NEHRU MEMORIAL COLLEGE
(AUTONOMOUS)
PUTHANAMPATTI-621 007

B.C.A

CURRICULUM AND SYLLABI

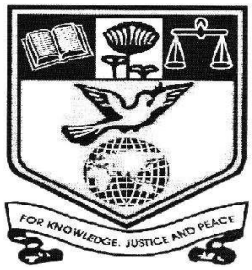
2019-2020

Curriculum and Syllabi for

Bachelor of Computer Applications (BCA)

(To be implemented from the academic year 2019-2020)

(UNDER CHOICE BASED CREDIT SYSTEM-CBCS)



POST GRADUATE AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE

NEHRU MEMORIAL COLLEGE (AUTONOMOUS)
[Nationally Accredited with 'A' Grade by NAAC]
Affiliated to Bharathidasan University
Puthanampatti—621 007

(Approved by Board of Studies in Computer Applications (UG) in its meeting dated 28.09.2018)

VISION

To build highly skilled persons to meet the needs of the IT industry.

MISSION

- To enrich the technical skills
- To excel application development
- To develop as IT professional with ethics and human values.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

The Graduates of BCA programme will be able to

PEO1: Enhance creative and innovative thinking for improving their career.

PEO2: apply computing principles and related domain knowledge to work as a team or individual in IT fields, public and private sectors.

PEO3: apply current tools and techniques to create real world problems.

PEO4: pursue higher studies and professional development in their field.

PROGRAM OUTCOMES (PO)

At the end of the Programme the students will be able to

PO1: Scientific Knowledge: Apply the mathematical and computing knowledge to solve the problems.

PO2: **Problem Analysis**: Conceptualize, analyze and experiment solutions for complex problems.

PO3: Design and Development of Solution: Apply algorithmic and computational knowledge to provide solutions to the problems in diverse domain.

PO4: Conduct investigations of complex problems: Ability to design and develop algorithms by providing solutions to complex problems.

PO5: Modern Tool Usage: Create, select and adapt modern tools to solve real life problems.

PO6: Life Long Learning: Develop the independent and lifelong learning, according to the current socio-technological scenario.

PROGRAM SPECIFIC OUTCOMES (PSO)

PSO1: Apply computational techniques to solve problems in diverse domain

PSO2: Ability to work as a team or individual with professional ethics

PSO3: develop, select or use the algorithms to implement the specified concepts

PSO4: Understand the concepts and ability to design and apply appropriate methods and techniques

Eligibility & Other details:

Eligibility/Entry Requirements: A Pass in10+2 with Mathematics as one of the core subject.

Duration	: 3 Years
Level	: Under Graduate
Examination Type	: Semester Pattern
Medium of Instruction	: English
Credit System	: Total Number of credits=140

Curriculum Framework for the year 2019-2020

SEM	PART	TITILE	HRS	CRE	CIA	EE	TOT
I	I	Language Course - I (Tamil)	6	3	25	75	100
	II	English Language Course - I (English)	6	3	25	75	100
	III	CC - I Programming in C	5	5	25	75	100
		CC - II Programming in C Lab	3	2	40	60	100
		AC - I Statistical Methods	4	4	25	75	100
		AC-II Operations Research for computer applications	4	4	25	75	100
	IV	VE - Value Education	2	2	25	75	100
II	I	Language Course - II (Tamil)	6	3	25	75	100
	II	English Language Course - II (English)	6	3	25	75	100
	III	CC - III Object Oriented Programming Using C++ and Data structures	6	5	25	75	100
		CC – IV C++ and Data structures Lab	3	2	40	60	100
		AC - III Algebra and Calculus	5	4	25	75	100
	IV	SKBC - I Data Analytics	2	2	25	75	100
		EVS - Environmental Science	2	2	25	75	100
III	I	Language Course - III (Tamil)	6	3	25	75	100
	II	English Language Course - III (English)	6	3	25	75	100
	III	CC - V Problem solving using Python	5	5	25	75	100
		CC- VI Python Lab	3	2	40	60	100
		AC - IV Principles of Accountancy	5	4	25	75	100
		AC - V Accounts Package Lab	3	-	-	-	-
	IV	SKBC - II Image Editing	2	2	25	75	100
		GS - Gender Studies	0	1	25	75	100

IV	I	Language Course - IV (Tamil)	6	3	25	75	100
	II	English Language Course – IV(English)	6	3	25	75	100
	III	AC - V Programming using 'R' Lab	3	4	40	60	100
		CC - VII Database Systems	5	5	25	75	100
		CC - VIII RDBMS Lab	3	2	40	60	100
		AC - VI Digital Principles and Fundamentals	5	4	25	75	100
	IV	NMEC I	2	2	25	75	100
		SSC - Soft Skills Course	0	2	25	75	100
V	III	CC - IX Programming in JAVA	6	5	25	75	100
		CC - X Principles of Operating System	5	5	25	75	100
		CC - XI Data and Communication Networks	6	5	25	75	100
		CC - XII Java and System Administrations Lab	6	4	40	60	100
		Elective Course – I	5	5	25	75	100
	IV	NMEC II	2	2	25	75	100
VI	III	CC- XIII Mobile Apps Development	6	5	25	75	100
		CC - XIV Web Technology	6	5	25	75	100
		CC - XV Mobile Apps and Web technology Lab	6	4	40	60	100
		Elective Course – II	5	5	25	75	100
		Elective Course - III	5	5	25	75	100
	IV	EA - Extension Activities	0	1	-	-	-
	III	Technical Skill Development	2	-	-	-	-
			180	140	1105	2895	4000
	III	Comprehensive Course		4*			100

* Additional Credits

Elective Course I	Elective Course II	Elective Course III
Cloud Computing	**Software Engineering**	**Distributed Application Using .NET**
Mobile Commerce	**Artificial Intelligence and Expert System**	**Internet of Things**
Big Data Analytics	**Computer Graphics**	**Soft computing**

SKILL BASED COURSES (SKBC)	
SKBC-I	**Data Analytics Lab**
SKBC-II	**Image Editing Lab**

NON-MAJOR ELECTIVE COURSES(NMEC)	
NMEC-I	**Internet and Web design / BPO and Healthcare**
NMEC-II	**Office Automation Lab/ Image Editing Tools Lab**

CREDIT DISTRIBUTION

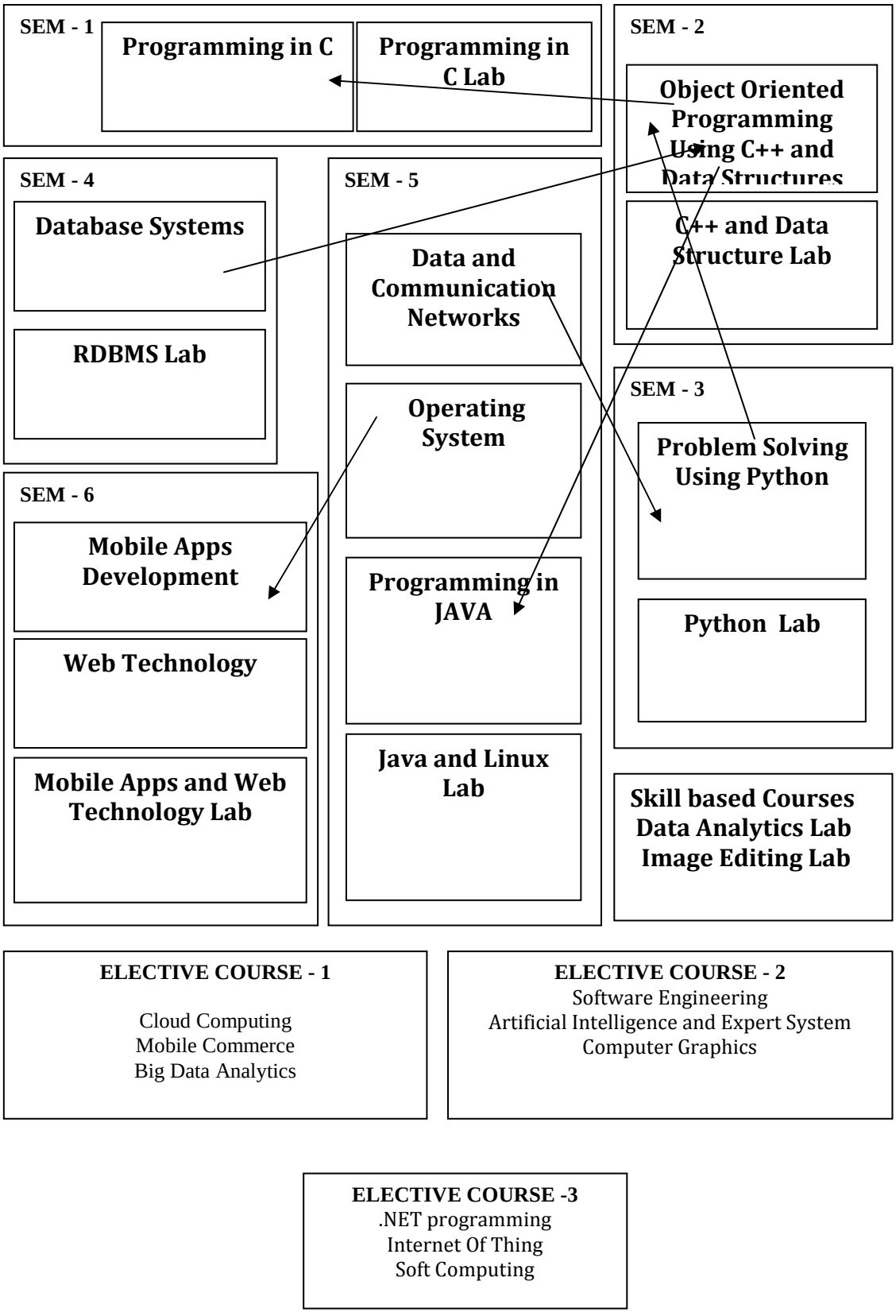
S. No	Course Category	No. of Courses	Credit/course	Total Credit
1	Language courses	4	3	12
2	English language course	4	3	12
3	Core courses	9	5	45
4	Core practical	6	4*2=8	14
			3*2=6	
5	Allied courses	5	4	20
6	Allied practical	1	4	4
7	Elective Courses	3	5	15
8	SKBC	2	2	4
9	NMEC	2	2	4
10	Soft Skill Course	1	2	2
11	EA: Extension Activities	1	1	1
12	Technical Skill Development	1	2	2
13	EVS	1	2	2
14	Value education	1	2	2
15	Gender studies	1	1	1
Total		**42**	**52**	**140**

Average Percentage of the Courses having focus on skills			
Courses	**Skill**	**Employability Skill**	**Knowledge Based**
CC-I Programming in C	**Y**		
CC-II ‘C” Lab		**Y**	
CC-III C++ and DS	**Y**		
C-IV C++ and DS Lab		**Y**	
CC-V Python	**Y**		
CC-VI Python Lab		**Y**	
CC-VII DBS			**Y**
CC-VIII RDBMS Lab		**Y**	
CC-IX JAVA	**Y**		
CC-X Linux OS	**Y**		
CC-XI N/W			**Y**
CC-XII Java and Linux Lab		**Y**	
CC-XIII Mobile Apps	**Y**		
CC-XIV Web tech	**Y**		
CC-XV Web & Mobile App Lab		**Y**	
EC-I (Cloud)	**Y**		
EC-II(SWE)	**Y**		
EC-III(.NET)		**Y**	
SKBC-I		**Y**	
SKBC-II		**Y**	
AC-VII Digital			**Y**
AC-VI ‘R’ Lab		**Y**	
Total (22)	**9**	**10**	**3**
% (100)	**40.91**	**45.45**	**13.63**

Internal and External Assessment Pattern

Theory Papers	
Internal	**External**
Distribution: Assignment - 5 Marks CIA Test-I - 10 Marks CIA Test-II– 10 Marks Total - 25 Marks	External Marks = 75 Question Paper Pattern Section - A 10*2 =20 Marks (Answer all questions) Section - B 5 * 5 =25 Marks (Either or pattern) Section - C 3 *10 = 30 Marks (Answer any 3 questions out of 5 questions)
Practical Courses	
Distribution: Observation - 10 Marks Test 1 -15 Marks Test 2 - 15 Marks Total =40 Marks	Practical - 50 Marks **Distribution** Logic - 30 Marks Coding -10 Marks Execution-10 Marks Record -10 Marks Total - 60 Marks

COURSE DETAILS - PREREQUISITE



Part 1 Tamil - Proposed Course Structure under CBCS
(For the candidate admitted from the academic year 2019-2020 onwards)

Semester	Course	Course Title	Ins. Hrs/ Week	Credits	Exam hrs	Int. Marks	Ext. Marks	Total
I	Language course 1 **(LC 1)**	செய்யுள் (இக்காலம்), சிறுகதை, பயன்முறைத் தமிழ், தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
II	Language course 2 **(LC 2)**	செய்யுள் (இடைக்காலம்), உரைநடை, தமிழ்ச் செம்மொழி வரலாறு, மொழிபெயர்ப்பியல், தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
III	Language course 3 **(LC 3)**	செய்யுள் (காப்பியங்கள்), கட்டுரை இலக்கியம், புதினம் , தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
IV	Language course 4 **(LC4)**	செய்யுள் (பழந்தமிழ் இலக்கியம்) நாடகம், தமிழ் இலக்கிய வரலாறு, கட்டுரை வரைவியல்	6	3	3	25	75	100
	Total		**24**	**12**				**400**

இளநிலைப் பட்டப் படிப்பு (கலையியல், அறிவியல், வணிகவியல் மற்றும் வணிக மேலாண்மையியல்)

முதலாமாண்டு : முதற்பருவம்

பகுதி 1 தமிழ் - தாள் 1

செய்யுள் (இக்காலம்), சிறுகதை, பயன்முறைத் தமிழ், தமிழ் இலக்கிய வரலாறு

பாட நோக்கம் (Course Objectives)

தன்னம்பிக்கை, பொறுப்புணர்வு, சமுதாய அக்கறை, மனித உறவுகளைப் போற்றுதல், சுற்றுச்சூழல் விழிப்புணர்வு, உலக அமைதி, அற உணர்ச்சி, தாய்மொழிப் பற்று முதலான இன்றைய இளம் தலைமுறையினருக்குத் தேவையான அடிப்படைப் பண்புகளைக் கற்பித்தல்.
இக்காலப் படைப்பிலக்கிய வகைமைகளை, படைப்பிலக்கியச் சூழல்களை, படைப்பாளர்களை அறிமுகம் செய்தல்.
பிழையின்றித் தமிழ் எழுதத் தேவையான அடிப்படைகளைக் கற்கச் செய்தல்.

பணித்தேர்வுகளுக்கு உதவக்கூடிய தமிழ்ப் பாடப்பகுதிகளைக் கற்பித்தல்.

அலகு – 1

1. பாரதியார் பாடல்கள் – புதுமைப்பெண் பா.எண்கள் 3,4,5,7,8
2. பாரதிதாசன் பாடல்கள் – எந்நாளோ
3. பெருஞ்சித்திரனார் – தமிழ் நெஞ்சம்
4. தமிழ் ஒளி – மழைக் காலம்
5. முருகுசுந்தரம் – சமுதாய தர்மம்
6. பொன்னடியான் – உள்ளம் உயர....
7. முடியரசன் – மொழியுணர்ச்சி
8. முத்துலிங்கம் – எது தேசியம்
9. தமிழேந்தி – தொண்டின் பழம்
10. தாரா பாரதி – வெறுங்கை என்பது

11. இன்குலாப் – கவலையும் கண்ணீரும் நம்முடன் இருக்கட்டும்

12. நா.காமராசன் - காகிதப்பூக்கள்

13. ஈரோடு தமிழன்பன் – இப்போது நினைந்து

14. தேவதேவன் – நுனிக்கொம்பர் நாரைகள்

15. காசி ஆனந்தன் – தமிழ் மண் வளம்

அலகு – 2

1. அப்துல் ரகுமான் - ஆறாத அறிவு

2. தணிகைச்செல்வன் - சுகம் எங்கே

3. மீரா - உழவன்

4. மு.மேத்தா – கண்ணீரின் கதை

5. சிற்பி - தம்பி உனக்காக

6. வைரமுத்து – கூடு

7. அறிவுமதி - வலி

8. பழநிபாரதி – கண்ணில் தெரியுது வானம், இரத்தத்தின் நிறம் பச்சை

9. பிச்சினிக்காடு இளங்கோ – பகல் நீ, தஸ்லிமா நஸ்ரின்

10. இளம்பிறை – மகளிர் நாள் வாழ்த்துகள், ஆசைகள்

11. சக்தி ஜோதி - நிலவென்று சொல்லாதே, பெண்

12. பாவலர் வையவன் – முறிந்த சிறகு, பாதை மறந்த போதை

13. தாமரை – என்னையும் அழைத்துப் போ, ஒரு கதவும் கொஞ்சம் கள்ளிப்பாலும்

14. ந.வீ.விசயபாரதி - தன்னம்பிக்கைத் தாமரைகள், புன்னகை மந்திரம், அன்புள்ள அம்மா

15. அ.வெண்ணிலா - ஆதியில் சொற்கள் இருந்தன

அலகு : 3

சிறுகதை – சிறுகதை மலர்

அலகு : 4

பயன்முறைத் தமிழ்
பிழைகளும், திருத்தங்களும் - வலிமிகுதல், வலி மிகாமை,
மயங்கொலி எழுத்துகளின் வேறுபாடுகள் - தமிழில் பிறமொழிச் சொற்கள்

அலகு : 5

தமிழ் இலக்கிய வரலாறு – இக்காலம்

கற்றல் விளைவுகள் (Course Outcome)

மாணவர்கள் வாழ்வியல் கூறுகளை அறிந்துகொள்வதோடு,
நற்பண்புகளை வளர்த்துக்கொள்வர்.
இன்றைய இலக்கியப் படைப்புச் சூழலை அறிந்து கொள்வதால்
படைப்பிலக்கியவாதிகளாகும் ஆற்றல் பெறுவர்.
சமுதாய, அரசியல், சூழலியல் விழிப்புணர்வு பெறுவர்.
தாய்மொழியில் திறன் பெறுவர்.

பணித்தேர்வுகளுக்கு உரிய தமிழ்த்திறன் பெறுவர்.

பாட நூல்கள்

1. செய்யுள் திரட்டு, தமிழ்த்துறை வெளியீடு.
2. சிறுகதை மலர் - பிரமி பதிப்பகம், திருச்சி-21.
3. பயன்பாட்டுத் தமிழ் (இலக்கணக் கையேடு), தமிழ் நாதன்
   பதிப்பகம், சென்னை - 110.
4. தமிழ் இலக்கிய வரலாறு,
   முனைவர் கோ.பாக்கியவதி, முனைவர் க.சுந்தரபாண்டியன்,
   பிரமி பதிப்பகம், திருச்சி-21.

B.A/B.SC/B.COM/ BCA/BBA PART II ENGLISH COURSE PATTERN (FROM 2019-2020)

Sem.	Course	Course Title	Hrs / Week	Credits	MAX.MARKS		
					Int.	Ext.	Total
I	Core Course I	English For Communication I	6	3	25	75	100
	Core Course II	English For Communication II	6	3	25	75	100
	Core Course III	English For Communication III	6	3	25	75	100
	Core Course IV	English For Communication IV	6	3	25	75	100
		TOTAL	24	12	200	300	400

Programme Educational objectives (PEO)

Programme Educational Objectives are broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve. PEO's are measured 4-5 years after graduation. The PEO is measured through employer satisfaction survey (yearly), alumni survey and placement records.

PEO 1: Learners will participate in critical conversations and prepare, organize, and deliver their work to the public

PEO 2: They will appreciate the literary works.

PEO 3: The Graduates will attain phonological and morphological aspects of English.

PEO 4: Learners can express a thorough command of English and its linguistic structures.

Program Outcome (PO)

The POs are narrower statements that describe what the students are expected to know and be able to do by the time of graduation. POs are based on relevance.

PO 1 Become knowledgeable in the subject of English for Communication and apply the principles of the same to the needs of the Employer/Institution/Enterprise/ Society.

PO 2: Gain Analytical skills in the field/area of English for Communication.

PO 3: Understand and appreciate professional ethics, community living and Nation Building initiatives.

PO 4: Develop language learning skills like Listening, Speaking, Reading and Writing.

PO 5: Making the Learners to realize their own Identity.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSOs are Statement that describe what the graduates of a specific educational Programme should be able to

PSO1: Design solution to overcome Communication Problems.

PSO 2: Apply Ethical Principles and Commit to Professional Ethics and Responsibilities.

PSO 3: Recognize the need of Extensive Reading Skills.

PSO 4: function as a team and an individual member amicably with other co-workers.

PSO 5: Use English effectively in formal and informal situations.

PSO 6: Develop vocabulary and communicative skills.

Course Code & Title	**ENGLISH FOR COMMUNICATION - I**		
Class	**I YEAR**	**Semester**	**I**
Cognitive Level	**K – 1 Acquire** **K – 2 Understand** **K – 3 Apply** **K – 4 Evaluate** **K – 5 Analyze**		
Course Objectives	**The Course aims** • **To expose students to effective communication in the form of prose** • **To make the learners aware of social issues** • **To help them to know great personalities** • **To make them aware of dangers from human carelessness** • **To help them realize the need for honesty**		
UNIT	**Content**		**No. of Hours**
I	1.Spoken English and Broken English: G.B.Shaw 2. Give us a Role Model : Dr. A.P. J. Abdul Kalam		
II	Water-The Elixir of Life : Sir C. V. Raman No Guarantee Please No Longer : A Newspaper Article		
III	I have a Dream : Martin Luther King Jr. The Gettysburg Address : Abraham Lincoln		
IV	Mosquitoes : Article Polluting the World :Article		
V	A Little Incident : Lu Hsun Jimmy Valentine : O. Henry		

	GRAMMAR: 1. Articles 2. Preposition 3. Adjective 4. Adverb	
Reference	Lessons will be edited and compiled.	
Course Outcomes	On completion of the course, students should be able to CO 1: communicate effectively CO 2: aware of social issues CO 3: know great personalities. CO 4: aware of dangers from human carelessness. CO 5: know the need for honesty	

Mapping of COs with PSOs & POs:

CO/PO	PO					PSO					
	1	2	3	4	5	1	2	3	4	5	6
CO1	S	M	S	M	M	M	S	S	M	M	S
CO2	S	M	M	M	M	S	M	S	M	M	M
CO3	S	M	S	M	M	M	S	S	M	M	S
CO4	S	M	M	M	M	S	M	S	M	M	M
CO5	S	M	S	M	M	M	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark
No Correlation (N) - 0 mark

Course Code & Title	CC-I PROGRAMMING IN C		
	Semester : I	**Credits : 5**	**Hrs/ Wk : 5**
Cognitive Level	**K1–Recall** **K2 –Understand** **K3 –Apply** **K4 – Analyze** **K5 –Create**		

Learning Objectives	**This Course aims to** • Familiarize the basic concepts of Programming and overview of C language • Present the syntax and semantics of 'C' Language. • Imbibe the knowledge of arrays and functions • Inculcate the concepts of structures, union and pre-processing • Demonstrate the fundamentals of pointers and file handling

PREREQUISITE: Basic Maths

UNIT-I: Introduction to Computers: Generation of computers – Types of computers – Components of computers – Types of software – programming languages – algorithms – flowchart – Algorithms and flowcharts for solvingsimple problems - **Overview of C:** History of C – Importance of C – Basic structure of C programs - Character set – C Tokens – Keywords and identifiers – Constants – Variables – Data types – Declaration of variables – Assigning values to variables – Defining symbolic constants – Declaring a variable as constant – Input and Output Functions. **(20Hours)**

Self- study portions: History and importance of C

UNIT-II: Operators: Arithmetic - Relational - Logical - Assignment - Increment and Decrement - Conditional - Bitwise - Special operators - **Expressions :** Arithmetic expressions - Evaluation of expressions - Precedence of Arithmetic operators - Managing I/O operations - Decision Making: Branching-Looping. (**15 Hours)**

Self- study portions: precedence of arithmetic operators

UNIT-III: Arrays: One dimensional array – Declaration – Initialization- Two dimensional array – Declaration – Initialization – User defined Functions: Need for user-defined functions – Elements – Definition - Return values and their types – Function calls – Function declaration – Category of functions – Nesting of functions – Recursion. (**15 Hours)**

UNIT-IV: Structures: Defining a structure – Declaring structure variables – Accessing structure through members – Initialization – Copying and comparing structure variables – Arrays of structures – Unions – Preprocessor. (**10 Hours)**

UNIT-V:Pointers: Understanding pointers – Accessing address of a variable – Declaring pointer variables – Initialization of pointer variables – Accessing a variable through its pointers – Chain of pointers – Pointer expressions – Pointer increment and scalar factor – Pointers and arrays - **File Management in C**: Defining a file – Opening and closing a file – I/O operations on files – Error handling. (**15 Hours)**

Books for Study:

1. S.Jaiswal, "***Information Technology Today***", Galgotia Publications, Fourth *Edition* - 2009 *ISBN* 81-7515-574-4
2. E. Balagurusamy, "***Programming in ANSI C***" — Tata McGraw Hill Publication - Sixth Edition. (For Unit II,III,IV,V) ISBN-13: 978-1259004612

Books for Reference:

1. Alexis Leon & Mathews Leon,"***Fundamentals of InformationTechnology***", 2nd Edition, Vikas Publishing House Private Limited, ISBN: 978818209221.
2. Byron S. Gottfried, "***Programming with C***", Schaum's Outline Series – Tata McGraw- Hill Publication, Second Edition,ISBN-13: 978-0070240353.
3. Yashavant P. Kanetkar, ***"Let us C"***, 13th Edition, BPB, ISBN-13: 978-8183331630.

Web References:

1. https://fresh2refresh.com/c-programming/c-basic-program/
2. https://www.programiz.com/c-programming/examples
3. https://c-language.com/c-tutorial/c-basic-program/

Course outcome:

On the successful completion of the course, students will be able to

CO1: summarize the basic knowledge of programming **K1**
CO2:understand the syntax and semantics of C language **K2**
CO3: apply the concepts of functions and arrays in solving real world problems **K3**
CO4: demonstrate structures, union and pre-processing techniques **K4**
CO5: develop programs using pointers and file concept **K5**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	S	S	M	S	S	S	S	M
CO2	S	S	S	S	W	S	S	M	S	S
CO3	S	S	S	S	M	S	S	M	S	S
CO4	S	S	M	S	M	S	S	S	S	S
CO5	S	S	S	S	M	S	S	M	S	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M)- 2 marks
Weakly Correlating (W)-1 mark

Course Code & Title	CC-IIPROGRAMMING IN C LAB		
	Semester : I	Credits : 2	Hrs/ Wk : 3
Cognitive Level	**K2 –** Understand **K3 –** Apply **K6 –** Create		

Prepared By	Ms.P.Kalpana
Verified By	Dr.M.Muralidharan

Learning Objectives	**This Course aims to** • imbibe the in-depth practical experience in basics of "C" programming • give hands on training in pointers, structures and files. • create simple real life applications in C.

Solve Problems using

1. Operators and expression
2. Control structures
3. Arrays
4. Functions
5. Storage Classes
6. Structure
7. Union
8. Pointers
9. File Management

Course Outcome:

On the successful completion of the course, students will be able to

CO1: develop and execute programs using Operators and control Structures **K2**
CO2:create programs in C to solve any kind of real world problem **K6**
CO3: Apply the programming concepts of C in the standalone applications. **K3**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	S	S	S	M	S	S	M	S	S
CO2	S	S	M	M	M	S	S	S	M	S
CO3	S	S	S	M	W	S	S	S	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Course Code & Title	AC I- Statistical Methods		
	Semester : I	Credits : 4	Hrs/ Wk : 4

Prepared By	Ms.P.Kalpana
Verified By	Dr.M.Muralidharan

Cognitive Level	**K1–** Acquire **K2 –** Understand **K3 –** Apply **K4 –** Evaluate **K5 –** Analyze	
Course Objectives	**This Course aims to** • train the students to improve the basic concepts in statistics • learn skewness and moments • study correlation and regression analysis • improve knowledge in probability concepts • classify various probability distributions	
UNIT	**Content**	**No. of Hours**
I	Measures of central tendencies and dispersion: Mean,Median, Mode, Standard Deviation, Variance, coefficient of variation.	12
II	Skewness, Moments and Kurtosis.	12
III	Correlation and Regression Analysis: Types of correlation-Karl Pearson's coefficient of correlation, Rank Correlation coefficient-Regression lines-equations.	12
IV	Definition of probability - Axiomatic approach to probability - Addition and Multiplication Theorems - Conditional Probability - Independent Events –Baye'stheorem.	12
V	Random Variables- distribution and density functions- Binomial, Poisson and Normal distributions: Definitions, Moments and Simple problems.	12
Reference	**Text Book:** **S.C. Gupta**, Fundamentals of Statistics, Himalaya Publishing House, 2009. **Unit I :** Ch 5 (5.4 - 5.6, 5.7 - 5.7.1, 5.7.2), Ch 6 (6.9, 6.9.1-6.9.4) **Unit II :** Ch 7 **Unit III :** Ch 8 (8.1 - 8.1.1, 8.4, 8.7), Ch 9 (9.1, 9.2,9.3-9.3.1-9.3.3) **Unit IV :** Ch 12 (12.7-12.11) **Unit V :** Ch 13 (13.1 - 13.5), Ch 14 (14.1-14.4) **Reference Books:** 1. **S.C.Gupta and V.K.Kapoor**, Fundamentals of Statistics, Himalayan publishingHouse, 1992. 2. **S.P.Gupta and V.K.Kapoor**, Statistical Methods, S Chand & Co., 2009.	

Course Outcomes	On completion of the course, students should be able to **CO 1:** acquire the concepts of Mean, Median and Standard deviation**K1** **CO 2**: understand the knowledge of Skewness and Kurtosis, Correlation and Regression Analysis**K2** CO3: analyze various methods to find correlation **K5** **CO 3:** apply the knowledge of axiomatic approach to independent events **K3** **CO 4:** evaluate the Binomial, Poisson and Normal Distribution**K4**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	M	S	S	M	M	S	M
CO2	M	M	S	M	W	S	M	S	M	S
CO3	M	W	S	M	M	S	S	M	M	M
CO4	W	S	M	S	M	S	S	M	M	S

Prepared By	Dr.V.MohanaSelvi
Verified By	Dr.M.Muralidharan

Course Code & Title	AC II- Operations Research for Computer Applications		
	Semester : I	**Credits : 4**	**Hrs/ Wk : 4**
Cognitive Level	**K1–** Acquire **K2 –** Understand **K3 –** Apply **K4 –** Evaluate **K5 –** Analyze		
Course Objectives	**This Course aims to** • understand the concepts of linear programming formulations. • Learn simplex method with different constraints • provide the basic tools of operations research in solving the management problems using Transportation problems. • understand the methods to process jobs using Sequencing problems in mathematics • apply the mathematical approach, network scheduling for decision making.		

UNIT	Content	No. of Hours
I	Linear Programming formulations – Graphical Solutions of two variables – Canonical and Standard forms of LPP.	10
II	Simplex method for <, =, > constraints – Simplex method – Big M method.	10

III	Transportation problem Algorithm – degeneracy algorithm – Degeneracy in TP – Unbalanced TP – Assignment Algorithm – Unbalanced Assignment problem.	11
IV	Sequencing problem - Processing of n jobs through two machines – Processing of n job through three machines – Processing of two jobs through m machines.	11
V	Network – Fulkerson's rule – Measure of activity – PERT computations – CPM computation.	10
Reference	**Text Book:** **KantiSwarup, P.K. Gupta, ManMohan,** Operations Research, Sultan Chand &Company Ltd,11th Edition , 2003. **Unit I :** Ch 1, Ch2 **Unit II :** Ch 3 **Unit III :** Ch 6, Ch 7 (7.1-7.3) **Unit IV :** Ch 10 (10.1-10.5) **Unit V :** Ch 21 **Reference Books:** 1. **A. Taha,** Operations Research, Keerthi Publishing House, 1997. 2. **J. K. Sharma,** Operations Research for Management, NPH, 1992. 3. **Prem Kumar Gupta, D.S. Hira,**Problems in Operations Research, S. Chand, 2010.	

Course Outcomes	On completion of the course, students should be able to **CO1**: convert standard business problems into linear programs.**K1** **CO2**: solve linear programming problems by Graphical solution, Simplex and Big-M method.**K5** **CO3:** apply transportation techniques to find least cost route**K3** **CO4**: apply the fundamental concept of sequencing problem.**K2** **CO5**: evaluate the PERT and CPM.**K4**

Prepared By	Dr.V.MohanaSelvi
Verified By	Dr.M.Muralidharan

Mapping of Cos with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	M	S	M	S	S	M	M	S	S
CO2	S	S	M	S	W	S	M	S	M	S
CO3	S	S	M	M	S	S	M	S	M	S
CO4	M	W	S	M	M	S	S	M	M	M
CO5	M	S	M	S	M	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark
No Correlation (N) - 0 mark

இளநிலைப் பட்டப் படிப்பு (கலையியல், அறிவியல், வணிகவியல் மற்றும் வணிக மேலாண்மையியல்)

Semester	Course	Course Title	Ins. Hrs/ Week	Credits	Exam hrs	Int. Marks	Ext. Marks	Total
I	Value Education **(VE)**	வாழ்வியல் கல்வியும் மனித உரிமைகளும் (Value Education and Human Rights)	2	1	3	-	100	100

முதலாமாண்டு : முதற்பருவம்

வாழ்வியல் கல்வியும் மனித உரிமைகளும்

(Value Education and Human Rights)

பாட நோக்கம் (Course Objectives)

தனித்திறன் மேம்பாடு, தன்னம்பிக்கை, நாட்டுப்பற்று, சமுதாயப் பொறுப்புணர்வு, மனித உறவுகளைப் போற்றும் பண்பு, அறச்சிந்தனை முதலான இன்றைய இளம் தலைமுறையினருக்குத் தேவையான அடிப்படை வாழ்வியல் பண்புகளைக் கற்பித்தல்.

கவலை, சினம், பொறாமை,சோம்பல் முதலான தீமை தரும் பண்புகளை விலக்கச் செய்தல்.உடல்நலத்தில் அக்கறை கொள்ளச் செய்தல்.

மனித உரிமைகளை அறியச் செய்தல்.

அலகு :1

வாழ்வியல் கல்வி : திறன் மேம்பாடும் உயர் பண்புகளும்

கல்வி, வாழ்வியல் கல்வியின் நோக்கம் - வாழ்வியல் கல்வியின் பரிணாம வளர்ச்சி - வாழ்வியல் கல்வியின் கூறுகள் - சுய முன்னேற்றம் - திறன் மேம்பாடு - உயர்பண்புகள் - தன்மதிப்பீடும் சுயபரிசோதனையும் - பாலினச் சமத்துவத்தை உளமாரப் பின்பற்றுதல் - மாற்றுத் திறனாளிகள், மனவளம் குன்றியோர், வயதில் பெரியவர்கள், அனுபவசாலிகள், சான்றோர்கள், குடும்ப உறுப்பினர்கள், அருகில் வசிப்பவர்கள், சுற்றத்தார், உடன் பணியாற்றுவோர் இவர்களுக்கு மதிப்பளித்தல் -

நற்பண்புகளும் நடத்தை உருவாக்கமும் - உண்மை - ஆக்கத்திறன் - தியாகம் - நேர்மை - கட்டுப்பாடு - உதவி செய்யும் மனப்பான்மை- - சகிப்புத்தன்மை - அறிவியல் கண்ணோட்டம்

அலகு : 2

தேசிய, உலக முன்னேற்றத்திற்கான வாழ்வியல் கல்வி

தேசம், சர்வ தேசங்கள் குறித்த எண்ணங்கள் - நமது நாடு - அரசமைப்பு - மக்களாட்சித் தத்துவம் - சமதர்மம் - மதச்சார்பின்மை - சமத்துவம் - சமூக நீதி, தனியுரிமை - சுதந்திரமும் சகோதரத்துவமும் சமூகப் பண்புகள் - இரக்கம் மற்றும் நேர்மை, சுயகட்டுப்பாடு, உலகளாவிய சகோதரத்துவம் - தொழில் சார் பண்புகள் - அறிவு வேட்கை - தொழிலில் நேர்மை - முறைமை - காலந்தவறாமையும் நம்பிக்கையும் - மதம் சார்ந்த பண்புகள் - சகிப்புத்தன்மை, மெய்யறிவு, நன்னடத்தை - அழகியல் பண்புகள் - இலக்கியம், நுண்கலைகள் ஆகியவற்றைப் பயில்தல், சுவைத்தல், மனதாரப் பாராட்டுதல் மதித்தல், பாதுகாத்தல், தேசிய ஒருமைப்பாடும் சர்வதேசப் புரிதலும்.

அலகு : 3

அறப்பண்புகள் மற்றும் வாழ்வியலில் உலகளாவிய பெருவளர்ச்சிகள் ஏற்படுத்தும் தாக்கங்கள்

அறிவியல் வளர்ச்சியின் தாக்கங்கள் - பன்பண்பாட்டு முரண்பாடுகளின் தாக்கங்கள் - பொருளியல் சிந்தனைகள் - மக்கள் தொடர்புச் சாதனங்கள் - இளமை உணர்ச்சி வேக நடத்தையின் நவீன அறைகூவல்கள் - இல்லறமும் நல்லுணர்வும் - ஒப்பீடும் போட்டி இடுதலும் - நேர்மறை, எதிர்மறை எண்ணங்கள் - அகந்தை - சினம் - சுயநலம் - அறைகூவல்கள்

அலகு : 4

உடல், உள்ள நலமும்

நோய் தீர்க்கும் செயல்பாடுகளும் உணவுப் பழக்கமும் உணவு முறைகளும் - பொருந்தும் உணவுகள் - பொருந்தா உணவுகள் - மனக் கட்டுப்பாடு - மனத்திண்மை - எளிய உடற்பயிற்சி - தியானம் - மனம், ஆன்மா சார்ந்த விளைவுகள் - யோகா - நோக்கங்கள் - வகைகள் - முறைகள் - ஆசனங்கள் - ஆசைகளை ஒழுங்குபடுத்துதல் - கவலை நீக்குதல் - சினம் தணிதல் - நெடுநீர், மறதி, சோம்பல் தவிர்த்தல் - தூக்கம் முறைப்படுத்துதல் - துக்கம், இழப்புகளை எதிர்கொள்ளல் - புகை, மது முதலானவைகளின் தீங்கு உணர்தல்- வாழ்த்துகளின் பயன்கள்
குறிப்பு : இந்த அலகு உடற்பயிற்சி : தியானம் - யோகா செய்முறைப் பயற்சிகளுடன் கூடியது.

அலகு : 5

மனித உரிமை, மனித உரிமைக் கருத்துகள்

தேசிய மற்றும் பன்னாட்டுக் கண்ணோட்டங்கள் - மனித உரிமையின் பரிணாமம் - மனித உரிமையின் பரந்த வகைப்பாடுகள் வாழ்தற்கான உரிமை, சுதந்திரம், கண்ணியத்துடன் வாழ்வதற்கான உரிமைகள் - கலாச்சாரம் மற்றும் கல்விக்கான உரிமைகள் - பொருளாதார உரிமைகள் - அரசியல் உரிமைகள் - சமூக உரிமைகள் - பெண்கள் மற்றும் குழந்தைகளின் மனித உரிமை - சமூகப் பழக்கங்களும் அரசியலமைப்புப் பாதுகாப்புகளும்.

கற்றல் விளைவுகள் (Course OutCome)

மாணவர்கள் வாழ்வியல் கூறுகளை அறிந்துகொள்வதோடு நற்பண்புகளை வளர்த்துக்கொள்வர். தீமை தரும் பண்புகளை அறிந்து அவற்றிலிருந்து தம்மைக் காத்துக்கொள்வர்.
உடல்நலத்தில் அக்கறை கொள்வர்.
மனித உரிமைகளை அறிந்து கொள்வர்.

பாடநூல்

வாழ்வியல் கல்வியும் மனித உரிமைகளும்,
தமிழ்த்துறை வெளியீடு,
நேரு நினைவுக் கல்லூரி, புத்தனாம்பட்டி.

முதலாமாண்டு : இரண்டாம் பருவம்

பகுதி 1 தமிழ் - தாள் 2

செய்யுள் (இடைக்காலம்), உரைநடை, தமிழ்ச் செம்மொழி வரலாறு, மொழிபெயர்ப்பியல், தமிழ் இலக்கிய வரலாறு

பாட நோக்கம் (Course Objectives)

பக்தி இலக்கியம், சிற்றிலக்கியங்களை அறிமுகம் செய்தல்.

இக்காலத் தமிழ் உரைநடையை அறிமுகம் செய்தல்.

தமிழ்ச் செம்மொழி வரலாற்றைக் கற்கச் செய்தல்.

ஆங்கிலச் சொற்களுக்கு இணையான தமிழ்ச்சொற்களைப் பயன்பாட்டு முறையில் அறியச்செய்தல்.

பணித்தேர்வுகளுக்கு உதவக்கூடிய தமிழ்ப் பாடப்பகுதிகளைக் கற்பித்தல்.

அலகு – 1 இடைக்கால இலக்கியங்கள்

1.தேவாரம் - திருநாவுக்கரசர் தேவாரம்

திருவையாற்றுப் பதிகம் - 3 பாடல்கள்

1. ஏருமதிக் கண்ணி யானை . . . . (பா.எண் -5)
2. விரும்பு மதிக் கண்ணி யானை .. . . . . (பா.எண் -8)
3. திங்கள் மதிக் கண்ணி யானை . . . . . (பா.எண் -10)

தனித்திருத் தாண்டகம் - 4 பாடல்கள்

1. முடிகொண்டார் முளையிளவெண் . . . . (பா.எண் -3)
2. பொக்கணமும் புலித்தோலும் . . . . . (பா.எண் -4)
3. அணிதில்லை அம்பலமா . . . . . (பா.எண் -7)
4. கடையொன்றிற் கங்கையையுந் . . . . . (பா.எண் -10)

2.திருவாசகம் - திருப்பூ வல்லி - 3 பாடல்கள்

1. எந்தை யெந்தாய் சுற்றம் . . . . . (பா.எண் -276)
2. தேனாடு கொன்றை . . . . (பா.எண் -279)
3. வானவன் மாலயன் . . . . (பா.எண் 286)

திருச்சதகம் – 4 பாடல்கள்

1. மெய்தான் அரும்பி .. . . . (பா.எண் -5)
2. நாடகத்தா லுன்னடியார் . . . . (பா.எண் -15)

3. ஆமாறுன் திருவடிக்கே . . . . (பா.எண் -18)
4. வானாது மண்ணாது . . . . . (பா.எண் -19)

3.திருமந்திரம் - 10 பாடல்கள்

1. நான் பெற்ற இன்பம் பெறுக . . . . . (பா.எண் -85)
2. அன்பும் சிவமும் இரண்டென்ப . . . . . (பா.எண் -270)
3. என்பே விறகா இறைச்சி .. . . . . (பா.எண் -272)
4. நிற்கின்ற போதே . . . . . (பா.எண் -292)
5. கல்லாத மூடரைக் காணவும் . . . . . (பா.எண் -317)
6. உள்ளத்தின் உள்ளே . . . . . (பா.எண் -509)
7. உள்ளம் பெருங்கோயில் . . . . . (பா.எண் -823)
8. உடம்பினை யானிருந்து . . . . . (பா.எண் -725)
9. ஒன்றே குலம் ஒருவனே தேவனும் . . . . . (பா.எண் -2103)
10. அறிவுக்கு அழிவில்லை . . . . . (பா.எண் 2358)

4.நாலாயிரத் திவ்ய பிரபந்தம் - 10 பாடல்கள்

குலசேகர ஆழ்வார் - பெருமாள் திருமொழி - நான்காம் திருமொழி

திருவேங்கடத்தில் இருத்தலும் போதியது எனல்

1. ஊனேறு செல்வத்து பா.எண் 677
2. ஆனாத செல்வத்து பா.எண் 678
3. ஒண்பவள வேலை பா.எண் 680
4. மின்னனைய நுண்ணியர் பா. எண் 682
5. வான்ஆளும் மாமதிபோல் பா.எண் 683

வித்துவக்கோட்டு அம்மானை வேண்டி நிற்றல்

1. தருதுயரம் தடாயேல் பா.எண் 688
2. கண்டார் பா.எண் 689
3. மீன் நோக்கும் பா.எண் 690
4. வாளால் அறுத்து பா.எண் 691
5. வெங்களத்தின் பா.எண் 692

5. இயேசு காவியம் - மலைப்பொழிவு

6. தீன் குறள் - இரு அதிகாரங்கள் – நல்லிணக்கம், வரன் தட்சணை

7. கலிங்கத்துப் பரணி - களம் பாடியது - 10 பாடல்கள்

1. தேவாசுரம், இராமாயணம் . . . . . (பா.எண் -473)
2. உடலின் மேல் பல காயம் . . . . . (பா.எண் -476)
3. நெடுங்குதிரை மிசைக் கலணை . . . . . (பா.எண் -477)
4. விருந்தினமும் வறியவரும் . . . . . (பா.எண் -478)
5. மா மழைபோல் பொழிகின்ற . . . . . (பா.எண் -480)
6. தன் கணவருடன் தாமும் .. . . . . (பா.எண் -482)
7. வாய் மடித்துக் கிடந்ததலை . . . . . (பா.எண் -483)
8. பொரு தடக்கை வாள் எங்கே . . . . . (பா.எண் -485)
9. ஆடல் துரங்கம் பிடித்து . . . . . (பா.எண் -486)
10. சாதுரங்கத் தலைவனைப் போர்க் களத்தில் . . . (பா.எண்-502)

8. குற்றாலக் குறவஞ்சி - குறத்தி கூறும் நாட்டு வளம் - 5 பாடல்கள்

1. சூழ மேதி இலங்குந் துறையில் .. . . . . (பா.எண் -3)
2. தக்க பூமிக்கு முன்புள்ள நாடு . . . . . (பா.எண் -5)
3. அஞ்சுநூறு மகம்கொண்ட நாடு . . . . . (பா.எண் -6)
4. மாதம் மூன்றும் மழையுள்ள நாடு . . . . . (பா.எண் -7)
5. நீங்கக் காண்பது சேர்ந்தவர் பாவம் . . . . . (பா.எண் -8)

9. தமிழ் விடுதூது - 110 -120 கண்ணிகள்

அலகு : 2

உரைநடை - காற்றின் கையெழுத்து - பழநிபாரதி

அலகு - 3

தமிழ்ச் செம்மொழி வரலாறு

செம்மொழி விளக்கம் - செம்மொழி வரலாறு - உலகச் செம்மொழிகள் - இந்தியச் செம்மொழிகள் - செம்மொழிக்கான தகுதிகள் அல்லது செம்மொழிப் பண்புகள் - தமிழ்ச் செம்மொழி நூல்கள்.

அலகு - 4

மொழிபெயர்ப்பியல் - ஒரு மடல்(கடிதம்) , ஒரு பத்தி ஆங்கிலத்திலிருந்து தமிழில் மொழிபெயர்த்தல்.

அலகு - 5

தமிழ் இலக்கிய வரலாறு - இடைக்காலம்

கற்றல் விளைவுகள் (Course Outcome)

மாணவர்கள் ஆன்மீகச் சிந்தனையுடன் கூடிய நற்பண்புகளை வளர்த்துக்கொள்வர்.

இடைக்கால இலக்கியப் படைப்புச் சூழலை அறிந்து கொள்வதால் இலக்கிய வரலாற்று அறிவு பெறுவர்.

சமுதாய, அரசியல், சூழலியல் விழிப்புணர்வு பெறுவர்.

தாய்மொழியில் திறன் பெறுவர்.

பணித்தேர்வுகளுக்கு உரிய தமிழ்த்திறன் பெறுவர்.

பாட நூல்கள்

1. செய்யுள் திரட்டு, தமிழ்த்துறை வெளியீடு.
2. தமிழ்ச் சொம்மொழி வரலாறு, முனைவர் மு.சாதிக்பாட்சா, இராஜா பப்ளிகேசன், திருச்சி-23.
3. மொழிபெயர்ப்புகள் (கடிதங்களும் பத்திகளும்) மகிழினி பதிப்பகம், சென்னை- 106.
4. தமிழ் இலக்கிய வரலாறு -பிரமி பதிப்பகம், திருச்சி-21.
5. காற்றின் கையெழுத்து, பழநிபாரதி, தமிழ்நாதன் பதிப்பகம், சென்னை.

Course Code & Title	**ENGLISH FOR COMMUNICATION – II**		
Class	**I YEAR**	**Semester**	**II**
Cognitive Level	**K – 1 Acquire** **K – 2 Understand** **K – 3 Apply** **K – 4 Evaluate** **K – 5 Analyze**		
Course Objectives	**The Course aims** **To expose students to the wisdom of great men** **To familiarize students with the danger of modern food and entertainment** **To make them realize to treat all equally** **To make them know to use science carefully** **To make them understand the need to help others**		
UNIT	**Content**		**No. of Hours**
I	It is Personality that matters : Swami Vivekananda Pele		

II	Fun Food Keep Television at Arm's length	
III	Women not the weaker sex : M.K. Gandhi A Tree Speaks : C. Rajagopalachary	
IV	The Despair of the Ganges : A. Damodharan The Fukushima- Nuclear Disaster :	
V	The Verger : William Somerset Maugham The Selfish Giant : Oscar Wilde	
Reference	Lessons will be edited and compiled.	
Course Outcomes	On completion of the course, students should be able to CO 1: Know the wisdom of great men. CO 2: know the dangers in modern life. CO 3: accept to treat all equally CO 4:realize the need to use science carefully. CO 5: understand the need to help others.	

Mapping of COs with PSOs & POs:

CO/PO	PO					PSO					
	1	2	3	4	5	1	2	3	4	5	6
CO1	S	M	M	M	M	S	M	S	M	M	M
CO2	S	M	S	M	M	M	S	S	M	M	S
CO3	S	M	M	M	M	S	M	S	M	M	M
CO4	S	M	S	M	M	M	S	S	M	M	S
CO5	S	M	M	M	M	S	M	S	M	M	M

Strongly Correlating(S) - 3 marks

Moderately Correlating (M) - 2 marks

Weakly Correlating (W) - 1 mark

No Correlation (N) - 0 mark

Course Code & Title	CC-III OBJECT ORIENTED PROGRAMMING USING C++ AND DATA STRUCTURES		
	Semester : II	**Credits : 5**	**Hrs/ Wk : 6**
Cognitive Level	**K2 –Understand** **K3 – Apply** **K4 –Analyze**		
Learning Objectives	**This Course aims to** • Introduce the basics of object oriented programming and basic syntax of C++ • Provide knowledge about functions, classes and objects, initialization, destruction of objects and usage of overloading • Familiarize the concept of inheritance and polymorphism • Inculcate the usage of file concepts • Familiarize the fundamentals of data structures		

PREREQUISITE: Programming in C, Basic Maths

UNIT-I:

Principles of Object Oriented Programming: Software Evolution – Procedure Oriented Programming – OOP Paradigm – Concepts, Benefits, Object Oriented Languages and Applications – **Structure of C++ program:** – Tokens, Keywords, Identifiers, Data Types, Variables, Manipulators – Expressions – Dynamic Initialization of variables- Reference Variables – Operators – Control Structures.

Self- Study Portions: Tokens, Keywords, Identifiers, Data Types, Variables, Expressions, Dynamic Initialization of variables- Reference Variables – Operators – Control Structures.

(18 Hours)

UNIT-II:

Functions: Main Function – Function Prototyping – Call by Reference – Return by Reference – Constant arguments – Inline Functions – Default Arguments – Function Overloading and ambiguity – Classes and Objects – Array of Objects – Static Data Members and Static Member Function. Constructors and Destructors - Friend Functions – Overloading Unary and Binary Operators – Type Conversions. **(18 Hours)**

UNIT-III:

Inheritance: Single Inheritance – Multiple Inheritance – Hierarchical, Hybrid Inheritance – Polymorphism – Constructors in Derived Classes – Virtual Base Class – Pointers – Virtual Functions – Polymorphism. Managing Console I/O Operations – **Files:** Classes for file Stream operations – Opening, Closing and Processing Files – End of File Detection – File Pointers – Sequential Input and Output Operations. **(18 Hours)**

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UNIT-IV:

Stacks and Queues: Stacks - Stacks using dynamic arrays - Queues - Circular Queues using dynamic arrays. **(18 Hours)**

UNIT-V:

Linked List: Singly linked lists and chains - Representing chains in C - Trees: Introduction - Representation of trees - **Binary Trees:** The Abstract data type - properties of binary trees-Binary tree representations – Binary Tree Traversals. **(18 Hours)**

Book for Study:

1. E. Balagurusamy, *"**Object Oriented Programming with C++"***,Sixth Edition,Tata McGraw Hill Publishing Ltd., New Delhi, *ISBN*-10: 125902993X.
2. Ellis Horowitz, SartajSahni and Susan Anderson-Freed, ***"Fundamentals of Data Structures in C"***, 2nd edition, University Press(India) Pvt. Ltd., Computer Science, Hyderabad, India, ISBN:978 81 7371 605 8

Books for Reference:

1. Robert Lafore, ***"Object Oriented Programming in C++"***,Fourth Edition,Sams Publishing, ISBN-13**:** 978-0672323089.
2. Herbert Schilt, ***"The Complete Reference",*** McGraw-Hill Osborne Media, Ninth Edition (March 11, 2014), ISBN-13: 978-0071808552.

Web Reference:

1. http://www.cplusplus.com/doc/tutorial/
2. https://www.javatpoint.com/cpp-tutorial

https://www.youtube.com/watch?v=vLnPwxZdW4Y

Course Outcome:

Upon successful completion of the course the students will be able to

CO1: Describe the basics of OOP and the syntax of C++ language **K2**

CO2: Apply the knowledge of functions, classes and objects for solving problem in the real world. **K3**

CO3: Experiment the concepts of initialization and destruction of objects and Test the usage of overloading of unary and binary operators **K4**

CO4: Demonstrate the usage of inheritance and polymorphism while solving real time problem **K2**

CO5: Apply file concepts and solve problems related to data files. **K3**

CO6: Implement the fundamental data structures using C++ language **K3**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	S	S	M	S	M	S	S	M
CO2	S	S	S	S	M	S	S	M	S	S
CO3	S	S	S	S	M	S	S	M	S	S
CO4	S	S	S	S	M	S	S	M	S	S
CO5	S	S	S	S	M	S	S	S	S	S
CO6	S	S	S	S	S	S	S	M	S	S

Strongly Correlating(S)-3 marksModerately Correlating (M)- 2 marks
Weakly Correlating (W)- 1 mark

Prepared By	Ms.P.Kalpana
Verified By	Dr.M.Muralidharan

Course Code & Title	CC-IVC++ AND DATA STRUCTURES LAB		
	Semester : II	**Credits : 2**	**Hrs/ Wk : 3**
Cognitive Level	**K2 –** Understand **K3 –** Apply **K6 –** Create		
Learning Objectives	**This Course aims to** • provide practical knowledge in solving simple problems using C++ Language • create programs using OOPs concepts • implement the basic data structures namely stack, queue and linked list using arrays and pointer		

Solve the Problems using

1. Simple Programs (Convert C to C++)
2. Control structures
3. Call by reference & call by value
4. Function Overloading and ambiguity
5. Program using Class and object
6. Array of Object
7. Object as argument
8. Constructor and Destructors
9. Static, abstract classes
10. Friend Function
11. Operator overloading
12. Programs using Inheritance
13. Object pointer
14. Virtual Function
15. Virtual base class
16. Files (Simple Programs)

Implementation of

1. Stack using arrays and pointer
2. Queue using array and pointers
3. Linked List using pointers
4. Trees

Course Outcomes:

Upon successful completion of the course the students will be able to

CO1: apply the concepts to solve problems using C++ programming language **K3**
CO2: implement the basic data structures using C++ **K6**
CO3: solve problems using OOPs concept **K2**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	S	M	S	M	S	S	S	M	S
CO2	S	S	S	M	M	S	S	S	M	S
CO3	S	S	S	M	M	S	S	S	S	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark
No Correlation (N) - 0 mark

Prepared By	Ms.P.Kalpana
Verified By	Dr.M.Muralidharan

Course Code & Title	AC-III Algebra and Calculus		
	Semester : II	**Credits : 4**	**Hrs/ Wk : 5**
Cognitive Level	**K1–** Acquire **K2 –** Understand **K3 –** Apply **K4 –** Evaluate **K5 –** Analyze		
Course Objectives	**This Course aims to** • gain the knowledge about types of matrices • inculcate the knowledge in theorems of differentiation and its applications • study the concepts of integration • solve the problems usindifferential equation • learn Laplace transformation and matrices.		

UNIT	Content	No. of Hours
I	Types of matrices – Characteristic Equation – Eigen values – Eigen vectors – Cayley Hamilton's theorem (without proof).	13
II	Successive differential – Leibnitz's theorem and its application.	13
III	Evaluation of integrals if types 1. $\int \frac{dx}{ax+bx+c}$ 2. $\int \frac{dx}{\sqrt{ax^2+bx+c}}$ 3. $\int \frac{(px+q)dx}{ax^2+bx+c}$ 4. $\int \frac{(px+q)dx}{\sqrt{ax^2+bx}}$ - Integrating by parts – Definite integral and its properties.	13
IV	To solve the second order differential equations when the RHS is of the type e^{kx}, $\sin kx$, $\cos kx$, $x^k, e^{ax}X$.	13
V	Definition of Laplace transform – Laplace transforms of e^{at}, $\cos at, \cos hat$, t^n, first shifting theorem – e^{-at} f(t), f'(t),f''(t) – Inverse transforms relating to the above standard forms.	13
Reference	**Text Books:** **A.Abdul Rasheed**,Allied Mathematics, McGraw Hill education Pvt. Ltd,2006. **Unit I : Ch(3.1,3.3, 3.4)** **Unit II : Ch 6(6.4)** **Unit III : Ch 7(7.3-7.3.1,7.3.2,7.4,7.6).** **Unit IV : Ch 10(10.4)** **Unit V : Ch 12(12.1,12.2).** **Reference Books:** 1. **M.K.Venkatraman,** Engineering Mathematics,NPC-1998 2. **P.Kandasamy, K.Thilagavathy, K.Gunavathy,** Engineering Mathematics, S.Chand& Company Ltd,1987.	

Course Outcomes	On completion of the course, students should be able to **CO1**: Understand the concepts of types of matrices, successive differentiation and Laplace transform. **CO2**: Find the eigen values and vectors, Leibnitz's theorem and its application. **CO3**:solve problems using integration **CO4**: Apply the concepts of Laplace transforms of e^{at}, $\cos at, \cos hat$, t^n and integration by parts and its properties. **CO5**: Solve the second order differential equation of the type e^{kx}, $\sin kx, \cos kx, x^k, e^{ax}X$.

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	M	M	M	S	S	M	M	S	M
CO2	M	M	S	M	W	S	M	S	M	S
CO3	M	S	S	M	M	S	M	M	M	S
CO4	M	W	S	M	M	S	S	M	M	M
CO5	S	S	M	S	M	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark
No Correlation (N) - 0 mark

Prepared By	Dr.MohanaSelvi
Verified By	Dr.M.Muralidharan

Course Code & Title	SKBC – I DATA ANALYTICS LAB		
	Semester : II	**Credits : 2**	**Hrs/ Wk : 2**
Cognitive Level	**K2–**Understand **K3 –** Apply **K6 –** Create		
Learning Objectives	**This Course aims to** • Give practical exposure to built-in functions and charts • Analyze the data using statistical methods and pivot table • Provide in depth practical knowledge in Data Processing.		

PART -1

1. Demonstrate the usage of the following built-in-functions in spreadsheet.
   MAX, SUM, AVERAGE, CONCATENATE, LEN, LOWER, UPPER and TRIM
2. Demonstrate the usage of the following logical functions in spreadsheet.
   AND,OR,NOT, IF and IFERROR
3. Demonstrate any 10 math and trigonometric functions in spreadsheet.
4. Create and demonstrate the usage of a pivot table in spreadsheet.
5. Create a bar-chart for the following data

Region	A	B	C
North	17235	15793	12114
East	12456	6000	5500
South	13122	13623	17224
West	5000	8000	5000

6. Display the transpose of a given matrix using spreadsheet.

PART - 2

7. Add the Data Analysis Toolpak in the spreadsheet.
8. Demonstrate the descriptive statistics in spreadsheet.
9. Perform the Student's T-test in spreadsheet.
10. Find the Correlation between two variables in spreadsheet.
11. Preform Regression analysis in spreadsheet.
12. Generate a Histogram for the data in spreadsheet.

Course Outcomes:

Upon successful completion of the course the students will be able to

CO1: apply built in functions of spread sheet **K3**
CO2:generate charts for the given data in the spreadsheet and use pivot table **K6**
CO4: demonstrate the data analysis using Data Analysis Toolpak in spreadsheet. **K2**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	M	M	S	S	S	S	M	M	S
CO2	S	S	S	S	M	S	S	S	S	S
CO3	S	S	S	M	S	S	S	M	S	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark
No Correlation (N) - 0 mark

Prepared By	Ms.P.Kalpana
Verified By	Dr.M.Muralidharan

இரண்டாமாண்டு : மூன்றாம் பருவம்

பகுதி 1 தமிழ் - தாள் 3

செய்யுள் (காப்பியங்கள்), கட்டுரை இலக்கியம், புதினம், தமிழ் இலக்கிய வரலாறு

பாட நோக்கம் (Course Objectives)

பண்டைத் தமிழரின் அரசியல் நேர்மை, குடிமக்களின் உரிமை, குடிமக்களின் பொறுப்புணர்வு, அறச்சிந்தனைகளை அறியச்செய்தல்.

நேர்மை, பிறருக்கு உதவும் பண்பு, நன்னெறிகளைப் பின்பற்றுதல் முதலான வாழ்வியல் பண்புகளை வளர்த்தல்.

வாழ்வின் எல்லா நிலைகளிலும் திறம்படச் செயலாற்றக் கற்றுத்தருதல்.

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பெண்களை மதிக்கச் செய்தல், சொல்லாடல் திறன் வளர்த்துக்கொள்ள உதவுதல்.

மிகச் சிறந்த தமிழ் உரைநடைகளை அறிமுகம் செய்தல்.

பணித்தேர்வுகளுக்கு உதவக்கூடிய தமிழ்ப் பாடப்பகுதிகளைக் கற்பித்தல்.

அலகு - 1

1. சிலப்பதிகாரம் : வழக்குரை காதை
2. மணிமேகலை : சிறைக்கோட்டத்தை அறக்கோட்டம் ஆக்கிய காதை 3. கம்பராமாயணம் - வாலி வதைப் படலம் – 106 பாடல்கள்

அலகு - 2

1. வில்லிபாரதம் : கன்னபருவம் – பதினேழாம் போர்ச்சருக்கம்- 104பா-ள் 2. சீறாப் புராணம் : மானுக்குப் பிணைநின்ற படலம் - 30 பாடல்கள்

3. தேம்பாவணி - வளன் சனித்த படலம் - 30 பாடல்கள்

4. இராவண காவியம் : இலங்கைக் காண்டம்-அரசியற்படலம் –40 பா-ள்

அலகு : 3 கட்டுரை இலக்கியம் - 'கட்டுரை இலக்கியம்' , பிரமி பதிப்பகம்

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அலகு : 4 புதினம் - வேரில் பழுத்த பலா, சு.சமுத்திரம்

அலகு : 5

தமிழ் இலக்கிய வரலாறு - காப்பிய காலம்

கற்றல் விளைவுகள் (Course Out Come)

மாணவர்கள் நேர்மைப் பண்பு, துணிவுடைமை, சமுதாய அக்கறை உள்ளவர்களாக வளம்பெறுவர்.
இல்லற வாழ்வில் பெண்களை மதித்தல் வேண்டும் என்ற உணர்வு பெறுவர்.

சமுதாய, அரசியல், சூழலியல் விழிப்புணர்வு பெறுவர்.

நல்ல தமிழ் உரைநடையில் பயிற்சி பெறுவர்.

பணித்தேர்வுகளுக்கு உரிய தமிழ்த்திறன் பெறுவர்.

பாடநூல்கள்

1. செய்யுள் திரட்டு, தமிழ்த்துறை வெளியீடு.
2. கட்டுரை இலக்கியம் - பிரமி பதிப்பகம், திருச்சி-21.
3. வேரில் பழுத்த பலா, சு.சமுத்திரம் என்.சி.பி.எச்.வெளியீடு, சென்னை.

தமிழ் இலக்கிய வரலாறு – பிரமி பதிப்பகம், திருச்சி-21.

<table>
<tr><td>Course Code & Title</td><td colspan="3">ENGLISH FOR COMMUNICATION III</td></tr>
<tr><td>Class</td><td><u>II YEAR</u></td><td>Semester</td><td><u>III</u></td></tr>
<tr><td>Cognitive Level</td><td colspan="3">K – 1 Acquire
K – 2 Understand
K – 3 Apply
K – 4 Evaluate
K – 5 Analyze</td></tr>
<tr><td>Course Objectives</td><td colspan="3">The Course aims
• To expose students to vocabulary
• To familiarize students with different levels of meaning.
• To help them to think logically
• To read and analyze a passage
• To make them competent to face an interview</td></tr>
<tr><td>UNIT</td><td colspan="2">Content</td><td>No. of Hours</td></tr>
<tr><td>I</td><td colspan="2">1. Synonyms : 100
2. Antonyms : 100
3. Words that Confuse : 50
4. Single Word Substitution : 100</td><td></td></tr>
<tr><td>II</td><td colspan="2">5. Phrasal verbs : 50
6.Idioms : 50</td><td></td></tr>
<tr><td>III</td><td colspan="2">7. Errors and How to avoid them :100
8. Spotting Errors :100
9. Jumbled Sentences :25</td><td></td></tr>
<tr><td>IV</td><td colspan="2">10. Reading Comprehension : 15
11. Dialogue Writing : 20</td><td></td></tr>
<tr><td>V</td><td colspan="2">12. Letter Writing (Application, Business& Complaints): 15
13. Report Writing : 10
14.Interview Skills
15. Group Discussion</td><td></td></tr>
<tr><td>Reference</td><td colspan="3">Lessons will be edited and compiled.</td></tr>
<tr><td>Course Outcomes</td><td colspan="3">On completion of the course, students should be able to

CO 1: use words correctly.
CO 2: understand different levels of meaning.
CO 3: think logically.
CO 4: analyze a passage.
CO 5: face an interview successfully</td></tr>
</table>

Mapping of COs with PSOs & POs:

CO/PO	PO					PSO					
	1	2	3	4	5	1	2	3	4	5	6
CO1	S	M	S	M	M	M	S	S	M	M	S
CO2	S	M	M	M	M	S	M	S	M	M	M
CO3	S	M	S	M	M	M	S	S	M	M	S
CO4	S	M	M	M	M	S	M	S	M	M	M
CO5	S	M	S	M	M	M	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark
No Correlation (N) - 0 mark

Course Code & Title	CC-V PROBLEM SOLVING USING PYTHON		
	Semester : III	**Credits : 5**	**Hrs/ Wk : 5**
Cognitive Level	**K1–Understand** **K2 –Apply** **K3 – Analyze** **K4 –Create**		
Learning Objectives	**This Course aims to** • understand the basic concepts of Python Programming • give insight for the data structures • imbibe the concepts of file handling and exception handling, overview of standard library and regular expression • elaborate the concepts of OOP • illustrate Tkinter interface		

PREREQUISITE: Basic Maths, C and C++

UNIT-I:

Using python: Installing python- The python Interpreter – Interactive mode –Writing and running programs in script mode- IDLE programming environment **– Input,Processing and Output:** Program Development cycle-input, processing and output – Displaying output with print function -Strings and String literals- Comments – variables –Reading input from the Keyboard - Operators- more about output – Decision structures and Boolean logic – RepetitionStructures **.** **(15 Hours)**

UNIT-II:

Lists and Tuples: Sequences – Introduction to Lists – List slicing – 'in' operator – list methods and built-in-functions – copying lists – processing lists – Two Dimensional Lists – Tuples.**Strings:** Basic String Operations – String Slicing – Testing, Searching and

manipulating strings **-Dictionaries and Set:** Dictionaries – Set – Serializing Objects – **Functions:** introduction to functions – Defining and calling functions – designing a program to use functions – Local variables – passing arguments to functions – Global variable and Global Constants- –Value returning functions: generation – user defined value returning functions – **Modules**: math module-Storing functions in modules(**15 Hours)**

UNIT-III:

File Handling: Introduction to File Input and Output – Using Loops to process files – processing records - Exceptions – Python Standard Library - Regular Expression. (**15 Hours)**

UNIT-IV:

Object Oriented Programming: Procedural and Object Oriented Programming –Classes – Working with instances – techniques for designing classes. – Inheritance: introduction to inheritance – Polymorphism(**15 Hours)**

UNIT-V:

GUI programming: Graphical User Interfaces – Using the TKinter module – Display Text with label Widgets – Organizing widgets with frames – Button widgets and Info Dialog Boxes – Getting input with Entry widget – using Labels with Output Fields –Radio Buttons and Check Buttons – Event Driven Programming.(**15 Hours)**

Book for Study:

Text Books:

1. Tony Gaddis, ***"Starting out with python"***, 2nd edition, Addison-Wesley,2012.ISBN-13: 978-0-13-257637-6 ISBN-10: 0-13-257637-6

Books for Reference:

1. Michael Dawson, ***"Python programming for the absolute beginner"***, Premier press, 2003.
2. Wesley Chun,"***Core python Programming***", Second Edition,Pearson Education-2006,ISBN: 0137061595.
3. Al Sweigart, "***Invent your own computer games with python***", 2nd edition, 2008

Web References:

1. https://docs.python.org/3/tutorial
2. https://www.python-course.eu/python_tkinter.php
3. https://pythonprogramming.net/python-3-tkinter-basics-tutorial/
4. https://www.datacamp.com/community/tutorials/python-oop-tutorial

Course Outcomes:

Upon successful completion of the course the students will be able to

CO1:write programs to solvesimple problems	**K1**
CO2: interpret and manipulate the data structures	**K2**
CO3: store and manipulate data using file system and handling errors	**K3**
CO4: solve problems using OOPs concept	**K2**
CO5: design GUI forms using Tkinter	**K4**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	W	S	S	M	S	S
CO2	S	S	S	M	M	S	S	S	S	S
CO3	S	S	S	S	M	S	S	S	S	S
CO4	S	S	S	S	M	S	S	M	S	M
CO5	S	S	S	S	S	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Course Code & Title	CC-VIPYTHON LAB		
	Semester : III	**Credits : 2**	**Hrs/ Wk : 3**
Cognitive Level	**K1–** Understand **K2 –** Apply **K3–** Create		
Learning Objectives	**This Course aims to** • familiar with Operators and control Structures • generate programs using sequences, functions and modules • execute programs using OOPs concepts and Tkinter Module		

Solve the Problems Using

Operators

Decision making statements

Loops

Data Structures

Functions

Modules

Classes and Objects

Inheritance

Overloading

Regular expressions

Tkinter Module

Prepared By	Mrs.K.PonvelAzhagu Lakshmi
Verified By	Dr.M.Muralidharan

Course Outcomes:

Upon successful completion of the course the students will be able to

CO1: develop and execute programs using Operators and control Structures **K1**
CO2: solve programs using sequences, functions and modules **K2**
CO3: design and execute programs using OOPs concepts and Tkinter Module **K3**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	S	M	S	S	S	S	S	S	S
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	S	S	M	S	S	S	S	M	S

Strongly Correlating(S)- 3 marksModerately Correlating (M)-2 marks
Weakly Correlating (W)-1 mark

Course Code & Title	AC-IV PRINCIPLES OF ACCOUNTANCY		
	Semester : III	**Credits : 4**	**Hrs/ Wk : 5**
Cognitive Level	**K1– Recall** **K2 – Understand** **K3 –Apply** **K6-Create**		
Learning Objectives	**This Course aims to** • enhance the basic knowledge of accounting principles, concepts and conventions. • acquire the knowledge of recording transactions in various subsidiary books. • acquire the skill to prepare the final accounts. • exhibit different methods of depreciation to find productive assets value. • know the concepts of Branch and Departmental accounts.		

UNIT-I:
Introduction-Accounting Concepts and conventions-Journal-Ledger-Trail Balance.
(12 Hours)

UNIT-II:
Subsidiary books- Purchase-Purchase return-Sales, Sales return-Cash Book.**(12 Hours)**

UNIT-III:
Final Accounts of a Solve trader-Adjustments-Outstanding, prepaid expenses and income-Provision on Debtors and Creditors-Interest on Capital and Drawings-Depreciation.**(12 Hours)**

UNIT-IV:
Depreciation-Meaning-Methods-Straight line method-Diminishing balance method-Annuity method-Sinking fund method.**(12 Hours)**

Prepared By	Mrs.K.PonvelAzhagu.Lakshmi
Verified By	Dr.M.Muralidharan

UNIT-V:
Branch Accounts-Departmental Accounts. **(12 Hours)**

Theory-25%, Problems-75%

Book for Study:

1. M.C.Shukla, T.S Grewal S.C.Gupta , "***Advanced Accountancy(vol-1)***" , Chand&CoLTD, New Delhi.

Books for Reference:

1. S.P.Jain and B.L Narang , "***Advanced Accountancy***", Kalyani Publishing, New Delhi.
2. R.L.Gupta and M.Radhaswamy, "***Advanced Accountancy***", S.Chand Publication, New Delhi.
3. M.A.Arulanandham and K.S.Raman, "***Advanced Accountancy*** ",Himalaya Publication,

Course Outcomes:
Upon successful completion of the course the students will be able to

CO1: acquire the concepts of Accounting Concepts and conventions, Journal, Ledger, Trail Balance **K1**

CO2: understand the knowledge of purchase, Purchase return, Sales, Sales return and Cash Book **K2**

CO3:apply accounting concepts in prepaid expenses and outcomes, capital and drawings by solving problems **K3**

CO4: Evaluate the assets and replace thatareenvisaged **K6**

CO5: Exhibit the accounts of branch and departments **K3**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	S	M	S	S	S	S	S	S	S
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	S	S	S	M	S	M	S	S	S
CO4	S	S	S	S	M	S	S	S	M	S
CO5	S	S	S	M	S	S	S	S	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark
No Correlation (N) - 0 mark

Course Code & Title	AC-V ACCOUNTS PACKAGE LAB		
	Semester : III	**Credits : -**	**Hrs/ Wk : 3**
Cognitive Level	**K1– Recall** **K2 – Understand** **K3 –Apply** **K4-Analyze** **K6-Create**		
Learning Objectives	**This Course aims to** • understand the fundamental concepts of manual and computerized Accounting. • acquire the concept of company,Groups and Ledgers • prepare the different types of vouchers and final accounts with adjustments. • demonstrate the skills in inventory management. • generate the reports of cost center and cost category.		

Unit-I:
Fundamentals of Computerized Accounting - Computerized Accountingvs manual accounting – Architecture and Customization of tally – features of tally- configuration of tally.

Unit-II:
Tally Screen and Menus – Creation, Select, Shout, Alter and Delete a company Groups, Ledger creation, Display, Alter and Delete.

Unit-III:
Voucher entry - Different Types of Vouchers – Deleting and editing the vouchers - Trial Balance – Final Accounts with adjustments - Service tax.

Unit-IV:
Introduction to Inventories, Creation, Display, Alter and Delete the Stock Groups, Stock category, Stock Items, Godown, Units of measurement - Different types of vouchers using inventory - FIFO, LIFO method – Average cost – Standard cost - Purchase Orders - sales order - Stock vouchers – VAT calculation (Value Added Tax)

Prepared By	Mrs.LakshmiPriya
Verified By	Mrs.JannathulFirthoes&Dr.M.Muralidharan

Unit-V:

Introduction to Cost, Creation, Edit, Alter and Deletion of Cost Center and Cost cat-egories. Usage of cost category and cost center in voucher entry – Category summary.

Book for Study:

1. A.K Nadhani, K.K. Nadhani, "***Implementing tally 7.2"*** – BPB Publication – New Delhi-1.

Books for Reference:

1. S.V. Srinivasavallabhan, "***Computer application in business"***,– Sultan hand & sons-New Delhi.
2. C.Nellaikannan, "***Tally"***, Nels publications.

Course Outcomes:

Upon successful completion of the course the students will be able to

CO1: Acquire the skills of computerized accounting system **K1**
CO2: Enhance to create the company, groups and ledgers **K2**
CO3: Apply the skills to preparation of final accounts with adjustments **K3**
CO4: Evaluate the concept of inventory management. **K6**
CO5: Analyze the report of cost centers and cost categories. **K4**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	S	M	S	S	S	S	S	S	S
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	S	S	M	S	S	S	S	M	S
CO4	S	M	S	M	S	S	S	M	M	S
CO5	S	M	S	M	S	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark
No Correlation (N) - 0 mark

Prepared By	Mrs.H.LakshmiPriya
Verified By	Ms.JannathulFirthoes&Dr.M.Muralidharan

Course Code & Title	SKBC-IIIMAGE EDITING LAB		
	Semester : III	**Credits : 2**	**Hrs/ Wk : 2**
Cognitive Level	**K1–** Understand **K2 –** Apply **K3–** Create		
Learning Objectives	**This Course aims to** • inculcate knowledge in layer masking and applying various effects in the image • give hands on training to conversion of images fom old to new and vice versa, slicing images and filling patterns • learn various techniques involved in animation.		

Exercises using GIMP

1. Two Images Layer Masking
2. Compose old Images to New Images
3. Convert New Images into old Images
4. Wind Effect on an Image
5. Create own Background Using Various Tools
6. Color Management
7. Pattern Filling
8. Image Slicing with path Tool and Marquee Tool
9. Creating a Blazing Flame Text
10. A simple Animation

Course Outcomes:

Upon successful completion of the course the students will be able to

CO1: apply various animation techniques **K1**
CO2: apply various concepts of image editing using GIMP tool **K2**
CO3: design and execute programs using Animation concepts and different styles. **K3**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	S	M	S	S	S	S	S	S	S
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	S	S	M	S	S	S	S	M	S

Strongly Correlating(S)-3 marksModerately Correlating (M)- 2 marks
Weakly Correlating (W) - 1 mark

Prepared By	Mrs.K.Deepa
Verified By	Dr.M.Muralidharan

இரண்டாமாண்டு : நான்காம் பருவம்

பகுதி 1 தமிழ் - தாள் 4

செய்யுள் (பழந்தமிழ் இலக்கியம்) நாடகம், தமிழ் இலக்கிய வரலாறு, கட்டுரை வரைவியல்

பாட நோக்கம் (Course Objectives)

பழந்தமிழரின் வாழ்வியல் அறம், வாழ்வியல் நுட்பங்கள், அக வாழ்வுச் சிந்தனைகளை அறியச்செய்தல்.

தனித் திறன்களை மேம்படுத்திக் கொள்ள உதவுதல்.

கடமை உணர்ச்சி, பெரியோரை மதித்தல் முதலான உயர்பண்புகளை வளர்த்தல். .

தமிழர்தம் இயற்கை வளம், செல்வ வளம், இலக்கிய வளங்களை அறிமுகம் செய்தல்.

நிகழ்கால வாழ்வியல் சிக்கல்களில் தெளிவுபெறச் செய்தல், சமுதாய அக்கறை கொள்ளச்செய்தல்.

பணித்தேர்வுகளுக்கு உதவக்கூடிய தமிழ்ப் பாடப்பகுதியைக் கற்பித்தல்.

அலகு – 1

1. குறுந்தொகை - 10 பாடல்கள்

குறிஞ்சி

1. நிலத்தினும் பெரிதே . . . . . (பா.எண் -3)
2. வேரல் வேலி .. . . . . (பா.எண் -18)
3. யாயும் ஞாயும் . . . . . (பா.எண் -40)
4. இடிக்கும் கேளிர் . . . . . (பா.எண் -58)

நெய்தல்

1. அணிற்பல் அன்ன . . . . . (பா.எண் -49)
2. ஞாயிறு பட்ட அகல்வாய் . . . . . (பா.எண் -92)
3. கடும்புனல் தொடுத்த . . . . . (பா.எண் -103)

மருதம்

1. தச்சன் செய்த சிறுமா . . . . . (பா.எண் -61)
2. நன்நலம் தொலைய . . . . . (பா.எண் -100)
3. வேம்பின் பைங்காய் . . . . . (பா.எண் -205)

2. நற்றிணை – 5 பாடல்கள்

1. நின்ற சொல்லர் ,.. . . . (குறிஞ்சி) . (பா.எண் -1)
2. விளம்பழம் கமழும் .. . . . (பாலை) . (பா.எண் -12)
3. தடமருப்பு எருமை . . . . (மருதம்) . (பா.எண் 120)
4. விளையாடு ஆயமொடு . . . . (நெய்தல்) . (பா.எண் -172)
5. அம்ம வாழி தோழி . . . . . (முல்லை) . (பா.எண் -289)

3. கலித்தொகை - 5 பாடல்கள்

1. பாலைக் கலி - வயக்குறு மண்டிலம் . . . . . (பா.எண் 24)
2. குறிஞ்சிக் கலி - பாடுகம் வா வாழி தோழி . . . . (பா.எண் 05)
3. மருதக்கலி - ஈண்டு, நீர்மிசைத் தோன்றி . . . . (பா.எண் 24)
4. முல்லைக் கலி - தனி பெறு தண் புலத்துத் . . . . . (பா.எண் 1)
5. நெய்தற் கலி - மா மலர் முண்டகம் .. . . . . (பா.எண் 16)

4. ஐங்குறுநூறு - 10 பாடல்கள்

வேழப்பத்து

1. மனைநடு வயலை வேழம் .. . . (பா.எண் 11)
2. பரியுடை நன்மான் . . . . (பா.எண் 13)
3. ஓங்குபூ வேழத்துத் . . . . (பா.எண் 16)
4. இருஞ்சாய் அன்ன ... . . . (பா.எண் 18)
5. நெகிழ்பு ஓடும் வளை . . . . (பா.எண் 20)

அன்னாய் வாழிப் பத்து

1. அன்னாய் வாழி! வேண்டு அன்னை! நம் படப்பை (பா.எண் 203)
2. அன்னாய் வாழி! வேண்டு அன்னை! அஃதெவன்கொல்?.. (பா. 204)
3. அன்னாய் வாழி! வேண்டு அன்னை! என்தோழி (பா.எண் 206)
4. அன்னாய் வாழி! வேண்டு அன்னை! நன்றும் (பா.எண் 208)
5. அன்னாய் வாழி! வேண்டு அன்னை! கானவர் (பா.எண் 208)

5. புறநானூறு - 5 பாடல்கள்

1. இரும்பனை வெண்தோடு. . . (பா.எண் 54)
2. உண்டாலம்ம இவ்வுலகம்... (பா.எண் 14)
3. யாண்டு பலவாக . . . (பா.எண் 191)
4. யாதும் ஊரே... (பாடல் எண் 192)
5. செய்குவம் கொல்லோ நல்வினை... (பா.எண் 214)

6. பத்துப்பாட்டு - பட்டினப்பாலை முழுவதும்

அலகு - 2

1. திருக்குறள் - 3 அதிகாரங்கள்

1. மடியின்மை
2. இடுக்கண் அழியாமை
3. சொல்வன்மை

2. நாலடியார் - 12 பாடல்கள்

பொறையுடைமை

1. காதலர் சொல்லுங் . . . . (பா.எண் 73)
2. அறிவதறிந்தடங்கி . . . . (பா.எண் 74)
3. இன்னா செயினும் . . . . .. (பா.எண் 76)
4. தான்கெடினும் தக்கார். . . (பா.எண் 80)

தீவினையச்சம்

1. அக்கே போல் அங்கை . . . (பா.எண் 123)
2. நெருப்பழல் சேர்ந்தக் கால் . . . (பா.எண் 124)
3. பெரியவர் கேண்மை . . . (பா.எண் 125)
4. யாஅர் ஒருவர் . . . . (பா.எண் 127)

பெரியாரைப் பிழையாமை

1. பொறுப்பரென் . . . (பா.எண் 161)
2. அவமதிப்பும் ஆன்ற . . . (பா.எண் 163)
3. நளிகடல் தண்சேர்ப்ப . . . . (பா.எண்166)
4. பெரியார் பெருமை . . . . (பா.எண் 170)

3.பழமொழி - 12 பாடல்கள்

அறிவுடைமை

1. அறிவின் மாண்பு .. . . (பா.எண் 27)
2. அறிவினர் மாண்பு(பா.எண் 28)
3. அறிவுடையாருடன் அறிவுடையார் சேர்தல் (பா.எண் 30)
4. அறிவிலாரை அறிவுடையார் புகவிடாமை(பா.எண் 31)

இன்னா செய்யாமை

1. முற்பகல் செய்யின் பிற்பகல் விளையும்(பா.எண்- 47)
2. நலியப் பெற்ற எளியர் அழுத கண்ணீர்(பா.எண் 48)
3. மதிப்பு மிக்கவரை அழிக்க முயலுதல்(பா.எண்-49)
4. நலிந்தாரை நலியாமை(பா.எண் 50)

சான்றோர் இயல்பு

1. சான்றோர் பெருமை(பா.எண் 70)
2. வறுமையினும் நின்ற நிலையில் வழுவாமை(பா.எண் 71)
3. பீடிலாவிடத்தும் பெருந்தகைமையில் வழுவாமை(பா.எண் 72)
4. இடருற்ற விடத்தும் மதிப்பிற் குறையாமை(பா.எண் 73)

4.இன்னா நாற்பது – 5 பாடல்கள்

1. அறமனத்தர் கூறும் கடுமொழி ... . . . (பா.எண் 6)
2. உண்ணாது வைக்கும் பெரும் பொருள் . . . (பா.எண் 16)
3. குலத்துப் பிறந்தவன் கல்லாமை யின்னா . . . (பா.எண் 19)
4. யானையின் மன்னரைக் கண்டால் . . . (பா.எண் 22)
5. பிறன் மனையாள் பின்னோக்கும் பேதைமை யின்னா . . . (பா.எண் 38)

5. இனியவை நாற்பது – 5 பாடல்கள்

1. பிச்சை புக்காயினும் கற்றல் . . . . (பா.எண் 1)
2. மானமழிந்தபின் வாழாமை முன்னினதே . . . (பா.எண் 13)
3. குழவிதளர் நடை காண்டல் இனிதே . . . (பா.எண் 14)
4. வருவா யறிந்து வழங்கல் . . . (பா.எண் 22)
5. பத்து கொடுத்தும் பதியிருந்து ... . (பா.எண் 40)

அலகு : 3

நாடகம் - பிசிராந்தையார் - பாரதிதாசன்

அலகு : 4

கட்டுரை வரைவியல் - பொதுக்கட்டுரைகள்

அலகு : 5

தமிழ் இலக்கிய வரலாறு – சங்க காலம், சங்கம் மருவிய காலம்

கற்றல் விளைவுகள் (Course OutCome)

மாணவர்கள் வாழ்வியல் நுட்பங்களில் வல்லமை பெறுவர்.

சமுதாய அக்கறை உள்ளவர்களாக மனவளம் பெறுவர்.

சமுதாய, பொருளியல், சூழலியல் விழிப்புணர்வு பெறுவர்.

பணித்தேர்வுகளுக்கு உரிய தமிழ்த்திறன் பெறுவர்.

பாடநூல்கள்

1. செய்யுள் திரட்டு, தமிழ்த்துறை வெளியீடு.
2. பிசிராந்தையார் - பாரதிதாசன், தமிழ் நாதன் பதிப்பகம், சென்னை – 110
3. பொதுக்கட்டுரைகள், மகிழினி பதிப்பகம், சென்னை- 106.
4. தமிழ் இலக்கிய வரலாறு,
   பிரமி பதிப்பகம், திருச்சி-21.

Course Code & Title	**ENGLISH FOR COMMUNICTION IV**		
Class	**II YEAR**	**Semester**	**IV**
Cognitive Level	**K – 1 Acquire** **K – 2 Understand** **K – 3 Apply** **K – 4 Evaluate** **K – 5 Analyze**		
Course Objectives	**The Course aims** • **To make the students to live meaningfully** • **To Familiarize students with various great personalities** • **To understand qualities like freedom** • **To know human values like patriotism and universal brotherhood** • **To realize the value of comradeship**		

UNIT	Content	No. of Hours
I	A Poison Tree : William Blake King Bruce and the Spider : Eliza Cook The Character of a Happy Life : Henry Wotton	
II	Ulysses : Lord Alfred Tennyson Money Madness : D. H. Lawrence I wow to thee my Country	
III	The Ocean : Lord Byron The Unknown Citizen : W. H. Auden Night of the Scorpion : Nissim Ezekiel	
IV	The Rising of the Moon : Lady Gregory The Little Man : John Galsworthy The Path Finder : Herman Ould	
V	A Tale of two cities : CharlesDickens	
Reference	Lessons will be edited and compiled.	
Course Outcomes	On completion of the course, students should be able to CO 1: live meaningfully. CO 2: know great qualities like leadership. CO 3: understand qualities like freedom and parenthood CO 4: live as a group in unity CO5: realize the value of comradeship	

Mapping of COs with PSOs & POs:

CO/PO	PO					PSO					
	1	2	3	4	5	1	2	3	4	5	6
CO1	S	M	M	M	M	S	M	S	M	M	M
CO2	S	M	S	M	M	M	S	S	M	M	S
CO3	S	M	M	M	M	S	M	S	M	M	M
CO4	S	M	S	M	M	M	S	S	M	M	S
CO5	S	M	M	M	M	S	M	S	M	M	M

Strongly Correlating(S) - 3 marks

Moderately Correlating (M) - 2 marks

Weakly Correlating (W) - 1 mark

No Correlation (N) - 0 mark

Course Code & Title	CC-VII DATABASE SYSTEMS		
	Semester : IV	**Credits : 5**	**Hrs/ Wk : 5**
Cognitive Level	**K2 –Understand** **K3 – Apply** **K4 –Analysis** **K6 –Create**		
Learning Objectives	**This Course aims to** • introduce the concept of database management and database system architecture • imbibe basic file system • create tables using SQL • apply normalization techniques • introduce the concept of network and hierarchical data base system		

UNIT-I:

An Overview of Database Management: Introduction - Definition Of Database System - Data Independence - Relational Systems. **Database System Architecture** : The Three Levels of the Architecture-Database Administrator-Client Server Architecture- Distributed Processing. **(15 Hours)**

UNIT-II:

Basic File System: Introduction – Factors affecting physical organization of data – Secondary storage devices – Basic Terminology – Disk organization – File organization – Heap, Sequential Indexed sequential – Hashed file organization – key – address – Transformations. **(15 Hours)**

UNIT-III:

Relational Data Model: Basic Definition and terminology – Relational Algebra - SEQUEL or SQL – QUEL - QBE. **TheRelational Calculus:** The tuple Calculus. **(15 Hours)**

UNIT-IV:

Relational Database Design: Functional Dependencies - Introduction - Basic Definitions – Normalization - First, Second, Third Normal Forms-BOYCE / CODD Normal Form. **(15 Hours)**

UNIT-V:

Network and Hierarchical Data Base System: Network Data Model – Introduction – CODASYL model – Commands for data manipulation – Hierarchical Data base system _ IMS Physical Database – TMS External model – The PCB mask – Security – Access control cryptosystem. **(15 Hours)**

Book for Study:

1. C.J.Date,"***An Introduction to Database Systems***", Pearson Education, Seventh Edition 2000. (Unit I – Chapters 1,2. Unit IV – Chapters 10,11). ISBN 81-7808-231-4
2. ArunK.Majumdar&Pritmoy Bhattacharyya, "***Data Base Management System***", Tata McGraw Hill, New Delhi, 1999. (Unit II, Unit III, Unit V) ISBN 0-07-462239-0.

Books for Reference:

1. BepinC.Desai, "***An Introduction to Data base system",*** Galogotia publications Private limited.
2. Ivan Bayross, "SQL ***and PL/SQL",*** BPB Publications, New Delhi.

Web References:

1. https://en.wikibooks.org/wiki/Introduction_to_Computer...Systems/Database
2. https://www.c-sharpcorner.com/UploadFile/.../types-of-database-management-systems/

Course Outcomes:

Upon successful completion of the course the students will be able to

CO1: understand the fundamentals of database system. **K2**

CO2: design and create tables in database and execute queries. **K6**

CO3:apply knowledge about file system. **K3**

CO4: design a database based on a data models using normalization. **K2**

CO5: have knowledge in network and hierarchical data base system. **K4**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	W	S	S	M	S	S
CO2	S	S	S	M	M	S	S	S	S	S
CO3	S	S	S	S	M	S	S	S	S	S
CO4	S	S	S	S	M	S	S	M	S	M
CO5	S	S	S	S	S	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Prepared By	Dr.D.Jayachitra
Verified By	Dr.M.Muralidharan

Course Code & Title	**CC-VIII RDBMS LAB**		
	Semester : III	**Credits : 2**	**Hrs/ Wk : 3**
Cognitive Level	**K2 –** Understand **K3 –** Apply **K4–** Analysis **K6–** Create		
Learning Objectives	**This Course aims to** • populate and query using DDL,DML,DCL,TCL • create tables in database using logical operator, set operator sequence and prepare SQL reports • create implicit and explicit cursor,triggers, procedure and function		

Solve the Problems using

1. DDL Commands
2. DML Commands
3. DCL Commands
4. TCL Commands
5. Queries using operators
    a. Logical operators
    b. SET operators
6. Nested queries using SQL
    a. Sub query
    b. Join Operations
7. Built in functions of SQL
8. Creating views and querying in views
9. Sequences
10. SQL Reports

Solve the Problems using PL/SQL

1. Cursors
    i. Implicit
    ii. Explicit
2. Triggers
3. Functions
4. Procedure

Course Outcomes:
Upon successful completion of the course the students will be able to

CO1: design and implement database schema for the given problem **K3**
CO2: populate and query using DDL,DML,DCL,TCL prepare SQL reports **K4**
CO3:create implicit and explicit cursor. and create triggers, procedures and function to manipulate with required data **K6**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	S	M	S	S	S	S	S	S	S
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	S	S	M	S	S	S	S	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark
No Correlation (N) - 0 mark

Prepared By	Dr.D.Jayachitra
Verified By	Dr.M.Muralidharan

Course Code & Title	AC-VROGRAMMING USING 'R' LAB		
	Semester : IV	**Credits : 4**	**Hrs/ Wk : 3**
Cognitive Level	**K2 –** Understand **K3 –** Apply **K4–** Analysis **K6–** Create		
Learning Objectives	**This Course aims to** • apply the basic concepts to create simple scripts • give practical exposure to various data stuctures • learn the data analysis using 'R' programming		

Solve the problems using

1. Operators
2. Control Structures
3. Switch function
4. User Defined Functions
5. Vector
6. Array
7. Matrix
8. Data Frames
9. Graphs

Course outcomes:

At the end of the course, the student should be able to

CO1: solve simple problems using R scripts **K6**

CO2: apply data structures to solve the given problem **K3**

CO3: parse data files using built-in functions and apply the various statistical functions and to produce high quality graphics **K4,K6**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	S	M	M	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	S	M	S	S	S	S	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark
No Correlation (N) - 0 mark

Prepared By	Ms.P.Kalpana
Verified By	Dr.M.Muralidharan

Course Code & Title	AC-VI DIGITAL PRINCIPLES AND FUNDAMENTALS		
	Semester : IV	**Credits : 4**	**Hrs/ Wk : 5**
Cognitive Level	**K2 –Understand** **K3 – Apply** **K4 –Analysis** **K6 –Create**		
Learning Objectives	**This Course aims to** • introduce the concept of number systems and its conversions. • give exposure to basic logic gates, Boolean logics, design circuits and simplify them. • illustrate the design of combinational circuits and its functions. • explain sequential circuits and its functionalities. • introduce different types of memory.		

PREREQUISITE: None

UNIT-I:

Digital Principles: Definitions for Digital Signals – Digital Computers – Number Systems and Codes: Binary Number System –Binary to Decimal Conversion – Decimal to Binary Conversion – Octal Numbers – Hexa Decimal Numbers – The ASCII Code – The Excess 3 Code – The Gray Code – Error Detection and Correction. Binary Addition– Subtraction – Unsigned Binary Numbers – Sign Magnitude Number – 2's Complement Representation – 2's Complement Arithmetic. **(18 Hours)**

UNIT-II:

Digital Logic: The Basic Gates NOT,OR, AND –Universal Logic gates- NAND, NOR – AND OR Invert Gates – Positive and Negative Logic. Boolean laws and theorems – Sum of Product – K- Map – Simplification Methods – Don't Care Conditions – Product of Sums Method – Product of Sums Simplification. **(14 Hours)**

UNIT-III:

Data Processing Circuits:Multiplexers –Demultiplexers – Decoder: 1 of 16 Decoder, BCD to Decimal Decoders – Encoders – Half Adder, Full Adder – Half Subtractor, FullSubtractor. **(10Hours)**

UNIT-IV:

Sequential Circuits: FLIP FLOPS: RS – Clocked RS – Edge Triggered RS – JK – Master Slave Flip Flop – Registers –Shift Registers – Counters – Asynchronous Counters – Synchronous Counters **(12Hours)**

UNIT-V:

Memory: Basic Terms – magnetic memory – Optical Memory – RAM-ROM-Micro Computer Memory- Memory Hierarchy **(10Hours)**

Books for Study:

1. Albert Paul Malvino, Donald P.Leach, "***Digital Principles and Applications***", McGraw Hill, 1996, ISBN: 0-07-047258-0.(Unit-I - Chapters 1,5,6; Unit-II – Chapters 2,3; Unit-III –4 Unit V-13.1-13.4)
2. M.Morris Mano "***Computer System Architecture***" Prentice-Hall of India Private Limited. Second Edition. (Unit IV- Chapter 1.5,1.6,2.2,2.4,2.5 Unit-V Chapter 2.6,2.7,12.2 & 12.3)

Book for Reference:

1. Thomas C.Bartee , "***Digital Computer Fundamentals***" McGraw-Hill International Edition, New Delhi 1985.

Course Outcomes:

Upon successful completion of the course the students will be able to

CO1: understand the fundamentals of number system and its conversions. **K2**

CO2: design simplified circuits using Boolean laws and map simplifications. **K6**

CO3:apply the functions of basic gates to design combinational circuits. **K3**

CO4:describe the functions of sequential circuits. **K2**

CO5:categorize memory types and its functions. **K4**

Mapping of COs with POs & PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	W	S	S	M	S	S
CO2	S	S	S	M	M	S	S	S	S	S
CO3	S	S	S	S	M	S	S	S	S	S
CO4	S	S	S	S	M	S	S	M	S	M
CO5	S	S	S	S	S	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Prepared By	Mrs.K.PonvelAzhagu Lakshmi
Verified By	Dr.M.Muralidharan

Course Code & Title	NMEC-I INTERNET AND WEB DESIGN		
	Semester : IV	**Credits : 2**	**Hrs/ Wk : 2**
Cognitive Level	**K2 –Understand** **K3 – Apply** **K4-Analyze** **K6 –Create**		
Learning Objectives	**This Course aims to** • introduce the fundamentals of HTML markup language • familiarize the various sections of HTML document and basic tags • create a HTML document using ordered and unordered lists and Tables • imbibe the knowledge of forms tags and DHTML • give exposure to creating forms and form elements		

UNIT - I:
Introduction to the Internet: Electronic mail- Remote Login-World wide web-Browsers-Introduction to static, dynamic web pages. Introduction to Html: Designing a home page-History of HTML-HTML Documents-Anchor tags-Sample HTML Documents.**(6Hours)**

UNIT - II:
Head and Body sections:Header section-Title -Colorful web page-Comment lines. Designing the body section: Heading-Aligning the headings-Horizontal Rule-Paragraph-Tab Setting-Images and Pictures. **(6Hours)**

UNIT - III:
Ordered and Unordered Lists: List-Unordered lists-Headings in a list-Ordered list-Nested list. Table Handling: Tables-Table creation in HTML-cell spanning - Multiple Rows/Columns-Coloring cells-Column specification.**(6Hours)**

UNIT - IV:
DHTML and Style sheets: Defining styles-Elements of styles-Linking a style sheet to an HTML documents-Inline Styles-Internal and External style sheets-Multiple Styles.Frames: Frameset definition-Frame definition-Nested framesets. **(6Hours)**

UNIT - V:
Forms: Action attribute-Method attribute-Dropdown list-Checkboxes-Radiobuttons-Textfield-Textarea-Password and Hidden fields-Submit and Reset Buttons-Designing simple forms.**(6Hours)**

Books for Study:

1. C.Xavier "***World Wide Web Design with HTML***", McGraw Hill Education, 2000, ISBN: 978004639719.

Books for Reference:

1. Andy Harris, "***HTML, XHTML & CSS All-in-one for Dummies***", 2nd edition, Published by Wiley Publishing, Inc. ISBN: 978-0-470-53755-8, 2011

Course Outcomes:

Upon successful completion of the course the students will be able to

CO1: Understand various text formatting tags **K2**

CO2:categorize head and body section tags **K4**

CO3:explain list and table tags **K3**

CO4: design and develop a static HTML page **K6**

CO5:create a user interface using HTML forms **K6**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	M	M	S	S	M	S	S	M	M	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Prepared By	Mr.P.Velmurugan
Verified By	Dr.M.Muralidharan

Course Code & Title	NMEC-I BPO AND HEALTH CARE		
	Semester : IV	**Credits : 2**	**Hrs/ Wk : 2**
Cognitive Level	**K2 –Understand** **K3 – Apply** **K4 – Analysis**		
Learning Objectives	**This Course aims to** • examine the outsourcing from the perspective of its application and implementation in businesses processes of all sizes • describe BPO as a socio-technical phenomenon • give a detail of the BPO Industry and there by stepping towards detailing the models. • focus on India as an outsourcing destination and briefly discusses relevant functions and sectors in outsourcing. • introduce the Business Process Outsourcing and its applications		

UNIT- I

Introduction to BPO: What is BPO - Features of Outsourcing - Effects of BPO in the global trends of outsourcing opportunities - Types of BPO – Voice & Non-Voice Process – Different BPO Domain -Indian's Strength towards positive outsourcing from US &UK. **(6Hours)**

UNIT -II

USHC Industry: BPO Industry – Employment Opportunities – Employee Structure – Skill Set Required– Contact Centre BPO – Types of Call Centers –Components and working of a Call center – Issues and Problems. **(6Hours)**

UNIT -III

Output Format: Introduction to ANSI and NSF – Objectives - Version & Overview of ANSI - Formats of ANSI - Components & Structure of ANSI - Sample ANSI Layout. **(6Hours)**

UNIT-IV

Quality: Quality concepts - Quality View Point - Statistical Process Control & QC Techniques - Problem Solving Techniques – Quality Management systems- QMA. **(6Hours)**

UNIT-V

Human Resource BPO – Reasons for outsourcing HR – Activities involved in HR BPO – HR Outsourcing Trends – Career in HR BPO – Publishing BPO.**(6Hours)**

Book for study: Material will be provided by the Department

Course Outcomes:

At the end of this course, the student will be able to

CO1:explain the basics of outsourcing with its applications. **K2**
CO2:describe the skill sets required and types of BPO in Industry perspective**.** **K4**
CO3:apply various output formats and layouts. **K3**
CO4:describe quality concepts and SPC **K4**
CO5:illustrate outsourcing trends and HR activities of BPO. **K3**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	M	M	S	S	S	S	S	S
CO3	S	W	S	S	S	S	S	S	S	S
CO4	S	M	M	S	M	S	S	M	W	S
CO5	M	M	M	M	M	S	S	W	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Prepared By	Mrs.V.Priya
Verified By	Dr.M.Muralidharan

Course Code & Title	CC-IX PROGRAMMING IN JAVA		
	Semester : V	**Credits : 5**	**Hrs/ Wk : 6**
Cognitive Level	**K2 –Understand** **K3 – Apply** **K4 –Analysis** **K6 –Create**		
Learning Objectives	**This Course aims to** • identify the distinct properties and features of Object Orientations. • analyze the name space, Exception conditions and concurrency Conditions of JAVA • discussInput/Output functions in java. • investigate GUI Programming and applications. • plan to Develop Java based Applications.		

PREREQUISITE: Programming in C++

UNIT-I:

Fundamentals of JAVA: Basic concepts of OOP – Benefits and Applications of OOP - Java Evolution - Overview of Java language – classes and Objects – Arrays , Strings and Vectors- Constructors - Garbage collection - The finalize method - Method overloading – this, static and final usage - Nested and Inner classes – Inheritance – Method overriding – abstract methods and abstract classes – final methods and final classes. **(25 Hours)**

UNIT-II:

Concepts of Java: Interfaces – Packages – Exception Handling: Types of Exception – try and catch – Nested try – throw and throws – Multithreading: Thread Life Cycle – Thread Exceptions – Thread Priority – Synchronization. **(20 Hours)**

UNIT-III:

I/O Streams: Stream Classes – Byte Stream – Character Stream – I/O Exceptions- Sequential Files. **(10 Hours)**

UNIT-IV:

AWT Package: Window Fundamentals _Working with Frame window –Event handling – Introducing graphics – AWT controls: Labels - TextField – TextArea –Button – CheckBox – Choice – List – ScorllBars – Layout Managers. **(15 Hours)**

UNIT-V:

Applet Programming: Applet Life Cycle – HTML applet tag – Passing parameters to Applets - JavaDatabase Connectivity: Establishing Connection – Creation of data tables – Entering data into the tables – Table Updating – Use of Prepared Statements – Result Sets – Stored Procedures. **(20 Hours)**

Books for Study:

1. Patrick Naughton and Herbert Schildt, "***JAVA – The CompleteReference***", Ninth Edition, Tata-McGraw-Hill, New Delhi, 2002. (Unit I- IV) ISBN: 9780071808569.
2. C. Muthu, "***Programming with Java***", Vijay Nicole Imprints Pvt. Ltd., Chennai, 2004. (Unit V). ISBN 981-254-265-5.

Book for Reference:

1. P. RadhaKrishna,"***Object Oriented Programming through JAVA***", Universities Press, 2007.
2. E. Balagurusamy, "***Programming with Java A Primer 3e***", Tata McGraw Hill Publishing Company Ltd., ISBN 0-07-061713-9.

Web References:

1. URL:http://Docs.oracle.com/javase/tutorials/java/index.html
2. URL:http://javabeginnerstutorial.com/core-java
3. URL:http://www.w3schools.in/java-tutorial/

Course Outcomes:

At the end of the course the student will be able to:

CO1: Identify the distinct properties and features of Object Orientations using JAVA **K4**

CO2: Analyze the name space, Exception conditions and concurrency condition in JAVA using package and Exception handling and Thread. **K4**

CO3: Discuss Input/Output functions with file manipulations using I/O Streams. **K2**

CO4: Analyze GUI programming applications using AWT packages. **K3**

CO5: Plan to Develop Java based Applications using GUI and user interface and database Connectivity **K6**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	M
CO5	S	S	S	S	S	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Prepared By	Mrs.V.Priya
Verified By	Dr.M.Muralidharan

Course Code & Title	CC-X PRINCIPLES OF OPERATING SYSTEMS		
	Semester : V	**Credits : 5**	**Hrs/ Wk : 5**
Cognitive Level	**K2 –Understand** **K3 – Apply** **K4 –Analysis** **K6 –Create**		
Learning Objectives	**This Course aims to** • learn about the types, design, implementation of operating system and I/O programming concepts. • cover the policies of different memory management schemes. • gain knowledge of processor management. • study the concepts of device management. • know about the management of information.		

PREREQUISITE: Data Structures

UNIT-I:

Evolution of Operating systems - Types of Operating System - Different views of OS Design and Implementation of Operating Systems – I/O programming concepts-Interrupt structure & processing. **(15Hours)**

UNIT-II:

Memory Management: - Single Contiguous Allocation-Partitioned Allocation-Relocatable Partitioned Allocation-Paged and Demand paged Memory management-Segmented Memory Management-Segmented and Demand paged Memory Management-Swapping and overlay techniques.**(15Hours)**

UNIT-III:

Processor Management: Job scheduling-process scheduling-Functions and policies-Evaluation of Round Robin Multiprogramming Performance-Process Synchronization-Race condition – Synchronization mechanism – Deadly embrace - Prevention and Detect and Recover methods. **(15Hours)**

UNIT-IV:

Device Management:-Techniques for Device Management- Device Characteristics - I/O Traffic Controller, I/O scheduler, I/O Device Handlers-Virtual Devices - Spooling**.** **(15Hours)**

UNIT-V:

Information Management: Simple File System, General model of a File system, Physical and Logical File systems. **(15 Hours)**

Book for Study:

1. Stuart E.Madnick and John J.Donavan, "***Operating Systems***",Tata McGraw Hill Book Company Ltd, Third Edition, ISBN 0-07-039455-5.

Book for Reference:

1. Milan Milenkovic, *"**Operating Systems (Concepts and Design)"***, Tata McGraw Hill Publishing Company Limited, New Delhi 1999, ISBN 0-07-463272-82.

Web References:

1. www.geeksforgeeks.org
2. www.tutorialspoint.com
3. www.studytonight.com

Course Outcomes:

On the successful completion of the course, students will be able to

CO1:understand the types, design, implementation of operating system and I/O programming concepts. **K2**

CO2: recognize the management of main and virtual memory schemes. **K1**

CO3:analyze different scheduling algorithms. **K3**

CO4: analyze the management of devices. **K3**

CO5: understand information management **K4**

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Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	M	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	M	S	M
CO5	S	S	S	S	S	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Prepared By	Mrs.K.Saraswathi
Verified By	Dr.M.Muralidharan

Course Code & Title	CC-XIDATA and COMMUNICATION NETWORKS		
	Semester : V	**Credits : 5**	**Hrs/ Wk : 6**
Cognitive Level	**K1 -Recall** **K2 –Understand** **K3 – Apply** **K4 –Analysis**		
Learning Objectives	**This Course aims to** • understand the basic concepts of computer Network • learn Signals and conversions • study the concepts of Protocols and switching • understand the Internet communication technology and its protocols • learn TCP/IP protocol suite		

PREREQUISITE: Data structures, Operating Systems

UNIT–I:

Basic Concepts: Line configuration – Topology – Transmission modes – Categories ofnetworks. The OSI model – Functions of the layers – TCP/IP protocol suite (**18 hours**)

UNIT–II:

Signals: Analog and digital data – analog and digital signals – periodic and aperiodicsignals – analog signals – decomposition of a digital signal. **Encoding andModulating:** Digital to digital conversion – analog to digital conversion – digital toanalog conversion – analog-to-analog conversion. **(22 hours)**

UNIT–III:

Data Link Protocols: Asynchronous protocols – synchronous protocols – character oriented protocols – bit oriented protocols **FDDI Switching**: Circuit switching – packet switching – message switching – point-to-point protocol.(**15 hours**)

UNIT–IV:

Networking and internetworking devices: Repeaters – bridges – routers – gate-ways – other devices – routing algorithms – distance vector routing – link state routing.
(**15 hours**)

UNIT-V:

Overview of TCP/IP – network layer – addressing – subnetting – transport layer –client server model – Domain Name System(DNS) – telnet – File Transfer Protocol (FTP) – Trivial File Transfer Protocol (TFTP) – Simple Mail Transfer Protocol(SMTP) – Simple Network Management Protocol (SNMP) – Hypertext Transfer Protocol (HTTP) – World Wide Web (WWW).(**20 hours**)

Books for Study:

1. Behrouz A Forouzan, "***Data Communication and Networking***", 4th edition, Tata McGraw Hill. ISBN: 0072967757

Books for Reference:

1. Andrews S. Tannenbaum, " ***Computer Networks***", , Prentice Hall of India, NewDelhi,July 1998 – 4th Edition.) ISBN 81-203-2175-8.

Web References:

1. http://library.aceondo.net/ebooks/Computer_Science/Data_Communication_and_Networking_by_Behrouz.A.Forouzan_4th.edition.pdf
2. http://iips.icci.edu.iq/images/exam/Computer-Networks---A-Tanenbaum---5th-edition.pdf

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: recognize the basic concepts of computer Network throw OSI Model **K1**
CO2:acquire the knowledge about Signals and conversions **K2**
CO3:analyze the concepts of Data link Protocols and Networking switching and devices **K4**
CO4: illustrate the Internet communication technology and its protocols **K3**
CO5: describe various protocols in TCP/IP suite **K2**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	M	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	M	S	M
CO5	S	M	M	M	M	S	M	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Prepared By	Mrs.V.Priya
Verified By	Dr.S.Mani

Course Code & Title	CC-XIIJAVA AND SYSTEM ADMINISTRATION LAB		
	Semester : V	**Credits : 4**	**Hrs/ Wk : 6**
Cognitive Level	**K2 –Understand** **K3 – Apply** **K4 –Analysis** **K6-Create**		
Learning Objectives	**This Course aims to** • provide a practical exposure in the basics ofJava programming • illustrate Data base connectivity with JAVA • develop shell scripts using LINUX commands.		

Programming in JAVA

Solve the problems using

1. Operators
2. Control structures
3. Arrays
4. String Manipulation
5. Classes and objects
6. Constructors
7. Method Overloading
8. Abstract class
9. Inheritance
10. Method overriding
11. ‘static’, ‘This’, ‘Final’ and ‘super’ keyword
12. Packages
13. Interfaces
14. Exception handling
15. Thread
16. Streams
17. AWT
18. Applet
19. Database connectivity (queries)

System Administration

Linux Basic Commands

Simple Shell Scripts

Usage of date command

Usage of du &df commands

User account management

Shutdown the system

Usage of find, cron, at, wall &crontab

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: solve programs using the basic concepts in JAVA **K2**

CO2: apply JDBC to work with back end and build simple applications **K3,K6**

CO3: apply basic commands and solve simple administrative tasks using LINUX **K4**

Mapping of Cos with PSOs &POs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S

Strongly Correlating(S) - 3 marks

Moderately Correlating (M) - 2 marks

Weakly Correlating (W) - 1 mark

Prepared By	Mrs.V.PriyaMrs..K.Saraswathi
Verified By	Dr.M.Muralidharan

Course Code & Title	EC-I- CLOUD COMPUTING		
	Semester : V	Credits : 5	Hrs/ Wk : 5
Cognitive Level	K1-Recall K2 –Understand K3 – Apply K4 –Analysis		
Learning Objectives	This Course aims to • understand the basic concepts of Cloud Computing • learn the cloud services and developing cloud in different platforms • conversant in developing cloud with reference architecture and cloud security • familiar with collaborating with word, spread sheet and presentation • study the various applications of cloud		

PREREQUISITE: Computer Networks

UNIT- I:

Introduction to Cloud Computing: Introduction to cloud computing – Characteristics of cloud computing – cloud models – Cloud services examples.Cloud concepts and technologies: Virtualization – load balancing – deployment - Replication – Monitoring – Software Defined Networking - Network Function visualization – MapReduce – Identity and Access Management – Service Level Agreement.**(15 Hours)**

UNIT- II:

Cloud services and platforms : Computer Services – Storage Services – DatabaseServices – Application Services – Content Delivery Services – Analytic Services – Deployment and Management Services – Identity and Access Management – Open source Private cloud software. Hadoop and map reduce: Apache Hadoop–HadoopMapReduce Job Execution – Hadoop schedulers – Hadoop Cluster setup.**(15 Hours)**

UNIT- III:

Developing cloud :Cloud Application Design – Introduction – Design Considerationfor cloud Application - Reference Architecture for cloud Applications – Cloud Application Design methodologies – Data Storage Approaches – **Cloud Security :** CSA cloud security Architecture – Authentication – Authorization – Identity and access management – Data security – key management – auditing. **(15 Hours)**

UNIT –IV:

Collaborating on Project Management: Understanding Project Management-Exploring Project Management Applications - **Collaborating on Word Processing**: How Web-Based Word Processing Works - Exploring Web-Based Word Processors - **Collaborating on Spreadsheets:** How Web-Based Spreadsheets Work-Exploring Web-Based Spreadsheets - **Collaborating on Databases:** Understanding Database Management - Exploring Web-Based Databases – **Collaborating on Presentations**: Preparing Presentations Online - Evaluating Web-Based Presentation Applications.**(15 Hours)**

UNIT-V:

Cloud Computing for the family: Centralizing Email Communications-Collaborating on Schedules, Grocery Lists,To-Do Lists,HouseholdBudgets,ContactLists,School Projects – Sharing Family Photos-Collaborating on Calendars - **Storing and SharingFiles and other online contents:** Understanding Cloud Storage-Evaluating OnlineFile-Storage and Sharing Services - Exploring Online Bookmarking Services –**SharingDigital Photographs:** Exploring Online Photo-Editing Applications-ExploringPhoto-Sharing Communities - **Controlling it all with web based Desktops:** Understanding Web-Based Desktops - Evaluating WebBased Desktops. (**15 Hours)**

Books for study:

1. Arshdeepbahga , Vijay madisetti,*"Cloud computing A hands on approach",* Universities Press (India) private limited ,ISBN 978-81-7371- 923-3
2. Michael Miller, ***"Cloud Computing: Web-Based Applications That Change theWay You Work and Collaborate Online",***Que Publication, First Print, August 2008,ISBN-13: 978-0-7897-3803-5 ISBN-10: 0-7897-3803-1

Books for reference:

1. George Reese, "***Cloud Application Architectures***", O'Reilly Publication, First Edition, April 2009, ISBN: 13: 978-81-8404-714-1.

Course Outcomes:

On the successful completion of the course, students will be able to

CO1:explain the characteristics, features and virtualization required for cloud computing **K1**
CO2:illustrate the basic terminology and techniques of cloud computing **K2**
CO3:analyze the usage and security of cloud. **K3**
CO4: explain collaboration on word,presentation and project management **K2**
CO5:apply and understand the different types of cloud apps. **K4**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	M	S	S	S	S	S	S	M	M	S
CO5	S	S	S	S	S	S	S	M	S	M

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Prepared By	Mrs.V.Priya
Verified By	Dr.M.Muralidharan

Course Code & Title	EC-I- MOBILE COMMERCE		
	Semester : V	**Credits : 5**	**Hrs/ Wk : 5**
Cognitive Level	**K1-Recall** **K2 –Understand** **K3 – Apply** **K4 –Analyze**		
Learning Objectives	**This Course aims to** • know about ecommerce and its business models • familiar with types of m-commerce services, benefits and limitations • learn m-commerce framework and the impact of technology • study the applications of m-commerce • inculcate knowledge in B2C services and Business-to-Business m-commerce		

PREREQUISITE: Computer Networks, Commerce

UNIT – I:

Electronic Commerce: Introduction -The e-commerce environment - The e-commerce marketplace -Focus on portals, Location of trading in the marketplace - Commercial arrangement for transactions - Focus on auctions - Business models for e-commerce - Revenue models - Focus on internet start-up companies - the dot-com - E-commerce versus E-business.(**15 Hours)**

UNIT-II:Mobile Commerce

Introduction – Infrastructure Of M– Commerce – Types Of Mobile Commerce Services – Technologies Of Wireless Business – Benefits And Limitations, Support, Mobile Marketing & Advertisement, Non– Internet Applications In M– Commerce – Wireless/ Wired Commerce Comparisons. (**15 Hours)**

UNIT- III: Mobile Commerce:Technology

A Framework For The Study Of Mobile Commerce – NTT Docomo's I– Mode – Wireless Devices For Mobile Commerce – Towards A Classification Framework For Mobile Location Based Services – Wireless Personal And Local Area Networks –The Impact Of Technology Advances On Strategy Formulation In Mobile Communications Networks. (**15 Hours)**

UNIT- IV: Mobile Commerce:Theory and Applications

The Ecology Of Mobile Commerce – The Wireless Application Protocol – Mobile Business Services – Mobile Portal – Factors Influencing The Adoption Of Mobile Gaming Services – Mobile Data Technologies And Small Business Adoption And Diffusion – M–Commerce In The Automotive Industry – **Location Based Services:** Criteria For Adoption And Solution Deployment – The Role Of Mobile Advertising In Building A Brand – M– Commerce Business Models. (**15 Hours)**

UNIT- V: Business –To-Business Mobile Commerce

Enterprise Enablement – Email And Messaging – Field Force Automation (Insurance,Real Estate, Maintenance, Healthcare) – Field Sales Support (Content Access, Inventory) – Asset Tracking And Maintenance/Management – Remote IT Support –Customer Retention (B2C Services, Financial, Special Deals) – Warehouse Automation – Security. **(15 Hours)**

Books for Study:

1. Dave Chaffey, "***E-Business and E-Commerce Management***", Third Edition, 2009, Pearson Education
2. Brian E. Mennecke, Troy J. Strader, "***Mobile Commerce: Technology***, Theory and Applications", Idea Group Inc., IRM press, 2003.
3. P. J. Louis, ***" M-Commerce Crash Course***", McGraw- Hill Companies February 2001.

Books for Reference:

1. Paul May, "***Mobile Commerce: Opportunities, Applications, and Technologiesof Wireless Business"*** Cambridge University Press March 2001
2. Michael P. Papazoglou, Peter M.A. Ribbers, ***'e-business organizational andTechnical foundation ',***Wiley India 2009
3. Dr.Pandey , Saurabh Shukla E***-commerce and Mobile commerce Technologies ,*** Sultan chand,2011

Course Outcomes:

On the successful completion of the course, students will be able to

CO1:understand the concepts of e-Commerce	**K1**
CO2:explain the basic terminology and techniquesof mobile commerce	**K2**
CO3:analyze the usage of mobile commerce.	**K4**
CO4:apply the mobile commerce concepts in applications.	**K3**
CO5: illustrate the services of business-to-business m-commerce	**K2**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	M
CO5	M	M	M	M	S	S	S	M	M	M

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Prepared By	Dr.J.Saigeetha
Verified By	Dr.M.Muralidharan

Course Code & Title	**EC-I- BIG DATA ANALYTICS**		
	Semester : V	**Credits : 5**	**Hrs/ Wk : 5**
Cognitive Level	**K1-Recall** **K2 –Understand** **K3 – Apply** **K4 –Analysis**		
Learning Objectives	**This Course aims to** • learn the characteristics, evolution and challenges of Big Data with its data types • know the technologies in Big data environment • study the data bases used in Big data • give exposure to Hadoop and its eco system • familiar with map reduce and yarn		

PREREQUISITES: Computer networks, Database System

UNIT I:

Introduction to big data: Data, Characteristics of data and Types of digital data: Unstructured, Semi-structured and Structured, Sources of data, Working with unstructured data, Evolution and Definition of big data, Characteristics and Need of big data, Challenges of big data, Data environment versus big data environment **(15 Hours)**

UNIT II:

Big data analytics: Overview of business intelligence, Data science and Analytics, Meaning and Characteristics of big data analytics, Need of big data analytics, Classification of analytics, Challenges to big data analytics, Importance of big data analytics, Basic terminologies in big data environment. **(15 Hours)**

UNIT III:

Big data technologies and Databases: Introduction to NoSQL, Uses, Features and Types, Need, Advantages, Disadvantages and Application of NoSQL, Overview of NewSQL, Comparing SQL, NoSQL and NewSQL, Introduction to MongoDB and its needs, Characteristics of MongoDB, Introduction of apache cassandra and its needs, Characteristics of Cassandra. **(15 Hours)**

UNIT IV:

Hadoop foundation for analytics: History, Needs, Features, Key advantage and Versions of Hadoop, Essential of Hadoop ecosystems, RDBMS versus Hadoop, Key aspects and Components of Hadoop, Hadoop architectures. **(15 Hours)**

UNIT V:

HadoopMapReduce and YARN framework: Introduction to MapReduce, Processing data with Hadoop using MapReduce, Introduction to YARN, Components, Need and Challenges of YARN, Dissecting YARN, MapReduce application, Data serialization and Working with common serialization formats, Big data serialization formats. (**15 Hours)**

Books for Study:

1. Seema Acharya and SubhashiniChellappan, "***Big Data and Analytics***", Wiley India Pvt. Ltd., 2016

Books for Reference:

1. Judith Hurwitz, Alan Nugent, Dr. Fern Halper and Marcia Kaufman, "***Big Data***", Wiley Publications, 2014.
2. SoumendraMohanty, MadhuJagadeesh and HarshaSrivatsa, Apress Media, "***Big Data Imperatives: Enterprise Big Data Warehouse, BI Implementations and Analytics***", Springer Science + Business Media New York, 2013 3.
3. AnandRajaraman, Jure Leskovec, Jeffery D. Ullman, "***Mining of Massive Datasets***", Springer, July 2013.
4. Tom White, "***Hadoop: The definitive Guide***", O'Reilly Media, 2010.

Course Outcomes:
On the successful completion of the course, students will be able to

CO1:understand the concepts and characteristics of Bigdata	**K1**
CO2: Analysis the basic terminology and techniques	**K2**
CO3:understand database with bigdata.	**K3**
CO4:manipulateHadoop frame work	**K4**
CO5: discuss map reduce and Yarn	**K2**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	M
CO5	S	M	S	M	S	S	S	M	S	M

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Verified By	Dr.M.Muralidharan

Course Code & Title	NMEC-IIOFFICE AUTOMATION LAB		
	Semester : V	**Credits : 2**	**Hrs/ Wk : 2**
Cognitive Level	**K1-Recall** **K2 –Understand** **K3 – Apply** **K4 –Analysis** **K6-Create**		
Learning Objectives	**This Course aims to** • introduce the preparation of documentation using word processor • inculcate the knowledge of using spreadsheets for computations • provide the knowledge of preparing presentations		

WORD PROCESSOR

1. i) Create a document, save it and edit the document as follows:
   a. Cut, Copy, Paste options.
   b. Find and Replace options.
   c. Undo and Redo options.

ii) Format the document:
   a. Using Bold, Underline and Italic.
   b. Change Character style and size.
   c. Formatting paragraph: Center, Left aligns & Right align
   d. Changing paragraph and line spacing, Using Bullets and Numbering in Paragraphs.
   e. Creating Hanging Paragraphs

2. Enhance the documents using Header, Footer, Page Setup, Border, Page number, watermarking, Orientation and Print Preview.

3. Insert tables and pictures in a document as follows
   a. Creating Tables in a document, Selecting Rows & Column sort the record
   b. Insert a picture – edit size and add name of the picture above it.
   c. Also do basic text formatting like – bold, italic, underline, alignments etc in table.,

4. Using mail merge, send an invitation /notice (by creating the invitation/notice) for the following situation (at least 5 addresses to be entered) (Any one of the following)
   a. For opening a new branch
   b. Inauguration function
   c. Informing about new scheme or offer

SPREADSHEET

5.a.Create a worksheet, moving/ copying/ inserting/ deleting rows and columns (usage of cut, paste, commands, copying a single cell, copying a range of data, filling up a cell. Undo command, inserting a row, column, deleting rows and columns).
b. Formatting worksheets
Bold, Italic, Font size changing, Auto fill, date format, Currency format.

6. Open an excel and create fields as follows

S.No	Name of the student	M1	M2	M3	M4	M5	Total	Avg	Result	Grade

i. Enter S.No, Name, marks for 10 students
ii. Find total and average using formula.
iii. Find Result whether the student is pass or fail and also assign grade as per our university norms.
iv. Insert a column chart showing the comparison of marks in different subjects of different students.

7. i) Creating and running a macro.
ii) Assigning button to a defined macro.
iii) Editing a macro.

PRESENTATION

8. Create a presentation with apply background/Themes, apply custom animation on text, insert images/word art and animate the images with effects.
9. Create "My album" use photos, audio, and videos with necessary Transition Effects
10. Making an Organization Structure in Power Point Starting an organization chart, Entering names and Titles, Adding Members, Formatting the Boxes, Text and Lines, Rearranging the Org Chart, Finishing the Chart.

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: create documents, apply formatting, editing text and paragraphs	**K1,K6**
CO2: create document with tables and mail merge	**K2**
CO3: use spreadsheet for calculations and apply formatting	**K4**
CO4: apply macro concept	**K3**
CO5: prepare a presentation for a seminar	**K6**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	M	S	M
CO4	S	S	S	S	S	S	S	M	M	S
CO5	S	S	S	S	S	S	S	S	S	S

Strongly Correlating(S)- 3 marksModerately Correlating (M)-2 marks
Weakly Correlating (W)-1 mark

Prepared By	Ms.P.Kalpana
Verified By	Dr.M.Muralidharan

Course Code & Title	NMEC-IIIMAGE EDITING TOOLS LAB		
	Semester : V	**Credits : 2**	**Hrs/ Wk : 2**
Cognitive Level	**K2 –Understand** **K3-Apply** **K6 --Create**		
Learning Objectives	**This Course aims to** • inculcate knowledge in layer masking and applying various effects in the image • give hands on training to conversion of images fom old to new and vice versa, slicing images and filling patterns • learn various techniques involved in animation.		

Exercises using GIMP

1. Two Images Layer Masking
2. Compose old Images to New Images
3. Convert New Images into old Images
4. Wind Effect on an Image
5. Create own Background Using Various Tools
6. Color Management
7. Pattern Filling
8. Image Slicing with path Tool and Marquee Tool
9. Creating a Blazing Flame Text
10. A simple Animation

Course Outcomes:
Upon successful completion of the course the students will be able to

CO1: apply various animation techniques **K3**
CO2: apply various concepts of image editing using GIMP tool **K2**
CO3: design and execute programs using Animation concepts and different styles. **K6**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	S	M	S	S	S	S	S	S	S
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	S	S	M	S	S	S	S	M	S

Prepared By	Mrs.K.Deepa
Verified By	Dr.M.Muralidharan

Course Code & Title	CC- XIII MOBILE APPS DEVELOPMENT		
	Semester : VI	**Credits : 5**	**Hrs/ Wk : 6**
Cognitive Level	**K1-Recall** **K2 –Understand** **K3 – Apply** **K4 –Analysis**		
Learning Objectives	**This Course aims to** • provide thorough introduction to Android. • learn the basic concepts of Android Development tools and Life cycle • impart knowledge about user interfaces • have an exposure about databases and content providers • understand the principles of graphics, messaging, sound , video and publishing the application		

PREREQUISITE: Programming in Java

UNIT - I: Android Introduction:

An Open Platform for Mobile Development – Understanding the android software stock– android development tools – what makes an android application? - Installation of JDK and Android Studio – creating your first android application – Running and debugging applications. **(18 hours)**

UNIT – II: Building Android Applications:

Exploring android project files –Editing project resources - Designing typical android application – Using the application context – working with activities - working with intents – working with dialogs – Logging application information. **(18 hours)**

UNIT - III: Building an Application framework:

Implementing an animated Splash Screen-Implementing Main Menu Screen – Developing the help and scores screen – Building forms to collect user input – Using dialogs to collect user input – Adding Application Logic. **(18 hours)**

UNIT - IV: Enhancing Application with Powerful Android features:

Working with Images and the Camera - Adding Support for Location-Based Services - Adding Basic Network Support - Adding Additional Network Features - Adding Social Features - Creating a Home Screen App Widget. **(18 hours)**

UNIT - V: Databases and Publishing the Application:

Databases: Introducing android database – introducing SQLite – content values and cursors- working with SQLite database - Publishing the Application: Getting Ready to Publish- Publishing on the Android Market. **(18 hours)**

Books for Study:

1. Lauren Darcey, Shane Conder, "***SAMS Teach Yourself Android Application Development in 24 Hours***", Second Edition.ISBN-13: 978-0-672-33569-3ISBN-10: 0-672-33569-7 (Unit I to IV)
2. Reto Meier, "***Professional Android 4 Application Development*** ", WROX Publication- Wiley – India, 2012 (Unit I and V)

Book for Reference

1. Pradeep Kothari &Kogent Learning Solutions Inc, ***" Android Application Development Black Book***", Dreamtech Press, Edition 2014, ISBN:978-93-5119-409-5

Web References

1. https://developer.android.com/guide/
2. https://studytonight.com/android

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: Student has the knowledge on architecture of Android software stock. **K1**
CO2: Student get the exposure about different types of project resources **K1**
CO3: Student can create their own application. **K2**
CO4: Student able to enhance the application with LBS, Network features, etc. **K3**
CO5: Students can generate the APK and Market it in **K4**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	M	S	S	S	M	M
CO3	S	S	S	M	S	M	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	M
CO5	S	S	M	M	S	S	S	S	S	S

Strongly Correlating(S)- 3 marksModerately Correlating (M)- 2 marks
Weakly Correlating (W)- 1 mark

Prepared By	Mr.P.Velmurugan
Verified By	Dr.M.Muralidharan

Course Code & Title	CC- XIV WEB TECHNOLOGY		
	Semester : VI	**Credits : 5**	**Hrs/ Wk : 6**
Cognitive Level	**K1-Recall** **K2 –Understand** **K3 – Apply** **K4 –Analysis** **K6-Create**		
Learning Objectives	**This Course aims to** • introduces the basic concepts of HTML and style sheet • learn how client and server side script works with JavaScript and PHP • incorporate the PHP and MySQL concepts • inculcate the knowledge of interacting with database with PHP • study mysql functions in php and handling and avoiding errors		

PREREQUISITE: Data Base System

UNIT-I

HTML: Basic HTML, The Document body, Text, Hyperlinks, Adding more formatting, Lists, Tables, Using colors and images, Images, Multimedia objects, Frames, Forms-towards interactivity, Cascading Style Sheets: Introduction, Using styles: Simple examples, Defining your own styles, Properties and values in styles. (**18 Hours)**

UNIT-II

Client Side Scripting : JavaScript: JavaScript—The basics, Variables, String manipulation, Mathematical functions, Statements, Operators, Arrays, Functions- Data and objects in java script, Regular expressions, Exception Handling, Built in objects, Events. Dynamic HTML with Java Script: Data validation, Opening a new window, Messages and Confirmations, The status bar, writing to a different frame, Rollover buttons, Moving images, multiple pages in a single download, A text-only menu system, Floating logos. (**18 Hours)**

UNIT-III

Server Side Scripting: PHP: evolution of PHP – structure and syntax of PHP and integrating the same with HTML – comments – variables – data types – operators – control structures – passing information between pages – Strings – Arrays and Functions. (**18 Hours)**

UNIT-IV

MySQL Databases: SQL tutorial(DDL, DML, DCL) - MySQL introduction – data types in MySQL – Pattern Matching – GroupBy – IS NULL – DISTINCT Optimization – Max and Min function – Using auto increment. (**18 Hours)**

UNIT-V

Integration of Apache, MySQL, PHP to design dynamic web pages: MySQLfunctions in PHP – Connecting and disconnecting from MySQL – Using tables – form design – editing the database – Validation – Handling and avoiding errors. (**18 Hours)**

Books for Study:

1. Timothy Boronczyk,Michael, Elizabeth Naramore, Jason Gerner, Yann Le Scouarnec, Jeremy Stolz,, Michael K. Glass "***Beginning PHP6, Apache, MySQLWeb Development***", Wiley Publishing, 2009 Edition.ISBN-13: 978-8126521227.
2. Chris Bates, ***"Web Programming Building Internet Applications"***, Third Edition, Wiley, 2007, ISBN-*10*: 0470017759. Unit- I & II

Books for Reference:

1. Robin Nixon,"***Learning PHP, MySQL &JavaScript With jQuery, CSS & HTML5***"
2. O'Reilly Media, Fourth edition,December 2014, ISBN:978-1-491-91866-1.
3. David R. Brooks, "***An Introduction to HTML and JavaScript for Scientists and Engineers***",Springer-Verlag London Limited 2007, ISBN-13: 978-1-84628-656.
4. Michael K Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz, Jason Gerner, "***Begining PHP, Apache, MySQL Web Development***", Wiley dreamtech press, 2004 edition. ISBN: 9780764557446

Web References:

1. php.net/manual/en/intro-whatis.php
2. https://teamtreehouse.com/tracks/beginning-php
3. https://www.mysql.com/
4. https://www.w3schools.com/Php
5. https://www.w3schools.com/js/

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: design a static web page using HTML	**K1,K2**
CO2: validate the HTML form data using JavaScript	**K3**
CO3: develop server side scripts using PHP	**K4**
CO4: communicate with MySQL database from PHP	**K4,K6**
CO5:demonstrate mysql functions and avoiding errors	**K2**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	M	S	S	S	M	M
CO3	S	S	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	M
CO5	S	M	S	M	S	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks

Weakly Correlating (W) - 1 mark

Course Code & Title	CC-XV MOBILE APPS AND WEB TECHNOLOGY LAB		
	Semester : VI	**Credits : 4**	**Hrs/ Wk : 6**
Cognitive Level	**K1-Recall** **K2 –Understand** **K3 – Apply** **K4 –Analysis** **K6--Create**		
Learning Objectives	**This Course aims to** • provide in depth practical knowledge in dynamic Webpage development • relate PHP and MYSQL to develop interactive web page • develop the simple mobile applications using Android.		

WEB TECHNOLOGY LAB

1. Create a web page with all types of cascading style sheets.
2. Create a form for Student information. Write JavaScript code to find Total, Average, Result and Grade.
3. Create a form for Employee information. Write JavaScript code to find DA, HRA, PF, TAX, Gross pay, Deduction and Net pay.
4. Using JavaScript perform Form Validation with Limit Login Attempts.
5. Write a PHP script to display the values entered into a Web form that contains:
   i. I .One text input field ii. One text area
   ii. iii. One hidden field Iv .One password field
   iii. v. One selection list vi. Two radio buttons
   iv. vii. Two checkboxes.
6. Create a calculator script that allows the user to submit two numbers and
   i. Choose an operation to perform on them (addition, multiplication,Division, subtraction).
7. Write a program in PHP for admin interface to add and delete users
   i. Using MySQL.

Prepared By	Mrs.K.PonvelAzhaguLakshmi
Verified By	Dr.M.Muralidharan

8. Create an authentication script that checks a username and password. If the user input matches an entry in the database, present the user with a special message. Otherwise, re-present the login form to the user.
9. Create a database with three fields: email (up to 70 characters), message (up to 250 characters), and date (an integer that contains a Unix timestamp). Build a script to allow users to populate the database.
10. Create a script that displays the information from the database.
    a. Use regular expressions to extract email addresses from a file.
    b. Add array and output the result to the browser.
11. Write a program in PHP to upload file using form control.

MOBILE APPS DEVELOPMENT LAB

Design and Develop problems using

1. Layouts
2. Views
3. Events
4. Files
5. Preferences
6. Notifications
7. Programs using SQlite
8. Audio and Video Applications

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: design a static web page using HTML	**K1,K6**
CO2: validate the HTML form data using JavaScript	**K2**
CO3: develop server side scripts using PHP	**K3**
CO4: communicate with MySQL database from PHP	**K4**
CO5: implement an application using Mobile Apps Layouts and Events	**K3**
CO6: Understand the concepts of Sqlite	**K6**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	M
CO5	S	S	S	S	S	S	S	M	M	S
CO6	S	S	S	S	S	S	S	S	S	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Course Code & Title	EC-II SOFTWARE ENGINEERING		
	Semester : VI	**Credits : 5**	**Hrs/ Wk : 5**
Cognitive Level	**K1-Recall** **K2 –Understand** **K3 – Apply** **K4 –Analysis**		
Learning Objectives	**This Course aims to** • provide the basic concepts, principal, and techniques of Software Engineering. • introduce the phases of Software Development Life Cycle. • inculcate the formal process that are employed for software projects in designing, developing, testing and deploying. • comprehend how to verify and validate, implement, apply and maintain software system. • Learnhow to develop the software projects using modern engineering techniques and tools.		

UNIT-I:

Introduction to Software Engineering: Definitions-Size Factors-Quality and Productivity Factors-Managerial Issues-Planning a Software Product: Defining the Problem-Developing the Solution Strategy-planning the development process-Planning the Organization Structure. **(15 Hours)**

UNIT-II:

Software Analysis: Software cost factors-Software Cost Estimation Techniques-Staffing level Estimation-Estimating Software Maintenance Costs-The Software requirements Specification-Formal Specification Technique. **(15 Hours)**

UNIT-III:

Software Design: Fundamental Design Concepts-Modules and Modularization Criteria-Design Notations-Design Techniques - Design Guide lines. **(15 Hours)**

Prepared By	MrP.Velmurugan
Verified By	Dr.M.Muralidharan

UNIT-IV:

Implementation: Structured coding techniques-Coding Style - Standards and guidelines-Documentation Guidelines. **(15 Hours)**

UNIT-V:

Testing: Quality Assurance - Walkthroughs and Inspections-Static Analysis-Symbolic Execution- Unit testing and debugging - System Testing - Formal Verification Maintenance: Enhancing Maintainability during development – Managerial aspects of Software Maintenance-Source Code Metrics. **(15 Hours)**

Book for Study:

1. Richard Fairley, "***Software Engineering Concepts***", Tata McGraw-Hill, 2nd Edition. ISBN 0-07-463121-7

Books for Reference:

1. Roger S. Pressman,"***Software Engineering – A Practitioner's Approach"***, 6th Ed., McGraw Hill International, 2005.
2. Ian Sommerville, "***Software Engineering***", Addition Wesely, Singapore,2002
3. K.K.Agarwal&Yogesh Singh, "***Software Engineering***", New Age International Publishers, Revised Second Edition, 2005.

Web References:

1. http://www/tutorialspoint/software engineering**.**

Course Outcomes:

On the successful completion of the course, students will be able to

CO1:illustrate basics of software engineering, various factors and planning for development process.	**K2**
CO2: analyze the software for cost, time and effort and prepare SRS	**K2**
CO3:classify various design techniques and criterias for software development	**K4**
CO4:apply coding standards and guidelines to create a software	**K3**
CO5:understand various quality measures and metrics	**K1**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	M	S	S	S	M	M
CO3	S	S	S	M	S	M	S	S	S	S
CO4	S	S	S	M	S	S	S	M	S	M
CO5	S	S	S	M	S	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Course Code & Title	EC-II ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM		
	Semester : VI	Credits : 5	Hrs/ Wk : 5
Cognitive Level	K1 -Recall K2 –Understand K3 – Apply		
Learning Objectives	This Course aims to • learn AI problems and techniques • study various searching techniques • identify issues in knowledge representation • understand the usage of predicate logic • describe rules for representing knowledge		

Prepared By	Mrs.P.Isabella
Verified By	Dr.M.Muralidharan

UNIT I:

Introduction: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search**. (15 Hours)**

UNIT II:

Heuristic Search techniques: Generate and Test – Hill Climbing – Best-Fist, Problem Reduction, Constraint Satisfaction, Means-end analysis.**(15 Hours)**

UNIT III:

Knowledge representation issues: Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representations – Frame Problem. **(15 Hours)**

UNIT IV:

Using Predicate Logic: Representing simple facts in logic – Representing Instance and Isa relationships – Computable functions and predicates – Resolution – Natural deduction.
(15 Hours)

UNIT V:

Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge Brief explanation of Expert Systems-Definition- Characteristics-architectureKnowledge Engineering-Expert System Life Cycle-Knowledge Acquisition Strategies- Expert System Tools.**(15 Hours)**

Book for Study:

1. Elaine rich and Kelvin Knight, "***Artificial Intelligence*** ", Tata McGraw Hill Publication, 2nd Edition, 1991. Chapters 1- 6.

Books for Reference:

1. Stuart Russell & Peter Norvig,"***Artificial Intelligence a modern Approach*** ", 2nd Edition Perason Education.
2. George F Luger , "***Artificial Intelligence*** ", 4th Edition , Pearsons Education Publ, 2002.
3. V S Janaki Raman, K Sarukesi, P Gopalakrishnan, "***Foundations of Artificial Intelligent and Expert Systems***", MacMillan India limited.

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: Understand AI problems and techniques	**K1**
CO2:categorize various searching techniques.	**K2**
CO3: explain knowledge representation issues	**K2**
CO4: apply predicate logics	**K3**
CO5:illustrate expert system life cycle	**K2**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	M	S	S	S	M	M
CO3	S	S	S	M	S	M	S	S	S	S
CO4	S	S	S	M	S	S	S	M	S	M
CO5	S	M	M	M	S	S	S	M	M	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Course Code & Title	EC-II COMPUTER GRAPHICS		
	Semester : VI	**Credits : 5**	**Hrs/ Wk : 5**
Cognitive Level	**K1-Recall** **K2 –Understand** **K3 – Apply** **K4 –Analysis**		
Learning Objectives	**This Course aims to** • introduce the concepts of computer graphics. • gain knowledge about graphics hardware devices and software used. • understand the two dimensional graphics and their transformations. • understand the three dimensional graphics and their transformations. • be familiar with understand clipping techniques.		

UNIT-I:

Introduction: Applications of Computer Graphics, Raster Scan System, Random Scan System, Raster Scan Display Processors. Output Primitives: Points and Lines – Line Drawing Algorithms, Mid-Point Circle and Ellipse Algorithms. **(15 Hours)**

UNIT-II:

Two Dimensional Geometric Transformations- Matrix Representations and Homogeneous Coordinates, Composite Transformations, Transformations between Coordinate Systems – Two Dimensional Clipping and Viewing: The viewing pipeline, Viewing coordinate reference Frame, Window to View-port Coordinate transformation, viewing functions, Cohen-Sutherland and Sutherland Hodgeman Polygon clipping algorithm. **(15 Hours)**

UNIT-III:

Graphics Structures – Hierarchical modeling – Graphical User Interfaces and Interactive Input Methods. **(15 Hours)**

UNIT-IV:

3-D Object Representation: Polygon surfaces, Quadric surfaces, Splinrepresentation, Hermite Curve, Bezier Curve and B-Spline Curve, Bezier and B-Spline surfaces - Three Dimensional Geometric Transformations: Three Dimensional Viewing, Clipping, Projections(Parallel and Perspective). **(15 Hours)**

UNIT-V:

Visible Surface Detection Methods: Classification, back-face Detection, Depth-buffer, scan-line and depth sorting– Computer animation. **(15 Hours)**

Books for Study:

1. Donald Hearn and M.Pauline Baker, "***Computer Graphics C Version***", PearsonEducation 2003, Second Edition,ISBN *0-13-530924-7*.
2. John F. Hughes, Andries Van Dam, Morgan McGuire, David F. Sklar, James D. Foley, Steven K. Feiner and Kurt Akeley ,"***Computer Graphics: Principles and Practice***", 3rd Edition, AddisonWesley Professional,2013.

Books for Reference:

1. Foley, Vandam, Feiner, Huges, "***Computer Graphics: Principles & Practice***",Pearson Education, Second Edition 2003, *ISBN*: 0201121107,9780201121100.
2. Donald Hearn and M. Pauline Baker, Warren Carithers, "**Computer Graphics With Open GL**", 4th Edition, Pearson Education, 2010.

Web References:

1. en.wikipedia.org/wiki/2D_computer_graphics
2. en.wikipedia.org/wiki/3D_computer_graphics
3. www.overdrivepc.com/computer_graphics_hearn_baker_solution_manual.pdf
4. www.edx.org/course/computer-graphics
5. www.cgmeetup.net/home/

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: design two dimensional graphics.	**K2**
CO2: apply two dimensional transformations.	**K2**
CO3: design three dimensional graphics.	**K1**
CO4: apply three dimensional transformations.	**K4**
CO5: apply clipping techniques to graphics.	**K3**
CO6: design animation sequences.	**K2**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	S	S	S	M	S	S
CO2	S	S	S	M	M	S	S	S	M	M
CO3	S	S	S	M	S	M	S	S	S	S
CO4	S	S	S	M	S	S	S	M	S	M
CO5	S	S	S	M	S	S	S	M	M	S
CO6	S	S	S	S	S	S	S	S	S	S

Strongly Correlating(S) - 3 marks
Moderately Correlating (M) - 2 marks
Weakly Correlating (W) - 1 mark

Course Code & Title	EC-III DISTRIBUTED APPLICATIONS USING .NET		
	Semester : VI	Credits : 5	Hrs/ Wk : 5
Cognitive Level	K1-Recall K2 –Understand K3 – Apply K4 –Analysis K6-Create		
Learning Objectives	This Course aims to • introduce the .NET architecture and its applications. • give a depth knowledge on VB.Net • familiar with the advanced concepts of VB.Net • learn features of ASP.NET and ADO.NET programming. • develop an applications in the .NET platform.		

UNIT-I:

The .NET Architecture: The vision and goals of .NET- The building blocks of .NET- An Overview of .NET Framework: The .NET Evolution- Design goals of the .NET framework – The .NET framework architecture- An Overview of .NET application.**(15 Hours)**

UNIT-II:

Basic Features of VB.Net: Introduction to VB.Net – Variables – Constants – Expressions – Control Statements – Methods & Arrays – Class , Properties, & Indexes. **(15 Hours)**

UNIT-III:

Advanced concepts in VB.Net: Inheritance & Polymorphism – Interfaces – Namespaces – Components – Exception Handling – Multithreading – Delegates – Events – Attributes.

(15Hours)

UNIT-IV:

ASP.NET: Overview of ASP.NET framework – Overview of CLR – Class Library – Overview of Asp.NET controls – Understanding of HTML Controls – Study of Standard Controls – Validation Controls – Rich Controls – Adding Controls to forms – Master page – Navigation Controls – Themes – Handling events using various Tools – Simple web services Programs. **(15 Hours)**

UNIT-V:

ADO.NET Fundamentals: Component Object Model – SQL Server – SQL Connected Mode – Disconnected Mode – Data Set – Data Reader – Identity - Data Access Control – Grid View Control – Other Controls. **(15 Hours)**

Books for Study:

1. Stephen C. Perry, AtulKhate, Joseph Mayo, "***Essentials of .Net and Related Technologies: With a focus on C#, XML, Asp.NET and ADO.NET"***, First Edition, Pearson Education., 2009.
2. C. Muthu "**Visual Basic .Net "** -Publisher: McGraw Hill Education .
3. Kevin Hoffman & Jeff Gabriel, ***"Professional .NET Framework",*** Shorff Publishers and Distributors Pvt. Ltd
4. Dave Mercer, ***"ASP.NET – A Beginners Guide"***, Tata McGraw Hill Publications Pvt. Ltd.

Web References:

1. https://www.tutorialspoint.com/net_framework_online_training/net_framework_introduction.asp
2. http://www.kciti.edu/wp-content/uploads/2017/07/vb.net_tutorial.pdf
3. https://www.visualchart.com/ContentManagement/Development/Manuals/EN/vbNet_programming.pdf
4. https://www.javatpoint.com/net-framework
5. https://www.javatpoint.com/asp-net-tutorial
6. https://asp.net-tutorials.com/basics/asp-net-web-forms-mvc-core/

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: The student will use Visual Basic.Net to build Windows applications using structured and object-based programming techniques. **K1**

CO2: Design/develop programs with GUI interfaces **K2**

K3

CO3: Perform tests, resolve defects and revise existing code

CO4: Develop dynamic web applications, create and consume web services **K4**

CO 5: Create applications that use ADO. NET **K4,K6**

CO6: Use appropriate data sources and data bindings in VB.NET / ASP.Net. **K3**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**
CO1	S	M	M	M	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	M
CO5	S	S	S	M	M	S	S	M	S	S
CO6	S	S	S	S	M	S	M	S	S	S

Strongly Correlating(S)- 3 marksModerately Correlating (M)- 2 marks

Weakly Correlating (W) - 1 mark

Course Code & Title	EC-IIISOFTCOMPUTING		
	Semester : VI	**Credits : 5**	**Hrs/ Wk : 5**
Cognitive Level	**K1Recall** **K2 Understand** **K3 Apply** **K4 Analysis**		
Learning Objectives	**This Course aims to** • impart knowledge in Fuzzy Set Theory • learn various Optimization methods. • know the basics of learning and neural networks • study the architecture, framework and functions of Neural Networks. • Identify the Applications Of Computational Intelligence		

UNIT- I:

FUZZY SET THEORY : Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set – Theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling. **(15 Hours)**

UNIT- II:

OPTIMIZATION: Derivative based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative Free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search. **(15 Hours)**

UNIT- III:

NEURAL NETWORKS: Supervised Learning Neural Networks – Perceptrons – AdalineBackpropagation Multilayer perceptrons – Radial Basis Function Networks – Unsupervised Learning and Other Neural Networks – Competitive Learning Networks – Kohonen Self – Organizing Networks – Learning Vector Quantization – Hebbian Learning. **(15 Hours)**

UNIT- IV:

NEURO FUZZY MODELING: Adaptive Neuro – Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework – Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum. **(15 Hours)**

UNIT- V:

APPLICATION OF COMPUTATIONAL INTELLIGENCE: Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction. **(15 Hours)**

Books for study:

1. J.S.R. Jang, C.T. Sun and E. Mizutani, "***Neuro Fuzzy and Soft Computing***", PHI, Pearson Education, 2004.

Books for Reference:

1. Timothy J. Ross, "***Fuzzy Logic with Engineering Application***", McGraw Hill, 1977.
2. Davis E. Goldberg, "***Genetic Algorithms Search, Optimization and Machine Learning***", Addision Wesley, 1989.
3. S. Rajasekaran and G.A.V. Pai, "***Neural Networks, Fuzzy Logic and Genetic Algorithms***", PHI, 2003. EmereoPvt Limited, July 2008.
4. Ahmar, Abbas, "***Grid Computing - A Practical Guide to technology and Applications***", Charles River media, 2003.

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: acquire the concepts of Fuzzy and SET theory **K1**
CO2: understand the knowledge of Optimization techniques **K2**
CO3:illustrate the various learning methods of learning in neural networks **K2**
CO4: apply the knowledge ofneuro fuzzy models. **K3**
CO5: identify and specify different soft computing Applications. **K4**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	M	S	S	S	M	S	S
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	M	M	M	S	S	S	M	M	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	M	S	M

Strongly Correlating(S)-3 marksModerately Correlating (M)-2 marks
Weakly Correlating (W)-1 mark

Course Code & Title	EC-IIIINTERNET OF THINGS		
	Semester : VI	**Credits : 5**	**Hrs/ Wk : 5**
Cognitive Level	**K1-Recall** **K2- Understand** **K3 - Apply** **K4-Analysis**		
Learning Objectives	**This Course aims to** • Understand the fundamentals of Internet of Things. • Learn the architecture of IoT • Describe the protocols of Data link Layer and Network layer • Explain transport and session layer protocols • Study service layer protocols and security issues		

UNIT I:

OVERVIEW: IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations. M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management **(15Hours)**

UNIT II:

REFERENCE ARCHITECTURE: IoT Architecture-State of the Art – Introduction, State of the art, Reference Model and architecture, IoT reference Model - IoT Reference ArchitectureIntroduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. Real-World Design Constraints- Introduction, Technical Design constraints-hardware is popular again, Data representation and visualization, Interaction and remote control. **(15 Hours)**

UNIT III:

IOT DATA LINK LAYER & NETWORK LAYER PROTOCOLS: PHY/MAC Layer (3GPP MTC, IEEE 802.11, IEEE 802.15), WirelessHART,Z-Wave,Bluetooth Low Energy, Zigbee Smart Energy, DASH7 - Network Layer-IPv4, IPv6, 6LoWPAN, 6TiSCH,ND, DHCP, ICMP, RPL, CORPL, CARP **(15 Hours)**

UNIT IV:

TRANSPORT & SESSION LAYER PROTOCOLS Transport Layer (TCP, MPTCP, UDP, DCCP, SCTP)-(TLS, DTLS) – Session Layer-HTTP, CoAP, XMPP, AMQP, MQTT.
(15Hours)

UNIT V:

SERVICE LAYER PROTOCOLS & SECURITY: Service Layer -oneM2M, ETSI M2M, OMA, BBF – Security in IoT Protocols – MAC 802.15.4, 6LoWPAN, RPL, Application Layer.

(15 Hours)

Books for study

2. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, David Boyle, "***From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence***", 1 st Edition, Academic Press, 2014

Books for Reference:

1. Peter Waher, "***Learning Internet of Things***", PACKT publishing, BIRMINGHAM – MUMBAI
2. Bernd Scholz-Reiter, Florian Michahelles, "***Architecting the Internet of Things***", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
3. Daniel Minoli, "***Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications***", ISBN: 978-1-118- 47347-4, Willy Publications
4. Vijay Madisetti and ArshdeepBahga, "***Internet of Things (A Hands-onApproach)***", 1 st Edition, VPT, 2014

Web References:

1. http:// www.cse.wustl.edu/~jain/cse570- 15/ftp/iot_prot/index.html

Course Outcomes:

On the successful completion of the course, students will be able to

CO1: recognize the fundamentals of IOT **K1**
CO2: acquire the knowledge of IOT architecture **K2**
CO3: interpret the protocols used in Data link and Network layer in IOT **K3**
CO4: classifydifferent protocols used in different layers of IOT **K4**
CO5:relate the service layer and application layer protocols in IoT architecture **K4**

Mapping of COs with POs &PSOs:

CO/PO	PO						PSO			
	1	2	3	4	5	6	1	2	3	4
CO1	S	M	M	S	M	S	S	M	S	S
CO2	S	S	S	M	M	S	S	S	M	S
CO3	S	S	S	S	S	S	S	S	m	S
CO4	S	S	S	S	S	S	S	M	S	M
CO5	S	M	M	M	S	S	S	M	M	S

Verified By	Dr.S.Murugan

NEHRU MEMORIAL COLLEGE [AUTONOMOUS], PUTHANAMPATTI—621007

POST GRADUATE DEPARTMENT OF COMPUTER SCIENCE

BACHELOR OF COMPUTER APPLICATIONS (2019-20)

S.No	2019-2020	REMARKS
1	Programming in C	Moved from Semester II to Semester I and removed data Structures
2	C Lab	Removed Data Structures
3	OOPs Using C++ and Data Structures	New Course
4	C++ and DS Lab	New Course
5	Problem solving Using Python	Shifted from Semester I to Semester III; Text Book Modifies and Contents are modified accordingly.
6	Python Lab	Shifted from Semester I to Semester III
7	Database System	No Change
8	RDBMS Lab	No Change
9	Programming in Java	No Change
10	Principles of Operating System	Text book modified and contents are changed according to it.
11	Java & System Administration Lab	No Change
12	Data and Communication Network	No change
13	Mobile Apps Development	No Change
14	Web Technology	Moved From Elective Course to Core Course
15	Mobile Apps Development Web Tech Lab	Mobile App-No Change ,Web-New Course

NEHRU MEMORIAL COLLEGE [AUTONOMOUS], PUTHANAMPATTI—621007

POST GRADUATE DEPARTMENT OF COMPUTER SCIENCE

BACHELOR OF COMPUTER APPLICATIONS(2019-20)

Comparison Table

S.No	2015-2016	2019-2020
1	CC I - Programming in Python	Programming in C
2	CC IIa – Software Lab-I (Python) CC IIb– Software Lab-II('C' and Data Structures)	C Lab
3	III – Programming in C and Data Structures	OOPs Using C++ and Data Structures
4	CC IV – Data Base Systems	C++ and DS Lab
5	CC Va – Software Lab-III ('RDBMS') CC Vb - – Software Lab-IV (Java)	Problem solving Using Python
6	CC VI – Programming in Java	Python Lab
7	CC VII – Data and Communication Network	Database System
8	CC VIII - Operating System	RDBMS Lab
9	CC IX - Distributed Programming using .Net	Programming in Java
10	CC X – – Software Lab-V (.Net & System Administration)	Operating System
11	CC XI - Software engineering	Java &System Administration Lab
12	CC XII – Mobile Apps Development	Data and Communication Network
13	CC XIII - Computer Graphics	Mobile Apps Development
14	CC XIV – Software Lab-VI (Mobile Apps Development & Application Development	Web Technology
15		Mobile Apps Development Web Tech Lab

Elective, SKBC and NMEC

Comparison Table

2015-2016	2019-2020
Elective Course - 1 Cloud Computing Mobile Commerce Big Data Analytics **Elective Course - 2** Web Technology XML and Web services Ruby on Rails	**Elective Course – 1** Cloud Computing Mobile Commerce Big Data Analytics **Elective Course – 2** Software Engineering System Analysis and Design Computer Graphics **Elective Course – 3** Distributed Programming Using .NET Soft computing Internet of Things
NMEC- 1 Internet and Web Design BPO and Health Care Desktop Publishing	**NMEC - I** Internet and Web Design BPO and Health Care **NMEC – II** Office Automation Tools Image Editing Tools
SKBC - 1 Image Editing and Manipulation **SKBC- 2** Image Editing Lab	**SKBC - 1** Data Analytics Lab **SKBC- 2** Image Editing Lab

Signature of the HOD & Chairperson (BOS) (UG- BCA)