Kunthavai Naacchiyar Govt. Arts College for Women (Autonomous), Thanjavur

Department of Computer Science

B.Sc., Computer Science

Syllabus 2022-23 (onwards)

KUNTHAVAI NAACCHIYAAR GOVERNMENT ARTS COLLEGE FOR WOMEN

An Autonomous College Affiliated to Bharathidasan University

Re-Accredited by NAAC with 'B' Grade

Thanjavur -613 007, Tamil Nadu, India.

CBCS & OBE

Scheme of Instruction and Syllabus for

B.Sc., Computer Science

(I to VI Semester)

Effective from 2022 - 2023 and onwards

PG DEPARTMENT OF COMPUTER SCIENCE

KUNTHAVAI NAACCHIYAAR GOVERNMENT ARTS COLLEGE FOR WOMEN
(AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE

I. VISION

To meet the dynamic high quality education.

To empower women with the knowledge, skills and values required for a globally competent professional in the field of computer science.

II. MISSION

To inculcate the right attitude to be socio-economically responsible women.

To improve the potential for suitable placement in the industry.

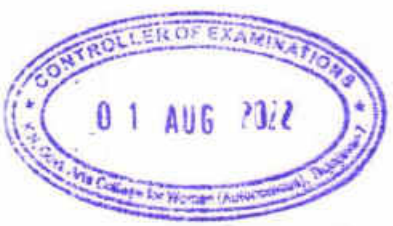
To provide in-depth understanding of core and advanced topics in the subject.

To develop problem solving skills.

III. PROGRAM OUTCOME (PO)

After completing the B.Sc., Programme the Students will be able to:

PO	FOCUS OF PO	PROGRAM OUTCOMES
1	**Advanced Concepts, Fundamentals.**	Understand the fundamental and advanced concepts of programming language.
2	**Protocols, Procedures.**	Transfer the power of data and understand the communication protocols and procedures.
3	**Importance, Clarity.**	Understand the definition and significance of Computer Fundamentals
4	**Design, Operation, Organization, Structure.**	Discuss the Architecture, Operations, Organizations and Design of Computer Systems
5	**Definition, Rules.**	Develop the syntax and semantics of object-oriented programming and Event-driven programming methods.
6	**Decision Making**	Analyze and critical thinking abilities for database and network-based decision making.
7	**Employment Skills**	Enhance the employability skills to design and develop programming language
8	**Trends in Theories**	Apply current theories, model and, illustrate the techniques in operating systems and software testing tools.
9	**Embedded Systems**	Conclude the concepts of hardware equipment like Microprocessors, Microcontrollers
10	**Problems Solving**	Identify, formulate and solve complex real-world problems by applying principles of computer.
11	**Novelty**	Facilitate to create effective and innovative designs to convey desired idea.
12	**Job Opportunity**	Prepare students for all the Government exams like TNPSC/RRB/SSC/IT etc.



Kunthavai Naacchiyaar Govt. Arts College for Women (Autonomous), Thanjavur - 7.

B.Sc. Computer Science Course Structure under CBCS

(For the candidates admitted from the academic year 2022 - 2023 onwards)

Semester	Part	Course	Subject Code	Title of the Paper	Inst. Hrs.	Credit	Exam. Hrs.	Marks		Total
								Int.	Ext.	
I	I	LC 1	22K1T1	செய்யுள் (இக்கால இலக்கியம்), சிறுகதை, பயன்முறைத்தமிழ், தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 1	22K1E1	English for Effective Communication – I	6	3	3	25	75	100
	III	CC 1	22K1CS01	C++ and Java Programming	6	5	3	25	75	100
		CC 2(P)	22K1CS02P:A	Office Automation & DTP Lab	3	3	3	20	30	50
		AC 1	22K1CSAM1	Probability and Statistics	5	3	3	25	75	100
		AC 2(P)		Integral Calculus, Differential Equations and Transforms	2	-	-	-	-	-
	IV	VE	22K1VE	Value Education	2	2	3	25	75	100
	Total				**30**	**19**	**-**	**145**	**405**	**550**
II	I	LC 2	22K2T2	செய்யுள் (இடைக்கால இலக்கியம்), புதினம், தமிழில் தொடரிலக்கணம், தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 2	22K2E2	English for Effective Communication – II	6	3	3	25	75	100
	III	CC 2(P)	22K2CS02P:B	Data Structures using Java Lab	3	3	3	20	30	50
		CC 3	22K2CS03	Data Structures and Algorithms	6	5	3	25	75	100
		AC 2	22K2CSAM2	Integral Calculus, Differential Equations and Transforms	(2)+3	3	3	25	75	100
		AC 3	22K2CSAM3	Numerical Methods and Graph Theory	4	3	3	25	75	100
	IV	ES	22K2ES	Environmental Studies	2	2	3	25	75	100
	Total				**30**	**22**	**-**	**170**	**480**	**650**

Semester	Part	Course	Subject Code	Title of the Paper	Inst. Hrs.	Credit	Exam. Hrs.	Marks		Total
								Int.	Ext.	
III	I	LC 3	22K3T3	செய்யுள் (காப்பியங்கள்), உரைநடை, அலுவல்முறை மடல்கள், தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 3	22K3E3	English for Effective Communication – III	6	3	3	25	75	100
	III	CC 4	22K3CS04	Programming in Python	6	5	3	25	75	100
		CC 5(P)	22K3CS05P:A	Python Programming Lab	3	3	3	20	30	50
		AC 4	22K3CSAP1	Applied Physics – I	4	3	3	25	75	100
		AC 5(P)		Applied Physics - II – Practical	3	-	-	-	-	-
	IV	NME 1			2	2	3	25	75	100
		ECC1	22K3ECCCS1:1	Quantitative Ability	-	3	3	-	-	100
			22K3ECCCS1:2	MOOC (Value Added)						
		ECC2	22K3ECCCS2	Add-On Course	-	4	-	-	-	-
	Total				30	19		145	405	550
IV	I	LC 4	22K4T4	செய்யுள் (பண்டைய இலக்கியம்), நாடகம், பொதுக்கட்டுரை, தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 4	22K4E4	English for Effective Communication – IV	6	3	3	25	75	100
	III	CC 5(P)	22K4CS05P:B	VB.Net Lab	3	3	3	20	30	50
		CC 6	22K4CS06	VB.Net	4	3	3	25	75	100
		AC 5(P)	22K4CSAP2P	Applied Physics - II – Practical	(3)+3	3	3	40	60	100
		AC 6	22K4CSAP3	Applied Physics – III	4	3	3	25	75	100
	IV	NME 2			2	2	3	25	75	100
		SBEC 1	22K4SBEC1	Life Skills	2	2	3	25	75	100
		ECC3	22K4ECCCS3:1	Reasoning Ability	-	3	3	-	-	100
		ECC3	22K4ECCCS3:2	MOOC (Value Added)						
	Total				30	22		210	540	750

Semester	Part	Course	Subject Code	Title of the Paper	Inst. Hrs.	Credit	Exam. Hrs.	Marks Int.	Marks Ext.	Total
V	III	CC 7	22K5CS07	Software Engineering and Testing	6	5	3	25	75	100
		CC 8	22K5CS08	Digital Design	6	5	3	25	75	100
		CC 9	22K5CS09	Database Systems	5	5	3	25	75	100
		CC10 (P)	22K5CS10P	MySQL Lab	4	3	3	40	60	100
		MBE1	22K5CSELCS1:1	Cloud Computing	5	5	3	25	75	100
			22K5CSELCS1:2	MIS & ERP						
	IV	SBEC 2	22K5SBEC2:1	Web Enabled Application Development	2	2	3	25	75	100
			22K5SBEC2:2	LAMP						
		SBEC 3	22K5SBEC3:1	External Internship	-	2	-	50	50	100
			22K5SBEC3:2	Internal Internship						
			22K5SBEC3:3	Field work						
		SSD	22K5SSD	Soft Skills Development	2	2	3	25	75	100
	Total				**30**	**29**		**240**	**560**	**800**
VI	III	CC 11	22K6CS11	Microprocessor Architecture	7	6	3	25	75	100
		CC12(P)	22K6CS12P	Digital and Microprocessor Lab	6	5	3	40	60	100
		CC 13	22K6CS13PW	Mini Project	6	6	-	-	80+20 DP-VV	100
		MBE2	22K6CSELCS2:1	Data Communications and Networks	5	5	3	25	75	100
			22K6CSELCS2:1	Network Security						
		MBE3	22K6CSELCS3:1	Operating System	5	5	3	25	75	100
			22K6CSELCS3:2	Distributed Operating System						
	V	GS	22K6GS	Gender Studies	1	1	3	25	75	00
		Extn. Act.	22K6EA	Extension and Extra Curricular Activities	-	1	-	-	-	-
	Total				**30**	**29**		**140**	**460**	**600**
	Grand Total				**180**	**140**				**3900**

IV. Electives

B.Sc., Computer Science - List of Elective Courses 2022-2023

Semester V	**Major Based Elective I**	**Code**	*Semester IV*	**Skill Based Elective I**	**Code**
MBE1:1	Database Systems	22K5CSELCS1:1	SBEC 1	Life Skills	22K4SBEC1
MBE1:2	MIS & ERP	22K5CSELCS1:2	*Semester V*	**Skill Based Elective II**	
Semester VI	**Major Based Elective II**		SBEC 2:1	Web Enabled Application Development	22K5SBEC2:1
MBE2:1	Data Communication and Networks	22K5CSELC21:1	SBEC 2:2	LAMP	22K5SBEC2:2
MBE2:2	Network Security	22K5CSELCS2:2	*Semester V*	**Skill Based Elective III**	
Semester VI	**Major Based Elective III**		SBEC 3:1	Internship – External	22K5SBEC3
MBE3:1	Operating System	22K5CSELCS3:1	SBEC 3:2	Internship – Internal	22K5SBEC3
MBE3:2	Distributed Operating System	22K5CSELCS3:2	SBEC 3:3	Field Work	22K5SBEC3

Non Major Elective - Semester III

Sl.NO	Course Title	Code	Department
1	பணித் தேர்வு தமிழ்	22K3TELO1	Tamil
2	English for Enhanced Competence - I	22K3EELO1	English
3	History of Freedom Movement in India	22K3HELO1	History
4	Basics of Indian Economy	22K3ECELO1	Economics
5	Operation Research – I	22K3MELO1	Mathematics
6	Laser Physics	22K3PELO1	Physics
7	Agro Chemistry	22K3CHELO1	Chemistry
8	Mushroom Technology	22K3BELO1	Botany
9	Poultry Science	22K3ZELO1	Zoology
10	Geography for Competitive Examination- I	22K3GELO1	Geography
11	Statistical Methods	22K3SELO1	Statistics
12	Introduction to IT	22K3CSELO1	Computer Science
13	Basics for Insurance	22K3COELO1	Commerce
14	Introduction to Principles of Management	22K3BBELO1	Business Administration

Non Major Elective - Semester IV

Sl.NO	Course Title	Code	Department
1	இணையமும் தமிழும்	22K4TELO2	Tamil
2	English for Enhanced Competence – II	22K4EELO2	English
3	History for Competitive Examinations	22K4HELO2	History
4	Economics for Competitive Examination	22K4ECELO2	Economics
5	Operation Research – II	22K4MELO2	Mathematics
6	Solar Energy	22K4PELO2	Physics
7	Hydro Chemistry	22K4CHELO2	Chemistry
8	Horticultural practices and Gardening	22K4BELO2	Botany
9	Vermiculture	22K4ZELO2	Zoology
10	Geography for Competitive Examination – II	22K4GELO2	Geography
11	Bio Statistics	22K4SELO2	Statistics
12	Fundamentals of Web Designing	22K4CSELO2	Computer Science
13	General Commercial Knowledge	22K4COELO2	Commerce
14	Introduction to Organisational Behaviour	22K4BBELO2	Business Administration

Add-on Course: Semester III :

V. Details on the number of Courses, Instruction hours and Credits

Course	Course Title	No. of Courses	Instruction Hours	Credits
Part I	Tamil	4	24	12
Part II	English	4	24	12
Part III	Core Course (Theory 8, Practical 4, Project Work 1)	13	74	65
Part III	Allied Course (Theory 5& Practical 1)	6	28	18
Part III	Major Based Elective	3	15	15
Part IV	Skill Based Elective	3	4	6
	Non Major Elective Course (NME)	2	4	4
	Value Education	1	2	2
	Environmental Studies	1	2	2
	SSD	1	2	2
Part V	Extension Activities	-	-	1
	Gender Studies	1	1	1
	Total	**39**	**180**	**140**
	ECC 1,2,3	**3**	-	**10**

VI. Semester – Wise Course Structure

Semester	Course	Total Courses	Ins. Hr/ week	Credit
I	LC1, ELC1, CC1, AC1, VE	4+1	30	19
II	LC2, ELC2, CC2P, CC3, AC2, AC3, ES,	6+1	30	22
III	LC3, ELC3, CC4, AC4, NME1	4+1	30	19
IV	LC4, ELC4, CC5P, CC6, AC5P, AC6, NME2, SBEC1	6+1+1	30	22
V	CC7, CC8, CC9, CC10P, MBE1, SBEC2, SBEC3, SSD	5+2+1	30	29
VI	CC11, CC12P, CC13, MBE2, MBE3, GS (+Ext Act)	5+1+1	30	29
	TOTAL	**39**	**180**	**140**

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VII. Continuous Internal Assessment System

	Maximum	Components			Passing Minimum
		Attendance	CIA	Seminar / Assignment	
Theory	25	05	15	05	10
Practical*	20	-	10	10 (Record + Skill)	08
Practical*	40	-	20	20 (Record+ Skill)	16

** Department specific*

VIII. Question Pattern

	Part A	Part B	Part C
Semester Exam: Theory (75)	20 X 1=20 (Answer All)	5 X 5= 25 (Internal choice)	3 X10 =30 (Open choice)
Semester Exam: Practical (30)	1 X 30 =30*	-	-
Semester Exam: Practical (60)	1 X 60 = 60*	-	-
Semester Exam: SBEC Theory (75)	5 X 5= 25 (Internal choice)	5 X10 =50(Open choice)	-
CIA Exam: Theory (50)	10 X 1=10 (Answer All)	4 X 5= 20 (Internal choice)	2 X10 =20 (Open choice)
CIA SBEC Theory (50)	4 x5 = 20 (Internal choice)	3 X10 =30 (Open choice)	-
Model Exam Theory (75)	20 X 1=20 (Answer All)	5 X 5= 25 (Internal choice)	3 X10 =30 (Open choice)
Model Exam: Practical (50) *	5X10 = 50	-	-

** Department specific*

IX . Question Allocation and Blooms Taxonomy for (Direct) Assessment

Unit	Section & Marks	Question Number	Bloom sLevel	Action Verbs
I	A (1 mark)	1-4	I / II	***Level I:*** *Choose, Define, Find, How, Label, List, Match, Name, Select, Show, Tell, What, When, Where, Which, Who, Why*
	B (5 mark)	21 (a) and (b)	I / II	***Level II:*** *Classify, Compare, Contrast, Demonstrate, Explain, Extend, Illustrate, Infer, Interpret, Outline, Relate, Show, Summarize, Translate*
	C (10 mark)	26	I / II	
II	A (1 mark)	5-8	I / II	***Level III:*** *Apply, Build, Choose, Construct, Develop, Experiment with, Identify, Interview, Make use of, Model, Organize, Plan, Select, Solve, Utilize*
	B (5 mark)	22 (a) and (b)	I / II	
	C (10 mark)	27	I / II	
III	A (1 mark)	9-12	I / II	***Level IV:*** *Analyze, Assume, Categorize, Discover, Dissect, Distinguish, Divide, Examine, Function, Inference, Inspect, Motive, Relationships, Simplify, Survey, Take part in, Test for, Theme*
	B (5 mark)	23 (a) and (b)	III / IV	
	C (10 mark)	28	III / IV	
IV	A (1 mark)	13-16	I / II	***Level V:*** *Agree, Appraise, Assess, Award, Conclude, Criteria, Criticize, Decide, Deduct, Defend, Determine, Disprove, Estimate, Evaluate, Importance, Influence, Interpret, Judge, Justify, Mark, Measure, Opinion, Perceive, Prioritize, Prove, Rate, Recommend, Rule on, Select, Support, Value*
	B (5 mark)	24 (a) and (b)	III / IV	
	C (10 mark)	29	V / VI	
V	A (1 mark)	17-20	I / II	***Level VI:*** *Adapt, Combine, Compile, Compose, Construct, Create, Delete, Design, Develop, Discuss, Elaborate, Estimate, Formulate, Happen, Imagine, Improve, Invent, Make up, Maximize, Minimize, Modify, Original, Originate, Plan, Predict, Propose, Solution, Solve, Suppose, Test, Theory*
	B (5 mark)	25 (a) and (b)	V / VI	
	C (10 mark)	30	V / VI	

BLOOM LEVEL	No. Of Questions (Sections)			Total Marks	% of Marks
	A	B	C		
I. Remembering	12	4	2	12	50
II. Understanding	08			48	
III. Applying	-	4	2	20	33
IV. Analyzing	-			20	
V. Evaluating	-	2	1	10	17
VI. Creating	-			10	
Total Questions	20	10	5	120	100

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X. Teaching Methodology Adopted: (Department specific)

Department may adopted at least a 20 % of ICT enabled classes out of total hours of each course work and proper documents *(Date, Hour, Course and unit, name of the faculty and sign of the representative student)* to be maintained for the same.

XI. Outline of Learning Outcomes- based Curriculum Frame work (LOCF)

(All the following categories of courses will be given with definition, procedure and system of implementation)

1. **LC:** Language Course (Part I):
2. **ELC:** English Language Course (Part II):
3. **CC** : Core Course :
4. **AC :** Allied Course
5. **EC**: Elective Course :
6. **MBE**: Major Based Elective:
7. **SBEC:** Skill Based Elective Courses:
8. (A) Internship-External
   (B) Internship-Internal
   (C) Field Work
9. **VA**: Value Added courses:
10. **NME** : Non-Major Elective:
11. **VE:** Value Education
12. **ES:** Environmental Studies
13. **SSD:** Soft Skill Development:

14: Extension and Extra Curricular Activities:

15. **ECC** - Extra Credit Course:
    (A) **SS**-Self Study:
    (B) **Add on Course:**

- Add-on Certificate Courses with 10-30 contact hours conducting by Course Coordinator of the department /College.

External or Internal Internship: 2 weeks During Month of March - April Executed by Internship Coordinator through internal guide.

OR

Field work: Can be a field study / industrial visit During Month of March - April Executed by Internship Coordinator through internal guide with submitting a 10 to 15 page report.

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QUESTION BLUE PRINT (75 Marks)

Q.No	*Unit*	*Blooms Level*
	Part A	
1	I	Remembering I / Understanding II
2	I	Remembering I / Understanding II
3	I	Remembering I / Understanding II
4	I	Remembering I / Understanding II
5	II	Remembering I / Understanding II
6	II	Remembering I / Understanding II
7	II	Remembering I / Understanding II
8	II	Remembering I / Understanding II
9	III	Remembering I / Understanding II
10	III	Remembering I / Understanding II
11	III	Remembering I / Understanding II
12	III	Remembering I / Understanding II
13	IV	Remembering I / Understanding II
14	IV	Remembering I / Understanding II
15	IV	Remembering I / Understanding II
16	IV	Remembering I / Understanding II
17	V	Remembering I / Understanding II
18	V	Remembering I / Understanding II
19	V	Remembering I / Understanding II
20	V	Remembering I / Understanding II
	Part B	
21 (a)	I	Remembering I / Understanding II
(b)	I	Remembering I / Understanding II
22 (a)	II	Remembering I / Understanding II
(b)	II	Remembering I / Understanding II
23 (a)	III	Applying III / Analyzing IV
(b)	III	Applying III / Analyzing IV
24 (a)	IV	Applying III / Analyzing IV
(b)	IV	Applying III / Analyzing IV
25 (a)	V	Creating V / Evaluating V I
(b)	V	Creating V / Evaluating V I
	Part C	
26	I	Remembering I / Understanding II
27	II	Remembering I / Understanding II
28	III	Applying III / Analyzing IV
29	IV	Applying III / Analyzing IV
30	V	Creating V / Evaluating V I

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								Int.	Ext.	
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	II	ELC 1	22K1E1	English for Effective Communication - I	6	3	3	25	75	100
	III	CC 1	22K1CS01	C++ and Java Programming	6	5	3	25	75	100
		CC 2 (P)	22K1CS02P:A	Office Automation & DTP Lab	3	3	3	20	30	50
		AC 1	22K1CSAM1	Probability and Statistics	5	3	3	25	75	100
		AC 2 (P)		Integral Calculus, Differential Equations and Transforms	2	-	-	-	-	-
	IV	VE	22K1VE	Value Education	2	2	3	25	75	100
	Total				**30**	**19**	**-**	**145**	**405**	**550**
II	I	LC 2	22K2T2	செய்யுள் (இடைக்கால இலக்கியம்), புதினம், தமிழில் தொடரிலக்கணம், தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 2	22K2E2	English for Effective Communication - II	6	3	3	25	75	100
	III	CC 2 (P)	22K2CS02P:B	Data Structures using Java Lab	3	3	3	20	30	50
		CC 3	22K2CS03	Data Structures and Algorithms	6	5	3	25	75	100
		AC 2	22K2CSAM2	Integral Calculus, Differential Equations and Transforms	(2)+3	3	3	25	75	100
		AC 3	22K2CSAM3	Numerical Methods and Graph Theory	4	3	3	25	75	100
	IV	ES	22K2ES	Environmental Studies	2	2	3	25	75	100
	Total				**30**	**22**	**-**	**170**	**480**	**650**
III	I	LC 3	22K3T3	செய்யுள் (காப்பியங்கள்), உரைநடை, அலுவல்முறை மடல்கள், தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 3	22K3E3	English for Effective Communication - III	6	3	3	25	75	100
	III	CC 4	22K3CS04	Programming in Python	6	5	3	25	75	100
		CC 5 (P)	22K3CS05P:A	Python Programming Lab	3	3	3	20	30	50
		AC 4	22K3CSAP1	Applied Physics - I	4	3	3	25	75	100
		AC 5 (P)		Applied Physics - II - Practical	3	-	-	-	-	-
	IV	NME 1			2	2	3	25	75	100
		ECC1	22K3ECCCS1:1	Quantitative Ability	-	3	3	-	-	100
			22K3ECCCS1:2	MOOC (Valued Added)						
		ECC2	22K3ECCCS2	Add-On Course	-	4	-	-	-	-
	Total				**30**	**19**		**145**	**405**	**550**

Semester	Part	Course	Subject Code	Title of the Paper	Inst. Hrs.	Credit	Exam. Hrs.	Marks		Total
								Int.	Ext.	
IV	I	LC 4	22K4T4	செய்யுள் (பண்டைய இலக்கியம்), நாடகம், பொதுக்கட்டுரை, தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 4	22K4E4	English for Effective Communication - IV	6	3	3	25	75	100
	III	CC 5 (P)	22K4CS05P:B	VB.Net Lab	3	3	3	20	30	50
		CC 6	22K4CS06	VB.Net	4	3	3	25	75	100
		AC 5 (P)	22K4CSAP2P	Applied Physics - II - Practical	(3)+3	3	3	40	60	100
		AC 6	22K4CSAP3	Applied Physics - III	4	3	3	25	75	100
	IV	NME 2			2	2	3	25	75	100
		SBE 1	22K4SBEC1	Life Skills	2	2	3	25	75	100
		ECC3	22K4ECCCS3:1	Reasoning Ability	-	3	3	-	-	100
			22K4ECCCS3:2	MOOC (Valued Added)						
	Total				**27**	**22**		**210**	**540**	**750**
V	III	CC 7	22K5CS07	Software Engineering and Testing	6	5	3	25	75	100
		CC 8	22K5CS08	Digital Design	6	5	3	25	75	100
		CC 9	22K5CS09	Database Systems	5	5	3	25	75	100
		CC 10 (P)	22K5CS10P	MySQL Lab	4	3	3	40	60	100
		MBE 1	22K5CSELCS1:1	Cloud Computing	5	5	3	25	75	100
			22K5CSELCS1:2	MIS & ERP						
	IV	SBE 2	22K5SBEC2:1	Web Enabled Application Development	2	2	3	25	75	100
			22K5SBEC2:2	LAMP						
		SBE 3	22K5SBEC3:1	External Internship	-	2	-	50	50	100
			22K5SBEC3:2	Internal Internship						
			22K5SBEC3:3	Field Work						
		SSD	22K5SSD	Soft Skills Development	2	2	3	25	75	100
	Total				**30**	**29**		**240**	**560**	**800**
VI	III	CC 11	22K6CS11	Microprocessor Architecture	7	6	3	25	75	100
		CC 12(P)	22K6CS12P	Digital and Microprocessor Lab	6	5	3	40	60	100
		CC 13	22K6CS13PW	Mini Project	6	6	-	-	80+20	100
		MBE 2	22K6CSELCS2:1	Data Communications and Networks	5	5	3	25	75	100
			22K6CSELCS2:1	Network Security						
		MBE 3	22K6CSELCS3:1	Operating System	5	5	3	25	75	100
			22K6CSELCS3:2	Distributed Operating System						
	V	GS	22K6GS	Gender Studies	1	1	3	25	75	100
		Extn. Act.	22K6EA	Extension and Extra Curricular Activities	-	1	-	-	-	-
	Total				**30**	**29**		**140**	**460**	**600**
	Grand Total				**180**	**140**				**3900**

Major Based Elective Papers

MBE - I : 22K5CSELCS1:1 Cloud Computing

MBE - I : 22K5CSELCS1:2 MIS & ERP

MBE - II : 22K6CSELCS2:1 Data Communications and Networks

MBE - II : 22K6CSECSELCS2:2 Network Security

MBE - III : 22K6CSELCS3:1 Operating System

MBE - III : 22K6CSELCS3:2 Districuted Operating System

NonMajor Elective Courses:

Sem	Part	Course	Subject Code	Title of the Paper	Inst. Hrs.	Credit	Exam. Hrs.	Marks		Total
								Int.	Ext.	
III	IV	NME 1	22K3CSELO1	Introduction to IT	2	2	3	25	75	100
IV	IV	NME 2	22K4CSELO2	Fundamentals of Web Designing	2	2	3	25	75	100

Allied Course: (Second Allied for B.Sc., Mathematics - Additional Section & SSS)

Sem	Part	Course	Subject Code	Title of the Paper	Inst. Hrs.	Credit	Exam. Hrs.	Marks		Total
								Int.	Ext.	
III	III	AC 4	22K3MACS1	Programming with C++	4	3	3	25	75	100
		AC5 (P)		C++ and Java Programming Lab	3	-	-	-	-	-
IV		AC5 (P)	22K4MACS2P	C++ and Java Programming Lab	(3)+3	3	3	40	60	100
		AC 6	22K4MACS3	Programming with Java	4	3	3	25	75	100

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Semester – I
CC 1

Hours - 6
Credit - 5

C++ and Java Programming (22K1CS01)

Objective: To give Complete Knowledge on OOP concept.

Unit - I: Principles of Object Oriented Programming: Software Crisis - Software Evolution - Basic Concepts of Object Oriented Programming - Benefits of OOP - Applications of OOP. Beginning with C++: Application of C++ - Structure of C++ Programs – Creating the source file – Compiling and linking.

Unit - II: Java Evolution: Java History – Java Features - Web Browsers - Java Environment. Overview of Java Language: Introduction - Simple Java Program - More of Java - Command Line Arguments. Constants, Variables and Data types: Scope of variables - Symbolic constants - Type Casting.

Unit – III: Decision making and Branching: If statement – If...Else – Nesting of If...Else – Elseif Ladder – Switch statement. Decision Making and Looping: While, Do, For statement. Classes, Objects and Methods: Defining a class – Creating Objects – Constructors – Overriding Methods – Visibility Controls.

Unit – IV: Interfaces: Multiple Inheritance: Defining interfaces – Implementing Interfaces – Accessing Interface variables. Packages: Putting Classes Together: Java API packages. Multithreaded Programming: Creating Threads – Life cycle of a thread – Thread Exceptions – Synchronization.

Unit - V: Managing Errors & Exceptions: Introduction - Types of errors - Exceptions – Syntax of Exception Handling Code - Multiple Catch Statements – Using Finally Statement - Throwing Our Own Exceptions - Using Exceptions for Debugging. Applet Programming: Introduction - Preparing to write Applet - Building Applet Code - Applet Life Cycle .

Unit – VI: **(For Internal Exam only)** Graphics Programming: Introduction - The Graphics class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing Polygons – Line graphs – Using control Loops in Applets – Drawing Bar charts – Introduction to Swings.

Text:
(Both Internal and External Exam)

1. "Object Oriented Programming with C++", E.Balagurusamy, McGraw Hill Education (India) Pvt. Ltd., Seventh Edition, Copyright 2018.
Unit I: Chapters: 1, 2.

2. "Programming with Java – A Primer", E.Balagurusamy, McGraw Hill Education (India) Pvt. Ltd., Fifth Edition, Fourth Reprint 2015.
Unit II to V: Chapters: 2, 3, 4, 6, 7, 8, 10 – 14.
Unit VI: (For Internal Exam only) Chapter: 15.

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Reference:

1. "C++ Programming", Mike McGrath, Easy Step, 2017, Fifth Edition.
2. "The Complete Reference JAVA", Herbert Schildt, MGH, Seventh Edition, 2017.
3. "Beginning Programming with JAVA", Barry Burd, Wiley Publication, 5th Edition, 2017

Course Outcome:

CO's	Statements	Bloom's Levels
CO1	**Apply** the concepts of C++ program using class and function overloading.	L3
CO2	**Explain** the concepts of Array in C++	L3
CO3	**Analyze** the concepts of Java program using Class and Objects.	L4
CO4	**Develop** the reusable programs using single Inheritance	L3
CO5	**Apply** the concepts of Exception handling to develop efficient and error free codes.	L3

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	2	-	-	1	2	2	-	1	2	3
CO2	1	-	1	-	2	-	1	-	-	2	2	2
CO3	-	-	1	2	-	-	2	-	-	2	-	1
CO4	-	-	-	1	-	2	1	2	-	2	-	1
CO5	-	-	-	2	1	1	2	1	-	1	-	2

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – I
CC 2(P)

Hours - 3
Credit - 3

Office Automation & DTP Lab (22K1CS02P:A)

MS-OFFICE:

MODULE 1 - MS - WORD:

1. Prepare a letter and resume with following formatting:

   i) Change the font size and font type.

   ii) Perform Alignments like left, right, centre and justify the text.

   iii) Underline and indent the text.

   iv) Insert bullets, header and footer.

2. Prepare an invitation to be sent to specific addresses in the data source using Mail Merge concept.

MODULE 2 - MS - EXCEL:

3. Prepare a worksheet using formula and built-in functions and Arrange the data in Ascending and Descending order (Both Numeric & Alphabetic).

4. Prepare a mark sheet for a student.

MODULE 3 - MS - POWER POINT:

5. Prepare a Slide Show Presentation for a Seminar (Choose your own topics) and do the following settings:

   i) Insert Clip Art and Pictures.

   ii) Enter the text in outline view.

   iii) Create Non-bulleted and bulleted Body Text.

   iv) Apply the appropriate text attributes.

   v) Insert Bar chart to display the percentage of a student.

MODULE 4 - MS – ACCESS:

6. Create a Table for Student with various fields such as Studno, Studname, Date-of-birth, Mark details, etc.,

7. Process SQL queries using a Student table.

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DTP:

MODULE 5 – PAGE MAKER:

8. Working with Text and Graphics in Page Maker
9. Creating a Master Page.
10. Create and Edit Images in Photoshop.
11. Use Various Tools in Photoshop.
12. Manage Layers in Photoshop.

Note: Questions should be framed from any two modules.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Develop** to acquire the basics of computer and to prepare documents.	L3
CO2	**Operate** spreadsheet with formula,macros spell checker.	L3
CO3	**Apply** animation tools and preparing presentation.	L3
CO4	**Create** background textures, design templates, hidden slides, auto content wizard.	L6
CO5	**Design** and **Manage** layers	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	2	-	-	-	-	-	-	-	-
CO2	-	-	-	3	-	-	-	-	-	-	-	-
CO3	-	-	-	3	-	-	-	-	-	-	-	-
CO4	-	-	-	1	-	-	-	-	-	1	1	-
CO5	-	-	-	2	1	-	-	-	-	-	-	-

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Semester – II
CC 2(P)

Hours - 3
Credit - 3

Data Structures using Java Lab (22K2CS02P:B)

1. Program to implement Stack Operations.
2. Program to implement Queue Operations.
3. Program to implement Singly Linked List.
4. Program to implement Binary Search.
5. Program for Binary Tree Traversal.
6. Program to implement Sort.
7. Program for Heap Sort.
8. Program for Hashing.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Design** and **Analyze** the various data structures including stack, Queue and Linked Lists.	L6
CO2	**Determine** the different methods for Traversing Trees.	L3
CO3	**Collect** the Various Sorting Techniques.	L3
CO4	**Analyze** the concept of Heap sort.	L4
CO5	**Focus** the method of hashing	L4

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	1	-	3	-	-	3	-	3
CO2	-	-	-	3	1	-	3	-	-	3	-	3
CO3	-	-	-	-	-	-	3	-	-	3	-	3
CO4	-	-	-	-	-	1	3	-	-	3	-	3
CO5	1	-	-	-	-	-	3	-	-	3	-	3

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Semester – II
CC 3

Hours - 6
Credit - 5

Data Structures and Algorithms (22K2CS03)

Objective: To provide basic understanding on common Data Structures and Algorithms.

Unit - I: Introduction: History of Algorithms – Definition, Structure and Properties of Algorithms – Development of an Algorithm – Data Structures and Algorithms – Data Structure - Definition and Classification. Analysis of Algorithms: Efficiency of Algorithms – Asymptotic Notations - Time Complexity of an Algorithm Using O Notation – Average, Best and Worst Case Complexities. Arrays: Introduction – Array Operations – Number of Elements in an Array – Representation of Arrays in Memory – Applications.

Unit – II: Stacks: Introduction – Stack Operations – Applications. Queues: Introduction – Operations on Queues – Circular Queues . Linked Lists: Introduction – Singly Linked List: Insertion and deletion – Circularly Linked Lists – Doubly Linked Lists.

Unit – III: Trees and Binary Trees: Introduction – Trees: Definition and Basic Terminologies: Definition of Trees – Representation of Trees – Binary Trees: Basic Terminologies and Types: Types of Binary Trees – Representation of Binary Trees: Array Representation of Binary Trees – Linked Representation of Binary Trees – Binary Tree Traversals.

Unit - IV: Binary Search Trees: Definition and Operations – Representation of a Binary Search Tree – Retrieval from a Binary Search Tree – Insertion into a Binary search Tree – Deletion from a Binary search Tree. Hash Tables: Hash Table Structure – Hash Functions – Linear Open Addressing - Chaining.

Unit – V: Searching: Linear Search – Ordered Linear Search – UnOrdered Linear Search – Binary Search: Decision Tree for Binary Search – Fibonacci Search: Decision Tree for Fibonacci Search. Internal Sorting: Bubble Sort – Insertion Sort – Selection Sort – Merge Sort – Quick Sort – Heap Sort.

Unit – VI: **(For Internal Exam only)** Applications: Array applications – Stack applications – Queue Applications – Linked Lists Applications.

Text:
(Both Internal and External Exam)
"Data Structures And Algorithms: Concepts, Techniques and Applications", G.A.VijayaLakshmi Pai, McGraw Hill Education (India) Pvt. Ltd., Thirteenth reprint 2016.
Unit: I to V : Chapters: 1, 2.1, 2.3, 2.4, 2.6, 3, 4, 5.1 – 5.3, 6.1 – 6.4, 8.1 - 8.4, 8.6, 10.2, 13.2 - 13.5, 15.2, 15.5, 15.6, 16.2 - 16.5, 16.7, 16.8 (Relevent Topics Only)
Unit: VI: (For Internal Exam only) Chapters: 3.5, 4.3, 5.5, 6.6.

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Reference:

1. "Hand Book of Data Structures and Applications", Dinesh P. Metha, Sartaj Sahni, CRC Press, 2018.
2. "Data Structure and Algorithms Easy Steps: Concepts Problems, Analysis, Questions and Solutions CodeAlgo", Chaudhary, Harry Hariom- 2015.
3. "Data Structure and Algorithm", Alfred V.Aho, John E.Hopcroft, Jeffrey D.Ullman, Pearson Education Ltd., 2012.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Construct** the Data structures and Algorithm concepts.	L6
CO2	**Develop** and Classify the Data structure Algorithms	L6
CO3	**Illustrate** the basic Terminologies and types of Binary Trees.	L3
CO4	**Conclude** the Operations of a Binary Search Tree and Hash Functions	L5
CO5	**Propose** Various Searching and Sorting Techniques.	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	3	1	-	-	-	-	-	-	-	-
CO2	-	-	3	2	-	-	-	-	-	1	-	--
CO3	-	-	3	-	-	-	2	-	-	1	-	-
CO4	-	-	3	2	-	-	2	-	-	2	-	-
CO5	-	-	3	2	-	-	3	-	-	2	-	-

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – III
CC 4

Hours - 6
Credit - 5

Programming in Python (22K3CS04)

Objective: To gain Knowledge about basics of python Programming.

Unit - I: Introduction to Computer and Python Programming: History of Python – Executing Python Programs – Commenting in Python. Basics of Python Programming: Python Character set – Token – Python core Data type – The print() function – Multiple Assignments – Writing simple Programs in Python - The input() function – The eval() function – Formatting Number and Strings – Python Inbuilt Functions.

Unit - II: Operators and Expressions: Operators and Expressions – Operator Precedence and Associativity – Translating Mathematical Formulae into Equivalent Python Expressions – The Compound Assignment Operator. Decision Statements: Boolean Type – Using Numbers with Boolean Operators – Boolean Expressions and Relational Operators – Decision Making Statements – Conditional Expressions.

Unit - III: Loop Control Statements: The While Loop – The range() function – The for Loop – Nested Loops – The break Statement – The Continue Statement. Functions: Syntax and Basics of a Function – Use of a Function – Parameters and Arguments in a Function – The Local and Global Scope of a Variable – The return Statement – Recursive Functions – The Lambda Function.

Unit - IV: Strings: The str class – Basic Inbuilt Python Functions for String – The index[ ] Operator – Traversing String with for and while Loop – Immutable Strings – The String Operators – String Operations. Lists: Creating Lists – Accessing the Elements of a List – Negative List Indices – List Slicing – The List Operator – List Comprehensions – List and Strings – Returning List from a Function.

Unit - V: Tuples, Sets and Dictionaries: Introduction to Tuples: Creating Tuples – The tuple() Function – Indexing and Slicing – Operations on Tuples – Lists and Tuples – Sort Tuples – The zip() Function – The Inverse zip(*) Function. Sets: Creating Sets – The Python Set Class – Set Operations. Dictionaries: Need of Dictionaries – Creating a Dictionary – Nested Dictionaries – Polynomials as Dictionaries.

Unit VI: **(For Internal Exam Only)** Graphics Programming: Drawing with Turtle Graphics: Moving the Turtle in any Direction – The color, bgcolor, circle and Speed Method of Turtle – Drawing with Colors – Drawing Basic Shapes using Iterations – Changing Color Dynamically Using List – Turtles to Create Bar Charts.

Text:
(Both Internal and External Only)
"Programming and Problem Solving with Python". Ashok Namdev Kamthane and Amit Ashok Kamthane, McGraw Hill Education (India) Private Limited, Copyright 2018.

Unit I – V: Chapters: 1.4, 1.6, 1.7, 2 – 8, 11.

Unit VI: (For Internal Exam Only) Chapter 12.

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Reference:

1. "Object Oriented Programming with C++", Robert Lafore, Galgotia Publication Pvt. Ltd., Second Edition, 1994.
2. "Python: The Complete Reference", Martin C Brown McGraw Hill Education (India) Pvt. Ltd., Third Reprint, 2019.
3. "Learning Python Powerful Object Oriented Programming", Mark Lutz, O'reilly Media, Fifth Edition, 2018.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Understand** the history and basics of Python.	L2
CO2	**Predict** the Proficiency in handling the decision making statements.	L3
CO3	**Interpret** the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.	L2
CO4	**Apply** the gained knowledge to write functions and strings in Python.	L3
CO5	**Practice** to work with List, Sets, Tuples and Dictionaries.	L3

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	-	2	-	-	-	-	-	-	-
CO2	2	-	-	-	-	-	-	-	-	-	-	-
CO3	1	2	1	-	1	-	1	-	-	-	-	1
CO4	-	2	3	-	3	1	1	-	-	-	-	-
CO5	3	3	3	-	3	-	3	-	-	-	3	3

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – III
CC 5 (P)

Hours - 3
Credit - 3

Python Programming Lab (22K3CS05P:A)

Develop the following Python Programs:

1. Program to print all the Disarium numbers between 1 and 100.
2. Program to construct the following pattern, using a nested loop

1

22

333

4444

55555

666666

7777777

88888888

999999999

3. Program to perform basic arithmetic operations.
4. Program to accept a string and calculate the number of Uppercase letters and Lowercase letters.
5. Program to calculate the equivalent binary number of X.
6. Program to check whether a passed string is palindrome or not.
7. Program to store the student name, roll number and marks in three subjects and display them.
8. Program to enter the element of a list and find maximum and minimum number from the list.
9. Program to display the multiplication table from 1 to 10 in the turtle graphics window.
10. Program to print a spirograph using turtle.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Develop** and execute simple Python programs	L3
CO2	**Examine** the conditions and loops for Python programs.	L3
CO3	**Apply** functions and represent compound data using lists.	L3
CO4	**Focus** the various mathematical applications using Python.	L4
CO5	**Experiment** with string functions and turtle in Python.	L3

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	2	-	2	3	-	-	-	-	3
CO2	-	-	-	-	-	2	3	-	-	-	-	-
CO3	2	-	-	1	-	-	-	-	-	-	-	-
CO4	1	-	-	2	-	-	3	-	-	-	-	3
CO5	1	-	-	2	-	-	-	-	-	-	2	3

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Semester – IV
CC 5(P)

Hours - 3
Credit - 3

VB.Net Lab (22K4CS05P:B)

1. Program for Temperature Conversion.
2. Program to Design a Calculator.
3. Program to Sort the Numbers in Ascending and Descending Order.
4. Program using CheckBox, Radio Button, and GroupBox Control.
5. Program using ControlPanel, PictureBox, ProgressBar and Timer Control.
6. Program using Menu and Built-in-Dialog Box Control.
7. Program to implement Polymorphism by Method Overloading.
8. Program to implement Exception Handling.
9. Program to Access Student Data with ADO.NET Using DataGrid View Control.
    a. Create and Open a Connection of Student Database.
    b. Insert, Update and Delete Records in the Student Table.
10. Program to Access Employee Data With ADO.NET Using Standard Controls.
    a. Create and Open a Connection of Employee Database.
    b. Insert Update and Delete Records in the Employee Table.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Understand** the VB. Net Environment to develop programs.	L3
CO2	**Appraise** the basic controls of VB. Net.	L3
CO3	**Integrate** multiple forms, modules and menus into working VB.Net Solutions.	L3
CO4	**Illustrate** method overloading to implement polymorphism.	L4
CO5	**Experiment** the database connectivity by using ADO.Net and manage the database.	L3

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CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	-	2	3	2	2	-	-	-	-	-
CO2	3	1	-	1	2	1	1	-	-	2	-	-
CO3	2	1	-	2	3	-	1	-	-	2	-	-
CO4	3	3	2	2	2	1	2	-	-	2	-	-
CO5	3	2	-	3	2	1	2	-	-	2	-	2

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Semester – IV
CC 6

Hours - 4
Credit - 3

VB.Net (22K4CS06)

Objective: To provide basic Knowledge on .NET programming concepts.

Unit - I: Introduction to Programming: Converting Source Code to Machine Language Code - Explaining Program Development Cycle. Introducing .NET Framework 4.5 and Visual Studio 2012 - Exploring Visual Studio 2012 IDE - Developing a Console Application.

Unit - II: Visual Basic: Getting started with Visual Baisc 2012: Visual Basic 2012 keywords – Operators – Variables – Constants – Arrays. Windows Forms: Adding Controls to a Form – Resizing and Moving Forms and Controls at Runtime – Creating Input Boxes – Creating Dialog Boxes.

Unit - III: Windows Forms Controls-I: Introducing the Control Classes – Using the Label Control – Using the Textbox Control - Using the Button Control – Using the RadioButton Control – Using the CheckBox Control – Using the ComboBox Control – Using the ListBox Controls – Using the GroupBox Control - Using the Panel Control - Using the PictureBox Control – Using the Timer Control - Using the ProgressBar Control.

Unit - IV: Windows Forms Controls II : Using the ToolStrip Control – Using the MenuStrip Control – Using the StatusStrip Control – Working with Dialog Boxes - Using FolderBrowserDialog Control – Using the OpenFileDialog Control – Using the SaveFileDialog Control – Using the FontDialog Control – Using the ColorDialogControl – Using the PrintDialog and PrintDocument Controls.

Unit - V: Windows Presentation Foundation: Exploring the Improvements in WPF 4.5 - The Ribbon Control - Support for Binding to Types that Implement ICustomTypeProvider- New Virtualizing Panel Features - Extensions for Events - Explaining WPF 4.5 Architecture - Windows Base – The Milecore Component - Exploring WPF 4.5 Designer - Using XAML in WPF - Working with WPF Controls.

Unit - VI: **(For Internal Exam Only)** LINQ in Visual Basic 2012: Creating a simple LINQ Query – Working with Standard Query Operators – Sorting, Set, Filtering, Projection, Partitioning, Grouping, Join, Quantifier, Generation, Element, Conversion, Aggregate , Equality, Concatenation, Zip Operators – Implementing LINQ to ADO.NET – LINQ to Dataset – LINQ to SQL – Exploring Parallel LINQ.

Text:
(For Both Internal and External Exam)
"Comdex .NET 4.5 Programming Course Kit", Vikas Gupta, DreamTech Press, Edition-2014.

Unit I –V: Preface: 1, 2 (Relevant topics only), Chapters: 1 – 5

Unit VI: (For Internal Exam Only) Chapter : 7.

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Reference:

1. "Comdex .Net 4.0 programming course kit", Vikas Gupta, DreamTech Press Edition 2010.
2. "Microsoft Visual Basic.NET", Gary B. Shelly, Thomas J. Cashman, Cengage Learning India, 2013.
3. "Introducing .NET 4.5", Alex Mackey, Willam Stewart Tulloch & Mahesh Krishnan, APress, 2012.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Understand** the fundamental concepts of Integrated Development Environment..	L2
CO2	**Identify** and **apply** the concepts of Objects, Primitive values, Message, Method, Selection control structure, Repetition control structures, Object Reference, Container and method parameter.	L2, L3
CO3	**Design** and **Examine** the VB. Net solutions using basic controls of forms.	L3, L6
CO4	**Construct** and **Experiment** the VB. Net solutions using the Toolstrip control and various DialogBox controls.	L3, L6
CO5	**Infer** the improvements in WPF 4.5 Architecture and translate general requirements into data related solutions using database concepts.	L2

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	2	3	2	-	-	-	-	2	-	-
CO2	3	1	2	3	2	-	-	-	-	2	-	-
CO3	3	-	2	3	-	1	-	-	-	2	-	-
CO4	3	2	1	3	-	1	2	-	-	1	-	2
CO5	2	1	1	3	-	1	2	-	-	1	-	2

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – V
CC 7

Hours - 6
Credit – 5

Software Engineering and Testing (22K5CS07)

Objective: To provide implementation – oriented skills in software design.

Unit - I: Introduction to Software Engneering: Some Definitions – Some Size Factors – Quality and Productivity Factors – Managerial Issues. Planning a Software Project : Introduction – Defining the Problem – Developing a Solution Strategy – Planning the Development Process – Planning an Organizational Structure – Other Planning Activities.

Unit - II: Software Cost Estimation: Introdution – Software Cost Factors: Programmer Ability – Product Complexity – Product Size – Available Time – Required Level of Reliability – Level of Technology - Software Cost Estimation Techniques: Expert Judgment – Delphi Cost Estimation – Work Breakdown Structures – Algorithmic Cost Models. Staffing-Level Estimation – Estimating Software Maintenance Costs. Software Requirements Definition: The Software Requirements Specification – Formal Specification Techniques.

Unit - III: Software Design: Introduction – Fundamental Design Concepts: Abstraction – Information Hiding – Structure – Modularity – Concurrency – Verification – Aesthetics - Modules and Modularization Criteria: Coupling and Cohesion – Other Modularization Criteria - Design Notations – Design Techniques – Detailed Design Considerations – Real-Time and Distributed System Design – Test Plans – Milestones, Walkthroughs, and Inspections - Design Guidelines.

Unit - IV: Implementation Issues: Introduction – Structured Coding Techniques: Single Entry, Single Exit Constructs – Efficiency Considerations – Violations of Single Entry , Single Exit – Data Encapsulation – The Goto Statement – Recursion - Coding Style – Standards and Guidelines – Documentation Guidelines: Supporting Documents – Program Unit Notebooks – Internal Documentation.

Unit – V: Software Testing Fundamentals: Introduction – Effective Software Testing – Types of Testing. Static Testing: Introduction – Principles of Static Testing: Automated Techniques: Syntax Parser – Static Verification – Symbolic Execution – Static Vs Dynamic Testing. Black Box Testing – White Box Testing.

Unit – VI: **(For Internal Exam only)** Software Testing Strategies: Introduction – Strategic Issues – Strategic Premises – Generic Testing Strategies – Completion of Testing – Testing Real-time Systems – Models for Software Testing. Plainning for Software Testing.

Text:
(For Both Internal and External Exam)

1. **"Software Engineering Concepts", Richard E.Fairely , McGraw Hill Education (India) Pvt. Ltd., Indian Edition, 39th Reprint 2013.**
   Unit : I – IV: Chapters: 1, 2, 3, 4.1, 4.2, 5, 6.

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2. "Software Testing – Concepts and Practices", K.Mustafa and R.A. Khan, Narosa Publishing House Pvt. Ltd., 2007.

Unit V: Chapters: 1.1, 1.3, 1.4, 3.1, 3.2, 3.5, 3.6, 4, 5 (Relevant Topics Only)

Unit VI: (For Internal Exam only) Chapter: 6

Reference :

1. "Software Engineering", RP Mahapatra, Govind Verma, Khanna Publishing House, First Edition, 2016.
2. "Software Engineering", A Practitiner's Approach, Seventh Edition, Roger S. Pressman McGraw Hill Education Indian Edition, (2017) .
3. "Concise Guide to Software Testing", Gerard O'Regan Springer international Publishing, First Edition 2019.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Dicuss** the basic Software Engineering Productivity Factors and Planning an Organizational Structure.	L2
CO2	**Estimate** Software cost using various cost estimate model.	L4
CO3	**Generalize** Various Design Tech's and Detailed Design Cinsidersation.	L6
CO4	**Establish** structural coding techniques and Implementation Issues.	L3
CO5	**Analyze** various verification and validation testing techniques.	L4

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	1	1	-	1	-	-	-	1	1	1
CO2	1	-	-	2	-	1	-	1	-	1	1	1
CO3	1	-	-	1	-	-	-	-	-	-	-	-
CO4	1	-	-	1	-	-	-	1	-	-	-	-
CO5	1	-	-	1	-	1	-	-	-	1	-	1

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – V
CC 8

Hours - 6
Credit - 5

Digital Design (22K5CS08)

Objective: To Impart basic knowledge on Digital Electronics.

Unit - I: Number Systems: Review of decimal number system - Binary number system - Binary to decimal conversion - Decimal to binary conversion - Hexadecimal number system - Hexadecimal to decimal conversion - Decimal to hexadecimal conversion - Hexadecimal to binary conversion - Binary to hexadecimal conversion - Octal number system - Octal to decimal conversion - Decimal to octal conversion - Octal to binary conversion - Binary to octal conversion.

Unit - II: Binary Arithmetic: Binary Addition - Binary Subtraction - Binary Multiplication - Binary Division - 1's and 2's Complements - Subtraction using complements - Signed Binary Number Binary Codes: BCD codes - 8421 code – 2421 and 4221 codes – Excess-3 code – Gray code – ASCII code.

Unit - III: Logic Gates and Logic Circuits: Introduction - Analog and Digital Signals - Basic logic gates, NOT, OR, AND - Logic circuits and Logic expressions - Sum of Products (SOP) - Product of Sums (POS) - NAND and NOR gates - Ex-OR and Ex-NOR gates. Boolean Algebra: Laws of Boolean Algebra - DeMorgan's Theorem - NAND as Universal gate – NAND -NAND network - NOR as Universal Gate.

Unit - IV: Karnaugh Map: Minterms and Maxterms - Relationship between K Map and truth table – 2-variable K-map using minterms - 3-variable K-map using minterms - 4-variable K-map using minterms - Don't care conditions. Arithmetic Circuits: Binary addition - Half adder and Full adder.

Unit - V: Combinational Logic: Introduction - Combinational circuits - Analysis Procedure - Decimal Adder –. Decoders – Encoders – Multiplexers. Synchronous Sequential Logic: Introduction - Sequential Circuits - Storage Elements: Latches, - Flip–flops. Registers and Counters: Registers – Shift Registers – Ripple Counters - Synchronous Counters - Other Counters – Design at the Register Transfer Level – Introduction – Register Transfer Level (RTL) Notation.

Unit – VI: (**For Internal Exam Only**) Experiments: Binary and Decimal Numbers – Digital Logic Gates - Simplification of Boolean Functions - Combinational Circuits – Counters - Shift Registers.

Text:
(For Both Internal and External Exam)
1. "Digital Fundamentals", V.Vijayendran, S.Viswanathan Printers & Publishers Pvt. Ltd., Reprint 2011.
Unit I – IV: Chapters: 1, 2, 3, 4, 5.1 - 5.5, 6.1 - 6.6, 8.1 - 8.2. (Relevant Topics only)

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2. "Digital Design", M. Morris Mano and Michael D. Ciletti, Fifth Edition, Pearson India Education Services Pvt. Ltd., Sixth Impression.
Unit V: Chapters: 4.1-4.11, 5.1-5.4, 6.1-6.5, 8.1–8.2 (Relevant Topics only)
Unit – VI: (For Internal Exam Only) Experiment : 11.2 - 11.5, 11.11 - 11.12

Reference:

1. "Fundamentals of Digital Design", Sivakumar, M.Senthil, S.Chand Publication, 2014.
2. "Digital Design", M.Morris Mano Michael D. Ciletti, Fourth Edition, Pearson Prentice Hall Published by Dorling Kindersley India Pvt. Ltd., Third Impression 2016
3. "An Engineering Approach to Digital Design", William L. Fletchar, Pearson India, First Edition.

Course Outcome:

COs	Statements	Bloom's Level
CO1	**Understand** the various number systems and implement its conversion in digital design	L2
CO2	**Implement** 1's and 2's Complements in problem solving	L3
CO3	**Organize** the concepts of various advanced gates	L4
CO4	**Testing** k-map's and truth tables.	L3
CO5	**Solve** combinational and sequential circuits	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	3	3	-	2	2	1	3	3	3	3
CO2	-	-	-	3	-	2	2	1	3	3	3	3
CO3	-	-	3	3	-	2	2	1	3	-	3	3
CO4	-	-	3	3	-	-	2	1	-	3	3	3
CO5	-	-	3	3	-	2	2	1	3	3	3	3

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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THANJAVUR- 7.

Semester – V
CC 9

Hours - 5
Credit - 5

Database Systems (22K5CS09)

Objective: To impart knowledge in Database concepts such as database Design, database languages, data system implementation.

Unit - I: Introduction: Database System Applications – Relational Databases – Database Design – Data Storage and Querying - Transaction Management – Database Architecture – Data Mining and Information Retrieval – Database Users and Administrators.

Unit - II: Introduction to the Relational Model: Structure of Relational Databases – Database Schema – Keys - Schema Diagrams – Relational Query Languages – Relational Operations. Introduction to SQL: Overview of the SQL Query Language – SQL Data Definition - Basic Structure of SQL Queries – Additional Basic Operations - Set Operations – Null Values – Aggregate Functions - Nested Subqueries - Modification of the Database.

Unit - III: Intermediate SQL: Join Expressions – Views - Transactions – Integrity Constraints - SQL Data Types and Schemas – Authorization. Database Design and the E-R Model: Overview of the Design Process – The Entity-Relationship Model – Constraints - Removing Redundant Attributes in Entity Sets - Entity-Relationship Diagrams.

Unit - IV: Relational Database Design: Features of Good Relational Design - Atomic Domains and First Normal Form – Decomposition using Functional dependencies: Keys and Functional Dependencies, Boyce-Codd Normal Form, BCNF and Dependency Preservation, Third Normal Form, Higher Normal Forms – Functional-Dependency Theory – Algorithms for Decomposition.

Unit - V: Transactions: Transaction Concept – A Simple Transaction Model – Storage Structure – Transaction Atomicity and Durability – Transaction Isolation – Serializability – Transaction Isolation and Atomicity – Transaction Isolation Levels – Implementation of Isolation Levels – Transactions as SQL Statements.

Unit - VI: **(For Internal Exam only)** Concurrency Control: Lock-Based Protocols – Deadlock Handling – Multiple Granularity – Timestamp-Based Protocols – Validation-Based Protocols – Multiversion Schemes – Snapshot Isolation.

Text:
(For Both Internal and External Exam)
"Database System Concepts", Abraham Silberschatz, Henry F.Korth, S.Sudarshan, McGraw Hill Education (India) Pvt. Ltd., Sixth Edition, Tenth Reprint, 2016.
Unit I - V
Chapters: 1, 2, 3, 4, 7.1 - 7.5, 8.1 - 8.5, 14.

Unit VI: (For Internal Exam Only) Chapter: 15.1 – 15.7.

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Reference:

1. "Database Management System", Ramakrishnam , McGraw Hill Higher Education, Third Edition, 2002.
2. "Database Management System the Complete Book", Jennifer Wisdom, Jeffrey D.Ullman, Hector Garcia –molina Pearson - First Edition - 2003.
3. "Database Management System", G.K.Gupta, Tata McGraw Hill Education Pvt. Ltd., First Edition, 2011.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Observe** the database system applications and database management system.	L2
CO2	**Understand** the Relational models and Overview of SQL.	L2
CO3	**Construct** the applications using conceptual modeling tools such as ER diagrams and design database schemes based on the model.	L3
CO4	**Infer** the normalization theory and **apply** that knowledge to normalize the database.	L2, L3
CO5	**Compose** the basics of transaction processing and concurrency control.	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	3	-	-	-	-
CO2	-	-	-	2	-	-	-	-	-	-	-	-
CO3	-	-	2	-	-	-	-	3	-	-	1	2
CO4	3	-	-	3	-	2	-	2	-	-	2	2
CO5	3	-	-	-	-	-	-	-	-	-	-	3

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – V
CC 10(P)

Hours - 4
Credit - 3

MySQL Lab (22K5CS10P)

1. Create a table and perform the following basic MySQL operations:
   a) Insert values
   b) Delete values
   c) Display values using various forms of select clause
   d) Drop the table

2. Create a table and perform the following basic MySQL operations:
   a) Set the primary key
   b) Check for the not null values
   c) Check the Unique constraints
   d) Check the reference constraints

3. Develop MySQL queries to implement the following set operations:
   a) Union
   b) Union all
   c) Intersect
   d) Intersect all

4. Develop MySQL queries to implement the following aggregate functions:
   a) Sum
   b) Count
   c) Average
   d) Maximum
   e) Minimum
   f) Group by clause & Having clause

5. Develop MySQL queries to implement following join operations:
   a) Natural join
   b) Inner join
   c) Outer Join

6. Develop MySQL queries to implement following join operations:
   a) Left outer join
   b) Right outer join

7. Develop MySQL queries to implement nested subqueries for the following set operations:
   a) Set membership(in, not in)
   b) Set comparison (some, all)
   c) Empty relation (exist, not exist)
   d) Check for existence of Duplicate tuples (unique, not unique)

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8. Develop MySQL queries to create a view and expand it.

9. Develop MySQL queries to implement
   a) String operations using %
   b) String operations using '_'
   c) Sort the element using asc, desc

10. Consider the following database for a banking enterprise and perform the following queries:
    BRANCH (branch-name:string, branch-city, string, assets:real)
    ACCOUNT (accno:int, branch-Name:string, balance:real)
    DEPOSITOR (customer-name:string, accno:int)
    CUSTOMER (customer-name:string, customer-street:string, customer-city:string)
    LOAN (loan-no:int, branch-name:string, amount:real)
    BORROWER (customer-name:string, loan-no:int)
   a) Create the above tables by properly specifying the primary keys and the foreign keys.
   b) Enter atleast five tuples for each relation.
   c) Find all the customers who have atleast two accounts at the main branch.
   d) Find all the customers who have an account at all the branches located in a specific city.
   e) Demonstrate how you delete all account tuples at every branch located in a specific city.
   f) Create suitable front end for searching and displaying the results.

Course Outcome:

CO'S	Statements	Bloom's Level
CO1	**Construct** a table and perform basic operations.	L4
CO2	**Design** the table and **Test** set operations and aggregate functions.	L4 , L6
CO3	**Desin** the table and **check** the joins conditons	L4 , L3
CO4	**Create** views and perform set operations.	L6
CO5	**Construct** a database and **demonstrate** string operations and basic queries.	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	1	2	1	1	-	1	-	-
CO2	-	2	1	1	-	1	-	-	-	1	-	-
CO3	1	1	1	2	-	1	2	1	-	1	-	-
CO4	2	1	1	1	1	1	1	1	-	1	-	1
CO5	2	-	1	2	1	1	2	1	-	1	-	1

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Semester – VI
CC 11

Hours - 7
Credit - 6

Microprocessor Architecture (22K6CS11)

Objective: To Impart basic understanding of advanced processor & hardware.

Unit - I : Introduction: Word Length of a Computer or Microprocessor - Evolution of Microprocessors - Evolution of Digital Computers - Computer Generations – Single-Chip Microcomputers - Embedded Microprocessors - Hardware, Software and Firmware - CPU – Memory - Buses - Processing Speed of a Processor.

Unit - II : Microprocessor Architecture : Introduction - Intel 8085 – Instruction Cycle - Timing Diagram. Instruction set of Intel 8085: Introduction - Instruction and Data Formats - Addressing Modes: Direct Addressing – Register Addressing – Register Indirect Addressing – Immmediate Addressing – Implicit Addressing - Status Flags - Symbols and Abbreviations - Intel 8085 Instructions.

Unit - III : Examples of Assembly Language Programs: Introduction – Simple Examples – Addition of two 8- Bit Numbers; Sum:8-Bit - 8-Bit Subtraction – Addition of two 8-bit Numbers sum: 16-bit - Find 1's Complement – Find 2's Complement – Shift – Masking - Move a Block of Data from One Section of Memory to Another Section of Memory.

Unit - IV : Intel 8086 And Intel's Other 16-bit Microprocessors: Introduction - Intel 8086 : Pins Description - Operating Modes of 8086 - Pin Description for Minimum Mode - Pin Description for Maximum Mode - Assembler Directives - Assembler Directives for Intel 8086 - Assembly Language Programs Using Assembler.

Unit - V : Microcontrollers: Introduction: Intel 8051 series of Microcontrollers (MCS-51) – Registers - Pins of Intel 8051 - I/O Lines - The 8051 Interrupts – Instruction set - Memory organization of Intel 8051 - Addressing Modes.

Unit – VI: **(For Internal Exam Only)** Microprocessor Applications: 7 – Segment LED display. Measurement of Physical Quantities: Temperature Measurement and Control – Water Level Indicator – Microprocessor-Based Traffic Control.

Text :
(For Both Internal and External Exam)
"Fundamentals of Microprocessors and Microcontrollers", B. Ram & Sanjay Kumar, Dhanpat Rai publications Pvt. Ltd., Eighth Revised Edition, Reprint, 2016.
Unit I – V : (for External Exam) Chapters: 1.1 – 1.11, 3, 4, 6.1- 6.37, 10 - 10.1.4, 10.1.7, 10.1.13 , 10.1.14, 11 - 11.2.4, 11.7 - 11.9 (Relevant topics only)

Unit – VI: (for Internal Exam Only) 9.3, 9.6.1, 9.6.4 , 9.8

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Reference:

1. "Microprocessors and microControllers", M.Saravanan, S.Jeevanathan, N.Senthikumar, Oxford University Press, Fifth Edition, 2010.
2. "Microprocessor And Programming and Applications with the 8085", Ramesh Gaonkar, Fifth Edition ,CBS Publications, 2011.
3. Microprocessor and Microcontrollers", Nagoor Kani, Second Edition, Tata McGraw Hill.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Group** the various hierarchical memories include cache memory and virtual memory	L2
CO2	**Classify** the Architecture, Addressing modes andInstructions Set of Intel 8085 microprocessor	L4
CO3	**Examine** the knowledge of assembly language programming	L3
CO4	**Review** the Operating Modes of Intel 8086 Microprocessor and Pin Description for Min and Max Modes.	L2
CO5	**Determine** the importance of Microcontrollers, Register and Memory Organization of Inter 8051.	L3

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	-	-	3	-	-	-	-	3	-	-
CO2	3	2	1	3	-	-	-	-	3	-	1
CO3	3	3	-	3	-	-	-	-	3	3	-
CO4	3	3	1	3	-	1	-	-	3	-	1
CO5	3	3	1	3	-	1	-	3	3	-	3

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – VI
CC 12(P)

Hours - 6
Credit - 5

Digital and Microprocessor Lab (22K6CS12P)

I. Experiments with Digital IC's:

1. Study of Gates :
   i) Construction of Logic Gates.
   ii) Construction of Fundamental Logic Gates using Universal Gates.
2. Construction of Half Adder / Full adder using logic gates.
3. Karnaugh Map reduction of Boolean expression (Maximum of Three variables expression only)
4. Study of Counters (Up / Down)
5. Study of Shift Registers (Serial / Parallel)

II. Experiments with Microprocessor Kits:

1. 8-bit addition, subtraction, multiplication, division.
2. Multi-byte addition, subtraction.
3. Data transfer from one part to other part of memory.
4. Sorting (Ascending / Descending)
5. Number Conversion (Hex to Decimal / Decimal to Hex)

Course Outcome:

COs	Statements	Bloom's Level
CO1	**Understand** the concepts related I/O and Memory interfacing	L2
CO2	Design and **implement** programs in Half adder and Full Adder.	L3
CO3	**Develop** the Basic Arithmetic programs.	L3
CO4	**Test** the concept knowledge of Sorting (Ascending and Descending Programs	L4,L5,L6
CO5	**Manipulate** various numbers conversions	L3

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	3	3	-	2	-	2	3	3	3	3
CO2	-	-	3	3	-	2	-	2	3	3	3	3
CO3	-	-	3	3	-	2	-	2	3	3	3	3
CO4	-	-	3	3	-	2	-	2	3	3	3	3
CO5	-	-	3	3	-	2	-	2	3	3	3	3

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Semester – VI
CC 13

Hours - 6
Credit - 6

Mini Project (22K6CS13PW)

Guidelines:

1. The students have to do the mini-project work as far as possible individually in the lab itself. In case of group project, the group size should not exceed three.
2. Any application either system oriented or application oriented may be selected.
3. One internal examiner and one external examiner shall evaluate the mini-project.
4. During the evaluation, there should be online demonstration.
5. The final copy of project report should be submitted to the department.
6. Individual member of the group should contribute to atleast one module.

Scheme of Valuation:

1. Selection of application & design	- 20 marks
2. Preparation of source code	- 20 marks
3. Demonstration / Execution	- 20 marks
4. Documentation	- 20 marks
5. Viva Voce	- 20 marks

CONTROLLER OF EXAMINATIONS
01 AUG 2022
H.H. The Rajah's Govt. Arts College for Women (Autonomous), Pudukkottai

Head, Dept. of Computer Science
Kunthavai Nachiaar Govt Arts College (W)
THANJAVUR- 7

B.Sc., Computer Science

Major Based Elective Courses

Semester – VI **Hours - 5**
MBE 1:1 **Credit - 5**

Cloud Computing (22K5CSELCS1:1)

Objective: To acquire knowledge in cloud based computing environment.

Unit - I: Understanding Cloud Computing : Introduction - History of Cloud Computing - Cloud Computing Works, Matters – Computing in the Cloud: The Pros And Cons of Cloud Computing – Beneficiaries of Cloud Computing: Collaborators – Road Warriors – Cost-Conscious Users – Cost - Conscious IT Departments.

Unit – II: Developing Cloud Services: – The Pros And Cons of Cloud Service Development – Types of Cloud Service Development – Discovering Cloud Services Development Services and Tools. Cloud Computing For Everyone of the Family: Centralizing Email Communications – Collaborating on Schedules, Grocery Lists, To-Do Lists, Household Budgets, Contact Lists – School Projects – Sharing Family Photos.

Unit – III: Cloud Computing for the Community: Collaborating on Schedules – Collaborating on Group Projects and Events. Cloud Computing for the Corporation: Managing Schedules, Contact Lists, Projects – Collaborating On Reports, Marketing Materials, Expense Reports, Budgets, Financial Statements, Presentations - Presenting on the Road - Accessing Documents on the Road.

Unit – IV: Collaborating on Calendars, Schedules and Task Management: Exploring Online Calendar Applications – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management. Collaborating on Event Management: Understanding Event Management Applications – Exploring Event Management Applications.

Unit – V: Collaborating on Contact Management: Understanding Contact Management and CRM – Exploring Contact Management and CRM Applications. Collaborating on Project Management: Exploring Project Management Applications.

Unit – VI: **(For Internal Exam Only)** Collaborating on Word Processing: Web-Based Word Processing. Collaborating on Spreadsheets: Web-Based Worksheets – Exploring Web-based Spreadsheets.

Text:
(For Both Internal and External Exam)
"Cloud Computing - Web based Applications that change the way you work and Collaborate Online", Michael Miller, Pearson Education, Tenth Impression.
Unit I to V: Chapters : 1-10

Unit VI (For Internal Exam Only) Chapters : 11, 12

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Reference:
1. "Cloud Computing A Practical Approach", Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, Tata McGraw Hill, Fourth Reprint 2010.
2. "Cloud Computing Principles, Systems, and Applications", Nick Antonopoulous, Lee Gillam, Springer, 2010
3. "Cloud Computing- SaaS,PaaS,IaaS, Virtualiztion, Business Models, Mobile, Security, and More", Kris Jamsa, Jones abd Barlett India Pvt. Ltd, First Indian Edition 2014.

Course Outcome:

COs	Statements	Bloom's Level
CO1	**Understand** the concepts of Cloud Computing and **Collaborate** the Cloud Computing Concepts	L2, L6
CO2	**Discover** and **Develop** the Cloud Services	L2, L6
CO3	**Manage** the Schedules and Tasks	L6
CO4	**Express** the Planning, Task and Event Management Applications	L6
CO5	**Collaborate** on Contact and Project Management Applications	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	2	1	-	-	2	-	-	2	1
CO2	2	-	1	-	1	-	-	3	-	-	1	1
CO3	3	-	-	3	-	-	-	3	-	-	3	1
CO4	3	-	-	3	-	-	-	3	-	-	3	3
CO5	3	-	1	1	-	-	-	3	-	-	3	3

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

Semester – V
MBE 1:2

Hours - 5
Credit – 5

MIS & ERP (22K5CSELCS1:2)

Objective: To give basic understanding in Management Information System.

Unit - I: Information Systems in Global Business Today: Information Systems essential for running and managing business: Transforming Business - Management Information Systems - Information Systems.

Unit - II: Dimensions of Information Systems: Technical Approach - Behavioral Approach. Global E-business and Collaboration: Business Processes - Information Technology Improves Business Processes. Systems for Different Management Groups - Systems for Linking the Enterprise - Collaboration - Social Business. Role of information systems function in a business: Organizing the Information Systems Function.

Unit - III: Information Systems, Organizations and Strategy: Organization - Features of Organizations - Impact of information systems on organizations - Economic Impacts - Organizational and Behavioral Impacts. IT Infrastructure and Emerging Technologies: IT Infrastructure - Components of IT infrastructure – Computer hardware platforms - Computer Software platforms and Trends.

Unit - IV: Foundations of Business Intelligence: Databases and Information Management: Managing data resources in a traditional file environment – Major capabilities of Data Management Systems (DBMS) – Principal tools and technologies for accessing information from databases.

Unit - V: Enterprise - An Overview: Introduction - Business functions and business Processes - The Role of the Enterprise - Business Modeling - Integrated Data Model. ERP and Related Technologies: Introduction - Business Process Reengineering - Data Warehousing - Data Mining - On-line Analytical Processing - Supply Chain Management - Customer Relationship Management – Geographic Information System – Intranets and Extranets.

Unit - VI: **(For Internal Exam Only):** E-Commerce and E-Business: Introduction – IT Revolution – Evolution of E-Commerce - E-Commerce: Growth Factors – E-Commerce to E-Business – E-Business.

Text:
(For Both Internal and External Exam)
1. "Management Information Systems - Managing The Digital Firm", Kenneth C.Laudon and Jane P. Laudon, Pearson Education (India) Pvt. Ltd., Fifteenth Edition, 2018.
Unit I-IV: Chapter: 1, 2, 3.1, 3.2, 5, 6.

2."ERP Demystified", Alexis Leon, McGraw Hill, Third Edition, 2014.
Unit V: Chapters: 1, 8.

Unit VI: (For Internal Exam Only) Chapter: 10.

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Reference:

1. "Computer concepts and Management Information Systems", C.P.Gupta and K.K.Goyal, Mercury Learning and Information, 2020.
2. "Integrated Business Information Systems", Llaus and Dieter Gronwald, Springer, Verlag Berlin Heidelberg - 2017.
3. "Modern ERP: Select, Implement, and Use Today's Advanced Business Systems", Marianne BradFord, Lulu Publication, Third Edition, 2015.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Illustrate** the dimensions of information system and **infer** the knowledge of business processes.	L2, L6
CO2	**Correlate** the different management groups and discuss role of information system.	L4, L2
CO3	**Collaborate** the economic impacts with emerging IT infrastructure.	L6
CO4	**Analyze** the major capabilities of DBMS	L4
CO5	**Anticipate** with the business process reengineering technologies.	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	1	-	1	-	-	-	1	-	1
CO2	-	-	2	2	-	-	1	-	-	-	-	1
CO3	-	-	1	1	-	-	-	-	-	-	-	-
CO4	1	1	1	-	-	1	1	1	-	-	-	-
CO5	1	1	2	2	-	2	2	2	1	1	2	2

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – VI
MBE 2:1

Hours -5
Credit - 5

Data Communications and Networks (22K6CSELCS2:1)

Objective: To impart knowledge on applications in communication and network field.

Unit - I: Introduction: Data Communications: Components, Data Representation, Data flow - Networks: Network Criteria, Physical structures - Network Types: Local Area Networks, Wide Area Network, Switching, The Internet, Accessing the Internet. Network Models: Protocol Layering: Scenarios, Principles of Protocol Layering - Logical Connections - TCP/IP Protocol Suite - The OSI Model.

Unit - II: Introduction to Physical Layer: Data and Signals: Analog and Digital Signals - Periodic Analog Signals: Sine Wave, Composite-Signals. Digital Signals: Bit rate, Bit length, Transmission of Digital Signals. Transmission Impairment: Attenuation, Distortion, Noise. Digital Transmission: Digital to Digital Conversion – Analog to Digital Conversion – Transmission Modes. Analog Transmission: Digital to Analog Conversion - Analog to Analog Conversion.

Unit - III: Switching: Introduction – Circuit Switched Networks: Three Phases, Efficiency, Delay – Packet Switching: Datagram Networks, Virtual-circuit Networks. Data Link Layer: Introduction – Link-Layer Addressing: Address Resolution Protocol.

Unit - IV: Error Detection and Correction: Introduction – Block Coding – Cyclic Codes: Cyclic Redundancy Check, Polynomials, Cyclic code Encoder Using Polynomials, Cyclic code Analysis - Other Cyclic codes. Checksum. Other Connecting Devices: Hubs, Link-Layer Switches, Routers.

Unit - V: Network-Layer Protocols: Internet Protocol (IP): Datagram Format, Fragmentation. Unicast Routing: Introduction: General Idea, Least cost Routing - Routing Algorithms: Distance Vector Routing, Link-state Routing, Path vector Routing – Unicast Routing Protocols.

Unit - VI: **(For Internal Exam only)** Standard Client-server Protocols: World Wide Web and HTTP - FTP – Electronic Mail: Architecture, Web-Based Mail, E-mail Security – TELNET: Local verses Remote Logging.

Text:
(For Both Internal and External Exam)
"Data Communications and Networking 5E", Behrouz A. Forouzan, McGraw Hill Education (India) Pvt. Ltd., Fifth Edition, Fourth Reprint 2014.
Unit I-V: Chapters: 1.1 – 1.3, 2.1 -2.3, 3.1 -3.4, 4.1 – 4.3, 5.1, 5.2, 8.1 – 8.3, 9.1, 9.2, 10.1 – 10.4, 17.1, 19.1, 20.1 – 20.3.

Unit VI: (For Internal Exam Only) Chapter: 26.1 - 26.4

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Reference:

1. "Modern digital and Analog Communications Systems", Ding, Zhi, Lathi, Bhagwandas and Pannalal, Oxford University Press, USA, Fifth Edition, 2018.
2. "Fundamentals of Data Communication Networks", Oliver C.Ibe, Wiley, First Edition, 2017.
3. "Business Data Communications and Networking", Jerry Fitz Gerald, Alan Dennis, Alexandra Durcikova, Wiley, 13th Edition, 2017.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Understand** the Network communications using the layered concepts of Open System Interconnection and TCP/IP model.	L2
CO2	**Categorize** the concepts of Signals and Transmission media.	L2
CO3	**Determine** the various Switching Technologies.	L3
CO4	**Determine** the knowledge of networking and Inter-networking devices.	L3
CO5	**Establish** the TCP/IP protocol Suite and other protocols in the Network Layer	L4

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	-	1	2	-	3	-	-	-	-	3
CO2	-	3	1	2	-	2	1	--	-	2	-	3
CO3	1	2	2	1	-	-	2	-	-	2	1	2
CO4	-	1	1	2	-	2	2	1	-	1	2	2
CO5	1	2	1	2	1	-	1	-	-	1	1	2

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – VI
MBE 2:1

Hours -5
Credit - 5

Network Security ((22K6CSELCS2:1)

Objective: To impart the knowledge of Network Security

Unit - I: Introduction: Secure Network - Network Security - Network Attacks – Perform Network Security Attacks - Attacks from within and External.

Unit - II: Firewalls: Defining and Access Control Policy - Definition of Firewall and Types - Firewalls (UNIX and NT) - Network Address Translation (NAT) - Firewall Logging - Firewall Deployment.

Unit - III: Intrusion Detection System (IDS):IDS Introduction - IDS Limitations. Authentications and Encryptions: Authentication - Encryption - Encryption Solutions.

Unit - IV: Visual Private Network: Basic – Setting of VPN. Virus, Trojans and Worms: Virus - Worms - Trojan Horses - Virus Preventive Measures.

Unit - V: Disaster, Prevention and Recovery: Disaster Categories - Network Disasters (Disaster Prevention – Server Disasters.

UNIT VI: (**For Internal Exam Only**) Level of Security: Promoting Risk Analysis - Developing Security Policy.

Text:
(For Both Internal and External Exam)
"Network Security", Kuldeep Singh Kohar, Vayu Education of India, First Edition 2009.
Unit I – V: Chapters: 1, 3 , 4, 5, 6, 7, 8.

Unit VI: (For Internal Exam Only) Chapter 2.

Reference:

1. "Cryptography & Network Security", Behrouz A. Forouzan, Tata Mc Graw Hill India, Third Edition, Reprint 2015.
2. "Internet Security Cryptographic Principles Algorthims and Protocols", Man Young Rhee, Wilely Publications 2003.
3. "Security in Computing", Charles Pfleeger, Prertice Hall of India, Fourth Edition, 2006.

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Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Understand** the basic concepts of Network & Security	L2
CO2	**Determine** the Knowledge of Firewall and Types	L3
CO3	**Predict** the Intrusion attacks and Encryption	L5
CO4	**Develop** Visual Private Network	L6
CO5	**Defend** the various Server Disasters	L5

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	-	1	1	1	1	-	-	-	-	-
CO2	-	1	-	-	1	1	-	-	-	1	-	-
CO3		1	-	1		1	-	-		1	-	-
CO4	-	1	-	-		1		1		1	-	-
CO5	-	-	-	1	-	1	-	1	-	1	-	1

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – V1
MBE 3:1

Hours - 5
Credit – 5

Operating System (22K6CSELCS3:1)

Objective: To provide understanding on system level resource handling.

Unit - I: Introduction: Operating Systems: Abstract View - Computer-System Orgranization – Computer-System Architecture – Operating-System Operations – Resource Management – Security and Protection – Virtualization – Distributed Systems. Operating System Structures: System Calls – System Services – Linkers and Loaders.

Unit - II: Process Management: Processes: Process Concept – Process Scheduling – Operations on Processes – Interprocess Communication – IPC in Shared-Memory Systems. CPU Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms - Thread Sheduling – Multi-Processor Scheduling.

Unit - III: Deadloacks: System Model – Deadlock in Multithreaded Applications - Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock. Memory Management: Main Memory : Background - Contiguous Memeory Allocation – Paging – Structure of the Page Table – Swapping..

Unit - IV: Virtual Memory: Background – Demand-Paging - Copy-on-Write – Page Replacement - Allocation of Frames – Thrashing – Memory Compression – Allocating kernal Memory – Other Considerations - Operating-System Examples.

Unit – V: Files Sytstem: File-Syste Interface – File Concept – Access Methods – Directory Structure – Protection – Memory-mapperd Files. File-System Implementaion: File-System Structure – File-System Operations – Directory Implementaion – Allocation Methods.

Unit - VI: **(for Internal Exam only)** The Linux System: Linux History – Design Principles – Kernel Modules – Process Management – Scheduling – Memory Management – Files Systems - Input and output – Interprocess Communication – Network Structure – Security.

Text :

(For Both Internal and External Exam)

"Operating System Concepts", Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, Wiley India Pvt. Ltd., Tenth Edition, 2018.

Unit - I to V : Chapters : 1.1 – 1.8, 2.3, 2.4, 3.1 - 3.5, 5.1 - 5.5, 8, 9.1 - 9.5 , 10, 13, 14.1 - 14.4.

Unit VI: (For Internal Exam only) Chapter: 20.

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Reference:

1. "Operating Systems: Three Easy Pieces", Remzi H. Arpasi, Dusseau, 2015.
2. "Operating Systems", Madnick (S.E.), Donovan (J.J), Tata McGraw Hill, 1999.
3. "Modern Operating Systems", Andrew S Tanenbaum, BOS, Herbert, Pearson Education (US), Langara College, Fourth Edition, 2016.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Generalize** the architecture and structure of OS	L6
CO2	**Describe** the process scheduling and scheduling Algorithms.	L3
CO3	**Practice** to handle deadlock methods like Detection, recovery and Avoidance	L3
CO4	**Categorize** the various memory management schemes, Analyze the performance of Demand Paging.	L4
CO5	**Summarize** the various types of distributed Operating System.	L2

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	1		-	2	-	-	-	-	3
CO2	-	1	-	2	1	-	3	1	-	3	-	3
CO3	-	-	-	2		-	2	1	-	2	2	1
CO4	-	1	-	1		2	2	2	-	2	2	3
CO5	1	2	2	1		-	2	3	-	1	1	2

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)

Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.

Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

Semester – V1
MBE 3:2

Hours - 5
Credit – 5

Distributed Operating Systems (22K6CSELCS3:2)

Objective: To provide the knowledge of communication, synchronization, resource management and security aspects in Distributed Operation System.

Unit I: Fundamentals: Distributed System – Evolution of Distributed Computing Systems - Distributed Computing System Models – Reasons for Distributed Computing Systems Gaining Popularity – Distributed Operating System – Introduction to Distributed Computing Environment (DCE).

Unit II: Computer Networks: Introduction – Network Types – LAN Technologies – WAN Technologies – Communication Protocols – Internetworking – ATM Technology: Main Features of ATM Technology – Basics Concepts of ATM Technology – ATM Protocol reference Model - ATM Networks – Problem and Challenges.

Unit III: Message Passing: Introduction – Desirable Features of a Good Message-Passing System – Issues in IPC by Message Passing – Synchronization – Buffering – Multidatagram Messages - Encoding and Decoding of Message Data – Process Addressing – Failure Handling - Group Communication.

Unit IV: Distributed Shared Memory: Introduction – General Architecture of DSM systems – Design and Implementation Issues of DSM – Granularity – Structure of Shared Memory Space – Consistency Models – Replacement Strategy – Thrashing - Other Approaches to DSM – Heterogeneous DSM - Advantages of DSM.

Unit V: Synchronization: Introduction – Clock Synchronization – Event Ordering – Mutual Exclusion – Deadlock – Election Algorithms. Process Management: Introduction – Process Migration – Threads: Motivation for Using Threads – Models for Organizing Threads – Issues in Designing a Thread Package – Implementing a Thread package – Case Study: DCE Threads.

Unit VI: **(For Internal Exam Only)** Security: Introduction – Potential Attacks to Computer Systems – Cryptography: Basics Concepts and Terminologies – Basic requirements – Symmetric and Asymmetric cryptosystems - Key Distribution problems - Authentication – Access Control – Digital Signatures – Design Principles.

Text :
(For Both Internal and External Exam)
"Distributed Operating Systems: Concepts and Design", Pradeep K. Sinha, Prentice-Hall of India Pvt. Ltd., Third Printing 2001.
Unit I –V: Chapters: 1-3, 5, 6, 8.

Unit VI : (For Internal Exam Only) Chapter: 11

Reference:
1. "Distributed Systems: Principles and Paradigms", Andrew S. Tanenbaum and Van Steen, Prentice Hall, 2002.

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2. "Distributed Operating Systems", D.L.Galli, Prentice Hall, 2002.
3. "Distributed Systems Concepts and Design", G.Coulouris, J.Dollimore, Addition Wesley.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Understand** the knowledge of Distributed Operating System Architecture.	L2
CO2	**Illustrate** principles and importance of Distributed Operating Systemand Communication Protocols.	L4
CO3	**Understand** the knowledge of Message Passing and synchronization.	L2
CO4	**Design** and **Implementation** Issues of Distributed Shared Memory	L6
CO5	**Practice** to handle Synchronization , Event Ordering Mutual Exclusion, Deadlock , ProcessManagement.	L3

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	1	-	-	-	-	-	-	-	-
CO2	-	2	-	-	-	-	-	3	-	-	-	-
CO3	1	1	-	1	-	1	-	2	-	-	-	-
CO4	-	1	-	-	-	-	-	-	1	-	-	-
CO5	-	1	-	1	-	-	-	3	1	-	-	-

Question Pattern:

Section A: MCQ Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks) EITHER OR (a or b) Pattern.
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

B.Sc., Computer Science

Skill Based Elective Courses

Kunthavai Naacchiyaar Government Arts College For Women (Autonomous)
Thanjavur-613007
Department of English
For All Undergraduate Candidates admitted from 2022-2023 onwards under CBCS pattern

LIFE SKILLS: LOVE AND COMPASSION

Semester	Course	Sub Code	Hours	Credits	Exam Hours	Marks	
						IA	EA
IV	SBEC1	22K4SBEC1	2	2	3	25	75

COURSE OUTCOME

1. Students can learn how to understand other points of view and manage strong emotions and build stronger relationships with friends.
2. Students can develop the ability to tolerate the distressing feelings, and be motivated to act or help others.
3. They can learn the importance of patience and understanding.
4. Students can cultivate compassion through training.
5. Students can increase the sense of wellbeing and improve the learning environment for all learners.

UNIT-I

Introduction, Words and Meaning of Love, Forms of love-for self, parents, family, friend, spouse, community, nation, humanity and other beings, both for living and non-living.

UNIT -II

Love and Systems of Ethical Thought, Love and Compassion and inter relatedness.

UNIT-III

Love in Action at Work in the Business Community, Love in Action in Non-Governmental Organizations.

UNIT -IV

Compassion for oneself, cultivating compassion for others.

UNIT- V

Love, compassion, empathy, sympathy and non-violence.

UNIT VI (For Internal Examination only)

Difference between Compassion and Friendship, Teaching Compassion in Education.

Books for Reference

1. Joshi Rokeach The *Nature of Human values,* New York: The Free Press, 1973.

2. Shanikumar Ghosh,Universal *Values*,The Ramakrishna mission, Kolkata

3. Dalai Lama, *Book of Love and Compassion*, Harper Collins, India.
4. Pandit Rajmani Tigunait, *Lighting the Flame of Compassion*., Himalayan Institute Press.

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Kunthavai Naacchiyaar Government Arts College For Women (Autonomous)
Thanjavur-613007
Department of English

For All Undergraduate Candidates admitted from 2022-2023 onwards under CBCS pattern

LIFE SKILLS: LOVE AND COMPASSION

Semester	Course	Sub Code	Hours	Credits	Exam Hours	Marks	
						IA	EA
IV	SBEC1	22K4SBEC1	2	2	3	25	75

QUESTION PATTERN FOR THE PAPER TITLED LIFE SKILLS : LOVE AND COMPASSION

Questions should be chosen from all the constituents of the five units.

S. No	Section	Questions	Type	Marks	Total Marks
1	Section- A	1-8	Any Five Paragraph Questions out of Eight	5X5=25	25
2	Section - B	9-16	Any Five Essay Questions out of Eight	5x10 = 50	50
				Total	75

Signature of the Faculty- in- Charge

R. Ramapriya
Signature of the Head of the Department

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Kunthavai Naachiaar Govt Arts College (W)
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Semester-V
SBE 2:1

Hours: 2
Credit: 2

Web Enabled Application Development (22K5SBEC2:1)

Objective: To create ability to choose appropriate methods for specific tasks and apply Dynamic HTML.

Unit - I: HTML: Introduction: Information Files Creation - Web Server - Web Client/Browser - HTML - Commonly Used HTML Commands - Titles and Footers - Text Formatting – Emphasizing Material in a Web Page – Text Styles – Other Text Effects. Lists: Types of Lists. Adding Graphics to Html Documents: Using Border, Width and Height, Align, Alt Attributes.

Unit - II: DHTML: Dynamic HTML: Cascading Style She10ets: Font Attributes – Color and Background Attributes – Text Attributes – Border Attributes – Margin Related Attributes – List Attributes – Class – Using the <SPAN> Tag - External Style Sheets – Working with JavaScript Style Sheets - Using the <DIV> Tag – Layers – To Move Forward.

Unit - III: JavaScript: Introduction: JavaScript in Web Pages – JavaScript: Advantages – Writing JavaScript into HTML – Basic Programming Techniques – Operators and Expressions – JavaScript Programming Constructs – Conditional Checking – Super Controlled-Endless loops – Functions in JavaScript – User Defined Functions – Placing Text in a Browser – Dialog Boxes.

Unit - IV: JavaScript Document Object Model: Introduction: Instance, Hierarchy – JavaScript Assisted Style Sheets DOM – Understanding Objects in HTML: Properties and Methods of HTML objects – Browser Objects – Web Page HTML Object Hierarchy: Access to Elements, Manipulation of Web Page Elements – Handling Web Page Events: Name JavaScript Event Handlers.

Unit - V: Forms Used by a Web Site: The Form Object: Form Object's Methods, Text, Password, Button, Submit button, Reset button, Checkbox button, Radio, TextArea, Select and Option Elements - Other Built-in objects : String, Math, Date Objects - User Defined Objects.

Unit VI: (for Internal Exam only) Tables: Introduction – Using the Width and Border Attribute – Using the Cellpadding Attribute – Using the CellSpacing Attribute – Using the BGColor Attribute – Using the ColSpan and RowSpan Attributes. Linking Documents – Frames.

Text:
"Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI", Ivan Bayross, BPB Publications, 3rd Revised Edition, 2007.
Unit I –V: Chapters: 2, 3, 4, 8, 9, 10, 12.

Unit VI: (for Internal Exam only) Chapters: 5, 6, 7.

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THANJAVUR.

Reference:

1. "Learning PHP, MySQL & Javascript", Robin Nixon, SPD Publication, 4th Edition.
2. "Beginning PHP6, Apache, MySQL Web Development", Timothy Boronczyk, Elizabeth Naramore, Jason Gerner, Yann Le Scouranee, Jeremy Stolz, Michael K Glass, Wrox Willey Publication.
3. "World Wide Web with HTML", C. Xavier, TataMC Graw Hill, 2004.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Develop** to acquire the basics of HTML.	L3
CO2	**Operate** StyleSheet with spreadsheet with Tags and Attributes.	L3
CO3	**Apply** methods, elements and objects in JavaScript.	L3
CO4	**Create** objects, functions and Event Handling.	L6
CO5	**Design** and **manipulate** forms, elements and use built-in objects.	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	2	-	-	-	-	-	-	-	-
CO2	-	-	-	3	-	-	-	-	-	-	-	-
CO3	-	-	-	3	-	-	-	-	-	-	-	-
CO4	-	-	-	1	-	-	-	-	-	1	1	-
CO5	-	-	-	2	1	-	-	-	-	-	-	-

Question Pattern:

Section A: Answer Any Five Questions: (5 x 5 =25 marks)
Section B: Answer ALL the Questions: (5 x 10 = 50 marks)

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Kunthavai Naachiaar Govt Arts College (W)
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Semester-V
SBE 2:2

Hours: 2
Credit: 2

LAMP (22K5SBEC2:2)

Objective:To provide the necessary knowledge to design and develop dynamic, datadase-driven web applications using PHP.

Unit - I: New in PHP5 Object-Oriented Changes: Passing Objects – Exceptions – Interfaces – Iterators – Constructors and Destructors – Access Modifier – The final keyword – The Static Keyword – The abstract keyword – Built-In Method Overloading Functions – New Functions – Other Changes to PHP5: MySQLi –XML Support – Tidy Extension – SQLite.

Unit - II: PHP5 OOP: Procedural Programming versus OOP: Basic Class Definitions – Visibility – Constructors and Destructors – Static keyword – Class Constants – Assignment versus Cloning –Magic Methods: call - get and set – Wakeup - toString.

Unit - III: More Obscure PHP: Array Functions and Callbacks: Using Callbacks – array_map() – array_walk() - array_fitter() and preg_grep() – preg_replace_callback() – calll_user-func_array() and call_user_func() – create_function() – Final Observations on the Array Functions – glob() .

Unit - IV: Advanced MySQL: The Basics, Revisited: Creating the Databases – Adding Information – Retrieving Information – Updating Information – Removing Information – Querying Multiple Tables: Inner Joins – Outer Joins – Unions – Full-Text Searching – Analyzing the Database – Data Maintenance.

Unit - V: PHP Configuration: Modifying php.ini: Recommended Configuration Directives – New to PHP5 – PHP Configuration during Runtime : Obtaining Current Runtime Settings – Changing Configuration Dynamically – Automated Version and Feature Checking.

Unit - VI: Apache Tricks: URL Rewriting: Enabling mod_rewrite – RewriteRule – RewriteCond – RewriteBase – RewriteLogLevel – URL Spell Checking – Content Compression – Using MYSQL with Apache – Apache and SSL – Apache as a File Repository.

Text:
(For Both Internal and External Exam)
"Professional LAMP: Linux, Apache, MySQL, and PHP5 Web Development", Jason Gerner, Elizabeth Naramore, Morgan L. Owens and Matt Warden, Wiley Publishing, Inc. 2006.
Unit I – V: Chapters: 1 to 5. (Relavant Topics only)

Unit VI: (For Internal Exam Only) Chapter: 6.

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Reference:

1. "Php 5 and MySQL", Larny Ullman, Dorling Kindersly Pvt. .Ltd., 2008, First Impression.
2. "Beginning PHP6, Apache, MySQL, Web Development", Timothy Boronczyk, Elizabeth Naramore, Jason Gerner, Yann Le Scouarnce, Jeremy Stolz & Michael K Glass, Sri Eswar Enterprises, Reprint Edition, 2016.
3. "PHP: The Complete Reference", Steven Holzner, McGraw Hill, 2016.

Course Outcome:

CO's	Statements	Bloom's Level
CO1	**Understand** the different Levels of IOT and deployment Templates.	L2
CO2	**Construct** Domain Specific IoTs, Summarize Network function Virtualization.	L4,L2
CO3	**Analyze** the domain Specification of the IoT, Collaborate IoT Design Methodology..	L6
CO4	**Focus** Basics building blocks of an IoT Devices, develop prototype systems using Rasberry Pi.	L4,L6
CO5	**Correlate** the Data Analytics for IoT.	L4

CO- PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	1	1		-	-	-	1	-	-	-
CO2	-	-	1	2	1	2	1	-	3	1	-	-
CO3	1	-	3	3	3	3	-	-	3	3	3	3
CO4	-	-	-	-	-	-	-	-	-	-	1	1
CO5	-	-	1	3	3	-	-	-	1	-	3	1

Question Pattern:

Section A: Answer Any Five Questions: (5 x 5 =25 marks)
Section B: Answer ALL the Questions: (5 x 10 = 50 marks)

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K.N. Govt. Arts College for Women (Autonomous), Thanjavur-7

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Kunthavai Naachiaar Govt Arts College (W)
THANJAVUR-7

B.Sc., Computer Science

Non Major Elective Courses

Semester – III
NME 1

Hours - 2
Credit - 2

Introduction to IT (22K3CSELO1)

Objective: To provide fundamental knowledge in Information Technology.

Unit - I: Internet Basics: Networking - Internet - Important Features - Prerequisities for Internet: Hardware - Software - Factors Affecting the Speed of Internet Connectivity - Internet Protocols : IP Address - Domain Naming System(DNS) - Communication Protocols - Configuring the Modem - Configuring a TCP/ IP Connection - Configuring Dial UP Networking.

Unit - II: Graspsing Blockchain Fundamentals: Tracing Blockchain's Origin – The shortcomings of current transaction systems – The emergence of bitcoin – Revolutionizing the Traditional Business Network. Blockchain WorksBlockchain for business.

Unit - III : Propelling Business with Blockchains: Recognizing types of Market Friction Moving Close to Friction - Free Business Networks - Transforming Ecosystem through increased visibility. Blockchain in Action: Financial service – Insurance – Government – Supply Chain Management – Health Care – The Internet of Things.

Unit - IV : Hyperledger, a LinuxFoundation Project: Hyperledger Vision, Fabric – Development Platform . Ten steps to your First Blochchain Application: Deciding whether blockchain has a place in your Industry – Identifying speed Bumps in Business Processes – Determining the goal of your Blockchain Network

Unit - V : Digital Currency, CrytoCurrencies and BitCoin: Physical prorperties of Currency – Currency – Payment Systems – Public Ledger – BitCoin – Stripping down BitCoin – Double Spends – Elements of BitCoin – Miners.

Unit - VI: TheoryCoin: **For Internal Exam only)** Tnasfer Money- Proof of Work – Problems – Anonymity – Payment System with Fixed Exchange rate – Money Created in Coin.

Text:
(For Both Internal and External Exam)
"Introduction to Information Technology", Sanjay Saxena, Vikas Publishing House Pvt. Ltd., – Reprint 2013.
Unit – I : Chapters : 8.

"BlockChain Fundamentals", Dr.Ravindhar Vadappalli, Study Material
Unit – II – IV: Chapters: 1-6

"MIT15_014s16_L16Bitcoi.pdf" – Study Material
Unit – V:
Unit –VI: (For Internal Exam only) – Study Material

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Reference :

1. "Information Technology Project Management", Kathy Schwalbe, Eighth Edition Cenage Learning Publishers, 2016.
2. "The Chain Reference Bible", Frank Charies Thompson, KJV Version- 2014.
3. "Blocks and Chains, Intorduction to Bitcoin, Cryptocurrencies and their Consensus Mechanisms", Aljosha Jugmayrer, Nicholas Stifer & others, Morgan & Claypool, 2017.

Course Outcome:

COs	Statements	Bloom's Level
CO1	**Understand** the Basics of Internet and DNS	L2
CO2	**Discuss** the concpts of Blcokchain and Current Transcation Systems	L2
CO3	**Infer** the Knowledge of various Blockchain actions	L2
CO4	Determine the goals of Blackchain Network	L2
CO5	Infer the Knowledge of Crytocurrencies and Bitcoins	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	3	-	-	-	1	-
CO2	-	-	-	-	-	-	3	-	-	-	1	-
CO3	-	-	-	-	-	-	3	-	-	-	1	-
CO4	-	-	-	-	-	-	3	-	-	-	1	-
CO5	-	-	-	-	-	-	3	-	-	-	1	-

Question Pattern:

Section A: Answer Any Five Questions: (5 x 5 =25 marks)
Section B: Answer ALL the Questions: (5 x 10 = 50 marks)

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Head, Dept. of Computer Science

Semester – IV
NME 2

Hours - 2
Credit - 2

Fundamentals of Web Designing (22K4CSELO2)

Objective: To provide basic knowledge in web concepts.

Unit - I: Introduction to Internet: Computers in Business - Networking - Internet - E-Mail - Resource Sharing - Gopher - WWW: Hyper - Text, Browsers, Search Engines - Usenet - Telnet - Bulletin Board Service - Wide Area Information Service.

Unit - II: Introduction to HTML: Designing Home Page - History of HTML - HTML Generations - HTML Documents - Anchor Tag Hyperlinks - Sample HTML Documents. Head and Body Sections: Header Section - Title - Prologue - Links: Previous and Next, Banner, Base Element, Colorful Web Page, Background: Colors, Background Color, Text Color, Link Colors - Comment Lines – Some Sample HTML Documents.

Unit – III: Designing the Body Section: Heading Printing - Aligning the Heading - Horizontal Rule: Size of the Horizontal Rule, Width of the Horizontal Rule, Alignment of the Horizontal Rule, Source, Paragraph: Binding Spaces - Tab Settings - Formatting Characters, Physical Styles Format, Font Tag, Base-Font, Pre-formatting Text, Special Characters.

Unit - IV: Ordered and Unordered Lists: Lists - Unordered Lists: Bullets in a List, Plain Attribute - Headings in a List - Ordered Lists – Type Attribute - Nested Lists - Table Handling: Tables - Tables Creation in HTML – Width of the Table and Cells.

Unit – V: Planning to Design web Page: Introduction – Objective – Building a case for planning - Drawing the Blue prints for site – Laying home page's foundation.

Unit VI: **(For Internal Exam only)** Updating Website & Archiving Web Elements: Introduction – Objectives – Website Updating - Tools for Updating Website – Web Archiving – Selection Process – Creation and Maintenance of pages to be archived.

Text:
(For Both Internal and External Exam)
"World Wide Web Design with HTML", C. Xavier, Tata McGraw Hill, Thirty Second Reprint 2018.
Unit - I to IV : Chapters: 1, 4, 5, 6- 6.5, 7, 8.1, 8.2, 8.3.
"Webdeenglish.pdf" – Study Material.
Unit –V: (Page No: 120 – 139)

Unit –VI: (For Internal Exam only) (Page No: 215 – 235)

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Reference:

1. "Advances in Internetworking, Data and Web Technologies", Leonard Barolli, Mingwu Zhanng, Xu a Wang- Springer, 2017.
2. "Learning Web Design – A Beginner'sGuide to HTML, CSS, JavaScript, and WebGraphics", Jennifer Niederst, O'Reilly Media, 2018.
3. "Web Design (Principles)", Joel Sklar, Course Technology, Fifth Edition-2011.

Course Outcome:

COs	Statements	Bloom's Level
CO1	**Categorize** the concepts of Internet Technologies and Internet Browsers.	L2
CO2	**Apply** the knowledge of HTML structure and sample HTML documents.	L3
CO3	**Describe** the concepts of HTML body section, Tab settings and Formatting Text.	L2
CO4	**Examine** ordered and unordered lists and Handling a Table in HTML	L3
CO5	**Design** a Web page and Develop a blueprints of homepage	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	-	2	-	2	1	-	-	-	2
CO2	2	1	2	-	-	1	-	2	2	-	-	1
CO3	1	1	1	-	-	2	2	-	-	-	1	2
CO4	1	2	2	-	-	1	2	2	-	-	2	2
CO5	-	1	-	-	-	-	2	2	-	-	-	2

Question Pattern:

Section A: Answer Any Five Questions: (5 x 5 =25 marks)
Section B: Answer ALL the Questions: (5 x 10 = 50 marks)

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THANJAVUR - 7

B.Sc., Mathematics

Allied Courses

for

(i) B.Sc., Mathematics(E/M)-Additional Section

(ii) B.Sc., Mathematics(e/M)-SSS

Semester – III
AC 4

Hours - 4
Credit - 3

Programming with C++ (22K3MACS1)

Objective: To provide knowledge in object oriented programming concept.

Unit - I: Overview of C: History of C - Importance of C - Basic structure of C programs. Constants, Variables and Data Types - Operators and Expressions: Arithmetic, Relational, Logical, Assignment, Increment, Decrement, Conditional, Bitwise, Special Operators - Arithmetic Expressions - Evaluation of Expressions - Type Conversion - Operator Precedence and Associativity.

Unit - II: Beginning with C++ - Applications of C++ - More C++ Statements - Structure of C++ Program. Tokens, Expressions and Control Structures: Tokens - Keywords - Identifiers and Constants - Basic Data Types - Declaration and Dynamic Initialization of variables - Operators in C++ - Expressions and their types - Operator Precedence - Control Structures.

Unit - III: Functions in C++: Introduction –The Main Function – Function Prototyping – Call by Reference – Return by Reference - Inline Functions – Default Arguments – const Arguments - Function Overloading - Friend and Virtual Functions - Math Library Functions.

Unit - IV: Classes and Objects: Introduction - Specifying a Class - Defining Member Functions - Nesting of Member Functions - Private Member Functions - Arrays within a class - Memory Allocation for objects - Arrays of Objects - Objects as Function Arguments - Friendly Functions – Returning Objects - Local Classes.

Unit - V: Constructors and Destructors: Constructors – Parameterized Constructors – Multiple Constructors – Dynamic Initialization of Objects – Copy Constructors – Destructors. Exception Handling: Introduction – Basics of Exception Handling - Exception Handling Mechanism – Throwing Mechanism - Catching mechanism - Rethrowing an Exception - Specifying Exceptions.

Unit – VI: **(For Internal Exam only)** New Features of ANSI C++ Standard: Introduction – New Data Types - New Operators – Class Implementation - Namespace Scope – Operator Keywords – New Keywords – New Headers.

Text:

1. "Programming in ANSI C", E. Balagursamy, McGraw Hill Education (India) Pvt. Ltd., Seventh Edition, Fourth Reprint 2017.
Unit - I: Chapters: 1, 2, 3.
2. "Object Oriented Programming with C++", E. Balagurusamy, McGraw Hill Education (India) Pvt. Ltd., Seventh Edition, 2018.
Unit - II to V: Chapters: 2, 3, 4, 5.1 - 5.10, 5.13 - 5.17, 5.19, 6.1 - 6.7, 6.11, 13.
Unit – VI: (For Internal Exam only) Chapter: 16

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Reference:

1. "C++ Programming", Mike McGrath, Easy Step, Fifth Edition, 2017.
2. "Object Oriented Programming with C++", Hanumanth Ladwa, 2021.
3. "An Introduction to programming with C++", Daine Zak, Cengage Learning., Eighth Edition, 2016.

Course outcome:

COs	Statements	Bloom's Level
CO1	**Describe** the concept of constants, variables and Data types.	L2
CO2	**Determine** the concept of Object-oriented programming.	L3
CO3	**Classify** the concepts of functions.	L2
CO4	**Categorize** the class hierarchies using the Object-oriented design process.	L2
CO5	**Express** the use of Exception Handling mechanism in C++.	L3

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	1	2	2	-	2	-	-	-	1	3
CO2	1	2	2	-	2	1	1	1	-	2	-	2
CO3	1	2	2	1	2	2	2	1	-	2	1	1
CO4	2	2	2	-	2	2	1	2	-	-	2	3
CO5	1	2	1	1	1	-	2	2	-	2	2	3

Question Pattern:

Section A: Answer ALL the Questions: (20 x1=20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks)
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Semester – III & IV (Examination in Semester IV) Hours – (3) + 3
AC 5(P) Credit - 3

C++ and Java Programming Lab (22K4MACS2P)

C++ Programs:

1. Program using class.
2. Program to handle function overloading.
3. Program to generate Fibonacci Series.
4. Program to arrange the given numbers in the Ascending order Descending order.
5. Program using class with constructor.

JAVA Programs:

1. Program using Classes and Objects.
2. Program to print multiplication table for n number.
3. Program using Single Inheritance.
4. Program for String Manipulation.
5. Program for Exception Handling.

Note: Questions should be framed for Practical Examination with internal choice (i.e., Either C++ or Java)

Course Outcome:

COs	Statements	Bloom's Level
CO1	**Apply** the concepts of C++ program using class and function overloading.	L3
CO2	**Explain** the concepts of Array in C++	L3
CO3	**Analyze** the concepts of Java program using Class and Objects.	L4
CO4	**Develop** the reusable programs using single Inheritance	L3
CO5	**Apply** the concepts of Exception handling to develop efficient and error free codes.	L3

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	3	3	2	1	3	-	-	3	-	3
CO2	1	-	3	-	-	1	3	1	-	3	-	3
CO3	2	2	3	2	2	-	3	-	-	3	-	3
CO4	-	-	-	3	3	-	3	-	-	3	-	3
CO5	-	1	-	1	-	-	3	-	-	3	-	3

Semester – IV
AC 6

Hours - 4
Credit - 3

Programming with Java (22K4MACS3)

Objective: To provide knowledge in object oriented programming concept.

Unit - I: Fundamentals of OOP: Object Oriented Paradigm - Basic Concepts - Benefits and Applications. Java Evolution: History – Features. Overview of Java Language: Program Structure - Tokens and Statements - Implementing Program – Java Virtual Machine - Command Line Arguments.

Unit - II: Constants, Variables and Data Types: Constants, Variables, Data Types - Declaration and Scope of Variables - Symbolic Constants - Type Casting. Operators and Expressions: Operators - Arithmetic Expressions - Evaluation of Expressions - Type Conversions - Operator Precedence and Associativity.

Unit - III: Decision Making and Branching: Simple if, if...else, nesting of if...else, else if ladder switch statements - Ternary Operator. Decision Making and Looping: while...do, do...while, for, Jumps in Loops - Labeled loops.

Unit - IV: Classes, Objects and Methods: Defining Class -Declaring Fields and Methods - Creating Objects - Accessing Class Members - Constructors - Method Overloading - Nesting of Methods - Inheritance - Overriding – Final Variables, Methods and Classes - Finalizer Methods - Abstract Methods and Classes - Visibility Control.

Unit - V: Arrays, Strings and Vectors: Wrapper Classes. Managing Errors and Exceptions: Introduction - Types of errors - Exceptions – Syntax of Exception Handling Code - Multiple Catch Statements – Using Finally Statement - Throwing Our Own Exceptions - Using Exceptions for Debugging.

Unit – VI: **(For Internal Exam only)** Applet Programming: Introduction –Preparing to Write Applets - Building Applet code - Applet Life Cycle - Creating an executable Applet – Designing a Web page - Applet Tag – Adding Applet to HTML File – Running the Applet – Event Handling.

Text:
(Both Internal and External Exam)
"Programming with Java - A Primer", E. Balagurusamy, McGraw Hill Education (India) Pvt. Ltd., Fifth Edition - Fourth Reprint 2015.
Unit I to V: Chapters: 1, 2.1 - 2.2, 3 to 9, 13.

Unit VI: (For Internal Exam only) Chapter: 16.

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Reference:

1. "Learning JAVA-An Introduction to Real World Programming with JAVA, Daniel Leuck, Patrick Niemeyer and Marc Loy, O' Reilly, Fifth Edition-2020,.
2. "Beginning Programming with JAVA", Barry Burd, Wiley Publication, Fifth Edition, 2017
3. "Another Introduction to Programming with JAVA", Talbot, Tim, 2016.

Course Outcome:

COs	Statements	Bloom's Level
CO1	**Construct** the Syntax and semantics of Java Programming Language and basic concepts of OOPs.	L3
CO2	**Focus** the concepts of Constants, Variables, data types, operators and Expressions	L4
CO3	**Classify** the various decision making, Branching and looping statements in Java programs.	L2
CO4	**Develop** simple java programs using objects, classes and methods.	L6
CO5	**Create** the concepts of Arrays, strings and various exception handling methods.	L6

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	-	2	-	-	-	-	1	2	2
CO2	-	-	2	2	2	-	1	-	-	1	2	2
CO3	1	-	2	-	1	1	2	-	-	1	2	2
CO4	1	-	-	-	-	2	2	2	-	-	2	1
CO5	1	-	-	1	-	-	2	-	-	1	2	2

Question Pattern:

Section A: Answer ALL the Questions: (20 x 1 =20 marks)
Section B: Answer ALL the Questions: (5 x 5 = 25 marks)
Section C: Answer ANY THREE Questions: (3 x 10 = 30 marks)

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Govt. Arts College for Women (Autonomous), Thanjavur

Head, Dept of Computer Science
Govt Arts College (W)

B.Sc., Computer Science

Extra Credit Courses

Semester – III
ECC 1 **Credit - 3**

Quantitative Ability (22K3ECCCS1:1)

Objective: To improve capability in Aptitude tests.

Unit I: Numbers: Decimal Fractions – Irrational Numbers – Surds and Indices – Square Root and Cube Roots – Average – Problems on Numbers – Problems on Ages – H.C.F and L.C.M of Numbers.

Unit II: Ratio and Proportion: Profit – Loss – Discount – Percentage – Clock – Calendar – Simple Interest and Compound Interest – Mixture.

Unit III: Partnership – Chain Rule – Time and Work – Pipe and Cisterns – Time and Distance – problems on Train – Problems on boats and stream.

Unit IV: Algebra – Linear Equation – Quadratic Equations – Logarithms – Area – Volume and Surface Area – Set Relations – Polynomial.

Unit V: Permutation and Combinations – Probability – Odd-man-out and Series – Data interpretation – Stocks and Shares.

Text:

"TANCET - Tamilnadu Common Entrance Test", Sakthi's Superior Guide, Sakthi Publishing House.

Reference:

1. "Quantitative Aptitude" R.S.Aggarwal, S.Chand and Company Ltd., Reprint 2008.
2. "TNPSC Group – I Aptitude Test" V.V.K. Subburaj, Sura Books Pvt. Ltd, Edition-2013.
3. www.careerbless.com
4. www.itacumens.com
5. www.elinxs.com

Semester – IV
ECC3 **Credit - 3**

Reasoning Ability (22K4ECCCS3:1)

Objective: To improve capability in Aptitude tests.

Unit I: General mental ability: Verbal Analogy – Verbal Classification: Letter cclassification – Number Classification – Word/Item Classification – Series Completion – Coding and Decoding – Blood Relations.

Unit II: Direction Sense Test – Logical Venn Diagrams - Alphabet Test – Number - Ranking and Time Sequence Test – Mathematical Operations – Logical Sequence of Words – Asserts and Reason – Verification of Truth of the Statement.

Unit III: Logical Reasoning: Logic – Statement and Arguments – Statement and Assumption – Statement and Courses of action - Statement and Conclusions. Ddiagrams: Type 1 – Type 2 – Type 3 – Type 4 - Miscellaneous Logical Puzzles.

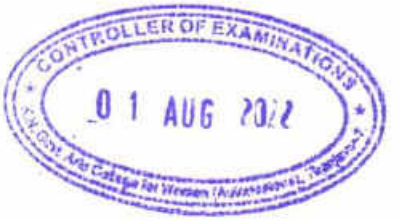
Unit V: Critical Reasoning: Logical Diagrams – Deriving Conclusion from Passage – Problem Solving – Synonyms and Antonyms – Miscellaneous Reasoning.

Text:

"TANCET - Tamilnadu Common Entrance Test", Sakthi's Superior Guide, Sakthi Publishing House.

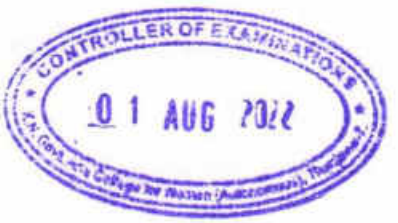
Reference:

1. "A Modern Approach to Verbal and Non-Verbal Reasoning",– R.S.Aggarwal, S.Chand and Company Ltd., Reprint 2008.
2. " MCA Entrance Examination", Victory Publishers.
3. www.careerbless.com
4. www.itacumens.com
5. www.elinxs.com



B.Sc., Computer Science

Part - IV Courses



SEM I	VE	VALUE EDUCATION	22K1VE	Ins.Hrs.2	Credit:2

CO	STATEMENT	
	After successful completion of the course, the students will be able to	
1	Know the value education by various religions.	K1
2	Learn and practice social value and responsibilities.	K2
3	Understand and start applying the essential steps to become good leaders.	K2
4	Analyse the personal value, mind culture value personal health.	K4
5	Collecting news details about value education and to encourage writing skills highlight moral value.	K6

K1 – Remember; **K2** - Understand; **K3** – Apply; **K4** – Analyse; **K5** – Evaluate; **K6** – Create

UNIT - I

1. Introduction: Definition of Value Education – Need for Value Education – Teachings of values by various religions like Hinduism, Buddhism, Christianity, Jainism, Islam etc.

UNIT - II

2 **Living & Social Values**

2.1 Living Values: Peace, respect, co-operation, freedom, happiness, honesty, humility, love, responsibility, simplicity, tolerance, optimism and positive thinking

2.2 Social values: Love and Compassion, Sharing and Generosity, Politeness and Courtesy, Gratitude, Duty and Responsibilities towards Society, Tolerance and Unity.

UNIT - III

3.1 **Role of Visionaries and Leaders in Social Reforms**: Rajaram Mohan Roy, Mahatma Gandhi, Swami Vivekananda, EVR Periyar, Mother Therasa.

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3.2 **Value Crisis:** Religious Fundamentalism and Terrorism – Corruption in Society– commerce without Ethics – Education without Character – Wealth without efforts

3.3 Time Management

UNIT - IV

4. **Yoga:** Teaching yoga – Manavalakkalai- by Qualified Yoga Teachers – The aim is to acquire Physical Health – Mental Acuteness- Strength of Life Forces and Wisdom – to achieve a holistic way of life- to take up and get involved in Social Welfare Activities – to learn their commitment to society.

UNIT - V

5.1 **Human Rights** : Child Labour – Womens Rights – Bonded Labour – Problems of Refuges.

5.2 **Role of State Public service Commission:** Constitution provisions and formation-methods of recruitment – rules and notification , syllabi for different exams – written and oral – placement.

Teaching Learning Process

1. Conventional chalk and board teaching.
2. Class interaction and discussions.
3. Power point presentations for important topics.

References

1. Radhakrinshnaan, "Religion and Culture"(1968), Orient paperbacks, New delhi.
2. Das,M.S.&Guptha,V.K.(1995),"Social Values among Youth Adults: A Changing Scenario", New Delhi.
3. Venkataiah. M(ed.), (1998), "value Education New Delhi, A PH Publishing Corporation.

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4. Sharma.O.P.,(1997),"value Education in Action" New Delhi, University Book House.
5. Chakraborti, Mohit.,(1997)"value Education:Changing Perspectives", New Delhi,kanishka Publishers, Distributors.
6. C.S.Devnoth(1996) "Adipodai manitha urimaigal" Narmadha Publishers.
7. D.Kulanthaiyaya "Evai manitha urimaigal " Narmadha Publishers.

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SEM I	VE	விழுமக் கல்வி	22K1VE	Ins.Hrs.2	Credit:2

அலகு - I

1.1 **முகவுரை** : விழுமக்கல்வி என்பதன் வரையறை – விழுமக் கல்வியின் அவசியம் - பல்வேறு சமயங்களில் கல்வியின் மதிப்பு பற்றிய போதனைகள் - இந்து சமயக்கல்வி, புத்த சமயக்கல்வி, கிறிஸ்தவ சமயக்கல்வி, ஜைனமத நன்னெறிகள், இஸ்லாமிய சமயக்கல்வி.

அலகு – II

2 **வாழ்க்கை மற்றும் சமூக நெறிமுறைகள்**

2.1 **வாழ்க்கை நெறிமுறைகள்** : அமைதி, மதிப்பு, ஒற்றுமை, சுதந்திரம், மகிழ்ச்சி, நேர்மை, தாழ்மை, அன்பு, பொறுப்பு, எளிமை, சகிப்புத்தன்மை, நம்பிக்கை தளராதிருத்தல் மற்றும் நேர்மறை எண்ணங்கள்.

2.2 **சமூக நெறிமுறைகள்** : அன்பு மற்றும் இரக்கம், பகிர்தல் மற்றும் உதாரகுணம், பணிவு மற்றும் மரியாதை, நன்றி மனநிலை, கடமை மற்றும் பொறுப்பு, சகிப்புத்தன்மை மற்றும் ஒற்றுமை.

அலகு – III

3.1 தொலைநோக்கு சிந்தனையாளர்களின் சமுதாய சீர்திருத்தங்கள் ராஜராம் மோகன் ராய், மகாத்மா காந்தி, சுவாமி விவேகனந்தா, ஈ.வே.இரா பெரியார், அன்னை தெரசா.

3.2 **விழுமச் சீரழிவு** : சமயசார்பு நம்பிக்கை மற்றும் பயங்கரவாதம் சமுதாயத்தில் ஊழல் - நீதியில்லாத வணிகம் - நல்லொழுக்கமில்லாத கல்வி – உழைப்பில்லாத செல்வம்.

3.3 நேரத்தை நிர்வகித்தல்.

அலகு – IV

4.1 **யோகா** : யோகா கற்பித்தல் - மனவளக்கலை – தகுதி வாய்ந்த யோகா ஆசிரியர்கள் - உடல் ஆரோக்கியம் மேம்படுவதற்கான நோக்கம் - மனத்திடம் - வாழ்க்கையின் வலிமை மற்றும் ஞானம் - வாழ்க்கையின் முழுமையை அடைய வழி – சமூக நல ரீதியான செயல்பாடுகளில் தேர்தெடுத்தல் மற்றும் ஈடுபடுதல்.

அலகு - V

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5.1 மனித உரிமைகள் : குழந்தை தொழிலாளர் - பெண்கள் உரிமைகள் - ஒப்பந்த தொழிலாளர் - அகதிகளின் பிரச்சனைகள்.

5.2 மாநில அரசு பணியாளர் தேர்வாணையத்தின் பங்கு : அரசியலமைப்பு ஒதுக்கீடுகள் மற்றும் உருவாக்கம் - பணியமர்த்தங்களின் முறைகள் - விதிகள் மற்றும் அறிவிப்புகள், வெவ்வேறு தேர்வுக்களுக்கான பாடத்திட்டம் - எழுத்து மற்றும் வாய்வழி – வேலைவாய்ப்பு.

CO – PO Mapping :

Value Education **Code : 22K1VE**

CO/PO	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										

1 – Low, 2 – Moderate, 3 – High correlation

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SEM II	ES	ENVIRONMENTAL STUDIES	22K2ES	Inst. Hrs 2	Credit 2

CO	STATEMENT
1	To learn the concept and importance of Environmental Studies.
2	To create awareness about the essentials of the preservation of Natural Resources.
3	To explore India as a Land of Mega Bio-Diversity.
4	To study various Environmental Pollutions and to create awareness on reducing the Pollutions.
5	To understand the close connection between Pollution and Environment.

UNIT I

Definition, Scope and Importance – Need for Public Awareness.

UNIT II

Natural Resources – Forest Resources – Water Resources – Mineral Resources – Food Resources – Energy Resources – Land Resources.

UNIT III

Eco Systems remaining – Forest Eco system – Grassland Eco system – Desert Eco system – Aquatic Eco system – Bio Geographical classifications of India – Hot-spots of Bio Diversity.

UNIT IV

Environmental Pollution – Air Pollution – Creating Awareness on reducing the usage of Fireworks – Water Pollution – Soil Pollution – Noise Pollution – Thermal Pollution – Nuclear Hazards – Pollution case studies.

UNIT V

Human Population and Environment – Population Explosion – Family Welfare Programme – Environment and Human Health – Human Rights – HIV / AIDS – Women and Child Welfare.

UNIT VI

Multidisciplinary Nature of Environment – Mental Studies – Essentials of the Preservation of Natural Resources – Endangered Species of India – India as a Mega Biodiversity Nation.

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Text Book:

[1] K Kumaraswamy, A Alagappa Moses, M Vasanthy, "Environmental Studies", Bharathidasan University, Trichy – 620 024.

[2] P Chandrasekaran, "சுற்றுச்சூழல் பயில்வுகள்", U.G.C Core Module Course in Environmental Studies, T k Publication, Pudukkottai.

[3] N Arumugam, "Survey of the Environmental Studies".

[4] V Kumaresan, "Plan Ecology and Phytogeography".

[5] D Dharmaraj, "Environmental Science".

References:

[1] N Arumugam, "Environmental Studies".

[2] B Chandrasekaran, "Environmental Studies".

[3] Purohit, "A Text Book of Environmental Sciences".

[4] M P Mishara, "Our Environmental Pollution Control and Future Strategies".

SEM II	ES	சுற்றுச் சூழல் கல்வி	22K2ES	Inst. Hrs 2	Credit 2

அலகு I

சுற்றுச்சூழல் கல்வி – விளக்கம் – நோக்கம் மற்றும் முக்கியத்துவம் – சுற்றுச்சூழல் பற்றிய பொது மக்களின் விழிப்புணர்வின் அவசியம்.

அலகு II

இயற்கை வளங்கள் – வன வளங்கள் – நீர் வளங்கள் – கனிம வளங்கள் – உணவு வளங்கள் - ஆற்றல் வளங்கள் – நில வளங்கள்.

அலகு III

எஞ்சிய சூழல் – காட்டு சூழல் – புல் நில சூழல் முறை – பாலைவன சூழல் முறை – நீர் வள சூழல் முறை – இந்தியாவில் உள்ள உயிர்ப் புவியியலின் வகைகள் – பல்லுயிர்ப் பெருக்கம்.

அலகு IV

சுற்றுச்சூழல் மாசுபாடு – காற்று மாசுபாடு – பட்டாசு பயன்பாட்டை குறைப்பது பற்றிய விழிப்புணர்வை ஏற்படுத்துதல் – நீர் மாசுபாடு – மண் மாசுபாடு – ஒலி மாசுபாடு – அனல் மின் மாசுபாடு – அணு ஆபத்து – மாசு பற்றிய ஆய்வறிக்கை.

அலகு V

மக்கள் தொகை பெருக்கமும் சுற்றுச்சூழலும் – மக்கள் தொகை பெருக்கம் – குடும்ப நல திட்டம் – சுற்றுச்சூழலும் மனித ஆரோக்கியமும் - மனித உரிமைகள் – HIV / எய்ட்ஸ் – பெண்களும் குழந்தை நலனும்.

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1400 – 1545 hrs.

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SEM V	SSD	SOFT SKILLS DEVELOPMENT	22K5SSD	Ins.Hrs:2	Credit: 2

COURSE OBJECTIVES:

Today's world is all about relationship, communication and presenting oneself, one's ideas and the company in the most positive and impactful way. This course intends to enable students to achieve excellence in both personal and professional life.

Course Outcomes

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

CO1 – Help the students to understand themselves
CO2 – Identify the ways to improve relationships
CO3 – Have an introduction to art of speaking and listening.
CO4 – Develop Confidence with correct body language
CO5 – Manage stress.

UNIT I

Know Thyself/ Understanding Self

Importance of soft skills. How to Practice soft skill? Self discovery- Importance of knowing yourself. Process of knowing yourself. SWOT Analysis. Benefits of positive attitude. Ways to help you develop positive attitude. Steps to overcome negative attitude.

UNIT II

Interpersonal Skills/ Understanding Others

Skills needed for teamwork. Characteristics of effective team. Role of a team leader. Nine persons a successful team should have. Groups – Definition, Why are groups formed? Types of group, Stages of group development. Group cohesiveness –Definition, factors influencing group cohesiveness.

UNIT III

Communication Skills / Communication with others:

Art of speaking: Tips for effective communication, Conversation TIPS, Points to be kept in mind while communicating with others. Barriers to communication.

Art of listening: Meaning of Listening, Benefits/ advantages of active listening, Kinds of listening. Poor Listening habits.

UNIT IV

Corporate Skills / Working with Others:

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Benefits of etiquette. Tips to Develop Confidence with correct body language. Tips for professional etiquette. Manners to be followed in order to get respect from others. Mobile phone etiquettes to be followed. Annoying office habits.

UNIT V

Selling Self

Tips for writing a CV. Do's and Don'ts in Writing a resume. Do's and Don'ts while attending an Interview. Essentials elements of a Group Discussion. Etiquettes to be followed in Group discussion. Tips for managing stress.

TEXT BOOKS:

Alex K. (2012) Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi- 110 055.

REFERENCE BOOKS:

(i) Developing the leader within you John c Maxwell
(ii) Good to Great by *Jim Collins*
(iii) The seven habits of highly effective people Stephen Covey
(iv) Emotional Intelligence Daniel Goleman
(v) You can win Shiv Khera
(vi) Principle centred leadership Stephen Covey

PO-CO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1										
CO 2										
CO 3										
CO 4										
CO 5										

1-Low , 2-Moderate, 3- High Correlation

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பாலினக்கல்வி (Gender Studies)

பருவம் - VI கற்பித்தல் : 1 தரப்புள்ளி : 1 பாடகுறியீட்டுஎண்: 22K6GS

நோக்கம் : சங்க இலக்கியங்களின் சிறப்பையும், பொருமையையும் உணர்தல், நாடக இலக்கியங்களின் இயல்பு, சிறப்பு உத்திகள் பற்றி அறிதல்.

பயன்கள் : இலக்கியம் பற்றிய சிறந்த அறிவையும், நாடகப் படைப்பாற்றலையும் பெறச்செய்தல்

அலகு 1 : பாலியல் பாலின உடற்கூறுரீ தியாக நிர்ணயித்தல் -ஆணாதிக்கம்-பெண்ணியம்-பாலினபாகுபாடு-வேலைப்பாடு-பாலினஒருபடித்தவைகள்-பாலினஉணர்வூட்டல்-பாலின சமவாய்ப்பு-பாலின சமத்துவம்-பாலினமைய நீரோட்டமாக்கல்-அதிகாரப்படுத்துதல்.

அலகு 2 : பாலின சமத்துவக் கல்வி-பல்கலைக் கழகமானிய குழுவின் வழிகாட்டுதல்கள்-ஏழாவது ஐந்தாண்டு திட்டம் முதல் பதினோராவது ஐந்தாண்டுத் திட்டம்-பாலின சமத்துவக்கல்வி, பெய்ஜிங் மாநாடு மற்றும் பெண்களுக்கு எதிரான அனைத்துவரன் முறைகளையும் ஒழிப்பதற்கான சர்வதேச உடன்படிக்கை-இணைத்தல்-உட்படுத்தல்-ஒதுக்கல்.

அலகு 3 : பாலியல் பாகுபாட்டிற்கான தளங்கள் குடும்பம்-பாலினவி கிதாச்சாரம்-கல்வி, ஆரோக்கியம்-ஆளுமை, மதம்வேலைVs வேலைவாய்ப்பு-சந்தைஊடகங்கள்-அரசியல்-சட்டம்-குடும்பவன்முறை-பாலியல்துன்புறுத்தல்-அரசுகொள்கைகள் மற்றும் திட்டங்கள்.

அலகு 4 : பெண்கள் மேம்பாடு மற்றும் பாலின சமத்துவ மேம்பாடு-முயற்சிகள்-சர்வதேச பெண்களுக்கான சகாப்தம்-சர்வதேசபெண்கள்ஆண்டு-பெண்களின் மேம்பாட்டிற்கான தேசியகொள்கை-பெண்கள்அதிகா ஆண்டு 2001-சர்வதேச கொள்கைகளை மைய நீரோட்டமாக்கல்.

அலகு 5 : பெண்கள் இயக்கங்கள் மற்றும் பாதுகாப்பு நிறுவன ஏற்பாடுகள்-தேசியமற்றும் மாநிலமகளிர் ஆணையம்-அனைத்து மகளிர் காவல் நிலையங்கள்-குடும்பநீதிமன்றங்கள்-குடும்பவன் முறையிலிருந்து பெண்களைப் பாதுகாக்கம் சட்டம் 2005 பணியிடங்களில் பெண்கள் மீதான பாலியல் துன்புறுத்தல்களை தடுப்பதற்கான உச்சநீதி மன்ற வழிகாட்டுதல்கள்-தாய்சேய் சேமநலசட்டம்-பெண்சிசுக்களை கருவிலேயே கண்டறியும் தொழில் நுட்பம் (முறைப்படுத்தல் மற்றும் தவறாகப் பயன்படுத்தலை தடைசெய் திருச்சட்டம்-ஈவ்டிசிங் (பெண்களைத் தொல்லை செய்தல்) தடுப்பச்சட்டம்-சுயஉதவிக்குழுக்கள்-பஞ்சாயத்து அமைப்புகளுக்கான73வது மற்றும்74வது சட்ட சீர்திருத்தம்).

அலகு 6 : பாலின உடற்கூறுகள் பற்றி புரியச்செய்தல்-பாலின சமத்துவக்கல்வி-பெண்மேம்பாட்டுத்திட்டம் யாது எனகண்டறிதல்-ஊடகங்களின் வழிவிழிப்புணர்வை ஏற்பட செய்தல்-வன்கொடுமைக்கு எதிரானசட்டங்களை தெரிந்து பயன்படுத்துதல்

CONTROLLER OF EXAMINATIONS
01 AUG 2022

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பாடநூல்கள்:

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7. குடும்பவன் முறையிலிருந்து பெண்களைப் பாதுகாக்கும்சட்டம் - 2015
8. ஜி.ஆர்.ரவிந்திரநாத்ராகிங் ஒழிப்போம், ஈவ்டிசிங் ஒழிப்போம், I.D.P.D. வெளியீடு, சென்னை.

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THANJAVUR- 7.

விளைவுகள் :

1. பாலினக்கல்வியை உடற்கூறுரீதியாக வகைபாடுசெய்து புதியதெளிந்த சிந்தனையோடு உருவாக்குதல்.
2. பாலினக் கல்வியுடன் உட்கூறுகளை மானியக்குழு வழிகாட்டுதலின்படி நுண்நோக்குடன் பயிற்று வித்து மாணவர்களை உயர்த்துதல்.
3. பாலினப்பாகு பாட்டிற்கான இயங்குதளங்களை தொடர்புபடுத்துவதுடன் பாலினமரபின் ஆக்கத்தை மதிப்பீட்டை வளர்த்தல்.
4. பெண்களுக்கான தரமேம்பாட்டையும் சிறப்புக்கூறுகளையும் உருவாக்கி பிரபஞ் சஅறிவில்மேம் படச்செய்தல்
5. பாலினமரவசார்ந்த சமூகசீர்திருத்தங்களை வடிவமைத்து மேம்படுத்தும் இயக்கங்கள், நிறுவனங்களை உயர்த்துதல்.

CO	KEY ATTRIBUTES(K)	STATEMENTS
	வகைபாடு தெளித்தசிந்தனை உருவாக்குதல்	பாலினக்கல்வியை உடற்கூறுரீதியான வகைபாடு செய்துபுதிய தெளிந்த சிந்தனையோடு உருவாக்குதல்
	உட்கூறுகள் நுண்நோக்கி உயர்த்துதல்	பாலினக் கல்வியின் உட்கூறுகளை மானியக்குழு வழிகாட்டுதலின்படி நுண்நோக்குடன் பயிற்றுவித்து மாணவர்களை உயர்த்துதல்
	இயங்குதளம் தொடர்புபடுத்தல் ஆக்கம்	பாலினப் பாகு பாட்டிற்கான இயங்கு தளங்களை தொடர்படுத்து வதுடன் பாலின மரபின் ஆக்கத்தை மதிப்பீட்டை வளர்த்தல்
	தரமேம்பாடு சிறப்புக்கூறுகள் பிரபஞ்சஅறிவு	பெண்களுக்கான தரமேம்பாட்டையம் சிறப்புக் கூறுகளையும் உருவாக்கி பிரபஞ்சஅறிவில் மேம்படச் செய்தல்.
	அமைப்பு வடிவமைப்பு உயர்த்துதல்	பாலின மரவசார்ந்த சமூக சீர்திருத்தங்களை வடிவமைத்து மேம்படுத்தும் இயக்கங்கள், நிறுவனங்களை உயர்த்துதல்.

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JUSTIFICATION/ LEVEL OF CORRELATION

CoK1	po(F)
வகைபாடு தெளிந்தசிந்தனை உருவாக்குதல்	பாகுபாடு சிந்தனைத்தளம் படைப்புத்திறன்

Probability of co1 to po8=p(k2)+p(k8)+p(k2)=(1+1+1)/3 so correlation is =3

CoK2	po(F)
உடகூறுகள் நுண்நோக்கு உயர்த்துதல்	பாடுபொருள் நுட்பம் மேம்படுத்துதல்

Probability of co2 to po6=p(k1)+p(k6)+p(k5)=(1+1+1)/3 so correlation is =3

Co3	po(F)
இயங்குதளம் தொடர்புபடுத்துதல் ஆக்கம்	இயங்கும்ஆற்றல் ஒப்பீடு ஆற்றல்

Probability of co3 to po11=p(k5)+p(k11)+p(k8)=(1+1+1)/3 so correlation is =3

Co4	po(k)
தரமேம்பாடு சிறப்புக்கூறு பிரபஞ்சஅறிவு	தரம் புதியசிந்தனைத்தளம் உலகியல்அறிவு

Probability of co4 to p011 =p(k11)+p(k8)+p(k6)=(1+1+1)/3 so correlation is =3

Co5	po(k)
பாலினமரபு வடிவமைப்பு உயர்த்துதல்	இனமரபுமுன்னோடி கட்டமைப்பு மேம்படுத்துதல்

Probability of co5 to p012 =p(k1)+p(k12)+p(k5)=(1+1+1)/3 so correlation is 3

Co/po correlation probability: *பாலினக்கல்வி* **(Gender Studies)**

Co/po	1	2	3	4	5	6	7	8	9	10	11	12
1								1				
2	1				1	1						
3					1			1			1	
4						1		1			1	
5	1				1							1

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