

Bachelor of Computer Applications BCA/BCA – LE

Programme Project Report & Detailed Syllabus
Semester Pattern
From Calendar Year 2021 onwards

தமிழ்நாடு திறந்தநிலைப் பல்கலைக்கழகம்
Tamilnadu Open University
Department of Computer Science
School of Computer Science

(A state open University Established by Government of Tamilnadu,
Recognized by UGC & DEB, Member in Asian Association of Open
Universities & Association of Commonwealth Universities)



No. 577,
Anna Salai,
Saidapet,
Chennai
600 01
Tamilnadu



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Faculty of Sciences
Department of Computer Science
School of Computer Science

Tamilnadu Open University

577, Anna salai , Saidapet

Chennai - 600015

Tamilnadu, India

Website : www.tnou.ac.in

SEPTEMBER, 2020



Tamil Nadu Open University

[A State Open University established by Government of Tamil Nadu, Recognized by UGC-DEB,
Member in Asian Association of Open Universities and Association of Commonwealth Universities]

No- 577, Anna Salai, Saidapet, Chennai -600015, Tamil Nadu, India

Prof. K.Parthasarathy
Vice-Chancellor

My dear Learners,

Vanakkam,

I deem it a great privilege to extend a hearty welcome to you to the Under Graduate Programme being offered by the Tamil Nadu Open University (TNOU). I also appreciate your keen interest to know about the curriculum of the Programme, in which you shall gain an enthralling experience, and pleasurable and beneficial learning.

With passing a specific act in the Tamil Nadu Legislative Assembly (TNLA) in 2002, the TNOU came into existence as a State Open University (SOU). It has been offering the socially-relevant academic Programmes in diverse disciplines with due approval of the University Grants Commission (UGC) and the Distance Education Bureau (DEB), New Delhi since its inception. This Undergraduate Programme is one among the approved Programmes.

The Board of Studies, a statutory academic body of the University, consisting of the versatile scholars, eminent teachers including both internal and external, well-acclaimed industrialists, outstanding alumni, and prospective learners as members, has designed the robust curriculum of this Programme. The curriculum is overhauled to be more suitable to the socio-economic and scientific needs in the modern era based on the emerging trends in the discipline at State and National as well as International level and accordingly, modified to our local context. Moreover, the whole syllabi of this Programme have special focuses on promoting the learners to the modern learning environment.

With a Credit System / Choice Based Credit System (CBCS), this Programme is offered in semester/ non-semester pattern. The Self-Learning Materials that are the mainstay of pedagogy in the Open and Distance Learning (ODL) have been developed incorporating both the traditional and the modern learning tools, like web-resources, multi-media contents, text books and reference books with a view to providing ample opportunities for sharpening your knowledge in the discipline.

At this juncture, I wish to place on record my deepest appreciations and congratulations to the Chairperson and the Members of the Board of Studies concerned for having framed the curriculum of high standard.

I would also like to acknowledge the Director, the Programme Co-Ordinator and the members of staff of the respective School of Studies for their irrevocable contributions towards designing the curriculum of this Programme.

Last but not least, I register my profuse appreciation to Prof. S. Balasubramanian, the Director (i/c), Curriculum Development Centre (CDC), TNOU, who have compiled this comprehensive Programme Project Report (PPR) that includes the regulations and syllabi of the Programme, and also facilitated the designing in the form of e-book as well printed book.

I am immensely hopeful that your learning at TNOU shall be stupendous, gratifying, and prosperous.

Wish you all success in your future endeavours!

With warm regards,

(Prof. K. PARTHASARATHY)

05, September 2020



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**TAMIL NADU OPEN UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE
SCHOOL OF COMPUTER SCIENCE**

CHENNAI – 600 015

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Assistant Professor,
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**TAMILNADU OPEN UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE
SCHOOL OF COMPUTER SCIENCE**

**Bachelor of Computer Application (BCA/ BCA-LE)
Programme Project Report (PPR)**

(From Calendar Year 2021 onwards)

Programme's Mission & Objectives:

- To impart knowledge and skills in such a way that a learner function effectively in a dynamic technological era.
- To produce effective knowledge workers, practitioners who will be guided by vision, compassion, knowledge, discipline, discovery with deep respect for human values.
- To enable the learners to acquire rich knowledge and sound skills in core areas of computer applications.
- To facilitate the development and application of problem-solving skills in students. Develops critical thinking, analytical ability and creative skills.
- To acquire highly professionals knowledge in the concerned areas and convert demographic advantage to a knowledge and skill based society.

Relevance of the program with HEI's Mission and Goals:

Literacy and level of education are basic indicators of the level of development achieved by a society. Literacy forms an important input in overall development of individuals enabling them to comprehend their social, political and cultural environment better and respond to it appropriately. Higher levels of education and literacy lead to a greater awareness and also contributes in improvement of economic and social conditions. It acts as a catalyst for social upliftment enhancing the returns on investment made in almost every aspect of development effort such as employment of weaker sections of the society environmental etc.

B.C.A. programme offered through distance mode creates an avenue to acquire knowledge and skills on the domain courses. The courses have been identified to enable the learners to opt by horizontal mobility at the entry level. For this purpose, a wide range of options of the courses have been offered to cater to the needs. The structure of the programme meets the benchmark of similar programmes in conventional system of education.

Nature of prospective target group of learners:

Students, who passed 10+2 or equivalent, are eligible to enroll for B.C.A. Basic level of understanding and general aptitude in the information technology will entitle the students to pursue and excel in B.C.A. The programme is structured to gradually improve the capability of the students in the field of computers and information technology. It also attracts young minds to the potentially rich & employable field of computer applications.

Appropriateness of programme to be conducted in ODL mode to acquire specific skills and competence:

B.C.A programme through distance education can be able to spread more literacy in the society and reaching the unreached to upgrade their education skills. The structure of the programme meets the benchmark of similar programmes in conventional system of education. Programme syllabus is designed to enlighten on the basics of computer organization, programming, Data Base and Networking with ease of Self-study mode. The course needs only reasonable reading and grasping aptitude of students, to take up, to study and to groom as computer professional.

Instructional Design

The Curriculum and the Syllabus for Bachelor of Computer Applications Degree Programme has designed by covering all the aspects of latest technology in Computer Science. The duration of the BCA Programme is three years & BCA-LE is two years and the medium of instruction is English.

The Bachelor of Computer Applications Degree Programme is offered through the Learner Support Centres established by TNOU in the affiliated Arts and Science College, where the same Programme is offered through Conventional Mode.

The Faculty Members available at School of Computer Science of Tamil Nadu Open University and the faculties approved as Academic Counselors of TNOU at Learner Support Centres will be used for delivering the Bachelor of Computer Application Degree Programme

The credits systems suggested as per UGC-ODL Regulations-2020 have been assigned to Bachelor of Computer Applications Degree Programme in English. The total number of credit assigned for the Programme is 112. The Self Learning Materials in the form of print, e-content and audio/video materials wherever required has also been developed for the Programme.

Procedure for admissions, curriculum transaction and evaluation:

Eligibility:

The eligibility for Admission to the Bachelor of Computer Application Degree Programme is +2 pass or its equivalent. The eligibility for Admission to the Bachelor of Computer Application – Lateral Entry degree programme is any Diploma from recognized Polytechnic College. The Programme Fee is Rs.27,000/- for three years, (18,000/- for LE) plus Registration and other Charges. The admissions are carried out by Tamil Nadu Open University through Online and Offline through its Regional Centres located within the State of Tamil Nadu. The Theory Counselling and the Practical Counselling (if any) will be conducted through the Learners Support Centres of Tamil Nadu Open University. The evaluation will be carried by Tamil Nadu Open University consists of Continuous Internal Assessment through Assignment and External Assessment through Term End Examination.

Financial Assistance:

SC/ST Scholarship available as per the norms of the State Government of Tamil Nadu. Complete Admission fee waiver for the physically challenged/ differently abled persons.

Policy of Programme delivery:

The Academic Calendar for the Programme will be available for the learners to track down the chronological events/ happenings. The Counselling schedule will be uploaded in the TNOU website and the same will be intimated to the students through SMS.

Evaluation System:

Examination to Bachelor Degree Programme in Computer Applications is designed to maintain quality of standard. Theory will be conducted by the University in the identified Examination Centres. For the assignment, students may be permitted to write with the help of books/materials for each Course, which will be evaluated by the Evaluators appointed by the University.

Internal Continuous Assessment:

1 assignment for 2 credits is to be prepared by the learners. E.g. If a Course is of Credit 4, then 2 number of Assignments are to be written by the learner to complete the continuous assessment of the course. Assignment carries 30 marks, consists of Short Answer Questions (150 words) and Long Answer Questions (450 words) for each Course.

Section A	Three Short-Answer Questions [Each 5- Marks]	3 x 5 = 15 Marks
Section B	One Long Answer Question [10-Marks]	1 x 15 = 15 Marks
Total		30 Marks

Theory Examination:

Students shall normally be allowed to appear for theory examination after completing the Assignments. The Term -End Examination shall Carry 70 Marks and the Question Paper has three Sections: A, B & C for the duration of 3 hours.

Question Pattern for Theory Examinations:

Max. Marks: 70

Time: 3 hours

PART - A (5 × 2 = 10 marks)

Answer all FIVE questions in 50 words

[All questions carry equal marks]

- From Block - I
- From Block - II
- From Block - III
- From Block - IV
- From Block- V

PART - B (4 × 5 = 20 marks)

Answer any FOUR questions out of Seven questions in 150 words

All questions carry equal marks

- From Block - I
- From Block - II
- From Block – III
- From Block - IV
- From Block- V
- From any Block
- From any Block

PART - C (4 × 10 = 40 marks)

Answer any FOUR questions out of Seven questions in 400 words

[All questions carry equal marks]

- From Block - I
- From Block - II
- From Block - III
- From Block - IV
- From Block- V
- From any Block
- From any Block

Passing Minimum:

For theory examination:

The candidate shall be declared to have passed the theory examination if the candidate secures not less than 25 marks in the Term End Examinations (TEE) in each theory paper and secures not less than 13 marks in the Continuous Internal Assessment (CIA) [The mark distributions will be adhere as per TNOU norms time to time] and overall aggregated marks is 40 marks in both external and internal taken together. The Candidate must secure the minimum aggregated total of 40 marks for passing in the each course.

Continuous Internal Assessment (CIA)		Term End Examination (TEE)		Overall Aggregated Marks	Maximum Marks
Minimum Mark	Maximum Mark	Minimum Mark	Maximum Mark	CIA + TEE	
13	30	25	70	40	100

For practical examination:

The candidate shall be declared to have passed the practical examination if the candidate secures not less than 25 marks in the practical examinations in each practical course and secures not less than 13 marks in the Continuous Internal Assessment (CIA) and overall aggregated marks is 40 marks in both external and internal taken together. The Candidate must secure the minimum aggregated total of 40 marks for passing in the each course.

However submission of record notebook is a must.

Continuous Internal Assessment (CIA)		Practical Examination (PE)		Overall Aggregated Marks	Maximum Marks
Minimum Mark	Maximum Mark	Minimum Mark	Maximum Mark	CIA + PE	
13	30	25	70	40	100

Practical:

The following pattern is prescribed for practical courses for Bachelor of Computer Application (B.C.A.).

S.NO	Activities	Marks
1	Writing the Program	20
2	Compiling the Program	20
3	Running the Program	10
4	Record Work	10
5	Viva	10
	Total	70

Mini Project:

The objective of the Mini Project is to enable the students to work in convenient groups of not more than four members on a project with a Latest Software. The mini project work will be evaluated for 100 marks. The 100 marks is awarded for Evaluation of the Project. The passing minimum in the mini project work is 50% of the total mark. i.e. the student should get minimum 50 marks out of 100 marks in the mini project evaluation.

Classification of Successful Candidate:

Candidates who pass all the courses prescribed and who secure

- 75% and above (in first attempt only) will be placed in the First class with Distinction.
- 60% and above in the aggregate of marks will be placed in the First Class.
- 50% and above but below 60% in the aggregate will be placed in the Second Class.
- All other successful candidates will be placed in the Third Class.

Requirement of laboratory and Library Resources:

The Programme will be offered through the Learner Support Centre (LSC) maintained by Tamil Nadu Open University. The LSC's have the required infrastructural facilities to conduct the Counselling for the students who wish clear their doubts and also they are having well equipped laboratory facilities relevant to the Bachelor Degree Programme in Computer Applications.

A well equipped Library is available in the University Head quarters with about 24,000 books and lot of research journals. The learner Support Centre through which the Degree Programme is to be offered is also equipped with a full-fledged library having books and Journals.

Cost Estimate of the Programme and the Provisions

The cost estimate for development, delivery and maintenance of the Bachelor of Arts Degree Programme in Tamil is provided in the following Table.

S.No.	Details	Amount in Rs.
1	Programme development and launching cost (Expenditure)	-30,77,370
2	Programme Fee charged for 3 years per student (Income)	27,000
3	Examination Fee charged for 3 years (Income) per student	9,000
4	Examination expenses per student for 3 years per student (Expenditure)	- 3,600

Quality Assurance Mechanism & Programme Outcomes:

The Quality of the Bachelor Degree Programme in Computer Applications is maintained by adopting the curriculum suggested by the UGC. As per UGC guidelines the core courses, three elective courses, three subject specific elective courses, two practical courses are included in the Programme. As a part of Quality assurance, the curriculum for the Programme will be updated once in three years. Accordingly, the curriculum is updated and approved by Board of Studies held on 16-06-2020. Necessary steps are being taken to obtain the feedback from the students and the Academic Counsellors who are part of the Programme for effective delivery of the Programme.

Programme Outcomes:

- Transform complex computing tasks into solvable parts of problem, investigate, develop solutions and propose integrated solutions using emerging technologies.
- Develop an effective helping relationship with people in order to ensure better results through combined knowledge, abilities and Communicate effectively with the society through effective oral documentations and presentations
- Identify, deep drive analyze, interpret and to formulate complex solutions using to various computing domains.
- Augment broad knowledge across various fields of computer in global technological development.
- Work as a member or leader in various teams and organize to excel for team progress in multidisciplinary situation.
- Improve technical and technological knowledge in diverse areas of computer and enhancing competencies, skills for high carrier orientation and entrepreneurship.



Tamil Nadu Open University
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Structure of the BCA - Bachelor of Computer Applications Programme

Part	Name of the Course	Title of the Course	Course Code	Examination			
				Credit	Marks Distribution		Maximum Marks
					CIA*	TEE#	
1st Year - 1st Semester							
I	Language	Tamil or other language - I	BFTM-11	3	30	70	100
II	Language	English - I	BFEG-11	3	30	70	100
III	Core - I	Problem Solving Techniques	BCAP-11	4	30	70	100
	Core-II	Information Technology Essentials	BCAP-12	4	30	70	100
	Ancillary - I	Mathematics - I	BMSS-A1	3	30	70	100
IV	Core- Practical 1	Office Automation Laboratory	BCAPL-11	2	30	70	100
1st Year - 2nd Semester							
I	Language	Tamil or other language - II	BFTM-21	3	30	70	100
II	Language	English - II	BFEG-21	3	30	70	100
III	Core - III	Programming in C	BCAP-21	4	30	70	100
	Core-IV	Open Source Technology	BCAP-22	4	30	70	100
	Core-V	Digital Logic	BCAP-23	4	30	70	100
	Core Practical-II	C Programming Laboratory	BCAPL-21	2	30	70	100
2nd Year - 3rd Semester							
III	Core-VI	Programming Using C++	BCAP-31	4	30	70	100
	Ancillary- II	Mathematics-II	BMSS-A2	3	30	70	100
	Core -VII	Data Structures	BCAP-32	4	30	70	100
	Core Practical III	C++ Laboratory	BCAPL-31	2	30	70	100
	Core Practical IV	Data Structures Laboratory	BCAPL-32	2	20	70	100
IV	Elective	Environmental Studies	CCE	2	30	70	100
2nd Year - 4th Semester							
III	Core-VIII	Operating Systems	BCAP-41	4	30	70	100
	Core-IX	Data Base Management Systems	BCAP-42	4	30	70	100
	Core - X	Web Designing	BCAP-43	4	30	70	100
	Core -XI	Software Engineering	BCAP-44	4	30	70	100
	Core Practical V	Web Technology Laboratory(HTML/ DHTML/CSS)	BCAPL-41	2	30	70	100
	Core Practical - VI	Data Base Management System Laboratory	BCAPL-42	2	30	70	100

3rd Year - 5th Semester

III	Core -XII	Data Communication & Networking	BCAP-51	4	30	70	100
	Core-XIII	Programming in Java	BCAP-52	4	30	70	100
	Core-XIV	Programming in Python	BCAP-53	4	30	70	100
	Core Practical- VII	Programming in Java - Laboratory	BCAPL-51	2	30	70	100
	Core Practical -VIII	Programming in Python - Laboratory	BCAPL-52	2	30	70	100
IV	Elective	Non-Major Elective-1	--	2	30	70	100

3rd Year - 6th Semester

III	Core-XV	Visual Programming	BCAP-61	4	30	70	100
	Core Practical -IX	Visual Programming Laboratory	BCAPL-61	2	30	70	100
	Project Work	Mini Project	BCAPP-61	2	30	70	100
IV	Elective	Elective- I**		3	30	70	100
	Elective	Elective –II**		3	30	70	100
	Elective	Non-Major Elective-2		2	30	70	100

Total Credits = 112

Total Marks = 3600

* Continuous Internal Assessment (CIA)

#Term End Examination (TEE)

**Any one from the list of respective electives

Non-Major Elective Courses for other Discipline Students

1. Information Technology Essentials-BCAP12

2. Office Automation – BCAPN-01

Core and Elective Courses:

1. Core Courses
 - Core theory papers – I, II, III, IV, V, VI, VIII, XI, XIV
 - Core Practicals – I, II, IV, VI, VIII
2. Ability Enhancement Compulsory Courses (A ECC)
 - (i) English - I
 - (ii) Environmental Studies
3. Skill Enhancement Courses (SEC)
 - Core Practicals- III, V, VII, IX
4. Non-Major Elective (NME)
 - Candidates may choose one paper from the list given by the University
5. Discipline Specific Elective (DSE)
 - Core theory papers –VII, IX, X, XII, XIII, XV.

LIST OF ELECTIVES

Course Code Course Name

ELECTIVE – I

BCAPE-01	Principles of Management
BCAPE-02	Management Information Systems
BCAPE-03	Professional Ethics
BCAPE-04	Constitution of India

ELECTIVE – II

BCAPE-05	E- Learning
BCAPE-06	Business Analytics
BCAPE-07	Financial Accounting
BCAPE-08	Data Mining



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B. C. A. SYLLABUS - I YEAR (I SEMESTER)

பாடப் பெயர் (Course Title)	: தமிழ் - I (Tamil - 1)
பாடக் குறியீடு (Course Code)	: BFTM - 01
பாட கற்றல் அளவெண் (Course Credits)	: 3

பாட நோக்கங்கள்

- » தமிழ் இலக்கியங்களை அறிமுக நோக்கில் எடுத்துரைத்தல்
- » மொழித்திறன், மொழியறிவு, இலக்கியப் பொது அறிவு பெறும் வகையில் விவரித்தல்

பாடத்திணைப் படிப்பதால் விளையும் பயன்கள்

- » தமிழிலுள்ள சமய இலக்கியங்கள், சிற்றிலக்கியங்கள், மரபுக் கவிதை, புதுக் கவிதை, உரைநடை இலக்கியங்கள், மு.வ.வின் உரைநடைச் சிறப்புகள், பாரதிதாசனின் அமைதி நாடகச் சிறப்புகள் பற்றி மாணவர்கள் விரிவாக எடுத்துரைப்பார்கள்.

பிரிவு - 1 பன்னிரு திருமுறைகள்

தமிழில் சமய இலக்கியங்கள் சமய இலக்கியத் தோற்றம், சமணமும் பௌத்தமும், சைவ சமய வளர்ச்சி, பன்னிரு திருமுறை பட்டியல் - திருஞானசம்பந்தர் தேவாரம் பாடல் சிறப்புகள். - திருநாவுக்கரசரின் மாசில் வீணையும், நம்கடம்பனைப் பெற்றவள், சுந்தரர் - பித்தா பிறைசூடி, பொன்னார் மேனியனே, மாணிக்கவாசகர் - வானாகி மண்ணாகி, பால்நினைந்து ஊட்டும், திருமூலரின் ஒன்றே குலமும் ஒருவனேதேவனும், அன்பும் சிவமும் இரண்டென்பர், காரைக்காலம்மையார் - இன்று நமக்கெளிதே மாலுக்கும், அறிவானும் தானே அறிவிப்பான் .

பிரிவு - 2 நாலாயிரத் திவ்யப் பிரபந்தம்

முதல் மூன்று ஆழ்வார்கள் பொய்கையாழ்வார் பாடல் - வையம் தகளியா வர்க்கடலே, பூத்ததாழ்வார் பாடல் - அன்பே தகளியா ஆர்வமே - பேயாழ்வார் திருக்கண்டேன் பொன்மேனி கெண்டேன், திருமழிசை ஆழ்வார் பாடல் அன்பாய் ஆரமுதம் ஆவாய், நம்மாழ்வார் - இவையும் அவையும் உவையும், மதுரகவியாழ்வார் நன்மையால் மிக்க நான்மறை, குலசேகராழ்வார் செல்வத்து அரம்பையர்கள், பெரியாழ்வார் மாணிக்கம் கட்டி வயிரம் இடைகட்டி - ஆண்டாள் மத்தளம் கொட்ட வரிசங்கம், தொண்டரடிப் பொடியாழ்வார் பச்சைமா மலைபோல் மேனி, திருப்பாணாழ்வார் கொண்டல் வண்ணனைக் கோவலனாய், திருமங்கையாழ்வார் குலம்தரும், செல்வம் தந்திடும், அடியார்.

பிரிவு - 3 சீறாப்புராணம் (கதீசா கனவு கண்ட படலம்)

சீறாப்புராணம் காப்பிய அமைப்பு, கதீசா கனவு கண்ட படலம், காப்பிய முன்கதைச் சுருக்கம், படலக் கதைச் சுருக்கம் கதீசா கனவு கண்டு எழுதல் கதீசா கண்ட கனவு, கதீசாவின் ஏமாற்றம் கதீசாவின் இயல்பு நிலையில் மாற்றம் ஒப்பனை துறந்த விரக்தி, பஞ்சணை பொருந்தா நிலை கதீசாவின் புலம்பல் விதவசம் பொருந்துமோ எனல், மாதுலன் வசனம் சிதையுமோ எனல், கதீசா தேம்புதல். மெசறாவின் மடல் வருதல் மைசறா எழுதிய பத்திரம், சித்திர வரிதொறும் முத்தமிடுதல், கடலில் தவிப்பார்க்குக் கிடைத்த மரக்கலம்.

பிரிவு - 4 தேம்பாவணி (காட்சிப் படலம்)

தேம்பாவணி காப்பிய அமைப்பு, காட்சி படலம், காப்பிய முன்கதைச் சுருக்கம், படலக் கதைச் சுருக்கம், - கோவர கூட்டம் வந்து காணுதல் குழந்தை இயேசுவைத் தொழுதல், முல்லையார் தந்த முல்லை மாலை, பேரின்பத்தால் உயிர் ஊஞ்சலாடல் - கோவலர் போற்றி வாழ்த்துதல் நீவிப் போன ஆட்டை மீட்கவோ உதித்தனை எனல், பிணிக் குலத்தக்கது உதித்த பெற்றி போற்றல், அன்னையையும் ஆண்டவரையும் வாழ்த்துதல் கோவலர் செலுத்திய காணிக்கை இடைச்சியர் மாலை சாத்தல், இடையர் தந்த பால் காணிக்கை, குழந்தை இயேசுவின் அருள்நோக்கு ஓகனோடு ஓங்குதாயும் வாழ்த்தினாள் அன்பால் பீறிட்ட ஆனந்தக் கண்ணீர் மழை, வேந்தரை நீக்கி ஆயரைத் தெரிந்ததென் எனல்.

பிரிவு - 5 முத்தொள்ளாயிரம்

(யானை மறம் - மருப்பு ஊசி யாக, கொடிமதில் பாய்ந்துஇற்ற, அயிற்கதவம் பாய்ந்துழக்கி, கைக்கிளைப் பாடல்கள் உழுத உழுத்தஞ்சேய், நாண் ஒருபால் வாங்க நலன் ஒருபால், ஆய்மணிப் பைம்பூண் எனத் தொடங்கும் பாடல்கள்)

நந்திக்கலம்பகம் (ஊசல், மறம் உறுப்பில் அமைந்த பாடல்கள்)

தமிழில் சிற்றிலக்கியங்கள் சிற்றிலக்கியத் தோற்றம், சிற்றிலக்கிய வகைகள், கலம்பகம், பிள்ளைத்தமிழ் முத்தொள்ளாயிரம் - நூல்பெயர் விளக்கம், அமைப்பு, யானை மறம் விளக்கம், கைக்கிளை விளக்கம், - முத்தொள்ளாயிரம் யானை மறம் பாடல்கள் பாண்டியன் யானை மறம் ஒரு பாடல், சோழன் யானை மறம் ஒருபாடல், சேரன் யானை மறம் ஒரு பாடல் முத்தொள்ளாயிரம் கைக்கிளைப் பாடல்கள் பாண்டியன் கைக்கிளை ஒருபாடல், சோழன் கைக்கிளை ஒருபாடல், சேரன் கைக்கிளை ஒரு பாடல், - நந்திக்கலம்பகம் ஊசல், மறம் கலம்பக ஊறுப்புகள் 18 விளக்கம், ஊசல் உறுப்பில் அமைந்த பாடல், மறம் உறுப்பில் அமைந்த பாடல் நந்திக்கலம்பகம், தலைவன் தலைவி கூற்று தலைவன் கூற்றுப் பாடல், தலைவி கூற்றுப் பாடல்.

பிரிவு - 6 மீனாட்சியம்மை பிள்ளைத்தமிழ் (அம்புலி பருவம்)

பிள்ளைத் தமிழ் விளக்கம் பிள்ளைத் தமிழின் பத்துப் பருவங்கள், பிள்ளைத் தமிழுக்கு அம்புலி விளக்கம், - சாமம் என்னும் வழிமுறை சாமம் விளக்கம், சாமம் வழிமுறைப்பாடல் தானம் என்னும் வழிமுறை தானம் விளக்கம், தானம் வழிமுறைப் பாடல் பேதம் என்னும் வழிமுறை பேதம் விளக்கம், பேதம் வழிமுறைப் பாடல் தண்டம் என்னும் வழிமுறை தண்டம் விளக்கம், தண்டம் வழிமுறைப் பாடல்.

பிரிவு - 7 இக்கால மரபுக்கவிதைகளும் பாட்டு இலக்கியமும்

மரபுக் கவிதைகளும் பாட்டு இலக்கியமும் மரபுக் கவிதைகள் விளக்கம், பாட்டுக்கள் வள்ளலார், பாரதியார், பாரதிதாசன் வள்ளலார் இராமலிங்க அடிகள் பாடல் ஒருமையுடன் நினது திருமலரடி... - பாரதியார் யாமறிந்த மொழிகளிலே பாரதிதாசன் காலைஇளம் பரிதியிலே... நாமக்கல் கவிஞர், கவிமணி நாமக்கல் கவிஞர் இராமலிங்கம்பிள்ளை பாடல் தமிழென்று சொல்லடா... - கவிமணி தேசிகவிநாயகம் பிள்ளை - புலர்ந்து விடியும் பொழுதினிலே...சுரதா, முடியரசன் சுரதா சுவரின்மேல் ஒட்டிக் கொண்டிருக்கும் முடியரசன் சாதியைத்தான் முன்வைத்துச் சான்றுகின்றார்.

கண்ணதாசன் கேள்வி பிறந்தது அன்று, மருதகாசி சமரசம் உலாவும் இடமே, பட்டுக்கோட்டையார் சின்னப்பயலே சின்னப்பயலே...

பிரிவு - 8 புதுக் கவிதைகளும் ஐக்கூக் கவிதைகளும்

புதுக்கவிதைகளும் ஐக்கூக் கவிதைகளும் புதுக் கவிதைகள் விளக்கம், - நா. காமராசன் பாற்கடல் அமுதத்தை..., அப்துல் ரகுமான் நாகாலியாய் இருந்தவன் ..., மீரா மூட்டை மூட்டையாய்..., சிற்பி அகன்ற உலகு நான்..., இன்குலாப் பதவியூர் போகும்..., மு. மேத்தா என்னுடைய சம்பளநாளில்..., அபி பகல்வெளியில் எங்கோ..., ஈரோடு தமிழன்பன் நீலச் சேற்றில்..., சேசாலம் மண்ணின் வெடிப்பை..., வைரமுத்து அவிழ்ந்த கூந்தலை அள்ளிமுடிக்க..., ஐக்கூக் கவிதைகள் அப்துல் ரகுமான் இரவெல்லாம் ..., அமுதபாரதி எரியும் பிணங்கள், மித்ரா பசித்த குழந்தைகள், அறிவுமதி மரம் வெட்டிய..., கழனிபூரன் அன்புடைமை...

பிரிவு - 9

மு. வரதராசனாரின் “தமிழுக்கு முதல் இடம்”

தமிழில் உரைநடை வளர்ச்சி உரைநடையின் தோற்றம், தமிழில் கட்டுரைகள், தமிழில் மணிப்பிரவாள நடை, தமிழில் தனித்தமிழ்நடை, - மு. வரதராசனார் உரைநடை,- மொழிப்பற்று நூல் அறிமுகம், தமிழுக்கு முதல் இடம் கட்டுரை உட்பொருள் தமிழுக்கு முதல் இடம் தமிழ்நாட்டுக் கோயில்களில் வடமொழி, தமிழ் இசை கருநாடக இசையாக மாறிப்போனது, தமிழ் இசைக்கு முதல் இடம், ஆட்சித் துறையில் தமிழுக்கு முதல் இடம், ஆட்சிமொழி எவ்வழி பிறகுறைகள் அவ்வழி, இதழியல் துறையில் தமிழுக்கு முதல் இடம், ஆங்கிலப் பத்திரிகைகளும் அமாவாசைச் சாமியார்களும்.

பிரிவு - 10

பாரதிதாசனின் “அமைதி” நாடகம்

தமிழில் உரைநடை நாடக வளர்ச்சி, - தமிழில் நாடகங்களின் தோற்றம், 20 ஆம் நூற்றாண்டில் தமிழ் நாடகங்களின் நிலை, முத்தமிழில் நாடகத்தமிழ் விளக்கம், மௌன மொழி உலகப் பொதுமொழி. பாரதிதாசன் என்னும் நாடக ஆசிரியர் புரட்சிக்கவிஞரின் நாடகப் புரட்சி, பிரெஞ்சு நாடகத் தாக்கம், அமைதியின் சிறப்பு அமைதி நாடகக் கதைச் சுருக்கம் அமைதி களம் ஒன்று, களம் இரண்டு , களம் மூன்று, களம் நான்கு, களம் ஐந்து, களம் ஆறு, களம் ஏழு, அமைதி நாடகத் திறனாய்வு.

பார்வை நூல்கள்:

- » மு. வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்ய அக்காடெமி, புதுடெல்லி.
- » மது. ச. விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
- » தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.



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B. C. A. SYLLABUS - I YEAR (I SEMESTER)

COURSE TITLE	: Foundation in English-I (Literature and Grammar)
COURSE CODE	: BFEG-1
COURSE CREDIT	: 3

Course Objectives

- » To make the learners aware of the history of England
- » To cultivate the creativity among the learners
- » To improve the reading skills of the learners
- » To enhance the vocabulary of the learners
- » To make the learners read and write in English

Course Learning Outcomes

On successful completion of the Course, the learners will be able to:

- » describe the history of England
- » critically analyse the literary texts
- » use the words correctly
- » write in flawless English

Block 1 Brief History of England

Tudor England- Stuart England -Restoration England -Revolutions -Eighteenth Century-19th Century Education-20th Century

Block 2 Literary Texts

R.K. Narayan- *An Astrologer's Day* and Sarojini Naidu - *Bangle Sellers*

Block 3 Reading Comprehension

Definition of Comprehension- Types of Comprehension- Reading Materials-Vocabulary- Critical Reading- Effective Reading- Exercises

Block 4 Functional Grammars and Vocabulary

Parts of Speech- Tenses-Articles -Prepositions and Linkers –Punctuation-Common Mistakes -Polite Expression-Affixes

Block 5 Language Skills

Reading Skills: SQ3R Technique -Writing Skills -Dictionary Use.

References:

- Narayan R.K. Short Story Collections.
- Sarojini Naidu. Bangle Sellers
- Sinha C.A. Reading Comprehension. Prabhat Prakashan.
- Xavier A.G. An Introduction to the Social History of England. Viswanathan S. Printers, Chennai. 2009.

Web Resources:

- <https://www.digimat.in/nptel/courses/video/109106124/L01.html>
- <https://www.digimat.in/nptel/courses/video/109106138/L46.html>
- <https://www.coursera.org/lecture/multimodal-literacies/9-2-learning-to-read-reading-for-meaning-HdG3O>
- <https://nptel.ac.in/courses/109/107/109107172/>



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B. C. A. SYLLABUS - I YEAR (I SEMESTER)

COURSE TITLE	: Problem Solving Techniques
COURSE CODE	: BCAP-11
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Problem Solving, the student shall be able to:

- » Understand the Basic Principles of Algorithm Design
- » Understand the Role of Abstraction in Problem Solving
- » Acquire Knowledge about Algorithms that Involve a Simple Repetitive Process
- » Understand the Need for Problem Decomposition
- » Gain Knowledge on the Principle of Mathematical Induction for Problem Solving

COURSE OUTCOMES

After completion of the Problem solving techniques, the student can able to:

- » Identify needed information and/or eliminate extraneous information towards solving contextual problems.
- » Recognize proportional relationships from verbal, graphical, symbolic or numerical scenarios.
- » Use proportionality to solve and analyze a variety of multi-step contextual problems.

Block 1 INVARIANTS

Invariants – Chocolate-bar Problem – Empty-box Problem – Tumbler Problem – Tetrominoes – Goat-cabbage-wolf Problem - Brute-force Search – State-space Explosion – Abstraction – Nervous-couples Problem - Denoting States and Transitions – Rule of Sequential Composition – Bridge Problem – Conditional Statements.

Block 2 GAMES

Games – Matchstick Game – Winning Strategies – Subtraction-set Games - Sums of Games – Knights and Knaves – Logic Puzzles - Calculational Logic – Equivalence and Continued Equalities – Negation.

Block 3 INDUCTION

Induction – Black and White Colouring – Cutting the Plane – Triomino Problem - Looking for Patterns – The Need for Proof – From Verification to Construction.

Block 4 PROBLEM FORMULATION AND SOLUTION

Fake-Coin Detection – Problem Formulation – Problem Solution – Tower of Hanoi Problem - Specification and Solution –Inductive Solution – Iterative Solution - Principles of Algorithm Design – Iteration. Invariants and Making Progress – Sam Loyd’s Chicken-Chasing Problem.

Block 5 BRIDGE PROBLEM

Bridge Problem – Lower and Upper Bounds – Outline Strategy - Regular Sequences – Sequencing Forward Trips – Choosing Settlers and Nomads- Knight’s Circuit – Straight-Move Circuits – Super Squares – Partitioning the Board.

References:

- Roland Backhouse, “Algorithmic Problem Solving”, 2011 John Wiley & Sons Ltd.



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B. C. A. SYLLABUS - I YEAR (I SEMESTER)

COURSE TITLE	: Information Technology Essentials
COURSE CODE	: BCAP-12
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Information technology essentials course, the student shall be able to:

- » Know about the basics of computers
- » Understand the classification of software
- » Know about the various types of software and operating systems
- » Learn about the concepts of Networking and various types of LAN
- » Gain knowledge about the concepts of Internet and WWW.

COURSE OUTCOMES

After completion of the Information technology essentials course, the student can be able to:

- » Acquire the basic of knowledge of computer concepts
- » Understand the classification of software
- » Learn about the various types of software and operating systems
- » Aware about the concepts of Internet and WWW
- » Gain knowledge about the concepts of Networking and various types of LAN

Block 1 INTRODUCTION TO COMPUTER CONCEPTS

Definition – Importance – History – Classification – Benefits & Limitations - Software - Application Software – System Software - Computer Architecture – I/O Unit – CPU – Memory unit – Memory System – Memory hierarchy.

Block 2 SOFTWARE CONCEPTS

Classification of Software – System Software – application Software - Operating System: Types of Operating System – Functions of Operating System

Block 3 SOFTWARE TOOLS

Software Tools – Application Generator – Software Engineering & CASE Tools – System Software Utilities – Windows - General Purpose Application Software – Special Purpose Application Software.

Block 4 NETWORKING

Communication – Networking – Types of Networks – Components of Networks –Standard Topologies - Network Operating System: Concepts – Client Software – Server Software - LAN Expansion – Repeaters – Routers – Bridges – Gateways.

Block 5 INTERNET & WWW

Internet – functions – internet capabilities – Information retrieval on the internet - WWW – WebPages and HTML - Web browsers - Internet Benefits to Organization – Problem on the Internet.

References:

- Fundamentals of Information Technology, S.K. Bansal, A P H Publishing Corporation, 2002
- Introduction of Information Systems, Alexis Leon, Mathews Leon, Vijay Nicole, imprints, Pvt. Ltd, 2004



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B. C. A. SYLLABUS - I YEAR (I SEMESTER)

COURSE TITLE	: ALLIED MATEMATICS – 1
COURSE CODE	: BMSS-A1
COURSE CREDIT	: 3

COURSE OBJECTIVES

While studying the ALLIED MATEMATICS – 1, the Learner shall be able to:

- » To provide basic mathematical concepts required for students pursuing Physics
- » To provide basic mathematical tools used for computation in Physics
- » To introduce the concept of Operational Research

COURSE OUTCOMES

After completion of the ALLIED MATEMATICS – 1, the Learner will be able to:

- » understand basic mathematical concepts required for students pursuing Physics
- » understand basic mathematical tools used for computation in Physics
- » familiarize with the basics of Linear Programming Problem.
- » apply appropriate mathematical tools in Physical problems

Block 1 Properties of Matrices

- 1.1 Eigenvalues and Eigenvectors
- 1.2 Cayley Hamilton Theorem
- 1.3 Similar Matrices
- 1.4 Diagonalization of Matrices possessing Distinct Eigenvalues
- 1.5 Eigenvalues for symmetric matrices

Block 2 Differential Calculus

- 2.1 Higher Derivatives – nth derivative – Standard Results
- 2.2 Trigonometric Transformations
- 2.3 Formation of Equations Involving Derivatives
- 2.4 Liebnitz's formula for nth derivative – Problems involving Liebnitz's formula
- 2.5 Methods of Integration of functions of the Following Types:

$$\frac{1}{(x+p)\sqrt{ax^2+bx+c}}; \sqrt{(x-a)(b-x)}; \frac{1}{\sqrt{(x-a)(b-x)}}; \sqrt{\frac{(x-a)}{(b-x)}}.$$

Block 3 Differential Equations

- 3.1 Partial Differential Equation
- 3.2 Formation of Equations by Elimination of Constants and an Arbitrary Function
- 3.3 Definition of General, Particular, Complete and Singular Integral
- 3.4 Solutions of First Order Equations in their Standard Forms
- 3.5 Lagrange's Method of Solving of Linear Equations $Pp + Qq = R$

Block 4 Fourier Series

- 4.1 Definition of Fourier Series
- 4.2 Finding Fourier Coefficients for a given Periodic Function with Period $2p$
- 4.3 Odd and Even Functions
- 4.4 Half - Range Series
- 4.5 Development in sine and cosine series

Block 5 Linear Programming Problem

- 5.1 Formulation of LPP
- 5.2 Graphical Method
- 5.3 Simplex Method

Books For Study

1. Narayanan, S., Hanumantha Rao and T.K. Manicavachagam Pillai, Ancillary Mathematics – Volume - I. Madras.: Viswanathan, S, 2012.
Chapter 3: Sections 3.4, 3.5
Chapter 6: Sections 6.1
2. Narayanan S., R. Hanumantha Rao, T.K. Manicavachgam Pillay, and P. Kandaswamy.
3. Ancillary Mathematics – Volume – II. Madras.: Viswanathan, S, 1995 Reprint 2011.
Chapter 1 : Sections 8 (cases 5-9)
Chapter 2 : Sections 1 - 5
Chapter 6 : Sections 1-3, 5, 6.
4. Kalavathy S, Operations Research, Vikas Publishing House, Noida, Fourth Edition 2013
Chapter 2 : Sections 2.1, 2.2
Chapter 3 : Sections 3.1 – 3.3
Chapter 4 : Sections 4.1, 4.2

References

- Joseph, Edwards, An Elementary Treatise on the Differential Calculus, London: Macmillan, 1948.
- Manicavachagam Pillai T.K., Natarajan T. and Ganapathy K. S, Algebra Volume I.
- Madras.: Viswanathan, S., 2006.
- Manicavachagam Pillai T.K., Natarajan T. and Ganapathy K. S, Algebra Volume II.
- Madras.: Viswanathan, S., 2004.
- Singaravelu A., Allied Mathematics, Chennai: Meenakshi, 2010
- Sundaresan V., K.S. Ganapathy Subramanian, K. Ganesan. Resource Management Techniques, 4th ed. Arapakam: A.R. Publications, 2007.



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B. C. A. SYLLABUS - I YEAR (I SEMESTER)

COURSE TITLE	: Office Automation Laboratory
COURSE CODE	: BCAPL-11
COURSE CREDIT	: 2

COURSE OBJECTIVES

While studying the Office Automation Laboratory course, the student shall be able to:

- » Craft professional word documents, excel spread sheets, power point presentations using the Microsoft suite of office tools
- » Familiarize the students in preparation of documents and presentations with office automation tools.

COURSE OUTCOMES

After completion of the Information technology essentials course, the student can be able to:

- » Perform documentation
- » Perform accounting operations
- » Perform presentation skills

I. MS-WORD

- Text Manipulation: Write a paragraph about your institution and Change the font size and type, Spell check, Aligning and justification of Text
- Bio data: Prepare a Bio-data.
- Find and Replace: Write a paragraph about yourself and do the following. Find and Replace - Use Numbering Bullets, Footer and Headers.
- Tables and manipulation: Creation, Insertion, Deletion (Columns and Rows). Create a mark sheet.

II. MS-EXCEL

- Data sorting-Ascending and Descending (both numbers and alphabets)
- Mark list preparation for a student
- Individual Pay Bill preparation.
- Invoice Report preparation.

III. MS-POWERPOINT

- Create a slide show presentation for a seminar.
- Preparation of Organization Charts
- Create a slide show presentation to display percentage of marks in each semester for all students
- Use bar chart (X-axis: Semester, Y-axis: % marks).
- Use different presentation template different transition effect for each slide.



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B. C. A. SYLLABUS - I YEAR (I SEMESTER)

பாடப் பெயர் (Course Title)	: தமிழ் - I (Tamil – 1)
பாடக் குறியீடு (Course Code)	: BFTM - 02
பாட கற்றல் அளவெண் (Course Credits)	: 3

பாட நோக்கங்கள்

- » தமிழ் இலக்கியங்களை அறிமுக நோக்கில் எடுத்துரைத்தல்
- » மொழித்திறன், மொழியறிவு, இலக்கியப் பொது அறிவு பெறும் வகையில் விவரித்தல்

பாடத்திணைப் படிப்பதால் விளையும் பயன்கள்

- » தமிழ் உரைநடை பற்றியும், ஜெயகாந்தனின் சிறுகதைகள் பற்றியும் எடுத்துரைப்பர்.
- » தமிழ் பற்றியும் அலுவலகத் தொடர்பு மடல்கள் எழுதுவது எப்படி என்பது பற்றியும், மொழியை திறம்பட எவ்வாறு பயன்டுத்துவது என்பது பற்றியும் எடுத்துரைப்பர்.

பிரிவு - 1

ஜெயகாந்தனின் “நான் இருக்கிறேன்” - சிறுகதை

தமிழ் உரைநடையில் சிறுகதை வளர்ச்சி தமிழில் கதை இலக்கியத் தோற்றம், தமிழ்ச் சிறுகதைகளின் தோற்றமும் வளர்ச்சியும், சிறுகதை இலக்கணம் தமிழ்ச் சிறுகதைகளில் ஜெயகாந்தன் ஜெயகாந்தன் சிறுகுறிப்பு கதை அரங்கம் அறிமுகம், நான் இருக்கிறேன் கதைச் சுருக்கம் நான் இருக்கிறேன் சிறுகதை வியாதிக்காரன் அனுபவங்கள், சாகக் கற்றுக்கொடுத்த நொண்டி, வாழக் கற்றுக்கொடுத்த வியாதிக்காரன், நான் இருக்கிறேன் அம்மா, - நான் இருக்கிறேன் சிறுகதைத் திறனாய்வு.

பிரிவு - 2

வா.செ.குழந்தைசாமியின் அறிவியல் தமிழ் ஆக்கம் இற்றை நிலை

அறிவியல் தமிழ் - இயற்றுதல் அறிந்தோம் புணைதல் இல்லை - தமிழில் அறிவியல் இலக்கியம் படைப்போம் - வா.செ. குழந்தைசாமி - அறிமுகம் - அறிவியல் தமிழ் - எந்தத் துறைகளைக் குறிக்கும் - அறிவியல் தமிழை உள்ளடக்கியது - தோற்றம் - கலைச்சொல்லாக்கப் பணி - விடுதலைக்குமுன் - விடுதலைக்குப்பின் - பாடநூல் நிறுவனத்தின் பங்கு - பதிப்பகங்களின் பங்கு - பல்கலைக்கழகங்களின் பங்கு - இதழ்களின் பங்கு - இலங்கைத் தமிழரின் பங்கு - கருத வேண்டியவை.

பிரிவு - 3

சமய இலக்கியக் காலம் (கி.பி.700 - கி.பி 1100)

தமிழில் சமய இலக்கியங்கள் - சமண இலக்கியத் தோற்றம் - பௌத்த இலக்கியத் தோற்றம் - தமிழில் பௌத்த இலக்கியங்கள் - வைணவ இலக்கியங்கள் - சைவ இலக்கியத் தோற்றம் - தமிழில் சைவ இலக்கியங்கள் - வைணவ இலக்கியத் தோற்றம் - தமிழில் வைணவ இலக்கியங்கள் - தமிழில் இசுலாமிய இலக்கியங்கள் - தமிழில் கிறிஸ்தவ இலக்கியங்கள்.

பிரிவு - 4

சிற்றிலக்கியக் காலம் (கி.பி. 700 - கி.பி. 1400)

சிற்றிலக்கியத் தோற்றம் - சிற்றிலக்கிய வகைகள் - இலக்கண நூல்கள் - உலா - கலம்பகம் - பரணி - பிள்ளைத்தமிழ் - கோவை தூது.

- பிரிவு - 5 உரையாசிரியர்கள் காலம் (கி.பி. 1200 கி.பி. 1800)
உரைநூல்களின் தோற்றம் - பயன்கள் - உரை வகைகள் - நக்கீரர் - இளம்பூரணர் - பேராசிரியர் - சேனாவரையர் - நச்சினார்க்கினியர் - கல்லாடர் - தெய்வச்சிலையார் போன்றோர் - அடியார்க்கு நல்லார் - பரிமேலழகர் - பிரபந்த உரையாசிரியர்கள் - நன்னூல் உரையாசிரியர்கள் .
- பிரிவு - 6 புத்திலக்கியக் காலம் (கி.பி. 1800 - கி.பி 2000)
தமிழில் புதினம் - தமிழில் சிறுகதை - தமிழில் புதுக்கவிதைகள் - தமிழில் உரைநடை நாடகங்கள் - புதினங்கள் - சிறுகதைகள் - இலக்கியங்கள் - மரபுக் கவிதை இலக்கியங்கள் - புதுக்கவிதை இலக்கியங்கள் - தமிழில் ஐக்கூக் கவிதைகள்.
- பிரிவு - 7 கருத்துப் பரிமாற்ற மொழித்திறன்
கருத்து விளக்கக் கட்டுரைகள் - செய்திக் கட்டுரைகள் - சொற்பொழிவு - குழு விவாதங்கள் - நண்பர்களுடன் உரையாடும் திறன் - கணினித் தமிழ் - கட்டுரை - பெண்ணியம் - தலைப்பு - தேர்ந்தெடுக்கும் முறை - தகவல்கள் சேகரிக்கும் முறை - தகவல் திரட்டல் - நகைச்சுவைத் திறன் - அவை அறிதல் - உச்சரிப்புக் கவனம் - குழு விவாத அமைப்பும் குறிக்கோளும் - உரையாடலில் - சுயபுராணம் தவிர்த்தல் - உடன்பட வைக்கும் நாகரிக உத்தி .
- பிரிவு - 8 அலுவலகத் தொடர்பு மடல்கள்
நட்புறவு மடல்கள் - வேண்டுகோள் மடல்கள் - குறை தெரிவிக்கும் / புகார் மடல்கள் - கருத்து மடல்கள் - விண்ணப்ப மடல்கள் - அலுவலகத் தொடர்பு மடல்கள் - விண்ணப்ப மடலின் படிநிலைகள் - தன்குறிப்பு விவரங்கள் - விண்ணப்ப மடலின் வடிவமைப்பு - விண்ணப்ப மடல் எழுதும் முறை - குறிப்பு - வரைவு - கடிதம் - குறிப்பு மடல் - அலுவலக ஆணை - நேர்முகக் கடிதம்.
- பிரிவு - 9 எழுத்து - சொல் பிழைகளும் திருத்தமும்
ஒலி மயக்கம் தரும் எழுத்துக்கள் - ர,ற ஒலி மயக்கம் - ந, ன, ண ஒலி மயக்கம் - ல, ள, ழ, லி மயக்கம் - சொல் முதலில் வரும் எழுத்து மரபுகள் - சொல் இடையில் வரும் எழுத்து மரபுகள் - சொற்களின் சந்திப்பு மரபுகள் - வேற்றுமைப் புணர்ச்சியும் அல்வழிப் புணர்ச்சியும் - உயிர்முன் உயிர் புணர்தல் - குற்றியலுகரப் புணர்ச்சி - வல்லின ஒற்று மிகும் இடங்களும் மிகா இடங்களும்.
- பிரிவு - 10 இலாக்கிய அறிவு வினா விடை
பாடப்பகுதி தொடர்பானவை - பொதுவான தமிழ் இலக்கியம் தொடர்பானவை.

பார்வை நூல்கள்:

- » மு. வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்ய அக்காடெமி, புதுடெல்லி.
- » மது. ச. விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
- » தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
- » தமிழண்ணல், இனிய தமிழ்மொழியின் இயல்புகள் 1,2,3- பகுதிகள், மீனாட்சி புத்தக நிலையம், மதுரை.
- » முத்து கண்ணப்பன், தி.. தமிழில் தவறுகளைத் தவிப்போம், பாரிநிலையம், 184, பிராடவே, சென்னை.
- » கீ. இராமலிங்கனார், தமிழில் எழுதுவோம், கழக வெளியீடு, சென்னை.
- » செ. முத்துவீராசாமி நாயுடு, ஆவணங்களும் பதிவுமுறைகளும், கழக வெளியீடு, சென்னை.
- » டாக்டர் ச. பாலசுப்பிரமணியன், தகவல் தொடர்புக் கல்வி, மாநிலப் பள்ளிசாராக் கல்விக் குருவூலம், சென்னை.
- » எஸ். கலைவாணி, இதழியல் உத்திகள், பராசக்தி வெளியீடு, குற்றாலம்.
- » டாக்டர் அ. சாந்தா, டாக்டர் வீ. மோகன், மக்கள் ஊடகத் தொடர்பியல் புதிய பரிமாணங்கள், மீடியா பப்ளிகேஷன்ஸ், மதுரை.
- » பி.எஸ். ஆச்சார்யா, உயர்வுதரும் உரையாடல்கலை, நர்மதா பதிப்பகம், சென்னை.
- » மு. முத்துக்காளத்தி, பேசுவது எப்படி, கண்ணம்மாள் பதிப்பகம், பாரி நிலையம், சென்னை.



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B. C. A. SYLLABUS - I YEAR (I SEMESTER)

COURSE TITLE	: Foundation in English-II (Literature and Use of English)
COURSE CODE	: BFEG-2
COURSE CREDIT	: 3

Course Objectives

- » To cultivate the creativity among the learners
- » To improve the reading skills of the learners
- » To enhance the vocabulary of the learners
- » To develop pronunciation skills
- » To imbibe the use of internet for developing language skills

Course Learning Outcomes

On successful completion of the Course, the learners will be able to:

- » critically evaluate the literary texts
- » read the passages effectively
- » speak with good accent
- » communicate through online

Block 1 Literary Texts

Rabindranath Tagore's *Sacrifice* and John Donne's *The Sun Rising*

Block 2 Reading Comprehension

Reading passages-Preparing a glossary from passage- reading the meaning- respond to questions

Block 3 Vocabulary and Grammar

Synonyms and Antonyms- Homophones-Making of Nouns-Making of Adjectives-Compound Words-Phrases and Idioms-Words often confused-Spelling- Tenses

Block 4 Pronunciation and Spoken English

Importance of English-Pronunciation: An Exposition-Speech Sounds-Sounds and Spelling: The Relationship-Attributes of Good Speech-Dialogue Situations/ Situational Dialogues

Block 5 The Internet English

Email-Chat Groups-Virtual Words-The Web-Commentary

References:

- Balasubramanian T. English Phonetics for Indian Students - A Workbook. 2016.
- Daniel Jones. Cambridge English Pronouncing Dictionary. Cambridge University Press, 2011.
- Tagore, Rabindranath. Sacrifice and Other Plays. Niyogi Books, 2012.

Web Resources:

- <https://www.poetryfoundation.org/podcasts/75363/the-sun-rising>
- <https://nptel.ac.in/courses/109/103/109103135/>
- <https://nptel.ac.in/content/storage2/courses/109106085/downloads/03-%20Phonetics%20and%20Phonology-%20week%203.pdf>
- <https://nptel.ac.in/courses/109/106/109106085/>
- <https://nptel.ac.in/courses/109/107/109107172/>



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B. C. A. SYLLABUS - I YEAR (II SEMESTER)

COURSE TITLE	: Programming in C
COURSE CODE	: BCAP-21
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the programming in C course, the student shall be able to:

- » Understand the fundamentals and basics of C
- » Learn about the control statements in C
- » Familiarize with Arrays, Structures and Unions
- » Acquire knowledge on the Functions and storage classes
- » Know about the concepts of Pointers and files.

COURSE OUTCOMES

After completion of the Information technology essentials course, the student can be able to:

- » Know the fundamentals and basics of C.
- » Acquire knowledge on control statements in C
- » Aware about Arrays, Structures and Unions
- » Understand the concepts of Functions and Storage classes
- » Know the concepts of Pointers and Files

Block 1 FUNDAMENTALS OF C

C fundamentals Character set - Identifier and keywords - data types – constants - Variables - Declarations - Expressions – Statements - Arithmetic, Unary, Relational and logical, Assignment and Conditional Operators - Library functions.

Block 2 DATA INPUT, OUTPUT AND CONTROL STATEMENTS

Data input output functions - Simple C programs - Flow of control - if, if-else, while, do-while, for loop - Nested control structures - Switch, break and continue, goto statements - Comma operator.

Block 3 FUNCTIONS AND STORAGE CLASSES

Functions -Definition - prototypes - Passing arguments - Recursions. - Storage Classes - Automatic, External, Static, Register Variables - Multi-file programs.

Block 4 ARRAYS, STRUCTURES AND UNIONS

Arrays - Defining and Processing - Passing arrays to functions - Multi-dimension arrays - Arrays and String - Structures - User defined data types - Passing structures to functions - Self-referential structures - Unions - Bit wise operations.

Block 5 POINTERS AND FILES

Pointers - Declarations - Passing pointers to Functions - Operation in Pointers - Pointer and Arrays - Arrays of Pointers - Structures and Pointers - Files: Creating Processing, Opening and Closing a data file.

Text Book

- E.Balagurusamy, "Programming in ANSI C", Eighth Edition, Tata McGraw Hill, 2019.

References

- W.Kernighan and D M.Ritchie, "The C Programming Language", 2nd Edition, PHI,.. 1988
- H. Schildt, "C: The Complete Reference", 4th Edition. TMH Edition, 2000.
- Gottfried B.S, "Programming with C", Second Edition, TMH Pub. Co. Ltd., New Delhi 1996.
- Kanetkar Y., "Let us C", BPB Pub., New Delhi, 1999.



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B. C. A. SYLLABUS - I YEAR (II SEMESTER)

COURSE TITLE	: Open Source Technology
COURSE CODE	: BCAP-22
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Open Source Technology course, the student shall be able to:

- » Know about the open source methodologies
- » Aware about the history, philosophy and license
- » Learn about community building, opening and starting the open source projects
- » Gain knowledge on the servers
- » Know about the ethical, social and financial impacts of open source software

COURSE OUTCOMES

After completion of the Open Source Technology course, the student can be able to:

- » Understand the open source methodologies
- » Learn the history, philosophy and license
- » Aware about the community building, opening and starting the open source projects
- » Acquire knowledge on the servers
- » Understand the ethical, social and financial impacts of open source software

Block 1 INTRODUCTION

Introduction: Open Source, Free Software, Free Software vs. Open Source software, Public Domain Software, FOSS does not mean no cost. - History: BSD, The Free Software Foundation and the GNU Project.

Block 2 HISTORY, PHILOSOPHY AND LICENSE

Open Source History, Initiatives, Principle and methodologies. - Philosophy: Software Freedom, Open Source Development Model - Licenses and Patents: What Is A License, Important FOSS Licenses (Apache,BSD,GPL, LGPL), copyrights and copy-lefts - Patents Economics of FOSS: Zero Marginal Cost, Income-generation opportunities, Problems with traditional commercial software, Internationalization.

Block 3 COMMUNITY BUILDING

Community Building: Importance of Communities in Open Source Movement, JBoss Community - Starting and Maintaining an Open Source Project , Open Source Hardwar.

Block 4 SERVERS

Apache HTTP Server and its flavors - WAMP server (Windows, Apache, MySQL, PHP)- Apache - MySQL, PHP, JAVA as development platform.

Block 5 ETHICS, SOCIAL AND FINANCIAL

Open source vs. closed source Open source government, Open source ethics - Social and Financial impacts of open source technology - Shared software, Shared source.

TEXT BOOKS

- Sumitabha Das “Unix Concepts and Applications, Tata McGraw Hill Education 006
- The Official Ubuntu Book, 8th Edition
- Kailash Vadera, Bhavyesh Gandhi, “Open Source Technology”, University Science press.

References

- Paul Kavanagh, “Open Source Software: Implementation and Management”, Elsevier Digital Press
- The Linux Documentation Project : <http://www.tldp.org>
- Docker Project Home : <http://www.docker.com>.



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B. C. A. SYLLABUS - I YEAR (II SEMESTER)

COURSE TITLE	: Digital Logic
COURSE CODE	: BCAP-23
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Digital logic course, the student shall be able to:

- » Know about the basic concepts of Digital Computer Fundamentals
- » Aware about the concepts of logic gates, Boolean Algebra
- » Learn the combinational circuits and sequential logic
- » Acquire knowledge about the various counters and memory
- » Understand the concepts of registers.

COURSE OUTCOMES

After completion of the Digital logic course, the student can be able to:

- » Know the basics of Digital Computer Fundamentals
- » Understand the theory of logic gates, Boolean Algebra
- » Learn the combinational circuits and sequential logic
- » Know about various counters and memory
- » Understand the concepts of registers

Block 1 INTRODUCTION TO NUMBER SYSTEM

Number Systems and Codes: Number System, Base Conversion, Binary Codes. Code Conversion - Digital Logic: Logic Gates, Truth Tables, Universal Gates.

Block 2 BOOLEAN ALGEBRA AND BINARY ARITHMETIC

Boolean Algebra: Laws and Theorems, SOP, POS Methods - Simplification of Boolean Functions - Using Theorems, K-Map, Prime, Implicant Method - Binary Arithmetic: Binary Addition, Subtraction - Various Representations of Binary Numbers, Arithmetic Building Blocks, Adder, Subtractor.

Block 3 COMBINATIONAL LOGIC

Combinational Logic: Multiplexers, Demultiplexers - Decoders, Encoders, Code Converters - Parity Generators and Checkers.

Block 4 SEQUENTIAL LOGIC AND REGISTERS

Sequential Logic: RS, JK, D, and T Flip-Flops, Master-Slave Flip-Flops- Registers: Shift Registers, Types of Shift Registers.

Block 5 COUNTERS AND MEMORY

Counters: Asynchronous and Synchronous Counters, Ripple, Mod, Up, Down Counters, Ring Counters - Memory: Basic Terms and Ideas, Types of ROMs, Types of RAMs - Programmable Logic Devices – Programmable Logic Array (PLA) – Programmable Array Logic (PAL) – Field Programmable Gate Arrays (FPGA).

Text Books :

- Digital Design – Third Edition , M.Morris Mano, Pearson Education/PHI.
- Fundamentals Of Logic Design, Roth, 5th Edition,Thomson.

References:

- V.Rajaraman and T.Radhakrishnan, Digital Computer Design, Prentice Hall of India, 2001
- D.P.Leach and A.P.Malvino, Digital Principles and Applications – TMH – Fifth Edition – 2002.
- M. Moris Mano, Digital Logic and Computer Design, PHI, 2001.
- T.C.Bartee, Digital Computer Fundamentals, 6th Edition, Tata McGraw Hill, 1991.



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B. C. A. SYLLABUS - I YEAR (II SEMESTER)

COURSE TITLE	: C Programming Lab
COURSE CODE	: BCAPL-21
COURSE CREDIT	: 2

COURSE OBJECTIVES

While studying the C programming Lab course, the student shall be able to:

- » Make the student learn a programming language.
- » Learn problem solving techniques.
- » Write programs in C and to solve the problems.

COURSE OUTCOMES

After completion of the C Programming Lab course, the student can be able to:

- » Read, understand and trace the execution of programs written in C language.
- » Write the C code for a given algorithm.
- » Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
- » Write programs that perform operations using derived data types.

List of Programs

I. Summation of Series

1. Sin(x), 2. Cos(x), 3. Exp(x) (Comparison with built in functions)

II. String Manipulation

1. Counting the number of vowels, consonants, words, white spaces in a line of text and array of lines.
2. Reverse a string and check for palindrome.
3. Sub string detection, count and removal.
4. Finding and replacing substrings

III. Recursion

1. ${}^n P_r$, ${}^n C_r$
2. GCD of two numbers
3. Fibonacci sequence
4. Maximum & Minimum

IV. Matrix Manipulation

1. Addition and Subtraction
2. Multiplication
3. Transpose, and trace of a matrix
4. Determinant of a Matrix

V. Sorting and Searching

1. Insertion Sort
2. Bubble Sort
3. Linear Search
4. Binary Search



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B. C. A. SYLLABUS - II YEAR (III SEMESTER)

COURSE TITLE	: Programming Using C++
COURSE CODE	: BCAP-31
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Programming using C++ course, the student shall be able to:

- » Understand the basic concepts of the Object–Oriented Programming Paradigm.
- » Gain Knowledge on Functions in C++ and the different types of Constructors in C++.
- » Gain Knowledge on Operator Overloading.
- » Understand the different types of Inheritance.
- » Gain Knowledge on Stream Classes and Files.

COURSE OUTCOMES

After completion of the Programming using C++ course, the student can be able to:

- » Learn the basic concepts of the Object–Oriented Programming Paradigm.
- » Acquire Knowledge on Functions in C++ and the different types of Constructors in C++.
- » Gain Knowledge on Operator Overloading.
- » Learn the different types of Inheritance.
- » Understand the Stream Classes and Files.

Block 1 BASIC CONCEPTS OF OOP

Object-Oriented Programming (OOP) Paradigm – Basic Concepts of OOP – Benefits of OOP – Tokens – Keywords – Identifiers and Constants - Basic Data Types – User-Defined Data Types – Storage Classes – Derived Data Types – Symbolic Constants – Type Compatibility – Declaration of Variables – Dynamic Initialization of Variables – Reference Variables- Operators in C++ – Scope Resolution Operator – Member Dereferencing Operators – Memory Management Operators – Manipulators – Type Cast Operator - Expressions and Their Types – Special Assignment Expressions – Implicit Conversions – Operator Overloading – Operator Precedence – Control Structures.

Block 2 FUNCTIONS IN C++

Functions in C++ – The Main Function – Function Prototyping – Call By Reference – Return by Reference – Inline Functions – Default Arguments – ‘const’ Arguments – Recursion – Function Overloading – Friend and Virtual functions – Math Library Functions - Classes and Objects – Specifying a Class – Defining Member Functions – Making an Outside Function Inline – Nesting of Member Functions – Private Member Functions – Arrays within a Class - Memory Allocation for Objects – Static Data Members – Static Member Functions – Array of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects – ‘const’ Member Functions – Pointers to Members – Local Classes.

Block 3 CONSTRUCTORS AND DESTRUCTORS

Constructors – Parameterized Constructors – Multiple Constructors in a Class – Constructors with Default Arguments – Dynamic Initialization of Objects – Copy Constructors – Dynamic Constructors – Constructing Two-Dimensional Arrays – ‘const’ Objects – Destructors – Operator Overloading – Rules for Overloading Operators – Overloading Unary Operators – Overloading Binary Operators – Overloading Binary Operators Using Friends – Manipulation of Strings Using Operators – Type Conversions.

Block 4 INHERITANCE

Inheritance – Single Inheritance – Making a Private Member Inheritable – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance - Virtual Base Classes – Abstract Classes – Constructors in Derived Class – Nesting of Classes – Pointers – Pointers to Objects – ‘this’ Pointer – Pointers to Derived Classes – Virtual Functions – Pure Virtual Functions – Virtual Constructors and Destructors.

Block 5 C++ STREAMS

C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O operations – Managing Output with Manipulators - Files – Classes for File Stream Operations – Opening and Closing a File – Detecting End-of-File – Open () File Modes – File Pointers and their Manipulators - Sequential Files – Random Access Files – Error Handling during File Operations – Command-Line Arguments.

Text Book:

- E Balagurusamy, “Object Oriented Programming with C++”, Sixth Edition, McGraw Hill Education (India) Private Limited, 2013.

References:

- Herbert Schildt, “C++: The Complete Reference”, Fifth Edition, McGraw-Hill Education, 2012.



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B. C. A. SYLLABUS - II YEAR (III SEMESTER)

COURSE TITLE	: Applied Mathematics-II
COURSE CODE	: BMSS-A2
COURSE CREDIT	: 3

COURSE OBJECTIVES

While studying the ALLIED MATEMATICS – II, the Learner shall be able to:

- » To provide basic mathematical concepts required for students pursuing Physics
- » To introduce problem solving skills using Numerical Methods
- » To teach statistical tools using correlation

COURSE OUTCOMES

After completion of the ALLIED MATEMATICS –II, the Learner will be able to:

- » understand basic mathematical concepts required for students pursuing Physics
- » understand problem solving skills using Numerical methods
- » understand problem solving using correlation
- » apply Laplace transform in appropriate Physical problems

Block 1 Beta, Gamma Integrals

- 1.1 Definitions of Beta and Gamma Integrals
- 1.2 Recurrence Formula for Gamma Functions
- 1.3 Properties of Beta Functions
- 1.4 Relation between Beta and Gamma Functions

Block 2 Numerical Differentiation and Integration

- 2.1 Finite Differences- Forward and Backward
- 2.2 Derivatives using Newton's Forward Difference Formula
- 2.3 Derivatives using Newton's Backward Difference Formula
- 2.4 Numerical Integration using Trapezoidal Rule
- 2.5 Numerical Integration using Simpsons rule

Block 3 Multiple Integrals

- 3.1 Definitions of Double and Triple Integrals
- 3.2 Change of Order of Integration for Two Variables
- 3.3 Double Integrals and Triple Integrals in Cartesian Coordinates

Block 4 Laplace Transform

- 4.1 Definition and Transform of $f'(t)$ & $f''(t)$
- 4.2 Laplace Transform of Functions e^{-at} , $\cos at$, $\sin at$, and t^n where 'n' is a Positive Integer
- 4.3 First Shifting Theorem - Laplace Transform of $e^{-at} \cos bt$, $e^{-at} \sin bt$ and $e^{-at} t^n$
- 4.4 Inverse Laplace Transform
- 4.5 Solving Second Order Differential Equations with Constant Coefficients using Laplace Transform

Block 5 Statistics

- 5.1 Correlation
- 5.2 Scatter diagram and its uses
- 5.3 Karl Pearson's Coefficient of Correlation
- 5.4 Correlation coefficient for a Bivariate Frequency Distribution
- 5.5 Probable error of correlation coefficient
- 5.6 Spearman's rank correlation coefficient
- 5.7 Merits and demerits of rank correlation coefficient

BOOKS FOR STUDY

1. Narayanan S. and Manicavachagam Pillay T.K., Calculus-Vol II. Chennai: S.Viswanathan, 2012.
Chapter 7 Sec. 2.1, 2.3, 3 - 5
2. Narayanan S., R. Hanumantha Rao,T.K. Manicavachgam Pillay, and P. Kandaswamy., Ancillary Mathematics – Volume – II. Madras.: Viswanathan, S, 1995 Reprint 2011.
Chapter 3 Sec 1 - 3
Chapter 7 Sec 1 – 6
3. R. S. N. Pillai and V. Bagavathi, Statistics, S. Chand & company Ltd, New Delhi, 2007. Chapter 12: Page No: 363 – 395.
4. Sastry S.S., Introductory Methods of Numerical Analysis., Prentice – Hall of India Private Limited :New Delhi(2000).
Chapter 3 : Sections 3.3, 3.3.1, 3.3.2
Chapter 5 : Sections 5.1, 5.2(Numerical differentiation only), 5.4, 5.4.1, 5.4.2, 5.4.3

References:

- Gupta B.D., Numerical Analysis. Delhi.:Konark Publishers pvt. Ltd. , 1999
- S. C. Gupta and V. K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand & Sons, 2007 Reprint 2014
- Jeffrey Alan, Handbook of Mathematical formulas and Integrals, United States: Academic, 2004.
- Narayanan S. & T.K. Manicavachagam Pillay, Calculus-Vol I, Madras: S. Viswanathan, 1997.
- Vedamurthy, V.N., N. Ch. S. N. Iyengar. Numerical Methods. Delhi : Vikas Publishing House, 1998.



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B. C. A. SYLLABUS - II YEAR (III SEMESTER)

COURSE TITLE	: Data Structures
COURSE CODE	: BCAP-32
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Data Structures course, the student shall be able to:

- » Understand how to perform Matrix Operations using Two–Dimensional Arrays.
- » Gain Knowledge on Linked Lists and Linear Data Structures namely Stacks and Queues.
- » Gain Knowledge on Non Linear Data Structures namely Trees and Graphs.
- » Understand how to perform Search Operations using Linear Search, Binary Search and Hashing.
- » To familiarize Sorting techniques namely Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort and Bucket Sort.

COURSE OUTCOMES

After completion of the Data Structures course, the student can be able to:

- » Learn how to perform Matrix Operations using Two–Dimensional Arrays.
- » Acquire knowledge on Linked Lists and Linear Data Structures namely Stacks and Queues.
- » Understand the Non Linear Data Structures namely Trees and Graphs.
- » Understand how to perform search operations using Linear Search, Binary Search and Hashing.
- » Familiarize sorting techniques namely Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort and Bucket Sort.

Block 1 INTRODUCTION TO DATA STRUCTURES

Introduction to Data Structures – Linear and Non Linear Data Structures – Arrays – Types of Arrays – Representation of One-Dimensional Array in Memory - Array Traversal – Insertion and Deletion – Realizing Matrices using Two-Dimensional Arrays – Matrix Operations – Addition – Subtraction – Multiplication – Transpose - Linked Lists – Representation of Linked Lists – Advantages and Disadvantages of Linked List – Linked List Node Declaration – Linked List Operations – Linked List Implementation - Circular Linked List Operations – Circular Linked List Implementation – Doubly Linked List Node Declaration – Doubly Linked List Operations – Doubly Linked List Implementation.

Block 2 STACKS AND QUEUES

Stacks – Stack Representation in Memory – Arrays vs. Stacks – Stack Operations – Array Implementation of Stacks – Linked Implementation of Stacks - Queues – Logical Representation of Queues – Queue Operations – Array Implementation of Queues – Linked Implementation of Queues - Circular Queues – Priority Queues – Double-Ended Queues.

Block 3 TREES

Trees – Tree Terminology – Binary Tree – Array representation of Binary Tree – Linked Representation of Binary Tree - Binary Tree Traversal – Binary Search Tree – Insert, Delete, and Search Operations on a Binary Tree and Binary Search Tree – Expression Trees.

Block 4 GRAPHS

Graphs – Graph Terminology – Implementing Graphs Using Adjacency Matrix, Path Matrix and Adjacency List - Shortest Path Algorithm – Breadth First Search and Depth First Search Traversal of a Graph - Searching – Linear Search – Binary Search – Hashing.

Block 5 SORTING

Sorting – Selection Sort – Insertion Sort – Bubble Sort - Quick Sort – Merge Sort – Bucket Sort.

Text Book:

- E Balagurusamy, “Data Structures”, McGraw Hill Education (India) Private Limited, 2019.

References:

- Mark Allen Weiss, “Data Structures and Algorithm Analysis in C++”, Third Edition, Pearson Education, 2007.
- Reema Thareja, —Data Structures Using C||, Second Edition , Oxford University Press, 2011.
- Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, —Fundamentals of Data Structures in C||, Second Edition, University Press, 2008.



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B. C. A. SYLLABUS - II YEAR (DISTANCE MODE)

COURSE TITLE	: C++ Laboratory
COURSE CODE	: BCAPL-31
COURSE CREDIT	: 2

COURSE OBJECTIVES

While studying the C++ Laboratory course, the student shall be able to:

- » Know about how to write basic C++ programming
- » Learn how to use control statements
- » Understand the usage of arrays and functions
- » Practice how to create classes

COURSE OUTCOMES

After completion of the C++ Laboratory course, the student can be able to:

- » Understand how to write programs in C++
- » Practice how to use control statements
- » Learn about arrays and functions
- » Know how to create classes

List of Programmes

1. Write a C++ program to calculate average marks scored by a student for 3 subjects.
2. Write a C++ program to find the area and perimeter of a circle and rectangle.
3. Write a C++ program to swap two numbers.
4. Write a C++ program to find largest of three numbers.
5. Write a C++ program to find the maximum number among three numbers.
6. Write a C++ program to generate Fibonacci series.
7. Write a C++ program to perform string manipulation.
8. Find the length of a string. Compare two strings, Concatenate two strings, Reverse a string, Copy a string to another location.
9. Write a C++ program to find quotient and remainder of 2 numbers.
10. Write a C++ program to manipulate the class account using classes and function. A user should be able to perform the following functions.
Deposit money.
Withdraw money,
Calculate the interest
Check the total balance in his account.

11. Write a C++ program to generate Prime numbers between 1 and 50.
12. Write a C++ program to perform matrix addition and multiplication.
13. Write a C++ program to check whether the given matrix is a sparse matrix or not.
14. Write a C++ program to overload unary minus operator.
15. Write a C++ program to calculate total sales and average sales made by a salesman.



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B. C. A. SYLLABUS - II YEAR (III SEMESTER)

COURSE TITLE	: Data Structure Laboratory
COURSE CODE	: BCAP-32
COURSE CREDIT	: 2

COURSE OBJECTIVES

While studying the Data Structures Laboratory course, the student shall be able to:

- » Know about the working of linked list
- » Understand the working of matrix manipulation
- » Gather knowledge about how Stack Tree, and Queue is working
- » Know about the working of quick sort algorithm

COURSE OUTCOMES

After completion of the Data Structures Laboratory course, the student can be able to:

- » Acquire knowledge about the working of linked list
- » Understand the working of matrix manipulation
- » Learn how to program Stack Tree, and Queue
- » Know the working of quick sort algorithm

List of Programs

1. Implement PUSH, POP operations of stack using Arrays.
2. Implement PUSH, POP operations of stack using Pointers.
3. Implement add, delete operations of a queue using Arrays.
4. Implement add, delete operations of a queue using Pointers.
5. Conversion of infix to postfix using stack operations
6. Postfix Expression Evaluation.
7. Addition of two polynomials using Arrays and Pointers.
8. Creation, insertion, and deletion in doubly linked list.
9. Binary tree traversals (in-order, pre-order, and post-order) using linked list.
10. Depth First Search and Breadth first Search for Graphs using Recursion.



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B. C. A. SYLLABUS - II YEAR (III SEMESTER)

COURSE TITLE : ENVIRONMENTAL STUDIES
COURSE CODE : CCE
COURSE CREDIT : 2

Block 1

The Multi-disciplinary nature of environmental studies - Definition, scope and importance - Need for public awareness.

Block 2

Natural Resources - Renewable and non-renewable resources - Natural resources and associated problems.

- Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- Water resources: Use and over – utilization of surface and ground water, floods, drought, conflicts over water, dams – benefits and problems.
- Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity case studies.
- Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
- Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources - Equitable use of resources for sustainable lifestyles.

Block 3 Eco systems:

Ecosystems - Concept of an ecosystem - Structure and function of an ecosystem - Producers, consumers and decomposers - Energy flow in the ecosystem - Ecological Succession - Food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of the following ecosystem:-

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Block 4 Biodiversity and its conservation:

Biodiversity and its conservation - Introduction – Definition : genetic, species and ecosystem diversity - Biogeographical classification of India - Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels - India as a mega – diversity nation - Hot-spots of biodiversity - Threats to biodiversity : habitat loss, poaching of wildlife, man wildlife conflicts - Endangered and endemic species of India - Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

Block 5 Environmental Pollution:

Environmental Pollution - Definition - Causes, effects and control measures of : Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards - Solid waste Management - Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution - Pollution case studies - Disaster management: floods, earthquake, cyclone and landslides.

Block 6 Social Issues and the Environment:

Social issues and the Environment - From Unsustainable to Sustainable development - Urban problems related to energy - Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people; it's problems and concerns. Case studies - Environmental ethics: Issues and possible solutions - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies - Wasteland reclamation - Consumerism and waste products - Environment Protection Act - Air (Prevention and Control of Pollution) Act - Water (Prevention and control of Pollution) Act - Wildlife Protection Act - Forest Conservation Act - Issues involved in enforcement of environmental legislation - Public awareness.

Block 7 Human Population and the Environment:

Human Population and the Environment - Population growth, variation among nations - Population explosion - Family Welfare Programme - Environment and human health - Human Rights - Value Education - HIV / AIDS - Women and Child Welfare - Role of Information Technology in Environment and human health - Case Studies.

Block 8 Field Work Visit:

Visit to a local area to document environmental assets-river / forest/ grassland/ hill / mountain

References:

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- Singh.J.S..Singh..S.P and Gupta,,S.R.2014.Ecology E nvironmental Science and Conservation, S.Chand Publishing .New Delhi .
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B. C. A. SYLLABUS - II YEAR (IV SEMESTER)

COURSE TITLE	: Operating Systems
COURSE CODE	: BCAP-41
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Operating Systems course, the student shall be able to:

- » Understand the need for Operating Systems
- » Acquire Knowledge on Inter Process Communication
- » Gain Knowledge on CPU Scheduling Algorithms
- » Understand the need for Memory Management
- » Acquire Knowledge on File Systems

COURSE OUTCOMES

After completion of the Operating Systems course, the student can be able to:

- » Understand the need for Operating Systems
- » Gain Knowledge on Inter Process Communication
- » Acquire Knowledge on CPU Scheduling Algorithms
- » Understand the need for Memory Management
- » Learn about File Systems

Block 1 FUNDAMENTALS OF OPERATING SYSTEM

Introduction– Types of Operating System –Operating-System Operations–Resource Management –Security and Protection –Virtualization –Distributed Systems - Operating-System Services – User and Operating-SystemInterface –System Calls –System Services - Linkers and Loaders–Operating-System Structure –Building and Booting an Operating System.

Block 2 PROCESS MANAGEMENT

Process Management –Process Concept –Process Scheduling –Operations on Processes - Interprocess Communication –IPC in Shared-Memory Systems –IPC in Message-Passing Systems–Examples of IPC Systems –Communication in Client–Server Systems - Threads and Concurrency–Multicore Programming –Multithreading Models –Thread Libraries –Implicit Threading –Threading Issues.

Block 3 CPU SCHEDULING

CPU Scheduling–Basic Concepts –Scheduling Criteria –Scheduling Algorithms –Thread Scheduling –Multi-Processor Scheduling – Real-Time CPU Scheduling - Process Synchronization –The Critical-Section Problem –Peterson’s Solution –Hardware Support for Synchronization – Mutex Locks –Semaphores–Monitors–Deadlocks–System Model.- Deadlock in Multithreaded Applications –Deadlock Characterization –Methods for Handling Deadlocks –Deadlock Prevention–Deadlock Avoidance –Deadlock Detection –Recovery from Deadlock.

Block 4 MEMORY MANAGEMENT

Memory Management – Contiguous Memory Allocation –Paging –Structure of the Page Table –Swapping –Virtual Memory–Demand Paging –Copy-on-Write – Page Replacement –Allocation of Frames –Thrashing –Memory Compression–Allocating Kernel Memory.

Block 5 FILE MANAGEMENT

File-System Implementation–File-System Structure –File-System Operations –Directory Implementation - Allocation Methods –Free-Space Management –Efficiency and Performance–Recovery – The WAFL File System–File-System Internals–File-System Mounting –Partitions and Mounting–File Sharing –Virtual File Systems –Remote File Systems–Consistency Semantics –Network File Systems.

Text Book:

- Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne “Operating System Concepts”, Tenth Edition, Wiley, 2018.

References:

- Andrew S. Tanenbaum, and Herbert Bos, “Modern Operating Systems”, Fourth Edition, Pearson Education Limited, 2015.



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B. C. A. SYLLABUS - II YEAR (IV SEMESTER)

COURSE TITLE	: Data Base Management System
COURSE CODE	: BCAP-42
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Data Base Management System course, the student shall be able to:

- » Understand the need for Database Management Systems
- » Develop conceptual models for any real world application
- » Design databases for any real world application using the Relational Data Model and retrieve data.
- » Understand the need for Database Normalization
- » Gain Basic Understanding on NOSQL Databases and Big Data

COURSE OUTCOMES

After completion of the Database Management Systems course, the student can be able to:

- » Understand the basics of Databases
- » Describe the Conceptual Data Modeling and Database Design
- » Get clear idea about Relational Data Model, Relational Algebra and SQL
- » Acquire knowledge on Database Normalization
- » Gain knowledge of Relational Database Design, NOSQL Databases and Big Data

Block 1 INTRODUCTION TO DATABASES

Introduction – Example – Characteristics of the Database Approach – Actors on the Scene – Workers behind the Scene – Advantages of Using the DBMS Approach - Database Applications – When Not to Use a DBMS – Data Models – Schemas – Instances – Three Schema Architecture - Data Independence – Database Languages and Interfaces – Database System Environment – Architectures for DBMSs – Classification of DBMSs.

Block 2 CONCEPTUAL DATA MODELING AND DATABASE DESIGN

Entity Relationship Model – Entity Types – Entity Sets – Attributes – Keys – Relationship Types – Relationship Sets – Roles - Structural Constraints – Strong Entity Types – Weak Entity Types – Enhanced Entity Relationship Model - Specialization and Generalization – Constraints and Characterization of Specialization and Generalization Hierarchies.

Block 3 RELATIONAL DATA MODEL, RELATIONAL ALGEBRA AND SQL

Relational Model Concepts – Super Key – Candidate Key – Primary Key – Alternate Key – Foreign Key - Relation Model Constraints and Relational Database Schemas – Update Operations – Transactions and Dealing with Constraint Violations - Unary and Binary Relational Operations in Relational Algebra – Queries in Relational Algebra – Basic SQL – SQL Data Definition and Data Types – Specifying Constraints in SQL - Basic Retrieval Queries in SQL – Insert, Delete and Update Statements in SQL – Views in SQL.

Block 4 RELATIONAL DATABASE DESIGN

Mapping Entity Relationship Model to Relations – Mapping Enhance Entity Relationship Model to Relations - Database Normalization – Functional Dependencies – First Normal Form – Second Normal Form and Third Normal Form.

Block 5 NOSQL DATABASES AND BIG DATA

Introduction – CAP Theorem – Document Based NOSQL Systems and MongoDB – NOSQL Key Value Stores – Column Based NOSQL Systems – NOSQL Graph Databases – Neo4j - Big Data – Characteristics of Big Data – Introduction to MapReduce and Hadoop – Hadoop Distributed File System.

Text Book:

- Ramez Elmasri, Shamkant B. Navathe, “Fundamentals of Database Systems”, Seventh Edition, Pearson Education, 2017.

References:

- Abraham Silberschatz, Henry F. Korth, S. Sudharshan, “Database System Concepts”, Sixth Edition, Tata McGraw Hill, 2014.
- C. J. Date, A. Kannan, S. Swamynathan, “An Introduction to Database Systems”, Eighth Edition, Pearson Education, 2006.



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B. C. A. SYLLABUS - II YEAR (IV SEMESTER)

COURSE TITLE	: WEB Designing
COURSE CODE	: BCAP-43
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Web Designing course, the student shall be able to:

- » Gain knowledge about the basic HTML tags
- » Learn how to design Network
- » Understand the concepts Swing and AWT
- » Know about the database connectivity and Servlet
- » Learn the Java Beans concepts.

COURSE OUTCOMES

After completion of the Web Designing course, the student can be able to:

- » Acquire knowledge about the basic HTML tags
- » Understand how to design Network
- » Know the concepts Swing and AWT
- » Learn about the database connectivity and Servlet
- » Understand the Java Beans concepts.

Block 1 INTRODUCTION TO APPLLET

Introduction to applet –lifecycle of applet- servlet and its life cycle – HTML fundamentals - JSP fundamentals-variables-control structures, Applet to servlet communications. Servlets –deployment of simple servlets - web server (Java web server/Tomcat sever/Web logic)- HTTP GET and POST request-Session tracking-cookies - JDBC-Simple Web application-multi tier applications.

Block 2 NETWORKING AND RMI

Connecting to a Server - Implementing Servers - Advanced Socket Programming: InetAddress - URL Connections. Remote Method Invocations: Setting Up Remote Method Invocation -Parameter Passing in Remote Methods.

Block 3 ADVANCED SWING AND AWT

Lists – Trees – Tables - Styled Text Components - Component Organizers – Shapes - Images.

Block 4 DATABASE CONNECTIVITY AND SERVLET

The Design of JDBC - Basic Concepts - Executing Queries - Result Sets – Metadata -Transactions, Servlets.

Block 5 JAVABEANS

The Bean-Writing Process - Using Beans to Build an Application - Bean Property Types -Customizers.

References:

- Cay S. Horstmann, Gary Cornell, Core Java™ 2: Volume II—Advanced Features, Prentice Hall, 2008.
- Patrick Naughton & Herbert Schildt, The Complete Reference: Java 2, Tata McGraw Hill, 8 th Edition 2011.



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B. C. A. SYLLABUS - II YEAR (IV SEMESTER)

COURSE TITLE	: Software Engineering
COURSE CODE	: BCAP-44
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Software Engineering course, the student shall be able to:

- » Understand the Fundamentals of Software Engineering and Umbrella Activities in Software Engineering.
- » Gain Knowledge on Process Models.
- » Gain Knowledge on Requirements Engineering
- » Understand Analysis and Design Methods.
- » Gain Knowledge on Software Testing Strategies and Software Configuration Management.

COURSE OUTCOMES

After completion of the Software Engineering course, the student can be able to:

- » Know the Fundamentals of Software Engineering and Umbrella Activities in Software Engineering.
- » Acquire Knowledge on Process Models.
- » Gain Knowledge on Requirements Engineering
- » Learn Analysis and Design Methods.
- » Acquire Knowledge on Software Testing Strategies and Software Configuration Management.

Block 1 THE NATURE OF SOFTWARE

The Nature of Software – Defining Software – Software Application Domains – Legacy Software – The Changing Nature of Software – WebApps – Mobile Applications – Cloud Computing – Product Line Software – Defining the Discipline – The Software Process – The Process Framework – Umbrella Activities – Process Adaptation – Software Engineering Practice – The Essence of Practice – General Principles – Software Development Myths – Software Process Structure – A Generic Process Model – Defining a Framework Activity – Identifying a Task Set – Process Patterns – Process Assessment and Improvement.

Block 2 PRESCRIPTIVE PROCESS MODELS

Prescriptive Process Models – The Waterfall Model – Incremental Process Models – Evolutionary Process Models – Concurrent Models – A Final Word on Evolutionary Processes – Specialized Process Models – Component-Based Development – The Formal Methods Model – Aspect-Oriented Software Development – The Unified Process – Phases of the Unified Process – Personal and Team Process Models – Personal Software Process – Team Software Process – Process Technology – Product and Process – Agility – Agility and the Cost of Change – Agile Process – Agility Principles – The Politics of Agile Development – Extreme Programming – The XP Process – Industrial XP – Other Agile Process Models – Scrum – Dynamic Systems Development Method – Agile Modeling – Agile Unified Process.

Block 3 MODELING

Modeling – Principles That Guide Process, Practice and Each Framework Activity – Communication, Planning, Modeling, Construction and Deployment Principles – Requirements Engineering – Establishing the Groundwork – Identifying Stakeholders – Recognizing Multiple Viewpoints – Working toward Collaboration – Asking the First Questions – Nonfunctional Requirements – Traceability – Eliciting Requirements – Collaborative Requirements Gathering –

Quality Function Deployment – Usage Scenarios – Elicitation Work Products – Agile Requirements Elicitation – Service-Oriented Methods – Developing Use Cases – Building the Analysis Model – Elements of the Analysis Model – Analysis Patterns – Agile Requirements Engineering – Requirements for Self-Adaptive Systems – Negotiating Requirements – Requirements Monitoring – Validating Requirements – Avoiding Common Mistakes – Requirements Analysis – Overall Objectives and Philosophy – Analysis Rules of Thumb – Domain Analysis – Requirements Modeling Approaches – Scenario-Based Modeling – Creating a Preliminary Use Case – Refining a Preliminary Use Case – Writing a Formal Use Case – UML Models That Supplement the Use Case – Developing an Activity Diagram – Swimlane Diagrams – Requirements Modeling: Class-Based Methods – Identifying Analysis Classes – Specifying Attributes – Defining Operations – Class-Responsibility-Collaborator Modeling – Associations and Dependencies – Analysis Packages.

Block 4 SOFTWARE DESIGN

Software Design – Design within the Context of Software Engineering – The Design Process – Software Quality Guidelines and Attributes – The Evolution of Software Design – Design Concepts – Abstraction – Architecture – Patterns – Separation of Concerns – Modularity – Information Hiding – Functional Independence – Refinement – Aspects – Refactoring – Object-Oriented Design Concepts – Design Classes – Dependency Inversion – Design for Test – Design Model – Data Design Elements – Architectural Design Elements – Interface Design Elements – Component-Level Design Elements – Deployment-Level Design Elements – Designing Class-Based Components – Basic Design Principles – Component-Level Design Guidelines – Cohesion – Coupling.

Block 5 SOFTWARE TESTING STRATEGIES

Software Testing Strategies – A Strategic Approach to Software Testing – Verification and Validation – Organizing for Software Testing – Software Testing Strategy – Criteria for Completion of Testing – Strategic Issues – Test Strategies for Conventional Software – Unit Testing – Integration Testing – Test Strategies for Object-Oriented Software – Unit Testing in the OO Context – Integration Testing in the OO Context – Test Strategies for WebApps – Test Strategies for MobileApps – Validation Testing – Validation-Test Criteria – Configuration Review – Alpha and Beta Testing – System Testing – Recovery Testing – Security Testing – Stress Testing – Performance Testing – Deployment Testing – The Art of Debugging – The Debugging Process – Psychological Considerations – Debugging Strategies – Correcting the Error – White-Box Testing – Basis Path Testing – Flow Graph Notation – Independent Program Paths – Deriving Test Cases – Graph Matrices – Control Structure Testing – Black-Box Testing – Graph-Based Testing Methods – Equivalence Partitioning – Boundary Value Analysis – Orthogonal Array Testing – Model-Based Testing – Software Configuration Management – Elements of a Configuration Management System – Baselines – Software Configuration Items – Management of Dependencies and Changes.

Text Book:

- Roger S. Pressman and Bruce R. Maxim, "Software Engineering", A Practitioner's Approach, Eighth Edition, McGraw-Hill Education, 2015.

References:

- Ian Sommerville, "Software Engineering", Tenth Edition, Pearson 2016.
- Ian Sommerville, "Engineering Software Products", Pearson 2019.



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B. C. A. SYLLABUS - II YEAR (IV SEMESTER)

COURSE TITLE	: Web Technology Laboratory (HTML/DHTML/CSS)
COURSE CODE	: BCAPL-41
COURSE CREDIT	: 2

COURSE OBJECTIVES

While studying the Web Technology Lab course, the student shall be able to:

- » Know about the how to design web pages using various HTML tags
- » Learn about the concepts of JavaScript
- » Aware how to create forms using JavaScript

COURSE OUTCOMES

After completion of the Web Technology Lab course, the student can be able to:

- » Understand how to design web pages using various HTML tags
- » Know about the how to use arrays in JavaScript
- » Learn how to create forms using JavaScript

List of Experiments

1. Create a form having number of elements (Textboxes, Radio buttons, Checkboxes, and so on). Write JavaScript code to count the number of elements in a form.
2. Develop a HTML Form, which accepts any Mathematical expression. Write JavaScript code to Evaluates the expression and Displays the result.
3. Create a page with dynamic effects. Write the code to include layers and basic animation.
4. Write a JavaScript code to find the sum of N natural Numbers.
5. Create a form for Student information. Write JavaScript code to find Total, Average, Result and Grade.
6. Create a form for Employee information. Write JavaScript code to find DA, HRA, PF, TAX, Gross pay, Deduction and Net pay.
7. Create a Web services with RMI.
8. Implement RMI program to perform arithmetic functions.
9. Develop a simple application to insert and retrieve data from database.
10. Design a color bean.



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B. C. A. SYLLABUS - II YEAR (IV SEMESTER)

COURSE TITLE	: Data Base Management System Laboratory
COURSE CODE	: BCAPL-42
COURSE CREDIT	: 2

COURSE OBJECTIVES

While studying the Data Base Management System Lab course, the student shall be able to:

- » Learn about the basic concepts of SQL Commands
- » Understand the concepts of nested and join queries
- » Aware about the concepts of functions, procedures and procedural extensions of databases.
- » Know about the concepts design and implementation of typical database applications.
- » Acquire knowledge about the concepts of a front end tool for GUI based application development.

COURSE OUTCOMES

After completion of the Data Base Management System Lab course, the student can be able to:

- » Understand the basic concepts of SQL Commands
- » Gain knowledge about the concepts of nested and join queries
- » Aware about the concepts functions, procedures and procedural extensions of databases.
- » Learn the concepts design and implementation of typical database applications.
- » Improve knowledge about the concepts of a front end tool for GUI based application development.

List of Experiments

1. Create a database table, add constraints (primary key, unique, check, Not null), insert rows, update and delete rows using SQL DDL and DML commands.
2. Create set of tables, add foreign key constraints and incorporate referential integrity.
3. Query the database tables and explore sub queries and simple join operations.
4. Query the database tables and explore natural, equi and outer joins.
5. Write user defined functions and stored procedures in SQL.
6. Execute complex transactions and realize DCL and TCL commands.
7. Write SQL Triggers for insert, delete, and update operations in database table.
8. Create View and index for database tables with large number of records.
9. Create a XML database and validate it using XML schema.
10. Create Document, column and graph based data using NOSQL database tools.



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B. C. A. SYLLABUS - III YEAR (V SEMESTER)

COURSE TITLE	: Data Communication & Networking
COURSE CODE	: BCAP-51
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Data Communication and Networking course, the student shall be able to:

- » Learn about the basics computer network
- » Aware about networking and inter networking devices
- » Know the concept of Data Link Layer and its protocols.
- » Gather information about the routing algorithm and IP Protocols.
- » Understand about the concept of transport layer services and network security.

COURSE OUTCOMES

After completion of the Data Communication and Networking course, the student can be able to:

- » Understand the basics computer network
- » Know about networking and inter networking devices
- » Learn the concept of Data Link Layer and its protocols.
- » Aware the routing algorithm and IP Protocols.
- » Gather information about the concept of transport layer services and network security.

Block 1 INTRODUCTION TO NETWORKS

Introduction to Network Hardware and Software - Reference Models – OSI and TCP/IP Models - Example Networks: Internet, ATM, Ethernet and Wireless LANs - Physical Layer - Theoretical Basis for Data Communication - Guided Transmission Media.

Block 2 WIRELESS TRANSMISSION

Wireless Transmission - Communication Satellites - Telephone System: Structure, Local Loop, Trunks and Multiplexing and Switching - Data Link Layer: Design Issues – Error Detection and Correction.

Block 3 DATA LINK LAYER

Elementary Data Link Protocols - Sliding Window Protocols - Data Link Layer in the Internet - Medium Access Layer - Channel Allocation Problem – Multiple Access Protocols – Bluetooth.

Block 4 NETWORK LAYER

Network Layer - Design Issues - Routing Algorithms - Congestion Control Algorithms - IP Protocol – IP Addresses – Internet Control Protocols.

Block 5 TRANSPORT LAYER

Transport Layer – Services - Connection Management - Addressing, Establishing and Releasing a Connection - Simple Transport Protocol – Internet Transport Protocols (ITP) -Network Security: Cryptography.

TEXT BOOK

- A. S. Tanenbaum, “Computer Networks”, 4th Edition, Prentice-Hall of India, 2008.

References

- B. A. Forouzan, “Data Communications and Networking”, Tata McGraw Hill, 4th Edition, 2007.
- F. Halsall, “Data Communications, Computer Networks and Open Systems”, Pearson Education, 2008.
- D. Bertsekas and R. Gallager, “Data Networks”, 2nd Edition, PHI, 2008.
- Lamarca, “Communication Networks”, Tata McGraw- Hill, 2002.



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B. C. A. SYLLABUS - III YEAR (V SEMESTER)

COURSE TITLE	: Programming in Java
COURSE CODE	: BCAP-52
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Programming in Java course, the student shall be able to:

- » Gain Knowledge on the Object Oriented features supported by Java.
- » Understand the use of Constructors in Java.
- » Exploring Class Hierarchy using Inheritance and implementing Interfaces.
- » Gain Knowledge on Creating, Accessing and Using a Package.
- » Acquire Knowledge on Exception Handling.

COURSE OUTCOMES

After completion of the Programming in Java course, the student can be able to:

- » Acquire Knowledge on the Object Oriented features supported by Java.
- » Know about the use of Constructors in Java.
- » Exploring Class Hierarchy using Inheritance and implementing Interfaces.
- » Gain Knowledge on Creating, Accessing and Using a Package.
- » Understand the Exception Handling.

Block 1 JAVA FEATURES

Java Features – Comparison of C++ and Java – Java Virtual Machine – Constants – Variables – Data Types – Scope of Variables – Type Casting – Java Program Structure - Operators and Expressions – Arithmetic – Logical – Relational – Assignment – Increment and Decrement – Conditional – Bitwise – Special Operators - Arithmetic Expressions – Evaluation of Expressions – Type Conversion in Expressions – Operator Precedence and Associativity – Mathematical Functions.

Block 2 LOOPING, CLASSES AND OBJECTS

Decision Making, Branching and Looping – If Statement – If ... Else Statement – Nesting of If ... Else Statements – Else If Ladder – Switch Statement – The ?: Operator - While Statement – Do Statement – For Statement – Jumps in Loops – Return Statement – Labeled Loops - Classes, Objects and Methods – Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing Class Members - Constructors – Method Overloading – Static Members – Nesting of Methods – Inheritance – Overriding Methods – Abstract Methods and Classes.

Block 3 ARRAYS

Arrays, Strings and Vectors – One Dimensional Arrays – Creating an Array – Two Dimensional Arrays - Strings – Vectors – Wrapper Classes – Enumerated Types – Annotations - Interfaces – Defining Interfaces – Implementing Interfaces – Accessing Interface Variables.

Block 4 PACKAGES

Packages – Java API Packages – Using System Packages – Naming Conventions - Creating Packages – Accessing a Package – Using a Packages – Adding a Class to a Package – Hiding Classes – Static Import.

Block 5 EXCEPTIONS

Managing Errors and Exceptions – Types of Exceptions – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements - Using Finally Statement – Throwing Our Own Exception – Using Exceptions for Debugging.

Text Book:

- E Balagurusamy, “Programming with Java”, Sixth Edition, McGraw Hill Education (India) Private Limited, 2019.

References:

- Herbert Schildt, “Java: The Complete Reference”, Ninth Edition, McGraw Hill Professional, 2014.



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B. C. A. SYLLABUS - III YEAR (V SEMESTER)

COURSE TITLE	: Programming in Python
COURSE CODE	: BCAP-53
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Programming in Python course, the student shall be able to:

- » Know about the basic concepts of Python language
- » Gather knowledge about the control statements in Python
- » Understand about the file handling and how to interact with Database
- » Acquire knowledge about the concepts of graphics programming
- » Aware about how testing is done and version control systems

COURSE OUTCOMES

After completion of the Programming in Python course, the student can be able to:

- » Understand the basic concepts of Python language
- » Improve knowledge about the control statements in Python
- » Know about the file handling and how to interact with Database
- » Aware about the concepts of graphics programming
- » Acquire knowledge how testing is done and version control systems

Block 1 INTRODUCTION

Introduction to Python - Why Python - Installing in various Operating Systems - Executing Python Programs - Basic Programming concepts - Variables, expressions and statements - Input/ Output – Operators.

Block 2 DATA FLOW

Conditions - Functions - Arguments - Return values - Iteration - Loops - Strings - Data Structures - Lists - Dictionaries - Tuples - Sequences - Exception Handling.

Block 3 FILE HANDLING AND DATABASE

File Handling - Modules - Regular Expressions - Text handling - Object Oriented Programming - Classes - Objects - Inheritance - Overloading Polymorphism - Interacting with Databases - Introduction to MySQL - interacting with MySQL - Building a address book with add/edit/delete/search features.

Block 4 GRAPHICS PROGRAMMING

Introduction to Graphics programming - Introduction to GTK - PyGTK - Developing GUI applications using PyGTK - Scientific Programming using NumPy / SciPy - Image Processing - Processing multimedia files -Network Programming - Web services using SOAP, Introduction to Graphics programming - PyGame

Block 5 TESTING AND VERSION CONTROL SYSTEMS

Introduction to Version Control Systems – Subversion/Git - Writing Unit Tests- Creating Documentation - Contributing to Open Source Projects

Text Book

- Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 1st Edition 2012, O'Reilly.

Reference Books

- Jeff McNeil, "Python 2.6 Text Processing: Beginners Guide", 2010, Packet Publications
- Mark Pilgrim, "Dive Into Python", 2nd edition 2009, Apress



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B. C. A. SYLLABUS - III YEAR (V SEMESTER)

COURSE TITLE	: Programming in Java - Laboratory
COURSE CODE	: BCAPL-51
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Programming in Python course, the student shall be able to:

- » Gather knowledge how the Java Compiler works and work with eclipse platform
- » Learn how to use the control statements in Java
- » Understand the concepts of multi threading and exception handling
- » Know the concepts of graphics programming

COURSE OUTCOMES

After completion of the Programming in Python course, the student can be able to:

- » Understand the Java Compiler and eclipse platform
- » Acquire knowledge about control statements in Java
- » Learn how to use multi threading and exception handling
- » Gather knowledge about the concepts of graphics programming

List of Experiments

1. Write a Java program for student Mark-List preparation.
2. Write a Java program to reverse and finding sum of individual digits of a given number
3. Develop an applet in Java that displays a simple message.
4. Develop an applet in Java that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named "Compute" is clicked.
5. Write a Java program for finding volume of a sphere (Concept: Class and Object)
6. Write a Java program for preparing Employee salary Report (Concept : Array of Objects)
7. Write a Java program for checking whether a given number is palindrome or not (Concept : Abstract Class).
8. Write a Java Program for Electricity charge calculation (Concept : Implementing Multiple Inheritance).
9. Write a Java program to find area of Triangle and Rectangle (Concept : Package , Interface).
10. Write a Java program for queue implementation (Concept : Exception Handling; User defined Exception).
11. Write a Java program to implement Multi- Threading (Concept: Multi- Threading by extending Thread class).
12. Write a program for simple Railway Reservation System (Concept : IO Streams: DataInput Stream & DataOutputStream).
13. Write a Java program to display an image (Concept : Pixel Grabber Class : Getting pixels of an image)
14. Write a Java program that connects to a database using JDBC and does add, delete, modify and retrieve operations.
15. Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired (Use Adapter classes).



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B. C. A. SYLLABUS - III YEAR (DISTANCE MODE)

COURSE TITLE	: Programming in Python - Laboratory
COURSE CODE	: BCAPL-52
COURSE CREDIT	: 2

COURSE OBJECTIVES

While studying the Python Programming Lab course, the student shall be able to:

- » Understand how write program in basics Python
- » Learn how write program in Python data structures
- » Know how to handle files
- » Aware how to connect with Database

COURSE OUTCOMES

After completion of the Python Programming Lab course, the student can be able to:

- » Know how write program in basics Python
- » Learn how write program in Python data structures
- » Aware how to handle files
- » Understand how to connect with Database

List of Experiments

1. Create a simple calculator to do all the arithmetic operations
2. Write a program to use control flow tools like if.
3. Write a program to use for loop
4. Data structures
use list as stack
use list as queue
tuple, sequence
5. Create new module for mathematical operations and use in your program
6. Write a program to read and write files, create and delete directories
7. Write a program with exception handling
8. Write a program using classes
9. Connect with MySQL and create address book
10. Write a program using string handling and regular expressions
11. Program to parse apache log file
12. Create a GUI program using pygtk



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B. C. A. SYLLABUS - III YEAR (VI SEMESTER)

COURSE TITLE	: VISUAL PROGRAMMING
COURSE CODE	: BCAP-61
COURSE CREDIT	: 4

COURSE OBJECTIVES

While studying the Visual Programming course, the student shall be able to:

- » Use a modern IDE to visually and programmatically create programs with GUI's
- » Understand and use the event-driven model and its interaction with the modern multitasking operating system
- » Design and implement applications using an object-oriented methodology
- » Create applications that using exception handling

COURSE OUTCOMES

After completion of the Visual Programming course, the student can be able to:

- » Demonstrate knowledge of programming terminology and how applied using Visual Basic
- » Develop a Graphical User Interface (GUI) based on problem description
- » Develop an Event Planning Chart based on problem description so as to define the processing that is to occur based on specific events
- » Develop an Algorithm to verify processing is accurate
- » Develop and debug applications using Visual Basic 2010 (or version required for the course) that runs under Windows operating system.

Block 1 INTRODUCTION TO WINDOWS PROGRAMMING

Introduction to Windows Programming and Visual Basic: Components of Windows Programming - Graphical User Interface – Window and its elements – Dialog Box – Drop-Down and Pop-Up menus – Visual Basic – Event-Driven Programming – Steps in Building a Project - User Interface Design – Writing Code – Visual Basic IDE – Creating and Running a simple project

Block 2 VISUAL BASIC FORMS AND CONTROLS:

Form – Tool Box controls – Property window – Design and Run-time properties – Events – Keyboard, Mouse, Code and System events - Visual Basic Object oriented programming – Creating buttons at run-time through object declaration - Screen, Printer, Error Objects.

Block 3 VISUAL BASIC PROGRAMMING:

Visual Basic Data Types - Constants: predefined constants – User-Defined constants – Variables - Scope Rules – Control Structures – If – Select Case – Loops – FOR , DO, WHILE loops – Goto – On Goto statements - Event procedures – User defined procedures.

Block 4 LIBRARY FUNCTIONS

Library functions – Numeric, String, Boolean and miscellaneous functions – Sub Main() procedure - User-defined functions – Public, Private Scope rules – Creating EXE files – Arrays – User-defined data type – Type statement – Control Arrays - Graphics handling – Using multiple forms – Activating a form – Multiple Document Interface – A simple MDI application.

Block 5 VISUAL BASIC ADVANCED FEATURES:

Creating a Database in VB – Accessing an external database with Data Control – Object Linking and Embedding (OLE) - Linking and embedding an excel worksheet with VB project – Using third-party controls in VB - Creating an Active X control project – Activating other applications from VB – Windows Application Program Interface functions (WINAPI)

References:

- An Introduction to Programming using Visual Basic, David I. Schneider, Prentice Hall, 1995
- Ready-to-Run Visual Basic Algorithms, Rod Stephens, J. Wiley Publication, 1998
- “Visual Basic 6 from ground up” Garry Cornell, TMH, 1999.



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B. C. A. SYLLABUS - III YEAR (VI SEMESTER)

COURSE TITLE	: VISUAL PROGRAMMING LABORATORY
COURSE CODE	: BCAPL-61
COURSE CREDIT	: 2

COURSE OBJECTIVES

While studying the Visual Programming practical course, the student shall be able to:

- » Demonstrate knowledge of programming terminology and how applied using Visual Basic
- » Develop a Graphical User Interface (GUI) based on problem description
- » Develop an Event Planning Chart based on problem description so as to define the processing that is to occur based on specific events
- » Develop an Algorithm to verify processing is accurate

COURSE OUTCOMES

After completion of the Visual Programming practical course, the student can be able to:

- » Design, create, build, and debug Visual Basic applications.
- » Apply arithmetic operations for displaying numeric output.
- » Apply decision structures for determining different operations.
- » Write and apply loop structures to perform repetitive tasks.
- » Write and apply procedures, sub-procedures, and functions to create manageable code

List of Experiments

1. Write a program to design a simple calculator to perform addition, subtraction, multiplication and division cure function for the calculation)
2. Write a application with a derive list box, Dirlistbox, Filelist box and image control and using through load an image at runtime
3. Write a program to change the color the color of text using scrollbar
4. Write a application to move an image using a timer and command button
5. Write a application that change the font, size and color for a given text box.
6. Write a application that calculate the age from the given data of birth. (use DTP control)
7. Write a application for encryption and decryption of string using random number
8. Write a application to show the usage of shape and line control.
9. Write a application by using navigation and manipulation method.
10. Write a application to display item details using database



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B. C. A. SYLLABUS - III YEAR (VI SEMESTER)

COURSE TITLE : Mini Project

COURSE CODE : BCAPP-61

COURSE CREDIT : 2

COURSE OBJECTIVES

While completing the project, the student shall be able to:

The objective of the Project Course is to help the students to study, analyze and design software or utility for research problems focused in the recent journals or application of such software related to problems in the area of Computer Application. The development of algorithms and derivation with respect to theoretical Computer Science in relevance to performance comparison, which will improve the skills of software development of the students, will be another objective of the mini project course.



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B. C. A. SYLLABUS – III YEAR (ELECTIVE I)

COURSE TITLE	: Principles of Management
COURSE CODE	: BCAPE-01
COURSE CREDIT	: 3

COURSE OBJECTIVES

While studying the Principles of Management course, the student shall be able to:

- » Know about the basic concepts of Management
- » Understand how to do planning and decision making
- » Gather information about how to organize in management
- » Aware about controlling and budgeting in management

COURSE OUTCOMES

After completion of the Principles of Management course, the student can be able to:

- » Acquire knowledge about the concepts of Management principles
- » Know about how to do planning and decision making
- » Gather knowledge about how to organize in management
- » Understand about controlling and budgeting in management

Block 1 INTRODUCTION

Management – Features, Functions – Management as an art, Science, Profession – Evolution of management thoughts.

Block 2 PLANNING

Planning – Process, Importance, Nature and Scope, Types, Steps in Planning. Objectives, Policies, Procedures, Strategy - Decision making: Types of decisions, difficulties in decision making – Management by Objectives.

Block 3 ORGANIZING

Organizing – Features, Importance – Principles of organizations – Types - Organization structure – Delegation – Span of control - Line and staff relationship – Use of staff units and committees.

Block 4 STAFFING

Staffing – Sources of recruitment – Selection process – Training - Directing – Nature and purpose – Communication process.

Block 5 CONTROLLING AND BUDGETARY

Need for Coordination – Controlling - Importance and functions of control – Control process - Budgetary and non-budgetary control.

References:

- Rustom Davar Management Process
- Management Process, Rustom Davar
- Principles of Management, L.M. Prasad
- Business Management, Dinkar & Pagare
- Essentials of Management, Koontz & O Donnell
- Principles of Management, Sherlekar



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B. C. A. SYLLABUS - III YEAR (Elective I)

COURSE TITLE	: Management Information Systems
COURSE CODE	: BCAPE-02
COURSE CREDIT	: 3

COURSE OBJECTIVES

While studying the Management Information Systems course, the student shall be able to:

- » Gather information about the basic concepts of Management Information Systems
- » Acquire knowledge about types of information systems
- » Improve knowledge about business information systems
- » Learn about the various tools available for system development

COURSE OUTCOMES

After completion of the Management Information Systems course, the student can be able to:

- » Learn about the concepts of Management Information Systems
- » Improve knowledge about the types of information systems
- » Gather information about business information systems
- » Aware about the tools available for system development

Block 1 INTRODUCTION TO MIS

Concept, Definition, Role, Impact, Importance, - MIS and Uses. Approaches to management, Functions of Manager - Manager and the environment, Management as a control System.

Block 2 TYPES OF INFORMATION SYSTEMS

Decision Making, Concepts- Methods, Functions of DSS - Executive information System, MIS, TPS, ES.

Block 3 BUSINESS INFORMATION SYSTEM:

Functional Information Systems- Marketing Information - Manufacturing Information System- Quality Information System.

Block 4 FINANCIAL INFORMATION SYSTEMS

Financial and Accounting Information System- Human Resource Information System.

Block 5 SYSTEM DEVELOPMENT LIFE CYCLE

System Development Life Cycle & Tools for IS Development - System Development- System Analysis, System Design, System Development Life Cycle - Preliminary Investigation- Tools for System Development - DFD- Data Dictionary- Decision Trees.

Text Books:

- Management Information System, W. S. Jawadekar , Tata Mcgraw hill
- Management Information System A Managerial Perspective, Uma G. Gupta, Galgotia Publications Pvt. Ltd. 1998.

References:

- Management Information System, W. S. Jawadekar , Tata Mcgraw hill
- Management Information System A Managerial Perspective, Uma G. Gupta, Galgotia Publications Pvt. Ltd. 1998.



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B. C. A. SYLLABUS - III YEAR (Elective I)

COURSE TITLE	: Professional Ethics
COURSE CODE	: BCAPE-03
COURSE CREDIT	: 3

COURSE OBJECTIVES

While studying the Management Information Systems course, the student shall be able to:

- » Create awareness on professional Ethics and Human Values.
- » Understand social responsibility of an Professional .
- » Appreciate ethical dilemma while discharging duties in professional life.

COURSE OUTCOMES

After completion of the Management Information Systems course, the student can be able to:

- » Build awareness on professional Ethics and Human Values.
- » Learn social responsibility of a Professional.
- » Understand ethical dilemma while discharging duties in professional life.

Block 1 HUMAN VALUES

Morals, Values and Ethics – Integrity – Work Ethic – Honesty – Courage –Empathy – Self-Confidence –Character.

Block 2 ETHICS

Senses of 'Professional Ethics' - variety of moral issued - types of inquiry - moral dilemmas – moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories. Valuing Time – Co-operation – Commitment.

Block 3 ETHICAL DILEMMAS, SOURCES AND THEIR RESOLUTIONS:

What is an Ethical Dilemma, Sources of Ethical Behaviour, Code of Personal Ethics for Employees, How to Resolve an Ethical Problem, How to Resolve Ethical Dilemmas.

Block 4 SAFETY, RESPONSIBILITIES AND RIGHTS

Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the three mile island.

Block 5 GLOBAL ISSUES

Multinational corporations - Environmental ethics - computer ethics - weapons development –Professional as expert witnesses and advisors -moral leadership.

TEXT BOOKS

- Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996.
- Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

References:

- Charles D. Fleddermann, "Engineering Ethics", Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint now available).
- Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available)
- John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.
- Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.



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B. C. A. SYLLABUS - III YEAR (Elective II)

COURSE TITLE	: Constitution of India
COURSE CODE	: BCAPE-04
COURSE CREDIT	: 3

COURSE OBJECTIVES

While studying the Constitution of India course, the student shall be able to:

- » Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
- » To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional
- » Role and entitlement to civil and economic rights as well as the emergence nation hood in the early years of Indian nationalism.
- » To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.

COURSE OUTCOME

After completion of the Constitution of India course, the student can be able to:

- » Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
- » Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
- » Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
- » Discuss the passage of the Hindu Code Bill of 1956.

Block 1 HISTORY OF MAKING OF THE INDIAN CONSTITUTION:

History, Drafting Committee, (Composition & Working). Philosophy of the Indian Constitution: Preamble, Salient Features.

Block 2 CONTOURS OF CONSTITUTIONAL RIGHTS AND DUTIES:

Fundamental Rights, Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties.

Block 3 ORGANS OF GOVERNANCE:

Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions.

Block 4 LOCAL ADMINISTRATION:

District's Administration head: Role and Importance Municipalities: Introduction, Mayor and role of Elected Representative, CEO, Municipal Corporation. Pachayati raj: Introduction, PRI: Zila Pachayat. Elected officials and their roles, CEO Zila Pachayat: Position and role. Block level: Organizational Hierarchy(Different departments), Village level:Role of Elected and Appointed officials, Importance of grass root democracy.

Block 5 ELECTION COMMISSION:

Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners - Institute and Bodies for the welfare of SC/ST/OBC and women.

References:

- The Constitution of India,1950(Bare Act),Government Publication.
- Dr.S.N.Busi, Dr.B. R.Ambedkar framing of Indian Constitution,1st Edition, 2015.
- M.P. Jain, Indian Constitution Law, 7 th Edn., Lexis Nexis,2014.
- D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.



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B. C. A. SYLLABUS - III YEAR (Elective II)

COURSE TITLE	: E- Learning
COURSE CODE	: BCAPE-05
COURSE CREDIT	: 3

COURSE OBJECTIVES

While studying the e-Learning course, the student shall be able to:

- » Know about the basic concepts and history of e-Learning
- » Gather information about various trends and best practices in teaching
- » Acquire knowledge about learning management systems
- » Understand about various types of e-Learning

COURSE OUTCOMES

After completion of the e-Learning course, the student can be able to:

- » Understand the basic concepts and history of e-Learning
- » Acquire knowledge about various trends and best practices in teaching
- » Improve knowledge about learning management systems
- » Know about various types of e-Learning

Block 1 INTRODUCTION

E-Learning - E-Learning cycle - E-Learning types - challenges and support Blockies – cognitive presence – Approaches to design E-Learning - E-Learning framework – 6C framework - E-Learning Tools

Block 2 E-LEARNING STRATEGY

Role of tutor - E-Learning strategy - Blended E-Learning – M-Learning- problem based learning- Enterprise learning- Corporate Learning- Web based Learning - Pod casting - Learning Management systems – Content development process – E-Learning standards- SCORM standard- managing e-learning quality - case studies.

Block 3 PRINCIPLES OF E-LEARNING

Philosophy of E-Learning – theory of learning – Applying principles of multimedia - Applying principles of contiguity - Applying principles of modality - Applying principles of redundancy - Applying principles of coherency - Applying principles of personalization- web-based learning comm. Blockies - knowledge sharing and Knowledge management in e-learning- social networks and social media in e-learning

Block 4 DESIGN

On line E-Learning technologies – visual communication techniques- Computer-based technologies - Computer-mediated communication (CMC) – Assessment and evaluation-Organizing and designing learning sequences, Characteristics of Interactive Online Learning Media.

Block 5 IMPLEMENTATION

Leverages example in E-Learning – collaborative E-Learning- Learner control in E-Learning- guidelines to solve issues in E-Learning – Implementation of an E-Learning Course Content for a complete online course, Research in content retrieval and generation for E-Learning, Role of cloud and semantic Grid in E-Learning

References:

- D.Randy Garrison “E-Learning in the 21st century a framework for research and practice”, 2nd edition, Taylor and Francis, 2011.
- Robin Mason, “E-Learning : the key concepts”, Routledge, 2007.
- William Horton, “E-Learning by Design”, Pfeiffer Wiley, 2006.
- John Gardner, Bryn Holes, “E-Learning : Concepts and practice” SAGE Publications, 2006.
- R.C.Clark and R.E.Mayer, “E-Learning and the science of instruction”, Pfeiffer Wiley, 2011.
- Mark J Rosenberg, “E-Learning: strategies for delivering knowledge in the Digital Age”, McGraw- Hill, 2001.

Reference links

- <https://www.aupress.ca/books/120258-emergence-and-innovation-in-digital-learning/>
- <https://opentextbc.ca/teachinginadigitalage/part/chapter-2-the-nature-of-knowledge-and-the-implications-for-teaching/>
- <https://www.coursera.org/learn/elearning>



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B. C. A. SYLLABUS - III YEAR (Elective II)

COURSE TITLE	: Big Data Analytics
COURSE CODE	: BCAPE-06
COURSE CREDIT	: 3

COURSE OBJECTIVES

While studying the Big Data Analytics course, the student shall be able to

- » Familiarize with R Programming.
- » Understand data analysis using R and HADOOP Integrated Programming Environment.
- » Understand Analytics for Big data 'at Rest' and Real-Time Analytical Processing for Big data 'in Motion'.
- » Understand the Pig Data model and Pig scripts.
- » Learn way of Querying Big Data using Hive

COURSE OUTCOMES

After completion of the Big Data Query Language, the student can able to:

- » Design applications using R,
- » HADOOP.Design applications using RHADOOP&
- » RHIFE.Develop analytic applications for data Streams.
- » Develop Pig scripts for Big data applications. Design Big data applications schema and use HIVE QL.

Block 1 INTRODUCTION TO R PROGRAMMING

Introduction to R –Vectors –Filtering –Matrices –Creating Matrices –Applying Functions to Matrix Rows and Columns –Lists –Creating List –General List Operations - Data Frames –Creating Data Frames –Matrix like Operations in Frames –Applying Functions to Data Frames –Factors and Tables - Math and Simulations in R –Input/Output –Reading and Writing Files –Graphics –Creating Three-Dimensional Plots –Linear Models –Non-linear models –Clustering.

Block 2 DATA ANALYSIS USING R AND HADOOP

Features of R Language -HADOOP Features –HDFS and MapReduce architecture –R and Hadoop Integrated Programming Environment-RHIFE - Introduction –Architecture of RHIFE –RHIFE function reference. RHADOOP Introduction –Architecture of RHADOOP –RHADOOP function reference, SQL on HADOOP.

Block 3 ANALYTICS FOR BIG DATA STREAMS

IBM Pure Data Systems –Netezza's Design Principles –The Netezza Appliance –Extending the Netezza Analytics –Real-Time Analytical Processing - InfoSphere Streams Basics –InfoSphereStreams Working –enterprise class –industry use cases –Indexing Data from Multiple Sources.

Block 4 PROGRAMMING WITH PIG

Introduction –installation and execution –PIG Data Model –PIG Latin –Input, Output-Relational Operators –User Defined Functions –Join Implementations - Integrating Pig with Legacy Code and Map Reduce –Developing and Testing Pig Latin Scripts –Embedding Pig Latin in Python –Evaluation Function in Java-Load Functions –Store Functions.

Block 5 PROGRAMMING WITH HIVE

Introduction –Data Types and File Formats –Databases in Hive –HiveQL - Data Definition –Data Manipulation –Queries –Views –Indexes –Schema Design.

References:

- Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
- Tom White "Hadoop: The Definitive Guide" Third Edition, O'Reilly Media, 2011.
- Zikopoulos, P., Parasuraman, K., Deutsch, T., Giles, J., & Corrigan, D.V Harness the Power of Big Data The IBM Big Data Platform. McGraw Hill Professional, 2012.
- Prajapati, V, "Big Data Analytics with R and Hadoop", Packt Publishing Ltd, 2013.
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- Capriolo, E., Wampler, D., & Rutherglen, J., "Programming Hive", O'ReillyMedia, Inc.",2012
- Norman Matloff , "The Art of R Programming: A Tour of Statistical Software Design", NoStarch Press, 2011.
- Jared P. Lander, "R for Everyone: Advanced Analytics and Graphics", Addison-Wesley Data & Analytics Series, 2013.



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B. C. A. SYLLABUS - III YEAR (Elective II)

COURSE TITLE	: Financial Accounting
COURSE CODE	: BCAPE-07
COURSE CREDIT	: 3

COURSE OBJECTIVES

While studying the Financial Accounting course, the student shall be able to:

- » Know about the basic concepts of Accounting and its functions
- » Gain knowledge about the various types of Accounting
- » Learn about flow analysis
- » Understand about the theory of budgeting and costing

COURSE OUTCOMES

After completion of the Financial Accounting course, the student can be able to:

- » Understand the basic concepts of Accounting and its functions
- » Acquire knowledge about the various types of Accounting
- » Learn about flow analysis
- » Know about theory of budgeting and costing

Block 1 ACCOUNTING AND ITS FUNCTION

Fundamentals of Accounting: Principle of Accounting - Accounting and its Function: Double Entry Book Keeping - Ledger – Trial Balance – Rectification of Errors – Trading Profit and Loss Account – Balance Sheet - Journal – Rules of Journalising.

Block 2 TYPES

Financial concepts : Financial Statement – Nature of Financial Statements – Limitations of Financial Statements - Types of Analysis – Tools of Analysis – Trend Analysis – Comparative Statement.

Block 3 FLOW ANALYSIS

Ratio Analysis: Types of Ratio – Factors affecting efficiency of Ratio – Limitations of Ratio - Fund Flow Analysis - Cash Flow Analysis.

Block 4 COSTING BUDGETING

Costing: Marginal Costing – Break even analysis – Application of Marginal Costing – Limitations

Block 5 BUDGETING

Budgeting: Importance of Budgeting – Budget factors.

References:

- Advanced Accountancy, R.L.Gupta, and M.Radhasamy, Sultan Chand & Sons.
- Principles of Management Accounting, Man Mohan and Goyal.
- Studies in Cost Accounting, P. Das Gupta, Premier Book company.



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B. C. A. SYLLABUS - III YEAR (Elective II)

COURSE TITLE	: Data Mining
COURSE CODE	: BCAPE-08
COURSE CREDIT	: 3

COURSE OBJECTIVES

While studying the Data Warehousing and Data Mining course, the student shall be able to

- » Understand the need for Knowledge Discovery and Gain Insight on the Techniques for Data Preprocessing.
- » Gain Knowledge on Schemas of a Data Warehouse, OLAP and Cube Technology.
- » Understand the Methods for Mining Frequent Patterns, Associations and Correlations.
- » Gain Knowledge on the Basic Concepts and Methods for Classification.
- » Gain Knowledge on the Basic Concepts and Methods for Data Clustering.

COURSE OUTCOMES

After completion of the Data Warehousing and Data Mining, the student can able to:

- » Know the need for Knowledge Discovery and Gain Insight on the Techniques for Data Preprocessing.
- » Gain Knowledge on Schemas of a Data Warehouse, OLAP and Cube Technology.
- » Learning the Methods for Mining Frequent Patterns, Associations and Correlations.
- » Acquire Knowledge on the Basic Concepts and Methods for Classification.
- » Acquire Knowledge on the Basic Concepts and Methods for Data Clustering.

Block 1 Introduction

Introduction – Kinds of Data and Patterns That Can Be Mined – Technologies Used – Kinds of Applications Targeted – Major Issues in Data Mining – Data Objects and Attribute Types – Basic Statistical Description of Data – Data Visualization – Measuring Data Similarity and Dissimilarity – Data Preprocessing – Data Cleaning – Data Integration – Data Reduction – Data Transformation and Data Discretization.

Block 2 Data warehouse

Data warehouse – Basic Concepts – Operational Database Systems and Data Warehouses – Architecture of a Data Warehouse – Extract, Transform and Load – Metadata – Data Cube and OLAP – Multidimensional Data Model – Star Schema – Snowflake Schema – Starflake Schema – Fact Constellation Schema – Dimensions – Measures – OLAP Operations – Starnet Query Model for Querying Multidimensional Databases – Data Warehouse Design and Usage – Data Warehouse Implementation – ROLAP – MOLAP – HOLAP – Data Generalization by Attribute-Oriented Induction – Data Cube Technology – Data Cube Computation: Preliminary Concepts – Data Cube Computation Methods – Processing Queries by Exploring Cube Technology – Multidimensional Data Analysis in Cube Space.

Block 3 Mining Frequent Patterns

Mining Frequent Patterns, Associations, and Correlations – Basic Concepts – Market Basket Analysis – Frequent Itemsets, Closed Itemsets, and Association Rules – Frequent Itemset Mining Methods – Apriori Algorithm – Finding Frequent Itemsets by Confined Candidate Generation –

Generating Association Rules from Frequent Itemsets – Improving the Efficiency of Apriori – Pattern-Growth Approach for Mining Frequent Itemsets – Mining Frequent Itemsets Using Vertical Data – Mining Closed and Max Patterns – Pattern Evaluation Methods – Association Analysis to Correlation Analysis – Comparison of Pattern Evaluation Measures – Pattern Mining in Multilevel, Multidimensional Space – Mining Multilevel Associations – Mining Multidimensional Associations – Mining Quantitative Association Rules – Mining Rare Patterns and Negative Patterns – Constraint-Based Frequent Pattern Mining – Metarule-Guided Mining of Association Rules – Constraint-Based Pattern Generation: Pruning Pattern Space and Pruning Data Space.

Block 4 Classification

Classification – General Approach to Classification – Decision Tree Induction – Attribute Selection Measures – Tree Pruning – Scalability and Decision Tree Induction – Visual Mining for Decision Tree Induction – Bayes Classification Methods – Bayes' Theorem – Naïve Bayesian Classification – Rule-Based Classification – Using IF-THEN Rules for Classification – Rule Extraction from a Decision Tree – Rule Induction Using a Sequential Covering Algorithm – Model Evaluation and Selection – Metrics for Evaluating Classifier Performance – Holdout Method and Random Subsampling – Cross-Validation – Bootstrap – Model Selection Using Statistical Tests of Significance – Comparing Classifiers Based on Cost-Benefit and ROC Curves – Techniques to Improve Classification Accuracy – Ensemble Methods – Bagging – Boosting and AdaBoost – Random Forests – Improving Classification Accuracy of Class-Imbalanced Data – Classification by Backpropagation – Support Vector Machines.

Block 5 Cluster Analysis

Cluster Analysis – Requirements for Cluster Analysis – Overview of Basic Clustering Methods – Partitioning Methods – k-Means: A Centroid-Based Technique – k-Medoids: A Representative Object-Based Technique – Hierarchical Methods – Agglomerative versus Divisive Hierarchical Clustering – Distance Measures in Algorithmic Methods – BIRCH: Multiphase Hierarchical Clustering Using Clustering Feature Trees – Chameleon: Multiphase Hierarchical Clustering Using Dynamic Modeling – Probabilistic Hierarchical Clustering – Density-Based Methods – DBSCAN: Density-Based Clustering Based on Connected Regions with High Density – OPTICS: Ordering Points to Identify the Clustering Structure – DENCLUE: Clustering Based on Density Distribution Functions – Grid-Based Methods – STING: STatistical INformation Grid – CLIQUE: An Apriori-like Subspace Clustering Method – Evaluation of Clustering – Assessing Clustering Tendency – Determining the Number of Clusters – Measuring Clustering Quality.

Text Books

- Jiawei Han and Micheline Kamber, "Data Mining: Concepts and Techniques (The Morgan Kaufmann Series in Data Management Systems) 3rd Edition, July 6, 2011.
- Ian H. Witten, Eibe Frank, Mark A. Hall, "Data Mining: Practical Machine Learning Tools and Techniques", Elsevier; Third edition, 2014.
- Jiawei Han, Micheline Kamber, Jian Pei, "Data Mining: Concepts and Techniques", Third Edition, Morgan Kaufmann Publishers, 2011.

References:

- Arun K Pujari, "Data Mining Techniques", Fourth Edition, Orient BlackSwan, 2016.



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B. C. A. SYLLABUS - III YEAR (Non-Major Elective)

COURSE TITLE : Office Automation
COURSE CODE : BCAPN-01
COURSE CREDIT : 2

Block 1 BASICS OF COMPUTER

Unit -1 History & Generation of Computer, Applications of Computer, Advantages of Computer, Characteristics of Computer, Memory Units.

Block 2 MS-WORD

Unit -2 Introduction to word –working with documents
Unit -3 formatting page – formatting paragraph- shortcut keys.

Block 3 MS-EXCEL

Unit -4 MS-Excel: Basics – Menus – Tool Bars
Unit -5 Working with spreadsheets- shortcut keys.

Block 4 MS-POWERPOINT

Unit -6 Introduction to presentation – Templates – Layouts
Unit -7 Creating and Formatting presentation.

Block 5 INTRODUCTION TO INTERNET AND E-MAILS:

Unit- 8 World Wide Web (www) - History, Working-Web Browsers and its functions, Concept of Search Engines, Searching the Web. E-Mail: Creating an email-ID, e-mail reading, saving, printing, forwarding and deleting the mails, checking the mails, viewing and running file attachments, addressing with cc and bcc.

Text Books:

- Sanjay Saxena, —MS-Office 2000 for everyone||, Vikas Publishing House Pvt. Ltd, Reprint 2006.

References

- Nellai Kannan, —MS-Office||, Nels Publications, 3rd Edition, 2004.
- John Walkenbach, Herb Tyson, Michael R.Groh, Faithe Wempen and Lisa A.Bucki , — Microsoft Office 2010 Bible —, Wiley India Pvt. Ltd , Reprint 2010.

Mapping of curriculum for Bachelor of Computer Applications

S.No		BCAP-11	BCAP-12	BCAP -21	BCAP -22	BCAP -23	BCAP -31	BCAP -32	BCAP -41	BCAP -42	BCAP -43	BCAP-44	BCAP -51	BCAP -52	BCAP -53	BCAP -61
1	Fundamental understanding of the field	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	Application of basic computing concepts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	Linkages with related disciplines	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	Skills in related field of specialization	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	Ability to use in Real time problem	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	Skills in Design / Solution modeling	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	Skills in analysis and interpretation of data	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8	Develop investigative Skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	-
9	Skills in problem solving	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	Develop Technical Communication skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-