Infix to Postfix Conversion).
Queue (Array)- Operations-Linked Queue- Operations- - Singly Linked List - Operations, Application of List (Polynomial Addition)-. Doubly Linked List - Operations.

UNIT 5 - Trees and Graphs Trees: Binary Trees –Binary Search Tree- Operations - Recursive Tree Traversals Recursion Graph - Definition, Types of Graphs, Graph Traversal – Dijkstra's shortest path DFS and BFS.

REFERENCES

1. K.R.Venugopal, Raj Kumar, T.Ravisankar,"**Mastering in C++**",McGraw Hill, 2011.
2. Nell Dale, "**C++ Plus Data Structure**", Narosa Publications, 2000
3. ReemaThareja, "**Object Oriented Programming with C++**", Oxford University Press, 2015
4. Balagurusamy, "C++ programming", TMH.
5. Ellis Horowitz, SartajSahni and Dinesh Mehtha, "**Fundamentals of Data Structures in C++"**, Second Edition, University Press
6. VarshaH.Patil, "**Data Structures using C++**", Oxford University Press, 2012

SEM II	CORE PRACTICAL	Lecture	Practical	Credit
BPCA26	**C++ AND DATA STRUCTURES LAB**	**0**	**3**	**2**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Analyze, write algorithm and draw the class diagram for any given problem
2. Write programs using C++ basic concept
3. Develop C++ programs for data structures like Stack, Queue, Tree, Linked List etc, using OOPS concepts

SYLLABUS

1. Implementing classes, objects, constructors and member functions for calculating the area and perimeter of a circle.
2. Implementing function overloading (Find area / volume of rectangle, circle, sphere, cylinder, cone etc.).
3. Implementing operator overloading (Addition, subtraction, multiplication of matrices)
4. Implementing single, multiple, hierarchical inheritance.
5. Implementing sequential file operations using error handling functions.
6. Implementing PUSH, POP operations of stack using Arrays.
7. Implementing add, delete operations of a queue using Arrays.
8. Implementing Infix to postfix conversion of an expression using stack
9. Implementing Binary tree recursive traversals (in-order, pre-order, and post-order).
10. Implementing Polynomial addition using linked list.

REFERENCES

NIL

SEM II	ALLIED I	Lecture	Practical	Credit
BAMA25B	MATHEMATICAL FOUNDATION II	7	0	6

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Describe matrix and perform different operations on it
2. Solve Simultaneous Linear equations.
3. Test and explain the concepts of Consistency and Inconsistency of linear equations
4. Solve problems relating to matrix of linear transformations:
5. Solve problems using Integration techniques.
6. Compare and contrast Straight line equation from angle, point and slope in three dimensions.

SYLLABUS

UNIT 1 - MATRICES Multiplication of matrices, Singular and Non-Singular matrices, Adjoint of a Matrix, Inverse of a matrix Symmetric and Skew-Symmetric, Hermitian and Skew-Hermition, Orthogonal and unitary matrices, Rank of a matrix, Solution of Simultaneous Linear equations by

(i) Cramer's rule.

(ii) Matrix Inversion Method.

UNIT 2 - MATRICES Test for Consistency and Inconsistency of linear equations, (Rank Method), characteristic roots and characteristic vectors, Cayley - Hamilton theorem, matrix of linear transformations: reflection about the x, y axes and the line y=x, rotation about the origin through an angle, expansion or compression, shears, translation.

UNIT 3 - Integration Simple problems, integration of rational function involving algebraic expressions of the form

1 , 1 , px+q px+q ,px+q ax2+bx+c ax2+bx+cax2+bx+cax2+bx+cax2+bx+c integrations using simple substitutions integrations involving trigonometric functions of the form

1 , 1 ,

a+bcosx a2sin2x+b2cos2x Integration by parts.

UNIT 4 - Properties of definite integrals. Reduction formulae for xneaxdx, sinnxdx, cosnxdx , xm (1-x)n dx, applications of integration for (i) Area under plane caurves, (ii) Volume of solid of revolution.

UNIT 5 - ANALYTICAL GEOMETRY OF THREE DIMENSIONS

Planes, straight lines.

REFERENCES

1. P.R.Vittal, "**Mathematical Foundations**", Margham Publication, Chennai.
2. U. Rizwan, "**Mathematical Foundation**", SciTech, Chennai
3. V.Sundaram & Others, "**Discrete Mathematical Foundation**", A.P.Publication, sirkali.
4. P.Duraipandian & Others, "**Analytical Geometry 3 Dimension**", Emerald publication 1992 Reprint.
5. Manicavachagom Pillay Natarajan, "**Analytical Geometry part II three Dimension**", S.Viswanathan (printers & publication) Pvt Ltd., 1991.

SEM II	VALUE EDUCATION	Lecture	Practical	Credit
BGA20	**VALUE EDUCATION**	**2**	**0**	**2**

LEARNING OBJECTIVES

To know the values of human, social, local and global life in the context of one's own setting.

After completing this course, the students will be able to

1. Appreciate human values and gain self-esteem
2. Realize the importance of family and its members particularly women in the society
3. Interpret the ethical values in the context of profession, media, family and personal life.
4. Recognize the values of the society and its impact
5. Formulate the ethical system at the international level and modern trends.

SYLLABUS

UNIT 1 - Value Education - Definition - relevance to present day - Concept of Human Values – self introspection - Self-esteem.

UNIT 2 - Family values - Components, structure and responsibilities of family – Neutralization of anger - Adjustability - Threats of family life - Status of women in family and society - Caring for needy and elderly - Time allotment for sharing ideas and concerns.

UNIT 3 - Ethical values - Professional ethics - Mass media ethics - Advertising ethics – Influence of ethics on family life - psychology of children and youth - Leadership qualities - Personality development.

UNIT 4 - Social values - Faith, service and secularism - Social sense and commitment – Students and Politics - Social awareness, Consumer awareness, Consumer rights and responsibilities Redressal mechanisms.

UNIT 5 - Effect of international affairs on values of life/ Issue of Globalization – Modern warfare Terrorism. Environmental issues - mutual respect of different cultures, religions and their beliefs.

REFERENCES

1. T. Anchukandam and J. Kuttainimathathil (Ed), "**Grow Free Live Free**", Krisitu Jyoti Publications, Bangalore (1995)
2. Mani Jacob (Ed), "**Resource Book for Value Education**", Institute for Value Education, New Delhi 2002.
3. DBNI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
4. Daniel and Selvamony - Value Education Today, (Madras Christian College, Tambaram and ALACHE, New Delhi, 1990)
5. S. Ignacimuthu - Values for Life - Better Yourself Books, Mumbai, 1991.
6. M.M.M.Mascaronhas Centre for Research Education Science and Training for Family Life Promotion - Family Life Education, Bangalore, 1993

SEM II	SOFT SKILLS	Lecture	Practical	Credit
BSS20	**SOFT SKILLS**	**2**	**0**	**2**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Demonstrate the skills for listening, writing, reading and writing
2. Read and respond to instruction
3. Seek and respond to information in day to day life
4. Correct grammatical and spelling errors
5. Actively engage in formal, in-formal and non-verbal communication

SYLLABUS

UNIT 1 - 1.1.Skills in Listening and Writing 1.2. Skills in Reading and Understanding

UNIT 2 - 2.1.Skills to Read and Respond to Instructions 2.2. Skills of Interpretation and Transcoding Information

UNIT 3 - 3.1.Skills in Seeking and Responding to Information 3.2. Skills of Day-to-Day communication

UNIT 4 - 4.1. Grammatical skills and Spelling rules 4.2. Career skills

UNIT 5 - 5.1. Skills of formal and in-formal rules 5.2. Skills of non-verbal communication

REFERENCES

NIL

SEM III	CORE THEORY	Lecture	Practical	Credit
BCA31	**JAVA PROGRAMMING**	**5**	**0**	**3**

LEARNING OBJECTIVES

To improve Object Oriented Programming gathered already through an independent platform.

After completing this course, the students will be able to

1. Describe Object oriented programming concepts.
2. Write Java Programs using Arrays, Inheritance, Interface and Packages based on requirements.
3. Use String handling, exception handling and Multithreading concepts in Java programs
4. Create a simple application with the use of AWT controls and GUI Tools.
5. Develop a JDBC enabled Java Application.

SYLLABUS

UNIT 1 - BASICS, ESSENTIALS, CONTROL STATEMENT AND CLASSES & OBJECTS Computer and its Languages – Stage, Origin and Features for Java - JDK–OOP; Java Essentials: Program – API - Variables& Literals - Data Types - String Class – Operators - Type conversion - Constants - Scope – Comments - Keyboard Input; Control Statements: Conditional Statements – Looping Statements - Break and Continue Statements; Classes and Objects: Modifiers - Arguments - Constructors - Packages and import - Static Class - Overloaded Methods and Constructors - Returning Objects – toString() - this reference – Enumeration - Garbage Collection.

UNIT 2 - ARRAYS, INHERITANCE, INTERFACES AND PACKAGES Arrays - Three or More Dimensions; Inheritance: Basics - Calling the Superclass Constructor - Overriding Superclass Methods - Inheritance from Subclasses – Polymorphism -Abstract Classes and Methods - Interfaces: Fields - Multiple inheritance - Interface inheritance; Packages: Creating packages – Accessing package from other packages- Access Specifier.

UNIT 3 - STRING HANDLING, EXCEPTION HANDLING AND MULTITHREADING

String Handling: Basics - Operations –String Methods - String Buffer class – Stringbuilder – to String method -String Tokenizer class. Exception Basics: try and catch block - Multiple catch block - Nested try - throws keyword - Throw Vs Throws - Final Vs Finally Vs Finalize - Method Overriding - Custom Exception - Multithreading: Life Cycle - Methods in Thread - thread application – Thread priority – Synchronization - Inter-thread communication - Suspending, Resuming, and Stopping Threads;

UNIT 4 - APPLET AND GUI APPLICATION

Applets: Basis - Lifecycle - Applet classes - Application – Graphics; AWT-I: GUI Programming - AWT classes - Windows fundamentals- Creating Windows – Dialog Boxes - Layout Managers - Radio Buttons and Checkboxes – Borders-Swing

UNIT 5 - JAVA DATABASE CONNECTIVITY

JDBC - Types of Drivers- Architecture- Classes and Interfaces - Developing JDBC Application - New Database and Table with JDBC - Working with Database Metadata.

REFERENCES

1. S.Sagayaraj, R.Denis, P.Karthik&D.Gajalakshmi, "**Java Programming**", Universities Press, 2017 **(Text Book)**
2. Patrick Naughton and Herbert Schildt. "**The Complete Reference JAVA 2**". 3rd Edition. Tata McGraw-Hill Edition, 1999.
3. Muthu C, "**Programming with JAVA**". 2nd Editio, Vijay Nicole Imprints, 2011.
4. Ken Arnold Gosling and Davis Holmen, "**The Java Programming Language**, 3rd Edition. Addition Wesley Publication

SEM III	CORE THEORY	Lecture	Practical	Credit
BCA32	**E-COMMERCE**	**4**	**0**	**4**

LEARNING OBJECTIVES

Electronic Commerce Framework, Traditional vs. Electronic business applications, the anatomy of E commerce applications.

After completing this course, the students will be able to

1. Explain E-Commerce Frameworks and differentiate Traditional from E-Business Applications
2. Elaborate Network infrastructure for E-commerce and its components
3. Identify Firewalls, network Securities and the role of different protocols in network.
4. Explain various EDI Applications
5. List and demonstrate E-Payment options.

SYLLABUS

UNIT 1- Electronic Commerce Framework, Traditional vs. Electronic business applications, the anatomy of E-commerce applications.

UNIT 2 - Network infrastructure for E-Commerce - components of the I-way - Global information distribution networks - public policy issues shaping the I-way. The internet as a network infrastructure. The Business of the internet commercialization.

UNIT 3 - Network security and firewalls - client server network security - firewalls and network security - data and message security - encrypted documents and electronic mail.

UNIT 4 - Electronic Commerce and world wide web, consumer-oriented E-commerce, Electronic payment systems, Electronic data interchange (EDI), EDI applications in business, EDI and E-commerce EDI implementation.

UNIT 5 - Intra organizational Electronic Commerce supply chain management. Electronic Commerce catalogs, Document Management and digital libraries.

REFERENCES

1. R. Kalakota and A. B. Whinston, "**Frontiers of Electronic Commerce**", Addison Wesley, 1996.
2. R.Kalakota and A.B.Whinston, "**Readings in Electronic Commerce**", Addison Wesley, 1997.
3. David Kosiur, "**Understanding Electronic Commerce**", Microsoft Press, 1997.
4. P.Rizwan Ahmed, "**E-Commerce and E-Business**", Margham Publications.

SEM III	CORE THEORY	Lecture	Practical	Credit
BCA33	**RESOURCE MANAGEMENT TECHNIQUES**	**5**	**0**	**4**

LEARNING OBJECTIVES

To improve the skills of solving very common problems which we come across in various fields like transportation and industries with machines. To develop computational skill and logical thinking in formulating industry-oriented problems as a mathematical problem and finding solutions

After completing this course, the students will be able to

1. Describe and Formulate linear programming problem from real life problems.
2. Solve them graphical Method and Simplex Method while employing some convex analysis.
3. Classify the Transportation problems and Assignment problems.
4. Identifies the Sequencing models.
5. Illustrate the various forms and methods of solutions in sequencing models.
6. Explain the Concept of Replacement Models.
7. Distinguish between replacement items and group replacement policy.
8. Apply linear programming in the formulation of CPM and PERT.
9. Use algorithmic approach in solving various types of network problem

SYLLABUS

UNIT 1 - Introduction and Linear Programming BASICS OF OPERATIONS RESEARCH: Development–Definition–Characteristics–Phases – Models – Advantages and Limitations LINEAR PROGRAMMING: Formulation – Graphical Method of Solution – General Linear Programming Problem – Canonical and Standard forms of LPP – Simplex method.

UNIT 2 - Transportation and Assignment Model TRANSPORTATION MODEL: Definition–Formulation and Solution–Additional Problems ASSIGNMENT MODEL: Definition – Solution of Assignment Models – Hungarian Method – Additional Problems – Traveling Salesman problem.

UNIT 3 - SEQUENCING MODELS Sequencing Problems – Assumptions – Processing n jobs through two machines – Processing n jobs through three machines – Processing of two jobs through m machines.

UNIT 4 - REPLACEMENT MODELS Introduction – Replacement of items that deteriorate – Replacement of items whose maintenance and repair cost increase with time – Replacement of items that fail suddenly – group replacement policy.

UNIT 5 - NETWORKING ANALYSIS Project – Project Planning – Project Scheduling – Project Controlling – Activity on Node diagram – Critical Path Method – Program Evaluation and Review Technique

REFERENCES

1. P. K. Gupta and D.S. Hira, "**Operations Research**", S. Chand & Co, 5th Edition,-2008.
2. S.D.Sharma, Kedarnath, "**Operations Research**", Ramnath Delhi 16th Revised Edition, 2010.
3. Hiller & Libermann, "**Introduction to Operations Research**", CBS Publishes, 1st Edition, 1994.

SEM III	CORE PRACTICAL	Lecture	Practical	Credit
BPCA36	**JAVA PROGRAMMING LAB**	**4**	**0**	**3**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Write Java programs using Package, Inheritance and Interfaces
2. Create Simple GUI application using Applet and Swing classes
3. Develop client server applications using TCP and UDP
4. Develop simple JDBC enable java application for doing basic operation with database

SYLLABUS

1. Implementing Package, inheritances and interfaces
2. Implementing Flow, Border and Grid Layouts
3. Implementing Dialogs, Menu and Frame
4. Implementing User defined Exception Handling
5. Implementing Multithreading
6. Implementing I/O Stream File handling
7. Implementing a Calculator using Swing
8. CRUD operation Using JDBC
9. Client Server using TCP and UDP Socket
10. GUI application with JDBC

REFERENCES

NIL

SEM III	ALLIED II	Lecture	Practical	Credit
BCCM15C	**FINANCIAL ACCOUNTING I**	**7**	**0**	**4**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Explain the financial statements in accordance with appropriate standards. Solve Bank reconciliation statement from incomplete statement. Find of ratification errors
2. Find the depreciation value Classify straight line method and written value method
3. Explain the Bill of exchange Solve the Trade bills and Accommodation bills
4. Solve final accounting, explain the trading accounting, profit & loss accounting and balance sheet find out sole proprietorship
5. Explain ledger accounts using Single entry and double entry book keeping and record journal entries. Calculate of profit compare statement of affairs and balance sheet

SYLLABUS

UNIT 1 - Introduction Meaning of accounting – objectives of accounting – advantages and limitations of accounting- Accounting concepts and conventions - Methods of accounting -Rules of debit and credit- Journal - Ledger accounts– Trial Balance - Errors and their rectification - Rectification of Errors without suspense a/c - Rectification errors with suspense a/c (effect of rectification on profit and rectification during subsequent accounting year are excluded) - Bank Reconciliation Statement.

UNIT 2 - Depreciation, Provisions and Reserve Meaning of depreciation – causes for depreciation – need for charging depreciation – Methods of calculating depreciation: straight line method and written down value method (change in method of depreciation is excluded) – Methods of recording depreciation: by charging depreciation to assets account or by creating provision for depreciation account.

UNIT 3 - Bills of exchange Meaning of bill of exchange - features and advantages of bill of exchange- types of bill of exchange: Trade bills and accommodation bills - Accounting treatment of trade bills (accommodation bills are excluded).

UNIT 4 - Final accounts Meaning of final accounts – adjustments in preparation of final accounts – preparation of trading, profit & loss account and balance sheet of sole proprietorship concern.

UNIT 5 - Accounts from incomplete records Meaning of single-entry system – features and limitations of single-entry system – Distinction between single entry system and double entry system - Methods of calculation of profit: Statement of affairs method and Conversion method – Distinction between statement of affairs and balance sheet.

Note: Questions in section A, B and C shall be in the proportion of 20: 80 between theory and problems

REFERENCES

1. Jain &Narang, "**Financial Accounting**", KalyaniPublishers, New Delhi.
2. T.S. Reddy & Dr.A.Murthy, "**Financial Accounting**", Margham Publications, Chennai.
3. Gupta,R.L&Gupta, V.K, "**Advanced Accounting**", Sultan Chand & Sons, NewDelhi.
4. Shukla & Grewal, "**Advanced Accounting**", S.Chand & Co, NewDelhi.
5. Parthasarathy, S.& Jaffa Rulla A, "**Financial Accounting**", Kalyani Publishers, NewDelhi.
6. Murugadoss, Jaya, Charulatha and Baskar, "**Financial Accounting**", Vijay Nicholes Imprint Pvt. Ltd., Chennai.

SEM III	SKILL BASED SUBJECT	Lecture	Practical	Credit
BSCA34	**DESIGN AND ANALYSIS OF ALGORITHM**	**3**	**0**	**3**

LEARNING OBJECTIVES

To build a solid foundation of the most important fundamental subject in computer science. Creative thinking is essential to algorithm design and mathematical acumen and programming skills.

After completing this course, the students will be able to

1. Write pseudo code for given problems and analyze algorithms based on Time and Space.
2. Identify, analyze and apply the appropriate divide-and-conquer algorithms
3. Explain greedy algorithms and its types focusing on the efficiency of the algorithm.
4. Identify and apply the most appropriate dynamic-programming algorithms for the solution of a problem.
5. Identify and explain the different types of backtracking algorithm

SYLLABUS

UNIT 1 - ALGORITHM AND ANALYSIS What is an Algorithm? - Algorithm Specification- Performance Analysis- Randomized Algorithms.

UNIT 2 - DIVIDE AND CONQUER General Method - Binary Search - Finding the Maximum and Minimum- Merge Sort - Quick Sort - Selection Sort- Stassen's Matrix Multiplications.

UNIT 3 - THE GREEDY METHOD The General Method - Knapsack Problem – Tree Vertex Splitting - Job Sequencing with Deadlines- Minimum Cost Spanning Trees - Optimal Storage on Tapes - Optimal Merge Pattern - Single Source Shortest Paths.

UNIT 4 - DYNAMIC POGRAMMING The General Method – Multistage Graphs - All pair shortest path - String Editing - 0/1 Knapsack – Reliability Design - The Traveling Salesperson Problem

UNIT 5 - TRAVERSAL, SEARCHING & BACKTRACKING Techniques for Binary Trees- Techniques for Graphs - The General Method - The 8-queens Problem – Sum of Subsets- Graph Coloring- Hamiltonian Cycles

REFERENCES

1. Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, "**Fundamentals of Computer Algorithms**", Galgotia Publications, 1998.
2. Cormen T.H., LeisersonC.E., Rivest R.L., "**Introduction to Algorithms**", PHI 1998.
3. Introduction to the Design and Analysis of Algorithms, Anany Levitin, Pearson Education, 2nd Edition.

SEM III	NON-MAJOR ELECTIVE - PAPER 1	Lecture	Practical	Credit
BNEN35	**LANGUAGE SKILLS FOR COMMUNICATION**	**2**	**0**	**2**

LEARNING OBJECTIVES

To make students to understand English better and to improve communication both verbal and written in English language

After completing this course, the students will be able to

1. Read and comprehend the communication. The student will get an idea about agendas and minutes.
2. Plan and prepare well for speech effectively. The students will get an idea to use body language effectively.

SYLLABUS

UNIT 1 - 1. Email Communications 2. Non-Verbal Communication 3. Effective Listening 4. Making Presentations

UNIT 2 - 5. Interview Techniques 6. Group Discussion 7. Preparing an Effective CV

REFERENCES

1. "**Prescribed Text: Business Communication Techniques and Methods"**. (Orient Black Sewan) 2010 by OMP.Juneja&AaratiMujundar Rs.90/-

SEM IV	CORE THEORY	Lecture	Practical	Credit
BCA41	**DATABASE MANAGEMENT SYSTEM**	**5**	**0**	**2**

LEARNING OBJECTIVES

To incorporate a strong knowledge on databases to students

After completing this course, the students will be able to

1. Discuss the basic concepts of database and models
2. Compare and Contrast various data models
3. Convert E-R Model to database
4. Design conceptual model of a database using relational algebra
5. Retrieve data using relational calculus
6. Create a simple database using the rules of Normalization
7. Create and Retrieve any type of information from database using SQL Commands
8. Write PL/SQL Blocks to insert and retrieve data from database
9. Create stored procedures, functions, triggers and views to initiate/perform appropriate action on the database

SYLLABUS

UNIT 1 - Database Basics Introduction: Flat File – Database System – Database – Actionable for DBA. The Entity – Relationship Model: Introduction – The Entity Relationship Model. Data Models: Introduction – Relational Approach – The Hierarchical Approach – The Network Approach.

UNIT 2 - Relational Algebra Structure of Relational Databases – Fundamental Relational Algebra Operations –Additional Relational Algebra Operations - Extended Relational Algebra Operations - Null Values - Modification of the Database - The Tuple Relational Calculus – The Domain Relational Calculus

UNIT 3 - Normalization Introduction - Normalization – Definition of Functional Dependence (FD) – Normal Forms: 1NF, 2NF, 3NF and BCNF.

UNIT 4 - Structured Query Language Structured Query Language: Features of SQL – Select SQL Operations – Grouping the Output of the Query – Querying from Multiple Tables – Retrieval Using Set operators – Nested Queries. T-SQL – Triggers and Dynamic Execution: Transact-SQL.

UNIT 5 - Procedural Language Procedural Language- SQL: PL/SQL Block Structure – PL/SQL Tables. Cursor Management
and Advanced PL/SQL: Opening and Closing a Cursor – Processing Explicit Cursor – Implicit Cursor – Exception Handlers – Subprograms in PL/SQL – Functions – Precaution While Using PL/SQL Functions – Stored Procedure – Object Oriented Technology

REFERENCES

1. Rajesh Narang, "**Database Management Systems**", PHI Learning Private Limited, New Delhi, sixth printing, 2010. **(Text Book)**
2. S.K. Singh, "**Database Systems – Concepts, Design and Applications**", Dorling Kindersley (India) Pvt. Ltd., Second Impression, 2008
3. Abraham Silberchatz, Henry F Korth ,S.Sudarshan, "**Database System Concepts"**, McGraw-Hill - 5 th Edition - 2006.

SEM IV	CORE THEORY	Lecture	Practical	Credit
BCA42	**ENTERPRISE RESOURCE PLANNING**	4	0	4

LEARNING OBJECTIVES

The objective of the ERP Business Transformation Strategy is to modernize and integrate business processes and systems. This will empower the students to access information and provide services through an intuitive and integrated interface

After completing this course, the students will be able to

1. Explain Business Process and ERP System
2. Discuss about sales order process in ERP and CRM;
3. Identify the process of production and supply chain management information system.
4. Sketch the processes of accounting of ERP
5. Analyze the role of Human Resources Process in ERP

SYLLABUS

UNIT 1 - Business function and Business process: Functional areas and Business area of operations - Business process - Marketing Sales - supply Accounting and finance - Human Resource - Functional areas of information system - The development of ERP system SAP R/3 - New directions in ERP - significance and benefits of ERP software and systems.

UNIT 2 - Marketing information system and sales order process in ERP: sales and Distribution in ERP - Pre sales activities - sales order processing - inventory Sourcing - Delivery - Billing - payment - Customer Relationship Management - benefits of CRM.

UNIT 3 - Production and supply chain management information system: Production overview - The production planning process - The SAP ERP Approach to production planning - Sales forecasting - sales and operation Planning - Demand management - Material requirement planning in SAP ERP - ERP and supplier - Supply chain

UNIT 4 - Accounting in ERP: Accounting activities - using ERP for accounting Information - operational decision-making problem - credit management - Industrial credit management in SAP ERP - product profitability analysis - Management reporting with ERP system - Document flow for customer Service.

UNIT 5 - Human resource process in ERP: HR with ERP - Advance HR features - Time management - Payroll - Travel management - Training and Development - Management by objectives - ERP process modeling.

REFERENCES

1. ELLEN MONK and BRET WAGNER, "**ENTERPRISE RESOURCE PLANNING"** - 3rd edition - MGH.

SEM IV	CORE THEORY	Lecture	Practical	Credit
BCA43	**DECISION SUPPORT SYSTEM**	**5**	**0**	**3**

LEARNING OBJECTIVES

To provide decision support for problems within an organization that are continually changing--problems that often have more than one "right" answer.

After completing this course, the students will be able to

1. Define system and discuss its various elements
2. Apply decision-making process to any decision-related problem
3. Identify various technologies that support DSS
4. Elaborate major components of a DSS
5. Illustrate the various modelling approaches to DSS
6. Discuss the features of collaboration and group support systems
7. Explain an expert system and its components
8. Distinguish various cutting-edge decision support technologies
9. Apply the methodology to build a DSS

SYLLABUS

UNIT 1 - DECISION-MAKING AND COMPUTERIZED SUPPORT - Management Support Systems: An Overview, Decision Making, Systems, Modeling, and Support.

UNIT 2 - DECISION SUPPORT SYSTEMS - An Overview, Data Management: Warehousing, Access, and Visualization, Modeling and Analysis, Knowledge based Decision Support and Artificial Intelligence, User Interface and Decision Visualization Applications, Constructing a Decision Support System and DSS Research.

UNIT 3 - COLLABORATION, COMMUNICATION, AND ENTERPRISE SUPPORT SYSTEMS -Networked Decision Support: The Internet, Intranets, and Collaborative Technologies, Group Decision Support Systems, Executive Information and Support Systems.

UNIT 4 - FUNDAMENTALS OF EXPERT SYSTEMS AND INTELLIGEN SYSTEMS -Fundamentals of Expert Systems, Knowledge Acquisition and Validation, Knowledge Representation, Inferences, Explanations, and Uncertainty, Building Expert Systems: Process and Tools.

UNIT 5 - CUTTING-EDGE DECISION SUPPORT TECHNOLOGIES - Neural Computing: The Basics, Neural Computing Applications, Genetic Algorithms, Fuzzy Logic, and Hybrid Intelligent Systems, Intelligent Agents and Creativity, Implementing and Integrating Management Support Systems, Organizational and Societal Impacts of Management Support Systems.

REFERENCES

1. Efraim Turban, Jay E. Aronson, "**Decision Support Systems and Intelligent Systems**", Prentice Hall, New Delhi, 2004
2. George Marakas, "**Decision Support Systems in the 21st Century**", Prentice Hall, New Delhi, 2003
3. Robert J Thierauf, "**User Oriented Decision Support Systems**", Prentice Hall, New Delhi

SEM IV	CORE PRACTICAL	Lecture	Practical	Credit
BPCA46	**RDBMS LAB**	**0**	**4**	**3**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Create / Modify DB using Basic SQL commands
2. Combine tables using different types of Joins
3. Insert / Retrieve data using Subqueries
4. Write a PL/SQL block to create / retrieve data from a DB.
5. Write a function to retrieve data from the DB.
6. Write a trigger to initiate appropriate action on a table
7. Write Procedure & Views to manipulate / retrieve data

SYLLABUS

1. Table creation and simple Queries
2. Queries using Aggregate Function and Set Operations
3. Table creation with various Joins
4. Nested Subqueries and correlated Subqueries
5. View creation and manipulation
6. PL/SQL program for cursor
7. PL/SQL program for packages
8. PL/SQL program for triggers and its type
9. PL/SQL program for procedures and functions

REFERENCES

NIL

SEM IV	SKILL BASED SUBJECT	Lecture	Practical	Credit
BSCA44	**COMPUTER ORGANIZATION AND ARCHITECTURE**	**3**	**0**	**3**

LEARNING OBJECTIVES

To enable the student to have a better understanding of architecture of computer and prepare the student for higher level of programming

After completing this course, the students will be able to

1. Explain instruction cycle.
2. Discuss the different computer register
3. Identify and explain the appropriate I/O and O/P interrupts
4. Explain timing, control and memory reference instructions
5. Discuss the working of the control unit
6. Write micro programs for the control unit.
7. Compare and contrast the different instruction formats
8. Use appropriate addressing modes in micro instructions
9. Explain the different peripheral devices and interfaces
10. Discuss the three modes of data transfer (DMA, Program IO, Interrupt Driven)
11. Differentiate the I/O Processors
12. Elaborate the Organization of the memory Unit.

SYLLABUS

UNIT 1 - BASIC COMPUTER ORGANIZATION AND DESIGN Instruction Codes – Computer Registers – Computer Instructions – Timing and Control –Instruction Cycle – Memory Reference Instructions – Input-Output and Interrupts.

UNIT 2 - MICROPROGRAMMED CONTROL Memory – Address Sequencing – Micro program Examples – Design of Control Unit.

UNIT 3 - CENTRAL PROCESSING UNIT Introduction – General Register Organization – Instruction Formats – Addressing Modes.

UNIT 4 - MEMORY ORGANIZATION Peripheral Devices – I/O interface – Asynchronous Data Transfer – Modes of Transfer - Direct Memory Access – Input Output Processor (Excluding IBM and Intel IOPs).

UNIT 5 - MEMORY ORGANIZATION Auxiliary Memory – Main Memory – Auxiliary Memory - Associative Memory – Cache Memory -Virtual Memory

REFERENCES

1. Morris Mano M. "**Computer System Architecture**". Prentice Hall of India Private Limited, New Delhi, 2011 **(Text Book)**
2. William Stallings. "**Computer Organization and Architecture**". 8th edition. Pearson publication, 2010
3. Morris Mano. "**Digital Logic and Computer Design"**. New Delhi: Prentice Hall of India Private Limited, 2001

SEM IV	ALLIED II	Lecture	Practical	Credit
BACM25C	**FINANCIAL ACCOUNTING II**	**7**	**0**	**4**

LEARNING OBJECTIVES

To acquire knowledge of accounting in general and the system of Financial Accounting and to prepare different kinds of Financial Statements.

After completing this course, the students will be able to

1. Apply the financial accounting system at the branch level
2. Synthesize preparation of departmental trading, profit and loss account and balance sheet
3. Predict hire purchase system and find out default and repossession
4. Categorize partnership accounts and describe admission, retirement of partner in the firm
5. Assess dissolution of a firm by using Garner Vs Murray rule

SYLLABUS

UNIT 1 - BRANCH ACCOUNTS Meaning – objects of branch accounts – accounting in respect of dependent branches: debtors' system; stock and debtors' system; wholesale branch system and final accounts system - Independent branches – incorporation of branch trial balance in head office books.

UNIT 2 - DEPARTMENTAL ACCOUNTING Meaning of departments and departmental accounting – Distinction between departments and branches- need for departmental accounting – advantages of departmental accounting - Apportionment of indirect expenses – Inter departmental transfers at cost and selling price - preparation of departmental trading, profit & loss account and balance sheet.

UNIT 3 - HIRE PURCHASE AND INSTALMENT PURCHASE SYSTEMS Meaning and features of hire purchase system - calculation of interest – books of hire purchaser and books of hire vendor - default and repossession (Hire purchase trading account excluded)

Meaning of instalment system -distinction between hire purchase system and instalment system - calculation of interest – books of buyer and books of seller.

UNIT 4 - PARTNERSHIP ACCOUNTS (FUNDAMENTALS AND RECONSTITUTION OF PARTNERSHIP) Meaning and features of partnership – Partnership deed - calculation of Interest on capital and interest on drawings – preparation of profit & loss appropriation account – preparation of capital accounts (fixed and fluctuating) – admission of a partner – retirement of a partner – death of a partner – treatment of goodwill as per AS 10.

UNIT 5 - PARTNERSHIP ACCOUNTS (DISSOLUTION OF PARTNERSHIP FIRMS) Dissolution of a firm – insolvency of a partner (Garner Vs Murray rule) – Insolvency of all the partners – Piecemeal distribution: proportionate capital method and maximum loss method.

NOTE - Questions in section A, B and C shall be in the proportion of 20: 80 between theory and problems.

REFERENCES

1. Jain &Narang , "**Financial accounting**", Kalyani publishers, New Delhi
2. T.S. Reddy & Dr.A.Murthy, "**Financial accounting"**, Margham publications, Chennai
3. Gupta,R.L & Gupta,V.K, "**AdvancedAccounting"**,SultanChand&Sons,NewDelhi.
4. Shukla & Grewal, "**AdvancedAccounting"**, S.Chand&Co.NewDelhi.
5. Parthasarathy,S.& Jaffarulla,A. "**FinancialAccounting"**, KalyaniPublishers,NewDelhi.
6. Murugadoss, Jaya, Charulatha and Baskar, "**Financial Accounting"**, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

SEM V	CORE THEORY	Lecture	Practical	Credit
BCA51	**MOBILE APPLICATION DEVELOPMENT**	**6**	**0**	**3**

LEARNING OBJECTIVES

This course aims to provide the students with a detailed knowledge on Mobile Application and Development and covers Android programming from fundamentals to building mobile applications for smart gadgets

After completing this course, the students will be able to

1. Describe Android platform, Architecture and features.
2. Design User Interface and develop activity for Android App.
3. Use Intent, Broadcast receivers and Internet services in Android App.
4. Design and implement a Database Application and Content providers.
5. Use multimedia, camera and Location based services in Android App and address issues in security

SYLLABUS

UNIT 1 - INTRODUCTION TO MOBILE APPLICATIONS: Native and web applications - Mobile operating systems and applications - Mobile Databases. Android: History of Android - Android Features – OSS – OHA - Android Versions and compatibility - Android devices - Prerequisites to learn Android -– Setting up software – IDE - XML. Android Architecture: Android Stack - Linux Kernel - Android Runtime - Dalvik VM - Application Framework - Android emulator - Android applications.

UNIT 2 - ANDROID DEVELOPMENT: Java - Android Studio – Eclipse – Virtualization – APIs and Android tools – Debugging with DDMS – Android File system – Working with emulator and smart devices - A Basic Android Application - Deployment. Android Activities: The Activity Lifecycle – Lifecycle methods – Creating Activity. Intents – Intent Filters – Activity stack.

UNIT 3 - ANDROID SERVICES: Simple services – Binding and Querying the service – Executing services - Broadcast Receivers: Creating and managing receivers – Receiver intents – ordered broadcasts. Content Providers: Creating and using content providers – Content resolver. Working with databases: SQLite – coding for SQLite using Android – Sample database applications – Data analysis.

UNIT 4 - ANDROID USER INTERFACE: Android Layouts – Attributes – Layout styles - Linear – Relative – Table – Grid – Frame. Menus: Option menu – context menu - pop-up menu – Lists and Notifications: creation and display. Input Controls: Buttons-Text Fields-Checkboxes-alert Dialogs-Spinners-rating bar-progress bar.

UNIT 5 - PUBLISHING AND INTERNATIONALIZING MOBILE APPLICATIONS: Live mobile application development: Game, Clock, Calendar, Convertor, Phone book. App Deployment and Testing: Doodle app – Tip calculator app – Weather viewer app.

REFERENCES

1. Barry Burd, "**Android Application Development – All-in-one for Dummies**", 2nd Edition, Wiley India, 2016.
2. Paul Deitel, Harvey Deitel, Alexander Wald, "**Android 6 for Programmers – An App-driven Approach**", 3rd edition, Pearson education, 2016.
3. Jerome (J. F) DiMarzio, "**Android – A Programmer's Guide**", McGraw Hill Education, 8th reprint, 2015.
4. **http://www.developer.android.com**

SEM V	CORE THEORY	Lecture	Practical	Credit

BCA52	OPERATING SYSTEM	6	0	3

LEARNING OBJECTIVES

To Enable the student to get sufficient knowledge on various system resources.

After completing this course, the students will be able to

1. Explain architecture, services, types of an operating system.
2. Describe process and its scheduling methods
3. Analyze different approaches to handle and know memory management.
4. Examine the mapping techniques and the know how skills of paging memory.
5. Explain the File management concepts.

SYLLABUS

UNIT 1 - Operating System Basics - Services of Operating System-Classification of Operating System-Architecture and Design of an Operating System-Process Management -Introduction to Process-Process State -PCB - Process Scheduling - Interprocess Communication

UNIT 2 - Operating System Scheduling CPU Scheduling: Introduction - Types of CPU Scheduler - Scheduling Criteria - Scheduling Algorithms - FCFS Scheduling – SJF Scheduling; -Priority Scheduling - Round-Robin Scheduling- Multilevel Queue Scheduling - Deadlock - Basic Concept of Deadlock-Deadlock Prevention - Deadlock Avoidance- Deadlock - Detection and Recovery

UNIT 3 - Memory management - Address Binding; Logical and Physical Address Space- Memory Partitioning - Memory Allocation-Protection-Fragmentation and Compaction

UNIT 4 – Swapping - Using Bitmaps - Using Linked Lists- Paging-Mapping of Pages to Frames - Hierarchical Page Tables- Segmentation - Virtual Memory - Basic Concept of Virtual Memory- Demand Paging - Transaction Lookaside Buffer (TLB) - Inverted Page Table-Page Replacement Algorithms

UNIT 5 - File Management File Management - Basic Concept of File-Directory Structure-File Protection-Allocation Methods – Various Disk Scheduling algorithms

REFERENCES

1. Abraham Silberschatz Peter B. Galvin, G. Gagne, “**Operating System Concepts**”, Sixth Edition, Addison Wesley Publishing Co., 2003.
2. W. Stallings, “**Operating systems - Internals and Design Principles**”, 6th Edition, Pearson
3. William - Stalling “**Operating System**” Fourth Edition, Pearson Education, 2003.

SEM V	CORE THEORY	Lecture	Practical	Credit
BCA63	**DATA COMMUNICATION AND NETWORKS**	**4**	**0**	**2**

LEARNING OBJECTIVES

To equip students with the basics of Data Communication and prepare them for better computer networking.

After completing this course, the students will be able to

1. Distinguish the functionality of every layer in both OSI and TCP/IP
2. Compare and contrast the guided from the Unguided media
3. Illustrate the division of data into smaller frames
4. List and Use the appropriate method for correcting errors in data transmitted
5. Differentiate the various MAC protocols
6. Differentiate Static Routing from Dynamic Routing
7. Compare and Contrast Multicast & Broadcast routing
8. Compute the shortest path to a given destination using the metrics given.
9. Explain the TL Elements
10. Assess the functions performed by the TCP & UDP in data transmission
11. Discuss the function of DNS
12. Illustrate the working of E-mail
13. Elucidate how the data is transferred using WWW
14. Encrypt & Decrypt data using simple cipher techniques
15. Explain how the multimedia files get transferred over the network.

SYLLABUS

UNIT 1 - Basics of network Introductory Concepts - Network hardware - Network software – Network Architecture - Physical layer - Guided transmission media - Cable television.

UNIT 2 - Data Link Layer Data Link Layer - Design issues - Channel allocation problem - Multiple access protocols - Ethernet - Wireless LAN - 802.11 architecture.

UNIT 3 - Network Layer Network Layer: Design issues, Routing Algorithms, Shortest path routing, Flooding, Broadcast & Multicast routing congestion, Control & internetworking.

UNIT 4 - Transport Layer Transport Layer - Transport service - Elements of transport protocols - User Datagram Protocol - Transmission Control Protocol.

UNIT 5 - Application Layer Application Layer - DNS - Electronic mail - World Wide Web - Multimedia - Network security.

REFERENCES

1. Andrew Tanenbaum, "**Computer Networks"**, Fourth Edition, Prentice Hall of India Publications, New Delhi, 2003
2. William Stallings, "**Computer Networks"**, Fourth Edition, Prentice Hall of India Publications, New Delhi, 2003
3. William Buchanan, "**Mastering Networks"**, Palgrave, 2002
4. Behrouz Forouzan,"**Introduction to Data communication and Networking"**, Tata Mc-Graw-Hill Edition, New Delhi

SEM V	CORE PRACTICAL	Lecture	Practical	Credit
BPCA56	**MOBILE APPLICATION DEVELOPMENT LAB**	**4**	**0**	**3**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Install and configure Android application development tools.
2. Design and develop Mobile application in selected Application framework.
3. Deploy the application in mobile phones.

SYLLABUS

1. Intent and Activity
2. Using Controls
3. Alert Dialogs
4. List View
5. Options Menu
6. Seek Bars
7. Shared Preferences
8. Status Bar Notifications
9. Tab Widgets Talking Clock.
10. Tween Animation
11. Grid View
12. Internal Storage - Files
13. SQlite - Database
14. Google Map
15. Permissions

REFERENCES

NIL

SEM V	CORE PRACTICAL	Lecture	Practical	Credit
BPCA57	**OPERATING SYSTEM LAB**	**4**	**0**	**2**

LEARNING OBJECTIVES

To Enable the student to get sufficient practical knowledge on various system processes and scheduling concepts.

After completing this course, the students will be able to

1. Setup Environment to write and execute shell programs
2. Write basic shell script programs
3. Implement CPU scheduling algorithms, System calls using c language

SYLLABUS

1. Implementing the Process system calls.
2. Implementing I/O system calls.
3. Implementing IPC using message queues.
4. Implementing CPU scheduling algorithm for first come first serve scheduling.
5. Implementing CPU scheduling algorithm for shortest job first scheduling.
6. Implementing perform priority scheduling.
7. Implementing CPU scheduling for Round Robin Scheduling.
8. Implementing pipe processing.
9. Implementing first fit, best-fit algorithm for memory management.
10. A program to simulate producer-consumer problems using semaphores.
11. A Shell Program to find factorial of a given number
12. A shell program to generate Fibonacci number

REFERENCES

NIL

SEM V	ELECTIVE I	Lecture	Practical	Credit
BECA54A	DATAMINING	3	0	3

LEARNING OBJECTIVES

To Enable the student to get sufficient knowledge on mining the data

After completing this course, the students will be able to

1. Define data mining and its process.
2. List the different types of techniques in data mining
3. Compare data mining Vs Query Tools
4. Describe Data Models, Cubes and OLAP
5. Illustrate the types of Metadata
6. Apply data pre-processing techniques in the real-world problem.
7. Describe & Demonstrate basic data mining algorithms
8. Analyze the different classification method
9. Evaluate clustering method with an example
10. Describe the various web mining methods.

SYLLABUS

UNIT 1 - Data Mining Basics Introduction: Definition of data mining - data mining vs. query tools - machine learning - steps in data mining process - overview of data mining techniques.

UNIT 2 - Data Models Multidimensional Data Model - Data Cube - Dimension Modeling - OLAP Operations - Meta Data - Types of Metadata.

UNIT 3 - Data Editing Data Pre-Processing and Characterization: Data Cleaning - Data Integration and Transformation - Data Reduction - Data Mining Query Language - Generalization - Summarization - Association Rule Mining

UNIT 4 - Classification: Classification - Decision Tree Induction - Bayesian Classification - Prediction - Back Propagation - Cluster Analysis - Hierarchical Method - Density Based Method - Grid Based Method - Outlier Analysis.

UNIT 5 - Analysis Cluster analysis: Types of data - Clustering Methods - Partitioning methods - Model based clustering methods - outlier analysis. Advanced topics: Web Mining - Web Content Mining - Structure and Usage Mining - Spatial Mining - Time Series and Sequence Mining.

REFERENCES

1. PaulrajPonnaiah, "**Data Warehousing Fundamentals"**, Wiley Publishers, 2001.
2. Jiawei Han, MichelineKamber, "**Data Mining: Concepts and Techniques**",Morgan Kaufman Publishers, 2006.
3. Usama.Fayyad, Gregory Piatetsky Shapiro, Padhrai Smyth RamasamyUthurusamy, "**Advances in Knowledge Discovery and Data Mining**", the M.I.T. Press, 2007.
4. Ralph Kimball, Margy Ross, "**The Data Warehouse Toolkit, John Wiley and Sons Inc**"., 2002
5. Alex Berson, Stephen Smith, Kurt Thearling, "**Building Data Mining Applications for CRM**", Tata McGraw Hill, 2000.
6. Margaret Dunham, "**Data Mining: Introductory and Advanced Topics**", Prentice Hall, 2002.
7. Daniel T. Larose John Wiley & Sons, Hoboken, "**Discovering Knowledge in Data: An Introduction to Data Mining**", New Jersey, 2004.

SEM V	ELECTIVE I	Lecture	Practical	Credit
BECA54B	**COMPUTER GRAPHICS**	**3**	**0**	**3**

LEARNING OBJECTIVES

To equip students to basics of computer drawing and prepare them for computer modeling of objects

After completing this course, the students will be able to

1. List the basic concepts used in computer graphics.
2. Implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
3. Describe the importance of viewing and projections.
4. Explain the three-dimensional transformation, viewing and clipping concepts
5. Explain the different types of visible surface detection methods

SYLLABUS

UNIT 1 - OVERVIEW OF GRAPHICS SYSTEMS AND OUTPUT PRIMITIVES Video Display Devices- Raster Scan System- Random Scan Systems- Hard Copy Devices-Graphic Software- Line Drawing Algorithms: DDA- Bresenham's Line -Circle Generating Algorithms

UNIT 2 - ATTRIBUTES AND TWO-DIMENSIONAL TRANSFORMATIONS Line Attributes- Curve Attributes-Color and Gray Scale Level- Area Fill Attributes- Character Attributes- Inquiry Functions- Basic Transformations - Composite Transformation – Other transformation

UNIT 3 - TWO-DIMENSIONAL VIEWING AND CLIPPING The Viewing Pipeline- Window to Viewport Transformation –Clipping Operations- Point Clipping- Line Clipping: Cohen Sutherland- Liang Barsky- Sutherland Hodgeman Polygon Clipping- Text Clipping- Exterior Clipping- Logical Classification of Input Devices- Interactive Picture Construction

UNIT 4 - THREE DIMENSION TRANSFORMATION, VIEWING AND CLIPPING Translation-Rotation-Scaling-Viewing Pipeline- Viewing Coordinates- Projections -View Volumes and General Projection Transformation- Clipping -

UNIT 5 - VISIBLE SURFACE DETECTION METHODS Classification of Visible Surface Detection Algorithms - Back Face Detection - Depth Buffer Method - A Buffer Method - Scan Line Method - Depth Sorting Method- BSP Tree Method - Area Subdivision Method - Octree Methods - Ray Casting Method

REFERENCES

1. Donald Hearn and M.Pauline Baker, "**Computer Graphics (C version)"**, Pearson- 2nd Edit. 2012.
2. Edward Angel, "**Interactive Computer Graphics–A top down approach using Open GL"**, Pearson, 5th Edition.
3. Peter Shirley, Steve Marschner, "**Computer Graphics"**, Cengage Learning, Indian Edition,2009.

SEM V	ELECTIVE I	Lecture	Practical	Credit
BECA54C	**INFORMATION SECURITY**	3	0	3

LEARNING OBJECTIVES

To enable the student to understand various methodology available for securing information

After completing this course, the students will be able to

1. Define key terms and critical concepts of information security and understand the phases of SDLC.
2. List the different threats and attacks and understand the Legal, Ethical and Professional Issues.
3. Identify, Assess and control the risk
4. Explain different standards, Policy and Practices and Security Model.
5. Describe how to handle the physical security issues

SYLLABUS

UNIT 1 - INFORMATION SECURITY BASICS: INTRODUCTION -History, what is Information Security? Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT 2 - SECURITY INVESTIGATION: SECURITY INVESTIGATION - Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT 3 - SECURITY ANALYSIS: SECURITY ANALYSIS-Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT 4 - SECURITY MODELS: LOGICAL DESIGN-Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT 5 - SECURITY PHYSICAL DESIGN: PHYSICAL DESIGN-Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel.

REFERENCES

1. Michael E Whitman and Herbert J Mattord, "**Principles of Information Security**", Vikas Publishing House, New Delhi, 2003
2. Micki Krause, Harold F. Tipton, " **Handbook of Information Security Management**", Vol 1-3 CRC Press LLC, 2004.
3. Stuart McClure, Joel Scrambray, George Kurtz, "**Hacking Exposed**", Tata McGraw-Hill, 2003
4. Matt Bishop, "**Computer Security Art and Science**", Pearson/PHI, 2002.

SEM V	SKILL BASED SUBJECT III	Lecture	Practical	Credit
BSCA55	**SOFTWARE ENGINEERING**	**3**	**0**	**3**

LEARNING OBJECTIVES

To introduce the concepts and methods required for the construction of large software intensive systems.

After completing this course, the students will be able to

1. Apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
2. Identify the various methods involved in software process for requirements and apply the same to a simple project
3. Appreciate various design concepts and methods to build an analysis cum design model including as many diagrams as possible.
4. Summarize various testing methods in software engineering
5. Develop a project plan applying the methods of estimation, scheduling and quality reviews.

SYLLABUS

UNIT 1 - Introduction - Evolving Role of Software - Changing Nature of Software – Software Myths; A Generic View of Process: Layered Technology - Process Models: Waterfall Model - Evolutionary Process Models.

UNIT 2 - Requirements Engineering: Tasks - Initiating the Requirements Engineering Process – Eliciting Requirements - Building the Analysis Model - Requirements Analysis - Data Modeling Concepts.

UNIT 3 - Data Engineering: Design Process and Design Quality - Design Concepts - The Design Model Creating an Architectural Design: Software Architecture - Data Design -Architectural Design - Mapping Data Flow into Software Architecture; Performing User Interface Design: Golden Rules.

UNIT 4 - Testing Strategies: Strategic Approach to Software Testing- Test Strategies for Conventional and Object-Oriented Software - Validation Testing - System Testing -Art of Debugging. Testing Tactics: Fundamentals - White Box- Basis Path - Control Structure - Black Box Testing Methods

UNIT 5 - Project Management: Management Spectrum - People - Product - Process - Project. Estimation: Project Planning Process - Resources - Software Project Estimation - Project Scheduling - Quality Concepts - Software Quality Assurance - Formal Technical Reviews.

REFERENCES

1. Roger S Pressman, "**Software Engineering - A Practitioner's Approach**", Sixth Edition, McGraw Hill International Edition, New York: 2005.
2. Ian Somerville, "**Software Engineering**", 7th Edition, Pearson Education, 2006.
3. Mall Rajib, "**Software Engineering**", 2/E, PHI, 2006.

SEM VI	CORE THEORY	Lecture	Practical	Credit
BCA61	**CLOUD COMPUTING**	**7**	**0**	**5**

LEARNING OBJECTIVES

To enable the students to learn the basic functions, principles and concepts of cloud Systems.

After completing this course, the students will be able to

1. Articulate the main concepts, key technologies, History, Architecture, strengths, and limitations of cloud computing.
2. Explain the different types of Cloud Services.
3. Use and propose different cloud computing services.
4. Choose the appropriate cloud player, Programming Models and approach.
5. Address the core issues of cloud computing such as security, privacy and interoperability.

SYLLABUS

UNIT 1 - UNDERSTANDING CLOUD COMPUTING Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Cloud Services.

UNIT 2 - DEVELOPING CLOUD SERVICES Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

UNIT 3 - CLOUD COMPUTING FOR EVERYONE Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-do Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events.

UNIT 4 - PROGRAMMING MODEL Parallel and Distributed Programming Paradigms – Map Reduce, Twister and Iterative Map Reduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, Open Stack, Aneka, CloudSim.

UNIT 5 - SECURITY IN THE CLOUD Security Overview - Cloud Security Challenges and Risks - Software-as-a-Service Security Security Governance - Risk Management - Security Monitoring - Security Architecture Design - Data Security - Application Security - Virtual Machine Security - Identity Management and Access Control - Autonomic Security.

REFERENCES

1. Michael Miller, "**Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online**", Que Publishing, August 2008.
2. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "**Distributed and Cloud Computing, From Parallel Processing to the Internet of Things**", Morgan Kaufmann Publishers, 2012.
3. John W.Rittinghouse and James F.Ransome, "**Cloud Computing: Implementation, Management, and Security**", CRC Press, 2010.
4. Toby Velte, Anthony Velte, Robert Elsenpeter, "**Cloud Computing, A Practical Approach**", TMH, 2009. 4.
5. Kumar Saurabh, "**Cloud Computing – insights into New-Era Infrastructure**", Wiley India, 2011.

SEM VI	CORE THEORY	Lecture	Practical	Credit
BCA62	**OPEN SOURCE PROGRAMMING**	6	0	4

LEARNING OBJECTIVES

To discuss techniques that can be effectively applied in practice about HTML5, JavaScript, PHP, CSS and Linux

After completing this course, the students will be able to

1. Design a web page using HTML, JavaScript and CSS
2. Explain the Linux Operating system architecture and its commands
3. Write Queries for storing and retrieving data using MYSQL commands.
4. Develop simple web application using PHP
5. Develop web application with database transaction through PHP

SYLLABUS

UNIT 1 - INTRODUCTION TO HTML5, JAVA SCRIPT, PHP AND CSS Introduction to Dynamic Web content- HTTP and HTML- Request and Response Procedure- The Benefits of PHP, JAVA Script, CSS, and HTML5- Introduction to HTML5- The Canvas The HTML5 Canvas- HTML5 Audio and Video- Introduction to CSS- CSS Rules-Style Types- CSS Selectors- CSS Colors.

UNIT 2 - LINUX Introduction: Linux Essential Commands – File system Concept – Standard Files – The Linux Security Model – Vi Editor – Partitions Creation – Shell Introduction – String Processing – Investigation and Managing Processes – Network Clients – Installing Application.

UNIT 3 - MYSQL Introduction to MY SQL – The show Databases and Table – The USE command – Create Database and Tables – Describe Table – Select, Insert, Update, and Delete statement – Some Administrative details – Table Joins – Loading and Dumping a Database.

UNIT 4 - PHP Introduction – General Syntactic Characteristics – PHP Scripting – Commenting your code – Primitives, Operations and Expressions – PHP Variables – Operations and Expressions Control - statement – Array – Functions.

UNIT 5 - PHP Basic Form Processing – File and Folder Access – Cooking – Sessions – Database Access with PHP – MySQL - MySQL Functions – Inserting Records – Selecting Records – Deleting Records – Update Records.

REFERENCES

1. Robin Nixon, "**Learning PHP, MySQL, Java Script, CSS and HTML5**", O'Reilly Publications, 3rd Edition, 2014.
2. Steven Holzner, "**HTML Black Book**", Dreamtech Press &Paraglyph Press Publishers, 2007
3. P.Rizwan Ahmed, "**Open Source Software"**, Margham Publication, Chennai, 2015

SEM VI	CORE PRACTICAL	Lecture	Practical	Credit
BPCA67	**OPEN SOURCE PROGRAMMING LAB**	**0**	**4**	**3**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Set up environment to run PHP application
2. Develop a web-based application in PHP using HTML, CSS, JavaScript etc.
3. Connect application to Database (MYSQL)
4. Deploy the application on the web server.

SYLLABUS

1. Create a web page with Frames and Tables.
2. Create a web page incorporating CSS (Cascading Style Sheets)
3. Write a shell program to find the factorial of an integer positive number
4. Write a shell program for checking whether a given string is a palindrome or not
5. Create a simple calculator in JavaScript.
6. Write a JavaScript program to scroll your name in the scroll bar
7. Develop a program and check the message passing mechanism between pages.
8. Develop a program and check file system functions, date & time functions.
9. Create a student database table in MYSQL and manipulate records (insert, delete, update) records in a web browser.
10. Develop a program using cookies and sessions.

REFERENCES

NIL

SEM VI	ELECTIVE II	Lecture	Practical	Credit
BECA63A	SOFTWARE TESTING	3	0	3

LEARNING OBJECTIVES

To make the student more proficient with error free software development.

After completing this course, the students will be able to

1. Explain the problem domain to choose process models, to develop SRS, to test the software by applying various testing techniques.
2. **D**ifferentiate White Box and Black Box Testing and apply it in a software.
3. Describe and distinguish Integration, System and Acceptance Testing and apply it in a software.
4. Describe and distinguish performance and regression testing to test the performance of the software.
5. Apply adhoc testing to find the errors in software.

SYLLABUS

UNIT 1 - PRINCIPLES OF TESTING A test in time - The cat and the saint - Test the tests first - The Policemen on the bridge - Phase of software project - Quality, Quality Assurance and Quality Control - Testing, Verification and Validation -Process model to represent different phases - Life cycle models.

UNIT 2 - BLACK BOX k WHITE BOX TESTING White box testing - Challenges - Static testing - Structural testing - Black box testing.

UNIT 3 - INTEGRATION, SYSTEM AND ACCEPTANCE TESTING Integration testing - Types - Phase of testing - Scenario testing - Defect bash - System and Acceptance testing: Overview - Functional vs. Non-Functional testing - Functional system testing - Non-functional Testing-Acceptance testing.

UNIT 4 - PERFORMANCE AND REGRESSION TESTING Introduction - Factors Governing - Methodology for Performance testing - Tools and Process for Performance Testing - Regression Testing - Types of Regression testing - How to do Regression Testing?

UNIT 5 - INTERNATIONALIZATION AND ADHOC TESTING Introduction to Internationalization - Primer on Internationalization - Test phases for Internationalization testing - Enabling testing - Locale testing - Internationalization Validation- Fake language testing - Language testing - Localization testing - Tools used for Internationalization - Challenges and Issues - Overview of Ad Hoc testing - Buddy, Pair, Exploratory, Iterative, Agile and Extreme Testing - Defect Seeding.

REFERENCES

1. Srinivasan Desikan, Gopalaswamy Ramesh, "**Software Testing: Principles and Practices**", Pearson Publications, 2006.
2. Renu Rajani, Pradeep Oak, "**Software Testing- Effective Methods, Tools and Techniques**", Tata McGraw Hill, 2004.
3. Boris Beizer, "**Software Testing Techniques**", Dream Tech Press, Second Edition, 2003.

SEM VI	ELECTIVE II	Lecture	Practical	Credit
BECA63B	**MOBILE COMPUTING**	**3**	**0**	**3**

LEARNING OBJECTIVES

To impart good knowledge of wireless communication to students

After completing this course, the students will be able to

1. Explain the fundamental concept of mobile computing.
2. Discuss the different MAC protocols
3. Distinguish the standards used for Wireless LAN (802.11,802.11a,802.11b)
4. Explain Mobile IP and DHCP Protocols.
5. Compare and Contrast Metrics of Routing
6. Differentiate between Mobile IP, Traditional Internet Protocol
7. Explain the working of WAP User Agent
8. Write WML Script
9. Discuss various database issues encountered in wireless communication

SYLLABUS

UNIT 1 - WIRELESS COMMUNICATION FUNDAMENTALS Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation - MAC – SDMA – FDMA –TDMA – CDMA – Cellular Wireless Networks.

UNIT 2 - TELECOMMUNICATION NETWORKS & WIRLESS LAN Telecommunication systems – GSM – GPRS - Satellite Networks, Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a -802.11b standards – HIPERLAN – Blue Tooth.

UNIT 3 - MOBILE NETWORK LAYER & TRANSPORT LAYER Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics. Traditional TCP, Mobile TCP

UNIT 4 - APPLICATION LAYER WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP user agent profile- caching model-wireless bearers for WAP - WML – WML Scripts

UNIT 5 - DATABASE ISSUES Database Issues: Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

REFERENCES

1. Jochen Schiller, "**Mobile Communications**", Second Edition, Pearson Education, 2003.
2. William Stallings, "**Wireless Communications and Networks**", Pearson Education, 2002.
3. KavehPahlavan, PrasanthKrishnamoorthy, "**Principles of Wireless Networks"**, PHI/Pearson Education, 2003.
4. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, "**Principles of Mobile Computing**", Springer, 2003

SEM VI	ELECTIVE II	Lecture	Practical	Credit
BECA63C	**MICROPROCESSOR AND ITS APPLICATIONS**	**3**	**0**	**3**

LEARNING OBJECTIVES

To learn the architecture, programming, interfacing and rudiments of system design of microprocessors.

After completing this course, the students will be able to

1. Explain computer architecture, memory organizations and working of I/O devices.
2. Evaluate assembly level instructions with respect to syntax and semantics.
3. Design and Implement assembly level programs for a specified problem.
4. Design and Implement I/O and memory devices interfacing for a specification.
5. Compare accepted standards and guidelines to select appropriate Microprocessor (8085 & 8086) and Microcontroller to meet specified performance requirements.

SYLLABUS

UNIT 1 - 8085 MICROPROCESSOR AND ARCHITECTURE Microprocessors - Memory - I/O Devices - Memory Mapped I/O - Pin diagram and internal architecture of 8085 - Registers, ALU, Control & Status Registers - Instruction and Machine Cycles. Interrupts

UNIT 2 - PROGRAMMING THE 8085 Introduction to 8085 Assembly language programming - 8085 instructions - Programming techniques with Additional instructions - Counters and Time Delays - Stack and Subroutines - Code Conversions

UNIT 3 - 8086 MICROPROCESSOR AND ARCHITECTURE Pin Details and Internal Architecture of 8086 - Register organization, Bus interface unit, Execution unit, Memory addressing, Memory segmentation. Operating modes - Hardware and Software interrupts - Addressing Modes.

UNIT 4 - PROGRAMMING THE 8086 8086 Assembly Language Programming - Implementing Standard Program Structures - String - Procedure and Macros. Instruction Description and Assembler Directives

UNIT 5 - INTERFACING PERIPHERALS 8255 PPI , 8253/8254 PIT, 8237 DMAC,8259 PIC, 8251 USART.

REFERENCES

1. Ramesh S.Gaonkar, "**Microprocessor Architecture, Programming and Applications with 8085"**, Penram International Publishing (India) Pvt. Ltd. 4th Ed. (for Units I,II and V)
2. Douglas V. Hall, "**Microprocessors and Interfacing"**,Tata McGraw Hill , 2nd Ed. (for Units III and IV)
3. Alan R. Miller, **Assembly Language Programming the IBM PC**,SubexInc, 1987.
4. "**Advanced Microprocessors and Peripherals"**, Ray A K ,Bhurchandi K M , TMH

SEM VI	ELECTIVE III	Lecture	Practical	Credit
BECA64A	**INTERNET OF THINGS**	**3**	**0**	**3**

LEARNING OBJECTIVES

To prepare the student for better application of internet technology.

After completing this course, the students will be able to

1. Understand the techniques of enterprises plan which includes IoT deployment in networks
2. Explain basic IoT applications on embedded platform featuring Response systems.
3. Design IoT applications for environment friendly which has as social impact.
4. Implementation of Data, Knowledge Management and the use of Devices in IoT Technology for Monitoring purposes.
5. Identify the application of IoT in Industrial Automation and identify Real World Design

SYLLABUS

UNIT 1 - IoT Introduction - Introduction to Internet of Things: Definition – Characteristics of IOT – Physical Design of IoT – Things in IoT – IoT Protocols – Logical Design of IoT – Iot Functional Blocks – IoT Communication Models – IoT Communication APIs – IoT Enabling Technologies

UNIT 2 - Domain-Specific IoT – I: Smart Lighting – Smart Appliances – Intrusion Detection – Smoke / Gas Detection – Smart Parking – Smart Roads – Structural Health Monitoring – Surveillance – Emergency Response – Weather Monitoring –

UNIT 3 - Domain Specific IoT – II: Air Pollution Monitoring – Noise Pollution Monitoring – Forest Fire Detection – River Flood Detection – Smart Grids- Smart Vending Machines – Route Generation & Scheduling – Fleet Tracking – Shipment Monitoring

UNIT 4 - Domain Specific IoT – III: Remote Vehicle Diagnostics – Smart Irrigation – Green House Control – Machine Diagnosis & Prognosis – Indoor Air Quality Monitoring – Health & Fitness Monitoring – Wearable Electronics

UNIT 5 - IoT and M2M: M2M – Difference Between IoT and M2M – SDN and NFV for IoT – IoT System Management with NETCONF – YANG: Need for IoT Systems Management – SNMP- Network Operator Requirements – NETCONF – YANG-IoT Systems Management with NETCONF - YANG

LEARNING OUTCOMES

REFERENCES

1. Jean-Philippe Vasseur, Adam Dunkels, Morgan Kuffmann.“**Interconnecting Smart Objects with IP: The Next Internet”,**
2. P.Rizwan Ahmed, “**Internet of Things”**, Margham Publications, Chennai.
3. Adrian McEwen (Author), Hakim Cassimally, “**Designing the Internet of Things”**

SEM VI	ELECTIVE III	Lecture	Practical	Credit
BECA64B	**SYSTEM SOFTWARE**	3	0	3

LEARNING OBJECTIVES

To make the student to become more proficient with system programming

After completing this course, the students will be able to

1. Understand SIC architecture, features of utility software such as assemblers, loaders, linkers, editors and macro processor.
2. Design simple assembler for Simple instruction computer.
3. Design linker and loaders for simple instruction computer.
4. Design elementary macro processor for simple assembly level language.
5. Design and implement simple lexer and parser using lex and yacc tools.

SYLLABUS

UNIT 1 - LANGUAGE PROCESSORS Language Processing Activities – Fundamentals of Language Processing – Fundamentals of Language Specification – Language Processor Development Tools.

UNIT 2 - ASSEMBLERS AND MACRO Elements of Assembly Language Programming – Overview of Assembly Process - Design of a Two – Pass Assembler - Macro Definition and Call – Macro Expansion – Nested Macro Calls.

UNIT 3 - COMPILER I Scanning: Finite State Automate – Regular Expressions – Building DFA – Performing Semantic Action – Writing a Scanner – Parsing: Parse Tree and Abstract Syntax Trees – Top Down Parsing – Bottom-Up Parsing.

UNIT 4 - COMPILER II AND INTERPRETERS Aspects of Compilation –Memory Allocation - Compilation of Expressions-Compilation of Control Structure-Code Optimization - Interpreters.

UNIT 5 - LINKERS Relocation and Linking Concepts – Design of a Linker – Self-Relocating Programs – Linking for Overlays - Loader.

REFERENCES

D.M. Dhamdhere, "**System Programming and Operating Systems**",Tata McGraw-Hill Publishing Company Limited, New Delhi,1993.

SEM VI	ELECTIVE III	Lecture	Practical	Credit
BECA64C	**MULTIMEDIA SYSTEMS**	3	0	3

LEARNING OBJECTIVES

To present the Introduction to Multimedia, Images & Animation and enable the students to learn the concepts of Multimedia.

After completing this course, the students will be able to

1. Explain the importance of Multimedia Systems.
2. Describe various file formats for audio, video and text media.
3. Develop Multimedia Systems.
4. Design interactive multimedia software and apply various networking protocols for multimedia applications.
5. Evaluate multimedia application for its optimum performance.

SYLLABUS

UNIT 1 - Introduction to Multimedia: Introduction to Multimedia PCs – Components of Multimedia – Multimedia Tools Sound and Graphics: Digital Sound – Editing and Mixing sound files – MIDI creation – Tracking Procedure – Interactive and Non-Interactive Graphics – High Resolution Graphics – Difference between TV and Computer Display.

UNIT 2 - Video and Animation: Digital Image concepts – Video Capturing – Scanning Images – Digital Filters Morphing and Warping – Two Dimensional and Three-dimensional animation – Animation Tools – Layering technique – Blue Screen technique – Latest movie technologies – Motion Tracking System – Motion Capturing System.

UNIT 3 - Creating Presentation: Script Writing and creating interactive and non-interactive presentation – Linear and Non-Linear Editing – Authoring Tools – File Formats SOUND, VIDEO, ANIMATION, Presentation Images. Multimedia Programming: Text Links – Hyper Text system – Form Creation – File storing - Error Trapping.

UNIT 4 - Sound Links: Multimedia interfaces – MCI- API- High Level Multimedia Functions – WAVE, MIDI file processing. Animation: Color Palette – Events – ROPs.

UNIT 5 - Imaging Special Visual Effects: Bitmap – Brushes – Dissolve –Hotspot Editor – Scrolling. Media Control Interface: Simple Commands – API functions – CD Player – Video Capturing – Form – AVI Play Form.

REFERENCES

1. KaliyaperumalKarthikeyan,"**Introduction to Multimedia System**", LAP Lambert Academic Publishing, 2011
2. TayVaughan, "**Multimedia Making It Work Eighth Edition**", Tata McGraw-Hill Publishing Company, 2011
3. ParagHavaldarand Gerald Medioni, "**Multimedia Systems**", Cengage Learning, 2011
4. S. K. Bansal, "**Multimedia Systems**", Aph Publishing Corporation, 2011

SEM VI	SKILL BASED SUBJECT IV	Lecture	Practical	Credit
BSCA65	**ASP.NET**	**3**	**0**	**3**

LEARNING OBJECTIVES

To become well aware of .NET technology

After completing this course, the students will be able to

1. Configure and work with the ASP.NET Environment
2. Develop simple web application with basic controls of ASP.NET
3. Explain the different classes of ADO.NET
4. Develop web application with data sources using ADO.NET
5. Explain and Develop simple web-based application using XML and Web services.

SYLLABUS

UNIT1 - ASP.NET Basics Introduction to ASP.NET: .NET Framework (CLR, CLI, BCL), ASP.NET Basics, ASP.NET Page Structure, Page Life Cycle. Controls: HTML Server Controls, Web Server Controls, Web User Controls, Validation Controls, Custom Web Controls.

UNIT 2 - Form validation: Client-side validation, Server-side validation, Validation Controls: Required Field Comparison Range, Calendar Control, Ad rotator Control, Internet Explorer Control. State Management: View State, Control State, Hidden Fields, Cookies, Query Strings, Application State, Session State.

UNIT 3 - ADO.NET Architecture of ADO. NET, Connected and Disconnected Database, Create Database, create connection Using the ADO.NET Object model, Connection Class, Command Class, Data Adapter Class, Dataset Class, display data on data bound controls and Data Grid.

UNIT 4 - Database accessing on Web Applications: Data Binding Concept with web, Creating Data Grid, binding standard web server controls, display data on web form using Data Bound Controls.

UNIT 5 - XML Writing Datasets to XML, Reading datasets with XML. WEB services: Remote method call using XML, SOAP, Web service description language, Building and Consuming a web service, Web Application deployment.

REFERENCES

1. Bill Evjen, Devin Rader, Farhan Muhammad, "**Professional ASP.NET 1.1**", Scott HanselmanSrivakumarWrox.
2. "**Introducing Microsoft ASP .NET 2.0"**, Esposito PHI
3. BipinJoshi, Donny Mack, Doug Seven, Fabio Claudio Ferracchiati, "**Professional ADO.NET"** Jan D NarkiewiezWrox
4. Richard Leineker "**Special Edition Using ASP.NET**" ,Person Education
5. Matthew MacDonald "**The Complete Reference ASP.NET**", TMH
6. **"ASP.NET Black Book"**, DreamTech

SEM VI	CORE PRACTICAL	Lecture	Practical	Credit
BPCA66	**ASP.NET LAB**	**0**	**4**	**3**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Demonstrate the features of ASP.NET Environment and design and develop a web application using ASP.NET IDE
2. Analyze and design and develop simple application using ASP.NET controls
3. Design and develop Database manipulation in ASP.NET & ADO.NET
4. Configure and Deploy application in IIS Server

SYLLABUS

1. Implement Validation Controls
2. Write a Program to implement ad rotator control
3. Write a Program to implement state management techniques
4. Write a Program to implement view State and Session State.
5. Write a Program to displaying data with the grid view
6. Write a Program to implement ASP.Net Server-Side Controls.
7. Write a Program to implement ASP.Net Master Pages, Themes and Skins.
8. Write a Program working with forms using ASP.Net
9. Write a Program working with pages using ASP.Net.
10. Write a Program to access data sources through ADO.NET

REFERENCES

NIL

CURRICULUM ENRICHMENT COURSES

SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) is the online education platform developed by MHRD, Govt. Of India. It offers numerious courses with transferable credits. All courses are offered free of cost under this program, however fees are levied in case the learner requires a certificate.

The students register themselves in a course which they like and produce the certificate after their completion of the course.

Every BCA Student is asked to attend at least a single SWAYAM course per year.

PROFESSIONAL EDUCATION COURSES which enrich the curriculum and provide exposure to recent technologies are offered by Bosco Institute of Information Technology (BIIT). All these courses are conducted from third semester to sixth semester, with three contact hours per week (12 weeks). A student can opt for any course. Combination of courses lead to a diploma program of study for the students.

1. OPEN SOURCE PHP TOOLS
2. ROBOTICS
3. WEB DEVELOPMENT USING HTML (Basic Level)
4. .NET PROGRAMMING (C# and Win Apps)
5. PROGRAMMING WITH PYTHON
6. WEB TECHNOLOGY
7. LAMP TECHOLOGY
8. MULTIMEDIA AND WEB DESIGN
9. WEB DEVELOPMENT USING PYTHON
10. MS OFFICE APPLICATIONS
11. PYTHON PROGRAMMING
12. MASTERING MS-EXCEL
13. TALLY 9.0
14. TECHNICAL WRITING

Students who qualify in at least four courses are given additional post-graduate diploma in Computer Applications. The offered diplomas are:

1. Diploma in Software Technology (.Net, Python, LAMP)
2. Diploma in Multimedia and Web Design
3. Diploma in Technical Writing

BRIDGE COURSES

Bridge Courses for first year students are conducted intensely at the beginning of every year and throughout the year. It is based on the performance of the students in CIE and Semester examinations. The main objective is to enable the students to understand the basic concepts and frameworks related to English, Computing fundamentals and mathematics.

The following bridge courses are conducted in the department

1. English for Life (for all first-year students, two semesters)
2. PC Software (for first-year students, first semester as association activity)
3. Computer Fundamentals (for slow learners)
4. Mathematical Foundation (for slow learners)

VOCATIONAL COURSES

Vocational courses aim at equipping the students with practical skills for a specific profession or field which helps them to upgrade their skills for that particular career.

The following vocational courses are offered

1. Music
2. Craftwork
3. Bridal
4. Cell Phone Repairing
5. Tailoring
6. Mushroom Cultivation

VALUE ADDED COURSES

The university curriculum may not cover all areas of importance or relevance of industry. It is important for higher education institutions to supplement the curriculum to make students better prepared to meet industry demands as well as develop their own interests and aptitudes. These courses are conducted after the class hours to add value to their resume.

The following value-added courses are offered

1. Life Skills
2. Information Literacy (from second semester to sixth semester)
3. General Knowledge
4. Professional Aptitude

SEM - ALL	VALUE ADDED COURSES	Seminar	Workshop	Test
IL01-IL04	**INFORMATION LITERACY**	1	1	1

OVERVIEW

Information literacy is a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.

An information literate individual is able to:

- Determine the extent of information needed
- Access the needed information effectively and efficiently
- Evaluate information and its sources critically
- Incorporate selected information into one's knowledge base
- Use information effectively to accomplish a specific purpose
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally

REALIZATION

This course is realized through Students@IT Association (Technology For Life – TFL) Meets which is organized by the students with a faculty member as its President.

STUDY DOMAINS

Technology, Systems, Applications, Environment

EVALUATION SCHEME

- Technical Report 30 Mks
- Technical Notes 30 Mks
- Participation 10 Mks
- Online Test 30 Mks

REFERENCES

Information Literacy Competency Standards for Higher Education, American Library Association, 2000
http://www.ala.org/acrl/ilcomstan.html
BIIT Quality Manual-2009, BICS InfoTech, Yelagiri Hills

SEM – III, IV,V,VI	VALUE ADDED COURSES	LECTURE	TEST
PRA	**PROFESSIONAL APTITUDE**	**1**	**1**

LEARNING OBJECTIVE

After the completion of this course, the student shall develop one's competency in reasoning and general aptitude.

REASONING
Statements and Conclusions – Statements – Arguments - Letter Coding – Number Coding – Mixed Letter Coding.
Statements – Assumptions – Courses of action – Syllogism using venn diagram – Analytical Decision making.
Blood Relations – Coded Relations – Analogy Figures, Series, Grouping – Coded Binary Numbers – Water Images.
Data sufficiency – Evaluating courses of action – mirror images – Figures series.
Evaluating Inferences – Forcefulness of the Argument – Punch Line – Analogy (Figures)
QUANTITATIVE APTITUDE
Numbers – HCF and LCM of Numbers - Decimal Fractions – Simplification – Square Roots and Cube Roots
Average – Problems on numbers – Problems of ages – Surds and Indices – Percentage
Profit and Loss – Ratio & Proportion – Partnership – Chain Rule – Time and Work
Pipes and Clisterns – Time and Distance – Problem on trains – Problem on boats – Allegation or Mixture
Simple Interest – Compound Interest – Logarithms – Area – Volume and Surface Areas – Races and Games of Skill
Calendar – Stocks and Shares – True Discount – Banker's Discount – Odd Man Out & Series – Data Interpretation

REFERENCES

R.S. Agarwal, *Quantitative Aptitude for Competitive Examinations*, 7th Revised Ed., S. Chand and Co. Ltd, New Delhi, 2005

Barron's Guide for GMAT, Galgotia Publications, New Delhi, 2006

Edgar Thorpe, *Course in Mental ability and quantitative aptitude*, Tata McGraw-Hill publishing company limited, New Delhi, 2000

R.S. Agarwal, *A modern approach to verbal and non-verbal reasoning*, S. Chand and Co. Ltd, New Delhi, 2004.