

Vision, Mission and Quality Policy of the College

Vision

Kovai Kalaimagal College of Arts and Science shall inspire and guide students to acquire knowledge, develop skill and a positive attitude that will enhance their personality, providing self-confidence to face the competitive world.

Mission

- To strive for excellence in academics.
- To inculcate a positive attitude and to develop skill in students, to meet the challenges of the competitive world.
- To develop self-confidence through adequate interaction and relevant exposure.
- To promote ethical and social values in the students.
- To identify and encourage talents in academics and sports by rewarding them with scholarships.

Quality Policy

“KKCAS shall provide value-based education to its students for continual improvement in their academic performance, enhancing their competency for higher education and employment.”

GRADUATES ATTRIBUTES

- Communication skill
- Domain knowledge
- Technical skills
- Knowledge inter-disciplinary in nature
- Positive attitude
- Critical thinking and problem solving skills
- Dynamism and team building skills
- Professional ethics and social values
- Self-awareness and emotional intelligence
- Entrepreneurship qualities
- Responsibility towards society and environment
- Thirst for knowledge through lifelong learning

PROGRAM EDUCATIONAL OBJECTIVES

PEO1: Core Competency: Graduate will solve real world problems appropriate to the discipline using strong foundation provided in Computer Science

PEO2: Breadth: Graduate will apply current industry accepted practices, new and emerging technologies to analyze, design, implement, and maintain state-of-art solutions.

PEO3: Learning Environment: Exhibit self- learning capabilities to assimilate and practice emerging theories and technologies.

PEO4: Professionalism: Graduates will pursue higher education and/or engage themselves in continuous professional development to meet global standards **adapt to the changing environment due to automation.**

PEO5: Preparation: Be successfully employed or accepted into a graduate program / higher studies, and demonstrate a pursuit of lifelong learning in advanced areas of computer science and related fields.

PEO6: Leader ship : Graduates will work as a team in diverse fields and gradually move into leadership positions.

PO(PROGRAM OUTCOMES)

- **Communication Skill:** Demonstrate english language proficiency to an appropriate level to perform effectively in the enterprise/industry/Community such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
- **Domain knowledge:** Develop doamin knowledege relevant to the industry enabling to succeed in rapidly changing working environment.
- **Technical skills:** Ability to apply the knowledge of computer system design principles in building system software and hardware.
- **Knowledge inter-disciplinary in nature:** Acquiring adequate knowledge in interdisciplinary subjects much as Commerce,Mathematics and Statistics for enhanced applications of softwares developed.
- **Positive attitude:** Developing positive attitude by instilling confidence in theminds of students by suitable programs.
- **Critical thinking and problem solving skills:** An ability to make the students think out of the box and slove complex problems arrising in shop floor situation.
- **Dynamism and team building skills:** An ability to function effectively and proactively and in teams,to accomplish a common goal.
- **Professional ethics and social values:** Ability to carry out any task with professional ethics and with out deviating from social values
- **Self-awareness and emotional intelligence:** An ability to recognize their own Strength and weekness and balance their own emotions at the time of crisis.
- **Entrepreneurship qualities:** An ability to acquire entrepreneurship qualities and to take efforts to become entreprenurs.
- **Responsibility towards society and environment:** Realizing the responsibilities towards the society and to protect the environment,use professional knowledge for providing better living condition to the people.
- **Thirst for knowledge through lifelong learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

MAPPING OF GRADUATE ATTRIBUTES WITH PROGRAMME OUTCOMES

S.No	Graduates Attributes	Program Outcomes
1	Communication skill	Demonstrate english language proficiency to an appropriate level to perform effectively in the enterprise/industry/Community such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
2	Domain knowledge	Develop domain knowledge relevant to the industry enabling to succeed in rapidly changing working environment.
3	Technical skills	Ability to apply the knowledge of computer system design principles in building system software and hardware.
4	Knowledge inter-disciplinary in nature	Acquiring adequate knowledge in interdisciplinary subjects such as Commerce,Mathematics and Statistics for enhanced applications of softwares developed.
5	Positive attitude	Developing positive attitude by instilling confidence in the minds of students by suitable programs.
6	Critical thinking and problem solving skills	An ability to make the students think out of the box and solve complex problems arising in shop floor situation.
7	Dynamism and team building skills	An ability to function effectively and proactively and in teams ,to accomplish a common goal.
8	Professional ethics and social values	Ability to carry out any task with professional ethics and with out deviating from social values
9	Self-awareness and emotional intelligence	An ability to recognize their own Strength and weakness and balance their own emotions at the time of crisis.

10	Entrepreneurship qualities	An ability to acquire entrepreneurship qualities and to take efforts to become entrepreneurs.
11	Responsibility towards society and environment	Realizing the responsibilities towards the society and to protect the environment,use professional knowledge for providing better living condition to the people.
12	Thirst for knowledge through lifelong learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

KOVAI KALAIMAGAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous Institute Affiliated to Bharathiar University)

Re - accredited with “A” grade by NAAC

Regulations for Undergraduate Programmes

(Under Choice Based Credit System)

(Effective from 2019- 20)

1. REGULATIONS

This regulation is effective from the academic year 2019 -'20.

1.1. Eligibility for Admission

Course	Eligibility Condition
B.Sc (CS)	A pass in higher secondary course. Preference will be given to those who have studied Mathematics as one of the subjects.

1.2. Duration and Course of Study

Three Academic years with six semesters, the duration of the first, third and fifth Semesters from June to November and the second, fourth and sixth Semesters from December to April. The duration of each semester is 90 working days.

1.3. The Medium of Instruction and Examinations

The medium of instruction and examinations shall be English.

1.4. Requirements for Attendance

- A candidate will be permitted to take the examination for any semester, if he/she secures not less than 75% of attendance out of the 90 working days during the semester.
- A candidate who has secured attendance less than 75% but 65% and above shall apply with the prescribed fee for the condonation of lack of attendance. On the recommendation of the Principal, he/she will be permitted to take up the examination.
- A candidate who has secured attendance less than 65% but 55% and above in any semester, will be permitted to continue the course but will not be permitted to appear for the examination in the current papers. However he/she will be permitted to appear for the examination in the papers in which he/she has arrears. He/she will have to compensate the shortage of attendance in the subsequent semester and take the examination in the papers of both the semester together .

- A candidate who has secured less than 55% of attendance in any semester will not be permitted to take the regular examinations and to continue the study in the subsequent semester. He/she has to re-do the course by rejoining in the semester in which the attendance is less than 55%.
- A candidate who has secured less than 65% of attendance in the final semester has to compensate his / her attendance shortage in a manner to be decided by the Head of the Department concerned after rejoining the course.

1.5 Restriction to take the Examinations

Any candidate having arrear paper(s) shall have the option to take the examinations in any arrear paper(s) along with the subsequent regular semester papers.

Candidates who fail in any of the papers shall pass the paper(s) concerned within five years from the date of admission to the said course. If they fail to do so, they shall take the examination in the revised text / syllabus, if any, prescribed for the immediate next batch of candidates. If there is no change in the text / syllabus they shall take the examination in that paper with the syllabus in vogue, until there is a change in the text or syllabus.

In the event of removal of that paper consequent to the change of regulations and / or curriculum after a five year period, the candidates shall have to take up an equivalent paper in the revised syllabus as suggested by the chairman and fulfill the requirements as per regulations/curriculum for the award of the degree.

1.6 The Evaluation System

The major objective of the institution's evaluation system is to motivate all students to excel in their performance. The students' performances are continually assessed through Continuous Assessment (CIA) and End Assessment (EAE). The CIA, EAE break up for theory papers is 25:75 and practical is 40:60.

1.6.1. Break Up of Continuous Internal Assessment (CIA) Marks**Theory (Languages, English, Core, Allied and Elective)**

Content	Marks Awarded
Continues Internal Assessment Test - I	05
Continues Internal Assessment Test - II	05
Model Examination	10
Assignment (2 Numbers)	05
Total	25

Theory (Communication Skills, Mathematics for Competitive Examinations and Aptitude & Soft Skills) #

Content	Marks Awarded
Continues Internal Assessment Test - I	25*
Continues Internal Assessment Test - II	
Internal Assessment Test III	25
Total	50

*Test I and Test II will be evaluated for 25 marks each and the average of these two will be considered.

Internal Evaluation only

Practical

Content	Marks Awarded (Max Marks: 100)	Marks Awarded (Max Marks: 50)
Minimum ten Experiments / Practical Paper / Semester	20	05
Continues Internal Assessment Test	05	05
Model Exam	10	05
Record Note Book	05	05
Total	40	20

Project Viva Voce

Content	Marks Awarded
Review and content Presentation (3 Reviews)(3*20)	60
Project Record Work	20
Total	80

1.6.2. End Assessment Examinations (EAE)

- Semester examination will be conducted at the end of each semester after completing a minimum of 90 working days.
- End Assessment Examination for the odd semester will generally be held during November and even semester during April.
- The question papers for all the courses will be set by the external examiners.
- The examinations for language, English, Core, Allied and Elective will be conducted for a maximum of 75 marks for three hours. The passing minimum is 40% (30 out of 75 marks) and overall passing minimum putting the CIA and EAE marks together will be 40%.
- Question Paper Pattern: (**Languages, English, Core, Allied and Elective**)

Part A	20 Marks	10 Questions - 2 Marks each – Descriptive type
Part B	25 Marks	5 Questions- 5 Marks each – either or type.
Part C	30 Marks	3 Questions- out of five questions -10 Marks each.
Total	75 Marks	

(f)The exams for Value Based Education and Non-Major Elective will be conducted for a maximum of 50 marks for three hours. The passing minimum is 40% (20 out of 50 marks)

(g)Question Paper Pattern: (**Value Based Education & Non Major Elective**)

Part A	50 Marks	Questions - either or type of question - 10 Marks each
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(h)Question paper pattern : (**Extra Credit Courses**)

Part A	40 Marks	5 Questions- 8 Marks each – either or type.
Part B	60 Marks	5 Questions- 12 Marks each – either or type.
Total	100 Marks	

(i)The marks secured in the extra credit course will get reflected in the mark sheet only if the candidate has secured 40% marks and above.

(j)The students will be allowed to choose only two papers per semester under the extra credit courses from third semester onwards.

(k) Job Oriented Training Programme: Every student should complete one job oriented course of minimum 25hrs duration .The student may register in PMKVY (supported by the central government) or other external agency .They should submit a certificate for the successful completion of the training programme from the agency concerned at the end of the third semester.

l) Online Course :Students have to register online courses like NPTEL /SWAYAM /MOOC / COURSERA /EDX etc and can appear for the exam in same web portal or through End Assessment Examinations in our College.

m) Question paper pattern : (Self Study - Manitha vazhkaiyum Gandhiadigalum and Women Rights)

Part A	50 Marks	5 Questions -10 Marks each – either or type.
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n) Question paper pattern : (Self Study -General Awareness

Part A	100 Marks	100 Questions -1 Marks each – objective type
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o) Practical

Content	Marks Awarded (Max Marks: 100)	Marks Awarded (Max Marks: 50)
Program – 1	20	10
Program – 2	20	10
Viva voce	10	05
Record	10	05
Total	60	30

p)Extra-Curricular Activities

The first year students can enroll themselves for NSS / RRC /YRC / Sports & Games / Clubs and earn the credit allotted. Participation in any one of these activities during the first four semesters is mandatory.A report regarding satisfactory participation in the activity issued by the faculty incharge of the activity and approved by the Head of the Department has to

be submitted to the CoE at the end of the fifth semester.

q)Co-curricular Activities

Participation of the students in any one of the activities conducted by other colleges during their courses of study is compulsory for the award of degree and it should be duly certified by the Head of the Department and submitted to the Controller of Examinations with a copy of the certificate of participation.

r)Internship

The students have the option to select any organisation – Government / Private like industry, bank, Research & Development organisations, Scientific Companies, IT related service providers etc.,in consultation with the staff Co-ordinator & Head of the Department.The students are to undergo training for a period of two weeks.The students must maintain a work diary and prepare a report of the training undergone and submit the same to the HoD on a stipulated date, there will be a viva voce with internal examiners at the end of the semester V.

s)Evaluation:

Content	Marks Awarded
Attendance	10
Work diary	15
Report	50
Viva Voce	25
TOTAL	100

This course carries 3 credit.

t)Project

The evaluation for the end semester examination should be as per the norms given below:

Content	Marks Awarded
Viva Voce	20
Total	20

u)The students who have opted for the languages other than Tamil in part I should undergo Basic Tamil Course during the 2nd year of the study as a Non-Credit course for which there would be only Internal evaluation.

v) For all the Non-Credit Courses result would be indicate as “Pass” or “Re-appearance” and not by marks or grades secured in the Grade Sheet.

There will be one independent valuation for all theory papers under parts I, II, III by External Examiner.

w)A candidate may request for re-totalling/revaluation of his/her answer script by submitting an application addressing to the Controller of Examination through the Principal, paying the prescribed fee. This provision is available for all theory papers taken in the EAE. However there is no provision for revaluation of Practical papers.

x) Candidates desirous of improving the marks awarded in a passed subject in their first attempt shall reappear once within a period of subsequent two semesters. The improved marks shall be considered for classification but not for ranking. When there is no improvement, there shall not be any change in the original marks already awarded.

y) Supplementary examination will be conducted for the benefit of final year students after 15 days of the declaration of the final semester results. Candidate who has arrears in any semester subject to a maximum of three papers can appear for the Supplementary exam conducted after the final semester.

1.7 Grading

The following table gives the marks, grade points, letter grades and classification to indicate the performance of the candidate.

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

Range of Marks	Grade Points	Letter Grade	Description
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction
70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Above Average
40-49	4.0-4.9	C	Average
00-39	0.0	U	Re - Appearance
ABSENT	0.0	AB	Absent

C_i = Credits earned for course i in any semester

G_i = Grade Point obtained for course i in any semester

n = refers to the semester in which such course were credited

For a Semester:

$$\text{GRADE POINT AVERAGE [GPA]} = \sum_i C_i G_i / \sum_i C_i$$

Sum of the multiplication of grade points by the credits of the courses

$$\text{GPA} = \frac{\text{Sum of the multiplication of grade points by the credits of the courses}}{\text{Sum of the credits of the courses in a semester}}$$

Sum of the credits of the courses in a semester

For the Entire Programme:

$$\text{CUMULATIVE GRADE POINT AVERAGE [CGPA]} = \sum_n \sum_i C_{ni} G_{ni} / \sum_n \sum_i C_{ni}$$

Sum of the multiplication of grade points by the credits of the entire programme

$$\text{CGPA} = \frac{\text{Sum of the multiplication of grade points by the credits of the entire programme}}{\text{Sum of the credits of the courses of the entire programme}}$$

Sum of the credits of the courses of the entire programme

CGPA	Grade	Classification of Final Result
9.5 and above up to 10.0	O+	First Class – Exemplary*
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	
6.5 and above but below 7.0	A+	First Class
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	
5.0 and above but below 5.5	B	Second Class
4.5 and above but below 5.0	C+	
4.0 and above but below 4.5	C	Third Class
0.0 and above but below 4.0	U	
		Re – Appearance

Classification of Successful candidates

A candidate who passes all the examinations in Part I to Part IV securing following

CGPA and Grades shall be declared as follows for each part:

CGPA	Grade	Classification of Final Result
9.5 and above up to 10.0	O+	First Class – Exemplary*
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	
6.5 and above but below 7.0	A+	First Class
6.0 and above but below 6.5	A	

5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
4.5 and above but below 5.0	C+	Third Class
4.0 and above but below 4.5	C	
0.0 and above but below 4.0	U	Re-Appearence

The candidates who have passed in the first appearance and within the prescribed semester of the Programme (Major, Allied and Elective Course alone) are eligible.

1.8 Course Completion

Students shall complete the programme within a period not exceeding three years for UG courses from the date of admission.

SCHEME OF EXAMINATION AND PROGRAMME STRUCTURE**Bachelor of Computer Science (2019 – 2022)**

Part	Subject Code	Study Components	Hrs Week	CIA	EAE	Total	Credits
Semester – I							
I	19U1TALT01	Language 1 : Paper I Tamil I/Hindi I/French I/Malayalam I	5	25	75	100	3
II	19U1ENLT01	Language 2 : Functional English I	5	25	75	100	3
III	19U1CSCT01	Core 1: C Programming	4	25	75	100	4
	19U1CSCT02	Core 2: Digital Fundamentals and Computer Architecture	4	25	75	100	4
	19U1CSCP03	Core 3: C Programming - Practical	3	40	60	100	3
	19U1CSAT01	Allied 1 : Numerical Methods and Statistics	5	25	75	100	4
IV	19U1VBET01	Value Based Education 1 : Environmental Studies **	2	-	50	50	1
	19U1VBET02	Value Based Education 2: Yoga for Youth Empowerment**	2	-	-	-	-
	19U1SBST01	Skill Based Subject 1 : Mathematics for Competitive Examinations - I	2	50	-	50	1
	19U1SBST02	Skill Based Subject 2 : Communication Skills -I	2	50	-	50	1
		Sports	2	-	-	-	-
TOTAL CREDITS							24
Semester – II							
I	19U2TALT02	Language 1 : Paper II Tamil II/Hindi II/FrenchII/Malayalam II	5	25	75	100	3
II	19U2ENLT02	Language 2 : Functional English II	5	25	75	100	3
III	19U2CSCT04	Core 4: C++ Programming	4	25	75	100	3
	19U2CSCT05	Core 5: Data Structures	4	25	75	100	3
	19U2CSCP06	Core 6: C++ Programming - Practical	3	40	60	100	3
	19U2CSAT02	Allied 2 : Discrete Mathematics	5	25	75	100	4
IV	19U1VBET02	Value Based Education 2: Yoga for Youth Empowerment**	2	-	50	50	4
	19U2VBET03	Value Based Education 3 : Ethics & Culture **	2	-	50	50	1
	19U2SBST03	Skill Based Subject 3 : Mathematics for Competitive Examinations – II	2	50	-	50	1
	19U2SBST04	Skill Based Subject 4 : Communication Skills -II	2	50	-	50	1
		Sports	2	-	-	-	-
TOTAL CREDITS							26
Semester – III							
III	19U3CSCT07	Core 7: Operating Systems	5	25	75	100	4
	19U3CSCT08	Core 8: Java Programming	5	25	75	100	3
	19U3CSCT09	Core 9: Data Communications and Networks	6	25	75	100	3
	19U3CSCP10	Core 10: Java Programming -Practical	6	40	60	100	3
	19U3CSAT03	Allied 3 : Operations Research	5	25	75	100	4

Scheme and Regulations(SR-4) (2019-2022)B.Sc (CS)

	19U2SBST05	Skill Based Subject 5 : Mathematics for Competitive Examinations – III	2	50	-	50	1
	19U3SBST06	Skill Based Subject 6 : Communicative Skills – III	2	50	-	50	1
IV	19U3NMET01	Non Major Elective 1: Food Science and Nutrition	2	-	50	50	2
	19U3BTLT01 / 19U3ATLT01	Non Credit Course:1 Basic Tamil I # / Advance Tamil #	-	-	-	-	-
		Job Oriented Course *	-	-	-	-	1
	19U3SSCT01	Self Study Course 1: Manitha vazhkaikum Gandhiadigalum**	-	-	50	50	1
		Library	2	-	-	-	-
		Sports	1	-	-	-	-
TOTAL CREDITS							23
Semester – IV							
III	19U4CSCT11	Core 11: Web Designing	5	25	75	100	4
	19U4CSCT12	Core 12: Network security and cryptography	6	25	75	100	4
	19U4CSCT13	Core 13: Software Engineering	5	25	75	100	3
	19U4CSCP14	Core 14: Web Designing - Practical	6	40	60	100	3
	19U4CSAT04	Allied 4: Business Accounting	5	25	75	100	4
	19U4SBST07	Skill Based Subject 7 : Mathematics for Competitive Examinations - IV	2	50	-	50	1
	19U4SBST08	Skill Based Subject 8 : Communicative Skills - IV	2	50	-	50	1
IV	19U4NMET02	Non Major Elective 2: Floriculture	2	-	50	50	2
	19U4BTLT02 / 19U4ATLT02	Non Credit Course:2 Basic Tamil II #/Advance Tamil #	-	-	-	-	-
	19U4SWCT01	Online Course (SWAYAM/NPTEL)*	-	-	-	-	1
	19U4SSCT02	Self Study Course 2: Women's Rights **	-	-	50	50	1
		Library	1	-	-	-	-
		Sports	2	-	-	-	-
TOTAL CREDITS							24
Semester – V							
III	19U5CSCT15	Core 15: ASP . Net & C #	5	25	75	100	3
	19U5CSCT16	Core 16: PHP & MYSQL	5	25	75	100	3
	19U5CSCP17	Core 17: ASP . Net & C# Practical	6	40	60	100	3
	19U5CSCP18	Core 18: PHP & MYSQL- Practical	6	20	30	50	3
	19U5CSET1A / 19U5CSET1B / 19U5CSET1C	Elective 1 : Data Mining and warehousing Mobile Computing Embedded Systems	4	25	75	100	3
	19U5CSET2A / 19U5CSET2B / 19U5CSET2C	Elective 2 : E-Commerce Client Server Technology Software Project Management	4	25	75	100	3
	19U5NCCT01	Non Credit Course 3 : Aptitude and Soft	3	-	-	-	-

		Skills - I					
	19U5SSCT03	Self Study Course 3: General Awareness	-	-	100	100	1
		Internship (15 days)	-	-	-	-	3
		Co-curricular activity (seminar/conference/ workshop)	-	-	-	-	1
		Sports	2	-	-	-	-
		Library	1	-	-	-	-
TOTAL CREDITS							23
		Semester – VI					
III	19U6CSCT19	Core 19: Graphics & Multimedia	5	25	75	100	3
	19U6CSCP20	Core 20: Software Testing	6	20	30	50	3
	19U6CSCP21	Core 21: Graphics & Multimedia - Practical	6	40	60	100	3
	19U6CSCV22	Core 22: Project and Viva Voce	5	80	20	100	4
		Elective 3:					
	19U6CSET3A	Artificial Intelligence & Expert Systems	4	25	75	100	3
	19U6CSET3B	Software Testing practical					
	19U6CSET3C	Enterprise Resource Planning					
		Elective 4:					
	19U6CSET4A	Compiler Design	4	25	75	100	3
	19U6CSET4B	Android Operating System					
	19U6CSET4C	Cloud Computing					
	19U6NCCT02	Non Credit Course4 : Aptitude and Soft Skills II	3	-	-	-	-
	19U6EXAY0 1	Extension Activities NSS/RRC/YRC/Sports&Games/YiNET/E coclub/ Photography	-	-	-	-	1
		Sports	2	-	-	-	-
		Library	1	-	-	-	-
TOTAL CREDITS							20
Total Marks							3800
							140

* It will not be considered for the the calculation of CGPA.

** Answers to the questions may also be given in Tamil.

The students who have not studied Tamil in Higher Secondary Course and not opted for Tamil under Language I in the Degree programme have necessarily to study Basic Tamil for 2hours/week during III & IV Semesters after their regular College working hours.

Project and Viva Voce:

Project Work carries 100 marks with 4 credits . The breakup of marks will be as follows:-

Internal assesment: 80 Marks (60 Marks for 3 reviews and 20 Marks for Record) and External

Assesment : 20 Marks (Viva Voce).

CURRICULUM STRUCTURE

S.No	Course	No of Papers	Credits
1	Language 1 : Tamil/Hindi/Malayalam/French	02	06
2	Language 2 : English	02	06
3	Core	22	72
4	Allied	04	16
5	Elective	04	12
6	Value Based Education	03	06
7	Skill Based Subject	08	08
8	Non-Major Elective	02	04
9	Non Credit Course	02	-
10	Job Oriented Course	01	01
11	Online Course	01	01
12	Self Study Course	03	03
13	Internship (15 days)	01	03
14	Co Curricular Activities	01	01
15	Extra Curricular Activities	01	01
16	Basic Tamil /Advance Tamil	02	-
Total Credits			140 Credits

EXTRA CREDIT COURSES		
Course Code	Subjects	Credits
2019ECC001	சுற்றுலா வளர்ச்சி	2
2019ECC002	இதழியல் கலை	2
2019ECC003	நாட்டுப்புறவியல்	2
2019ECC004	கணிப்பொறியில் தமிழ்	2
2019ECC005	தமிழக வரலாறும் மக்கள் பண்பாடும்	2
2019ECC006	தமிழ் இலக்கிய வரலாறு	2
2019ECC007	New Media	2
2019ECC008	Proofreading And Copyediting	2
2019ECC009	Personality Development	2
2019ECC010	Technical Writing	2
2019ECC011	An Introduction To Psychology	2
2019ECC012	Astronomy	2
2019ECC013	Fuzzy Mathematics	2
2019ECC014	Operation Research	2
2019ECC015	Mathematics For Professional Courses	2
2019ECC016	Multimedia And Its Applications	2
2019ECC017	Management Information System	2
2019ECC018	Theory Of Computation	2
2019ECC019	Oops With Java Programming	2
2019ECC020	Programming In C	2
2019ECC021	Internet Of Things	2
2019ECC022	Web Technology And Its Applications	2
2019ECC023	Network Security	2
2019ECC024	Mobile And Wireless Technology	2
2019ECC025	Cloud Computing	2
2019ECC026	Cross Culture Management	2
2019ECC027	Indian Economy And Trade Dependencies	2
2019ECC028	Export Marketing	2
2019ECC029	International Trade & Forex	2
2019ECC030	Brand Management	2
2019ECC031	Stress Management	2
2019ECC032	Risk And Insurance In International Trade	2

Scheme and Regulations(SR-4) (2019-2022)B.Sc (CS)

2019ECC033	Retail Marketing	2
2019ECC034	Export And Import Procedures	2
2019ECC035	Logistics And Supplychain Management	2
2019ECC036	Quality Management	2
2019ECC037	Management Of Small And New Enterprises	2
2019ECC038	Tourism Management	2
2019ECC039	Event Management	2
2019ECC040	Hospitality Management	2
2019ECC041	Consumer Behaviour	2
2019ECC042	Human Resource Management	2
2019ECC043	Principles And Practice Of Marketing Services	2
2019ECC044	Consumer Marketing	2
2019ECC045	Marketing Of Health Services	2
2019ECC046	International Banking	2
2019ECC047	E-Commerce	2
2019ECC048	International Accounting	2
2019ECC049	Corporate Social Responsibility And Governance	2
2019ECC050	Enterprise Resource Planning	2

SEMESTER – I

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U1TALT01	Title : Language 1:Tamil - I	Batch	2019-2022
			Semester	1
Hrs/week	5 Hours		Credits	3

நோக்கம்

- சமூகம் பற்றிய சிந்தனைகளைத் தமிழ்ப் படைப்பிலக்கியங்கள் மூலம் ஏற்படுத்துதல்
- புதுக்கவிதைகள், சிறுகதைகள் ஆகியவற்றைப் வாசிக்க வைத்தல், எழுத வைத்தல்
- தமிழ்நாடு அரசுப்பணியாளர் போட்டித்தேர்வு மையம் நடத்தும் போட்டித் தேர்வுகளுக்கு மாணவர்களைத் தயார் செய்தல்.
- மாணவர்களின் வாசிக்கும் ஆற்றலை ஊக்குவிக்கவும், தமிழ் இலக்கியத்தோடு தொடர்புடைய பிற நூல்களையும் மாணவர்கள் சுயமாக கற்று உணர்ச்செய்தல்
- மாணவர்கள் பிழையில்லாமல் எழுதுவதற்கும், பேசுவதற்கும், கருத்துப்பரிமாற்றத்திற்கும் இலக்கணம் உதவுகின்றன என்பதை அறிந்துகொள்ளல்.

பாடப்பகுதி கற்றலின் வெளிப்பாடு - Course Outcome (CO)

CO Number	CO Statement
CO1	தமிழ் மொழியின் வாயிலாக பண்பாடு, கலைகள் மற்றும் மரபுகள் முதலியவற்றை அறிதல்.
CO2	வாழ்வியல் நெறிகளை உணர்ந்து மனிதநேயத்துடனும் உயர்ந்த குறிக்கோளுடனும் சமுதாயத்தை நேசிக்கத் தகுந்தவர்களாக இருத்தல்.
CO3	இலக்கியங்களின் வாயிலாக பல்வேறு வகையான வாழ்க்கைத்தரம் மற்றும் மக்களின் வாழ்க்கை முறைகளைத் தெரிந்து கொள்ளுதல்.
CO4	அறத்தின் வழிநின்று பொருளிட்டி இன்பம் துய்ப்பது உன்னத வாழ்வின் அடிப்படை என்பதை இலக்கியங்கள் வாயிலாக மாணவர்கள் உணர்தல்.
CO5	சமூகம் மற்றும் பெண்ணியம் சார்ந்த கவிதைகளும், கருத்து பரிமாற்றத்திறனுக்கு அடிப்படையாக உள்ள இலக்கணமும், இன்றைய சமுதாய நிகழ்வுகளைப் பிரதிபலிக்கும் சிறுகதையும், தன்முயற்சிப்படிப்பின் வாயிலாக, நமது ஊரின் சிறப்புகளையும் மற்றும் வரலாற்றுச் செய்திகளையும் மாணவர்கள் அறிந்து கொள்ள செய்தல்.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்;

CO /PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	✓	-	-	✓	-	✓	-	✓	-	-	✓
CO2	-	-	-	-	✓	✓	-	✓	-	-	✓	-
CO3	-	-	-	-	✓	✓	-	-	✓	-	-	-
CO4	-	-	-	-	✓	-	-	-	-	✓	-	-
CO5	✓	-	-	-	-	-	-	-	✓	-	-	-

பாடத்திட்டம்

அலகு – 1 செய்யுள் திரட்டு : மரபுக் கவிதைகள் (10 மணிநேரம்)

1. பாரதியார் - புதுமைப்பெண் (பாரதியார் கவிதைகள்)
2. பாரதிதாசன் - புத்தகச் சாலை (பாரதிதாசன் கவிதைகள்)
3. கவிமணி - புத்தரும் ஏழைச் சிறுவனும் (மலரும் மாலையும்)
4. கண்ணதாசன் - பிறப்பில் வருவது (கண்ணதாசன் கவிதைகள்)

அலகு – 2 செய்யுள் திரட்டு : புதுக் கவிதைகள் (13 மணிநேரம்)

1. புவியரசு – ரகசியம் (ஒரு முக்கிய அறிவிப்பு)
2. சிற்பி – தெற்கு வளைவு பாட்டையா (ஒரு கிராமத்து நதி)
3. அப்துல் ரகுமான் - மாதிரி (ஆலாபனை)
4. வைரமுத்து – மரங்களைப் பாடுவேன் (வைரமுத்து கவிதைகள்)
5. கனிமொழி – என் வீடு (கருவறை வாசனை)
6. முத்துக்குமார் - தூர் (பட்டாம்பூச்சி விற்பவன்)
7. திலிப் குமார் - எனது மௌனங்கள் (ஒத்திகை)
8. சுடலைமணி – பிறந்தநாள் பூங்கா (நட்சத்திரக்கிழவி)

அலகு – 3 சிறுகதைத் தொகுப்பு

(13 மணிநேரம்)

1. புதுமைப்பித்தன் - காஞ்சனை.
2. ராஜம்கிருஷ்ணன் - சூரியக்கதிர்கள். (பெண்மையச் சிறுகதைகள்)
3. தி.ஜானகிராமன் - சிலிர்ப்பு. (கொட்டுமேளம்)
4. பிரபஞ்சன் - எனக்கும் தெரியும் (நேற்று மனிதர்கள்).
5. முத்துலிங்கம் - தாத்தா விட்டுப்போன தட்டச்சு மிசின் (கொழுத்தாடு பிடிப்பேன்)
6. வேணுகோபால் - தாய்மை, ஒரு துளி துயரம், பற்று
7. வெ. சுப்ரமணியபாரதி – மயங்கும் மனங்கள் (மரணித்த கணவனின் டைரி)
8. தாமரை – பசுத்தோல் (சந்திரக் கதிர்கள்)

அலகு 4 இலக்கணம், பயன்பாட்டுத்தமிழ்

12 மணி நேரம்

நிறுத்தற் குறிகள் இடும் இடங்கள் - காற்புள்ளி, அரைப்புள்ளி, முக்காற்புள்ளி, முற்றுப்புள்ளி, புள்ளி, உணர்ச்சிக்குறி, கேள்விக்குறி, இரட்டை மேற்கோள்குறி, ஒற்றைமேற்கோள் குறி. ஒருமை, பன்மை பிழைகளை நீக்குதல், மரபு பிழைகள், வழுவச்சொற்களை நீக்குதல், பிறமொழிச் சொற்களை நீக்குதல்.

3. சொற்களை சேர்த்தும் இடம் விட்டும் எழுதுதல் - பெயர், பெயர், பெயர், வினை, வினை, வினை, இரட்டைச் சொற்கள், இடைச்சொற்கள்

அலகு 5 இலக்கிய வரலாறு

12 மணி நேரம்

1. சிறுகதையின் தோற்றமும் வளர்ச்சியும்.
2. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்.
3. இலக்கணம் தோற்றமும் வளர்ச்சியும்.
4. தன்முயற்சி படிப்பு : தெரிந்த கோவை தெரியாத கதை
ஆசிரியர் : கவியன்பன்
வெளியீடு : விஜயா பதிப்பகம், கோயம்புத்தூர்.

பாடநூல் - செய்யுள் திரட்டு (தொகுப்பு) தமிழ்த்துறை வெளியீடு 2019

பார்வை நூல்கள்

வ. எண்	ஆசிரியர் பெயர்	நூலின் பெயர்	வெளியீடு	ஆண்டு ∴ பதிப்பு
1	புலவர் வெற்றியழகன்(தொ.ஆ.)	பாரதியார் கவிதைகள்	ராமையா பதிப்பகம், சென்னை.	முதற் பதிப்பு: ஏப்ரல் - 2008
2	தொ.பரமசிவன் (ப.ஆ.)	பாரதிதாசன் கவிதைகள்	நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை.	மூன்றாம் பதிப்பு: டிசம்பர் - 1998
3	வித்துவான் சிவ கன்னியப்பன்	மலரும் மாலையும்	பூம்புகார் பதிப்பகம், சென்னை.	முதற் பதிப்பு: செப்டம்பர் - 2002
4	கவியரசு கண்ணதாசன்	கண்ணதாசன் கவிதைகள்	கலைக்காவிரி பதிப்பகம், திருச்சி.	ஐந்தாம் பதிப்பு: 1997
5	புவியரசு	ஒரு முக்கிய அறிவிப்பு	விஜயா பதிப்பகம், கோவை.	இரண்டாம் பதிப்பு: டிசம்பர் - 2005.
6	சிற்பி	ஒரு கிராமத்து நதி	கவிதா பதிப்பகம் சென்னை.	எட்டாம் பதிப்பு: ஆகஸ்டு-2011
7	அப்துல் ரகுமான்	ஆலாபனை	நேசனல் பப்ளிஷர்ஸ், சென்னை.	நான்காம் பதிப்பு: ஏப்ரல் - 2003
8	வைரமுத்து	வைரமுத்து கவிதைகள்	சூர்யா வெளியீடு, சென்னை.	பனிரெண்டாம் பதிப்பு: நவம்பர் -2000
9	குனிமொழி	கருவறை வாசனை	திருமகள் நிலையம்	மே - 1998
10	முத்துக்குமார்	பட்டாம்பூச்சி விற்பவன்	வம்கி கிராபிக்ஸ்	4 ம் பதிப்பு திசம்பர் 2007

Scheme and Regulations(SR-4) (2019-2022)B.Sc (CS)

11	திலிப் குமார்	ஓத்திகை - எனது மௌனங்கள்	--	--
12	ப.சுடலைமணி	நட்சத்திரக்கிழவி (கவிதைத் தொகுப்பு)	--	திசம்பர் 2018
13	புதுமைப்பித்தன்	புதுமைப்பித்தன் கதைகள்	பூம்புகார் பதிப்பகம், சென்னை.	இரண்டாம் பதிப்பு: ஜூலை - 2006.
14	தி. ஜானகிராமன்	(கொட்டுமேளம்)	ஐந்திணைப் பதிப்பகம்	2012
15	பிரபஞ்சன்	நேற்று மனிதர்கள்	கவிதா பப்ளிகேசன்	ஜூன் 2001
16	முத்துலிங்கம்	கொழுத்தாடு பிடிப்பேன்	காலச்சுவடு பதிப்பகம்	திசம்பர் - 2013
17	வேணுகோபால்	ஒரு துளி துயரம்	விஜயா பதிப்பகம், கோவை.	பிப்ரவரி 2006
18	வெ. சுப்ரமணியபாரதி	மரணித்த கணவனின் டைரி	டிஸ்கவரி புக் பேலஸ்	ஜனவரி 2019
19	தூமரை	சந்திரக் கதிர்கள்	குமரன் பதிப்பகம்	ஜூன் 2004
20	வல்லிக்கண்ணன்	புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்	அகரம் பதிப்பகம்,, கும்பகோணம்.	நான்காம் பதிப்பு: ஜூலை - 1999.
21	கா.கோ.வெங்கட்ரா மன்	தமிழ் இலக்கிய வரலாறு	கலையக வெளியீடு, திண்டுக்கல்.	இரண்டாம் பதிப்பு: ஜூன் - 2002.
22	மது.ச.விமலானந்த ம்	தமிழ் இலக்கிய வரலாறு	முல்லை நிலையம், சென்னை.	2014.
23	மு.பரமசிவம்	நற்றமிழ் இலக்கணம்	சைவசித்தாந்த பதிப்பகம், திருநெல்வேலி.	முதற் பதிப்பு: 1995.
24	கவியன்பன். கே.ஆர் பாபு	தெரிந்த கோவை தெரியாத கதை	விஜயா பதிப்பகம் கோயம்புத்தூர்.	ஜூலை - 2011

SEMESTER-I

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U1FRLT01	Title : Language 1 :French I	Batch	2019-2022
Hrs/week	5		Semester	1
			Credits	3

COURSE OBJECTIVES

To enable the students to understand the basic structure of French language.

COURSE OUTCOMES (CO)

In Successful Completion of the course the students will be able to

CO Number	CO Statement
CO1	have access to the works of great french writers.
CO2	Develop the skills of speaking and writing without flaws.
CO3	Help the learners to have a good critical thinking.

MAPPING WITH PROGRAMME OUTCOMES

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	-	-	-	-	-	-	-	-	-	-	-
CO2	✓	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	✓	-	-	-	-	-	-

SYLLABUS

Prescribed text : LATITUDES I

Units : 1 – 4

Authors : Régine Mérieux

Yves Loiseau

Available at : Goyal Publishers Pvt Ltd

86, University Block

Jawahar Nagar (Kamla Nagar)

New Delhi – 110007

Tel : 011 – 23852986 / 9650597000

Question Paper Pattern

Semester I

Maximum Marks: 75

Time: 3 hrs.

(All questions to be set only from the prescribed text)

Section A (10)

1. Choisissez la meilleure réponse: (10X1=10)

Section B (25)

2. Dites vrai ou faux (5X1=5)

3. Traduisez les textes suivants en anglais:(4/5) (4X5=20)

Section C (40)

4. Compréhension (5x1=5)

5. Exercices de grammaire:(5X5=25) (either/or)

6. Remplissez le dialogue:(5X1=5)

7. Associez :(5X1=5)

SEMESTER I

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U1HILT01	Title : Language 1: Hindi I	Batch	2019-2022
Hrs/week	5		Semester	1
			Credits	3

COURSE OBJECTIVES

To enable the students to understand the basic structure of Hindi language.

COURSE OUTCOMES (CO)

On Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	Help the learners to communicate with others in any part of India with ease.
CO2	Develop the skills of speaking and writing without flaws.
CO3	Help the learners to have a good critical thinking.

MAPPING WITH PROGRAMME OUTCOMES

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	-	-	-	-	-	-	-	-	-	-	-
CO2	✓	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	✓	-	-	-	-	-	-

SYLLABUS**1. PROSE : NUTHAN GADYA SANGRAH**

Editor : Jayaprakash

(Prescribed Lessons – only 6)

Lesson 1 – Bharathiya Sanskurthi

Lesson 3 – Razia

Lesson 4 – Makreal

Lesson 5 – Bahtha Pani Nirmala.

Lesson 6 – Rashtrapitha Mahathma Gandhi

Lesson 9 – Ninda Ras.

Publisher : Sumitra Prakashan

Sumitravas, 16/4, Hastings Road,

Allahabad – 211 001.

2. NON DETAILED TEXT : KAHANI KUNJ

Editor : Dr. V.P. Amithab.

(Stories 1-6 only)

Publisher : Govind Prakashan

Sadhar Bagaar, Mathura,

Uttar Pradesh – 281 001.

3. GRAMMAR : SHABDHA VICHAR ONLY

(NOUN, PRONOUN, ADJECTIVE, VERB, TENSE, CASE ENDINGS)

Theoretical & Applied.

Book for Reference : Vyakaran Pradeep by Ramdev

Publisher : Hindi Bhavan,

36, Tagore Town

Allahabad – 211 002.

4. TRANSLATION : English – Hindi only.

ANUVADH ABHYAS – III

(1-15 lessons only)

Publisher : DAKSHIN BHARAT HINDI PRACHAR SABHA

CHENNAI – 17.

5. COMPREHENSION : 1 Passage from ANUVADH ABHYAS – III (16-30)

DAKSHIN BHARATH HINDI PRACHAR SABHA

CHENNAI-17.

SEMESTER – I

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U1MLLT01	Title : Language 1 :Malayalam I	Batch	2019-2022
Hrs/week	5		Semester	1
			Credits	3

COURSE OBJECTIVES

To enable the students to understand the basic structure of Malayalam language.

COURSE OUTCOMES (CO)

On Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	Help the learners to learn other Indian languages like Sanskrit,Tamil etc., through Malayalam without much effort.
CO2	Develop the skills of speaking and writing without flaws.
CO3	Help the learners to have a good critical thinking.

MAPPING WITH PROGRAMME OUTCOMES

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	-	-	-	-	-	-	-	-	-	-	-
CO2	✓	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	✓	-	-	-	-	-	-

SYLLABUS

This paper will have the following five units:

Unit I & II

Novel

Unit III & IV

Short story

Unit V

Composition & Translation

Text books prescribed:**Unit I & II**

Pathummayude Aadu - Vaikam Muhammed Basheerr

(D.C.Books, Kottayam, Kerala)

Unit III & IV

Ente Priyappeta Kadhakal – Akbar Kakkattil)

(D.C. Books, Kottayam, Kerala)

Unit V

Expansion of ideas, General Eassay and Translation. (A simple passage from English about 100 words to Malayalam)

Reference Books:

- 1.Malayala Novel Sahithya Charitram-K.M.Tharakan (N.B.S.Kottayam)
- 2.Chelukatha Innale Innu-M.Achuyuthan (D.C Books, Kottayam)
- 3.Sahithya Charitram Prasthanangalilude- Dr.K.M George, (D.C.Books Kottayam)
4. Malayala Sahithya vimarsam-Sukumar Azhee kode (D.C.books)

SEMESTER-I

Programme Code	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U1ENLT01	Language 2 -Functional English – I	Batch	2019-2022
			Semester	I
Hrs/ Week	5 Hrs		Credits	3

COURSE OBJECTIVES:

- To enable the students to understand the basic grammar in English.
- To acquaint students with the structure and strategies of conversation
- To make the students appreciate the significant works and style of prose.
- To develop the skills of speaking and writing without flaws.
- To develop an interest in the minds of the students to enjoy and appreciate the literary works in English.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	Speak and Write without committing grammatical errors.
CO2	Read and appreciate simple literary works.
CO3	Deal with various conversational situations with confidence.

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	-	-	-	-	-	-	-	-	✓
CO2	✓	-	-	-	-	-	-	-	-	-
CO3	-	-	✓	-	-	-	-	-	-	-

SYLLABUS**UNIT –I-POETRY****(Hours-12)**

1. The Lotus Eaters - Alfred Lord Tennyson
2. Menelaus and Helen - Rupert Brooke
3. Night of the Scorpion - Nizzim Ezekiel

UNIT- II- PROSE**(Hours-12)**

1. My Vision for India - Abdul Kalam
2. A Speech by N. R. Narayana Murthy - N. R. Narayana Murthy
3. A Little Bit of what You Fancy - Desmond Morris

UNIT- III- Short Story**(Hours-12)**

1. The Happy Prince - Oscar Wilde
2. An astrologer's day - R. K. Narayan
3. The Blue Bouquet - Octavio Paz

UNIT-IV-Grammar and Composition**(Hours-12)**

1. Modals
2. Verbs
3. Pronoun
4. Letter Writing
5. Reading Comprehension

UNIT- V- Dialogue Writing (CONVERSATION EXERCISES)**(Hours-12)**

Greeting , Introducing , Requesting, Inviting & Congratulating

Recent editions of the following books only are recommended

TEXT BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	A.G.Xavier	An Anthology of Popular Essays and Poems	Macmillan Indian Limited
2	Prof. A.E.Subramanian	Gifts to Posterity- An Anthology of Modern Short Stories	Chitra Publications, Chennai

REFERENCE BOOKS:

S.No	Author Name	Title of the Book	Publisher
1	N.Krishnaswamy	Modern English- A Book of Grammar Usage and Composition	Macmillan Indian Limited
2	Prof.K.Ramappa, Retd.	Essential English Grammar Usage & Composition	M. I. Publications
3.	Adibah Amin, Rosemary Eravelly, Farida J Ibrahim	Grammar Builder Level Volume 1	Cambridge University Press

Means of Curriculum Delivery: Lecture, Group Learning, Seminar, Assignment, Google Class Room.

SEMESTER-I

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U1CSCT01	Title:Core 1:C PROGRAMMING	Batch	2019-2022
			Semester	I
Hrs/Week:	4 Hrs		Credits	4

COURSE OBJECTIVES

- To learn the fundamental programming concepts and methodologies.
- Able to develop logics which will help them to create programs, applications in C.
- To help students to develop the logic and ability to solve the problems efficiently using C programming.
- To learn various concepts and techniques for problem solving and to implement those ideas using C programs.
- To able to take up Systems programming or Advanced C programming course.

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Explain the fundamental structure of C program and to develop different programs in C language.
CO2	Give in detail about branching,looping and arrays in C program using the development environment.
CO3	Solve problems using Functions and Arguments
CO4	Analyze the Structures and pointers concepts by developing programs.
CO5	Evaluate the file management in C language.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I**

Hours:15

Overview of C - Introduction – Structure of C - Character set - C tokens - Keyword & Identifiers - Constants - Variables - Data types - Declaration of variables - Assigning values to variables - Defining Symbolic Constants - Arithmetic, Relational, Logical, Assignment, Conditional, Bitwise, Special, Increment and Decrement operators – Arithmetic Expressions: - Evaluation of expression - Procedure of arithmetic operators – Type conversion in expression - operator precedence & associative - Mathematical functions - Reading & Writing a character-Formatted input and output.

UNIT II

Hours: 15

Decision making and Branching - Decision making with IF statement - simple IF statement - The IF ELSE Statement - Nesting of IF ...ELSE statements - The ELSE IF ladder - The switch statement - The?: operator - The GOTO statement -- Decision Making and Looping - The

WHILE statement - The DO statement - The FOR statement – Jumps in Loop:, - Arrays - One Dimensional - Two Dimensional - Multidimensional arrays - Character string Handling - Declaring and initializing string variables - Reading strings from technical -- writing strings to Screen - Arithmetic operation on character – Putting strings together - comparison of two strings - String handling Functions - Table of Strings.

UNIT III**Hours: 15**

Functions: User - defined Functions - Need for user Defined functions - A multi function program - The form of C functions - Return values and their types - Calling a function - Category of functions – Arguments: No Arguments and no return values - Arguments but no return values - Arguments with return values - Handling of non-integer functions. Nesting of functions - Recursion - Functions with arrays

UNIT IV**Hours: 15**

Structure : Structure definition - Giving values to members – Structure initialization - comparison of structure variables - Arrays of structures - Arrays within structures - Structures within structures- Structures and functions - unions - size of structures - Bit fields. Pointers - Understanding pointers - Accessing the Address of a variable - Declaring and initializing pointers - Accessing a variable through its pointers - pointer expressions pointer increments and scale factor – pointers and arrays - pointers and character strings – pointers and functions – pointers and structures.

UNIT V**Hours: 15**

File management in C - Defining and opening a file - closing file - I/O operations on files - Error handling during I/O operations - Random access to files - Command line arguments - The Preprocessor.

TEXT BOOKS:(Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers	Year of Publication
1.	E.Balagurusamy	“Programming in ANSI C ”	Tata Mc.Graw Hill 5 th Edition,	2012

REFERENCE BOOKS

S.No.	Authors	Title	Publishers	Year of Publication
1.	Byron Gottfried	“Programming with C”	Tata Mcgraw Hill Publishing Ltd., New Delhi, 1st Edition.	1998
2	Ashok.N. Kamathane,	“Programming with ANSI and Turbo C”	Pearson EdUCAtion Asia , 1st Edition.	2002
3	Yeswanth Kanethkar	Let us C++	Tata Mc. Graw Hill	1992

WEBSITE REFERENCE

- 1.<https://www.Springpoint.com/C-Programming>
- 2.<https://www.w3schools.com>

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Case studies and Google Classroom

SEMESTER – I

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U1CSCT02	Title:Core 2: Digital Fundamentals and Computer Architecture	Batch	2019-2022
			Semester	I
Hrs/Week:	4 Hrs		Credits	4

COURSE OBJECTIVES

- To provide a knowledge about the concepts of Computer Fundamentals and enable the students to understand Digital Logic Circuits and Gates.
- To know about number system and binary codes.
- To understand the basics of combinational logic circuits and its operations.
- To know about the sequential circuits and its designing architecture.
- To know about the input -output and memory organizations.

COURSE OUTCOMES (CO):

On the successful completion of the course, students should be able to achieve the following outcomes

CO Number	CO Statement
CO1	Apply the principles of number system, binary codes and Boolean algebra to minimize logic expressions
CO2	Acquire knowledge about various logic gates and logic families and analyze basic circuits of these families
CO3	Develop K-maps to minimize and optimize logic functions up to 5 variables
CO4	Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os.
CO5	Evaluate various design alternatives in processor organization

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	✓	✓	✓	-	-	-	-	-	✓	-	
CO2	-	✓	✓	✓	-	-	-	-	-	✓	-	
CO3	-	✓	✓	✓	-	-	-	-	-	✓	-	
CO4	-	✓	✓	✓	-	-	-	-	-	✓	-	-
CO5	-	✓	✓	✓	-	-	-	-	-	✓	-	-

SYLLABUS**UNIT - I****(Hours: 10)**

Introduction to Number System – Binary Codes- Binary, Decimal, Octal and Hexadecimal- Conversions – Binary to Decimal, Binary to Octal, Binary to Hexadecimal (Vice-Versa) – Binary Addition, Multiplication, Division- Floating Point Representation- 1's, 2's, 9's and 10's Complements.

UNIT - II**(Hours: 10)**

BCD Code- Excess3 Code- Gray Code- Arithmetic Circuits: Half Adder, Full Adder, Parallel Binary Adder, BCD Adder, Half Subtractor- Full Subtractor- Parallel binary Subtractor- Digital Logic: Basic Gates- AND,OR,NAND,NOR, XOR and NOT.

UNIT - III**(Hours: 10)**

Combinational Logic Circuits: Boolean Algebra- Karnaugh Map- Canonical Form- Implicants- Don't Care Combinations- Product Of Sum and Sum Of Product- Sequential Circuits: Flip-Flops, RS, D, JK and T Flip Flops - Multiplexers- Demultiplexers.

UNIT - IV**(Hours: 10)**

Input-Output Organization: Input- Output Interface, I/O Bus-Interface- I/O Bus Versus Memory Bus- Isolated versus Memory- Mapped I/O- Asynchronous Data Transfer: Strobe Control and Handshaking.

UNIT - V**(Hours: 10)**

Direct Memory Access: DMA Controller, DMA Transfer, Input-Output Processor- CPU-IOP Communication- Memory Hierarchy- Main Memory-Associative Memory- Cache Memory- Hardware Organization- Read and Write Operation.

Recent editions of the following books only are recommended

TEXT BOOKS

S. No	Author Name	Title of the Book	Publisher
1.	V.K. Puri	Digital Electronics Circuits and Systems	Tata Mc. Graw Hill
2.	M.Morris Mano	Digital Electronics Circuits and Systems	Tata Mc. Graw Hill

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1.	Albert Paul Malvino, Donald P Leach, Goutam Saha	Digital principles and applications	Tata Mc. Graw Hill
2.	S.Salivahanan, S. Arivazhagan	Digital Circuits and Design	Vikas Publishing House Pvt.,Ltd.,
3.	Thomas C.Bartee	Computer Architecture & Logic Design	Tata Mc. Graw Hill

WEBSITE REFERENCES

https://www.tutorialspoint.com/computer_fundamentals/computernumbersystem.htm

<http://www.csd.nutn.edu.tw/Digital%20Fundamentals/ch04.pdf>

<https://www.geeksforgeeks.org/flip-flop-types>

<https://www.allaboutcircuits.com/textbook/digital>

Means of Curriculum Delivery :Lecture,Group Learning,Seminar,Assignment,Google Classroom.

SEMESTER – I

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U1CSCP03	Title:Core 3: C Programming Practical	Batch	2019-2022
			Semester	I
Hrs/Week:	3 Hrs		Credits	3

COURSE OBJECTIVES:

- To enable the students to gain knowledge in developing C Programs for certain specified problems.
- To develop the applications using C Programming language.To apply the concepts like looping, functions, pointers and file types.

COURSE OUTCOMES (CO)

At the end of the practical session, students should be well-versed in

CONumber	CO Statement
CO1	Write programs using various data types in C.
CO2	Use various operators and expressions.
CO3	Apply the concept of Arrays, Pointers and strings
CO4	Apply the concept of loops and functional programming
CO5	Use the file handling concepts for maintaining record.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS

- Write a C program to explain various data types in C.
- Write a C program using various operators using switch case.
- Write a C program to illustrate the concept of expressions
- Write a C program using Loop & nested loop Statements (for, while, do-while)
- Write a C program to using different dimensions of Array.
- Write a C program to illustrate the concept of Strings.
- Write a C Program to illustrate the concept of functions.
- Write a C Program to store and display data using Structure.
- Write a C Program to demonstrate the concept of Pointers.
- Write a C program to illustrate the concept of file operations.

WEB REFERENCES

- <http://computer.howstuffworks.com/c.html>
- <http://www.le.ac.uk/cc/tutorials/c/>
- <http://www.cprogramming.com/tutorial.html>
- www.programiz.com/c-programming
- <https://www.coursera.org/course/cprogramming>

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation

SEMESTER -I

Programme Code :	B.Sc. CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U1CSAT01	Title :Allied 1 : Numerical Methods and Statitics	Batch	2019-2022
Hrs/week	5		Semester	I
			Credits	4

COURSE OBJECTIVES:

To enable the Students

- To understand the different Methods of solving numerical, algebraic and Transcendental Equations .
- To find derivatives using various formulae using numerical differentiation and integrate various functions using numerical integration.
- To have a knowledge of finding numerical solutions of ordinary differential Equations.
- To learn how to calculate various statistical constants.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Find Numerical Solution of Algebraic and Transcendental Equations.
CO2	Solve Simultaneous Linear Algebraic Equations by using different methods.
CO3	Explain the methods of Numerical Differentiation, Integration of various functions and finding Numerical Solution of Ordinary Differential Equation using different methods.
CO4	Calculate the Statistical Constants.
CO5	Explain the concepts of Correlation and Regression and their applications in practical situations

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO2	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO3	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO4	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO5	-	-	-	✓	✓	✓	✓	-	-	-	-	-

SYLLABUS**UNIT I****(Hours:12)**

The Numerical Solution of Algebraic and Transcendental Equations –The Bisection method, The method of false position , Newton – Raphson method.

UNIT II**(Hours:12)**

Solution of Simultaneous Linear Algebraic Equations – Gauss Elimination method, Gauss Jordan method, Gauss – Jacobi method, Gauss – Seidel method. Interpolation (For Equal Intervals) Newton’s Forward interpolation, Newton’s Backward interpolation.

UNIT III**(Hours:12)**

Numerical Differentiation – Newton’s Forward formula, Newton’s Backward Formula,

Numerical Integration – Trapezoidal Rule, Simpson's one third rule, Simpson's three-eighth's rule. Numerical solution of Ordinary differential equations – Taylor Method (first order)– Runge-Kutta method (fourth order)

UNIT IV**(Hours:12)**

Measure of Central Tendency – Mean, Median, Mode - Measure of Dispersion – Range, Quartile Deviation, Standard Deviation and Mean Deviation -problems.

UNIT V**(Hours:12)**

Correlation and Regression. No derivation required.

* Questions in problems carry 100% marks.

Recent editions of the following books only are recommended

TEXT BOOKS

S. No	Author Name	Title of the Book	Publisher
1	P.Kandasamy, K.Thilagavathy, K.Gunavathi	Numerical methods	S.Chand & Company
2	P.A. Navanitham	Business Mathematics and Statistics	Jai publishers

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1	Dr.M.K. Venkataraman	Engineering Mathematics Volume II	National publishing company
2	R.S.N. Pillai and V. Bhagavathi	Statistical Methods	Sultan chand and Sons company
3	P.R. Vittal	Business Mathematics	Margham Publications
4	A.Singaravelu	Numerical Methods	Meenakshi Publications

WEBSITE REFERENCE

1. <https://arxiv.org/pdf/0809.0465>
2. www.cfm.brown.edu/people/sg/AM35odes.pdf
3. www.maths.manchester.ac.uk/cds/internal/tables/numerical.pdf
4. <https://www3.nd.edu/~zxu2/acms40390F12/Lec-7.3.pdf>

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google classroom.

SEMESTER - I

Programme Code	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U1VBET01	Title: Value Based Education 1:ENVIRONMENTAL STUDIES	Batch	2019-2022
			Semester	I
Hrs/ Week	2 Hrs		Credits	1

COURSE OBJECTIVES:

- To make the students understand the various types of natural resources and their responsibility in the conservation of the same.
- To impart on various eco systems, biodiversity at various levels and their conservation
- To make the students know on various types of environmental pollution, their causes , effects, their prevention and the students role in the same.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	Be a responsible citizen in the conservation of natural resources.
CO2	To be able to make others to know about various ecosystems.
CO3	Make the society aware of the importance of conservation of biodiversity and take suitable steps towards that direction.
CO4	Make others to know about how this earth is being polluted by various types of pollution and realised the responsibility to take various measures to control such pollution.
CO5	Make the public aware of the dangerous of global warming and the immediate steps to be taken to reduce its impact.

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	-	-	-	-	-	✓
CO2	-	-	-	-	-	-	-	-	-	✓	✓
CO3	-	-	-	-	-	-	-	✓	-	-	✓
CO4	-	-	-	-	-	-	-	✓	-	-	✓

SYLLABUS**UNIT I****(Hours:06)**

The Multidisciplinary Nature of Environmental Studies- Definition, Scope and Importance; Need for public awareness, Natural resources - Forest resources, Mineral resources, Food resources, Energy resources and Land resources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable life style.

UNIT II**(Hours:06)**

Ecosystems - Concept of ecosystem, Structure and Functions of an ecosystem. Producer, Consumer, Decomposers, Energy flow in ecosystem, Ecological succession, food chain, food webs and ecological pyramids. Introduction, types, characteristics, features, structure and functions of forest ecosystem, grass land, desert and Aquatic Ecosystems (ponds, streams, lakes, rivers, oceans and estuaries).

UNIT III**(Hours:06)**

Biodiversity and its Conservation – Introduction - Definitions: Genetic, Species and

ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at Global, National and local levels. India as a mega-biodiversity nation. Hot spots of biodiversity. Threads of biodiversity: habitat loss, poaching of wild life. Man wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity-insitu and Exsitu conservation of biodiversity.

UNIT IV**(Hours:06)**

Environmental Pollution - Definitions, causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution and Thermal pollution. Solid waste management: causes, effects and control measures of Urban and Industrial wastes. Role of an individual in prevention of pollution. Pollutions case studies. Disaster management: Floods, Earthquake, Cyclone and Landslides.

UNIT V**(Hours:06)**

Social issues and the Environment - Sustainable development, urban problems related to energy, water conservation, rain water harvesting, water shed management. Resettlement and rehabilitation of people. Environmental ethics: issues and possible solution. Climate change, global warming, ocean layer depletion, acid rain, nuclear accident and holocaust, case studies. Consumerism and waste product. Environmental protection Act. Air (prevention and control of pollution) Act. Wild life protection act. Forest conservation Act. Issues involved in enforcement of environmental legislation. Public awareness. Human population and the environment.

Recent editions of the following books only are recommended

TEXT BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	Prof R. Ranganathan	Environmental Studies.	Bharathiar University Publications

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	Ritu Bir	Environmental Studies	Vayu Education of India
2	Erach Bharucha	Textbook for Environmental Studies	University Press India Pvt. Ltd
3	Anubha Kaushik & C.P.Kaushik	Perspectives in Environmental Studies	New Age International Publishers

Means of Curriculum Delivery: Lecture, Group Learning, Seminar, Assignment, Google Classroom.

SEMESTER I

Programme Code	B.Sc.CS	Programme Title	Bachelor of Computer Science
Course Code	19U1VBET02	Value Based Education 2: Yoga for Youth Empowerment **	Batch 2019-2022
Hrs/week	2		Semester I
			Credits -

Objectives

Providing the value education to improve the students' good character - Understanding yogic life and physical health - Maintaining youthfulness - Moderation in five aspect of life - Methods of concentration - Personality Development – Sublimation - Understanding the law of nature and yogaasanas.

Syllabus**Unit 1: Philosophy of Life Science****(Hours:06)**

Life – Purpose of life – Philosophy of Life- Law of Nature-Kindness towards living beings Preserving Natural resources.

அலகு 1: வாழ்வியல் தத்துவம்

வாழ்க்கை - வாழ்வின் நோக்கம் -வாழ்க்கைத் தத்துவம் -இயற்கை நியதி -பிற உயிர் பேணல் -இயற்கை வளம் காத்தல்

Unit 2: Human values**(Hours:06)**

Culture –Analysis of thought- Moralization of Desire- Neutralization of Anger- Eradication of Worry- Blessings and Benefits- Harmonious Friendship- Love and Compassion-Individual Peace.

அலகு 2: தனிமனித பண்புகள்

பண்பாடு -எண்ணம் ஆராய்தல் -ஆசை சீரமைத்தல் -சினம் தவிர்த்தல் -கவலை ஒழித்தல் - வாழ்த்தும் பயனும் - நட்பு நலம் - அன்பும் கருணையும் - தனிமனித அமைதி.

Unit 3: Social Values**(Hours:06)**

Family- Family Peace- Society-Life style- World Brotherhood- Greatness of Women- Five Duties- Economics- Hygiene and Health Care- Education – Politics- Responsibilities of people.

அலகு 3: சமுதாய மதிப்புகள்

குடும்பம் - குடும்ப அமைதி - சமுதாயம் - வாழ்க்கை முறை - உலக சகோதரத்துவம் - பெண்ணின் -பெருமை - ஐவகைக் கடமைகள் -பொருளாதாரம் -சுகாதாரம் -கல்வி -அரசியல் - மக்களின் பொறுப்பு -உலக அமைதி

Unit 4: Development of Mental prosperity**(Hours:06)**

Prosperity of Mind- Life force- Bio-Magnetism and Mind – Functions of Mind- Mental Frequency – Ten Stages of Mind-Genetic Centre- Meditation- Value spirituality-Universal Magnetism and Bio-Magnetism.

அலகு 4 : மனிதவள மேம்பாடு

மனவளம் - உயிரும் மனமும் :- உயிரின் இயக்க மையம் - மனத்தின் செயல்கள் :- மன அலைச்சுழல் :- மன இயக்கப் படி நிலைகள் :- கருமையம் - தவம்(தியானம்) - ஆன்மீக மதிப்பு - வான்காந்தம் - சிவகாந்தம்

Unit 5: Maintenance of Physical Health**(Hours:06)**

KKCAS (AUTONOMOUS)

Structure of Human Body- Three Functional Bodies-Harmony Between Body and Life force-Pain, Disease and Death- Reasons for Disease - Limit and Method in Five Factors- Simplified Physical Exercises- Practice for Simplified Physical Exercises.

Recent editions of the following books only are recommended

Text books:

S. No	Author Name	Title of the Book	Publisher
1	Vethathri maharish	Journey of Consciousness,	Vethathri Publications
2	Vethathri maharish	Simplified Physical Exercise	Vethathri Publications
3	Vethathri maharish	Unified Force	Vethathri Publications
4	Thathuvagnani Vethathri maharish	Yoga for modern age	Vethathri Publications
5	Dr. Chandrasekaran	Sound Health through yoga	Prem Kalyan Publications
6	Ntjhj;jpup kfup\p	vspa Kiw clw;gapw;rp	Ntjhj;jpup gjpg;gfk;

SEMESTER -I

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U1SBST01	Title :Skill Based Subject 1:Mathematics For Competitive Examinations - I	Batch	2019-2022
Hrs/week	2 Hours		Semester	I
			Credits	1

COURSE OBJECTIVES

To enable the Students

- To understand the fundamental arithmetic skills and various methods of problem solving.
- To learn about the average and Problems on numbers.
- To solve problem related to Ages, Calander and Clocks.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Recall the basic concepts of numerical computation.
CO2	Solve problems on ages, races, games of skills, stocks and shares.
CO3	Find solution to the problems on calender and clocks.

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO2	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO3	-	-	-	✓	✓	✓	✓	-	-	-	-	-

SYLLABUS**UNIT I****(Hours:06)**

Numbers – H.C.F and L.C.M of Numbers – Decimal Fractions – Simplification

UNIT II**(Hours:06)**

Square Roots and Cube Roots – Average - Problems on Numbers

UNIT III**(Hours:06)**

Problems on Ages - Surds and Indices-Percentage

UNIT IV**(Hours:06)**

Races and games of skill – Calendar

UNIT V**(Hours:06)**

Clocks – Stocks and shares (Simple Problems only)

Recent editions of the following books only are recommended

TEXT BOOK

S. No	Author Name	Title of the Book	Publisher
1	R. S. Agarwal	Quantitative Aptitude (for Competitive Examinations)	S. Chand and Company Limited

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1	R.V.Praveen	Quantitative Aptitude and Reasoning,	PHI Learning pvt. Ltd
2	Abhijit Guha	Quantitative Aptitude for Competitive Examinations	Tata Mc-Graw Hill Publishing Company

WEBSITE REFERENCE

1.<https://www.careerbless.com/aptitude/qa/home.php>

2.<https://www.indiabix.com/>

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google classroom.

SEMESTER-I

Programme Code:	B.Sc (CS)	Programme Title	Bachelor of Computer Science	
Course Code:	19U1SBST02	Skill Based Subject 2: Communication Skills- I	Batch	2019-2022
			Semester	I
Hrs/ Week	2 Hrs		Credits	2

COURSE OBJECTIVES:

- To make the students to understand the barriers in their communication and the ways to overcome the same.
- To make the students to know various types of listening and the effect of enhancing the listening skills .
- To encourage Group discussion and introduce to speak in different situations and the etiquette to be maintained.

COURSE OUTCOMES (CO):

On Successful completion of the course the students should be able to achieve the following outcomes.

CO Number	CO Statement
CO1	To communicate meaningfully and effectively with others
CO2	To explain various types of listening and be a careful listener
CO3	To deal with different kinds of situations by conversing effectively and maintaining the etiquette required for such situations

SYLLABUS**UNIT –I****(Hours:08)**

- What's a sentence
- Types of Sentences
- Articles
- Preposition

UNIT- II**(Hours:08)**

- Homophones-
- An Introduction
- Homonyms
- One Word Substitution
- Cloze Test

UNIT- III**(Hours:08)**

- Communication
- An Introduction
- E- Mail Drafting and Etiquette
- Interviews

Recent editions of the following books only are recommended

TEXT BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	Meenakshi Raman	Communication Skills	Oxford University Press
2	Shalini Aggarwal	Essential Communication Skills	Ane Books Pvt.Ltd. New Delhi

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	Course team, Bharathiyar University	Communication Skills a multi- skill course	Macmillan Publishers India LTD.
2	Krishna Mohan	Developing Communication Skills	Macmillan Publishers India LTD.
3	Joyce Pereire	Technical English – II	Vijay Nicole Imprints Pvt.Ltd.

Means of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Google Class Room.

SEMESTER – II

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U2TALT02	Title : Language 1:Tamil - II	Batch	2019-2022
Hrs/week	5		Semester	II
			Credits	3

நோக்கம்

- சமூகம் பற்றிய சிந்தனைகளைத் தமிழ்ப் படைப்பிலக்கியங்கள் மூலம் ஏற்படுத்துதல்
- இலக்கியங்கள், உரைநடைகள் ஆகியவற்றை வாசிக்க வைத்தல் மற்றும் விழிப்புணர்வை ஏற்படுத்துதல்.
- அடிப்படைத் தமிழ் இலக்கணத்தையும், பயன்பாட்டுத் தமிழான மொழிபெயர்த்தல், கடிதம் மற்றும் மடல்கள் எழுதுதல் பற்றியும் மாணவர்களை அறியச் செய்தல்.
- தமிழ்நாடு அரசுப்பணியாளர் போட்டித்தேர்வு மையம் நடத்தும் போட்டித் தேர்வுகளுக்கு மாணவர்களைத் தயார் செய்தல்.
- மாணவர்களின் வாசிக்கும் ஆற்றலை ஊக்குவிக்கவும், தமிழ் இலக்கியத்தோடு தொடர்புடைய பிற நூல்களையும் மாணவர்கள் சுயமாக கற்று உணர்ச்செய்தல்

பாப்பகுதி கற்றலின் வெளிப்பாடு - Course Outcome (CO)

CO Number	CO Statement
CO1	தமிழ் மொழியின் வாயிலாக பண்பாடு, கலைகள் மற்றும் மரபுகள் முதலியவற்றை அறிந்தல்.
CO2	நீதி இலக்கியங்கள், பக்தி இலக்கியங்கள் மூலம் வாழ்வியல் நெறிமுறைகளை அறிதல். உயர்ந்த நோக்கத்துடன், சமுதாயத்தை நேசிக்கத் தகுந்தவர்களாக இருத்தல்.
CO3	தமிழ் இலக்கியங்கள் வாயிலாக பல வகையான வாழ்க்கைத்தரம், மற்றும் மக்களின் வாழ்க்கை முறைகளைத் தெரிந்து கொள்ளுதல்.
CO4	அறத்தின் வழிநின்று பொருளிட்டி இன்பம் துய்ப்பது உன்னத வாழ்வின் அடிப்படை என்பதை இலக்கியங்கள் வாயிலாக மாணவர்கள் உணர்தல்.
CO5	சமுதாயம் மற்றும், கலைகள் சார்ந்த கவிதைகள் மற்றும் உரைநடைகளும், கருத்து பரிமாற்றத்திறனுக்கு உரிய அடிப்படை தமிழ் இலக்கணம் மற்றும் பயன்பாட்டுத் தமிழுக்குரிய பகுதியும், தன்முயற்சிப்படிப்பின் வாயிலாக, பேச்சுக்கலையின் முக்கியத்துவம், தேவை மற்றும் திறன்களை மாணவர்கள் அறிந்துகொள்ளல்.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்

CO /PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	✓	-	-	✓	-	✓	-	✓	-	-	✓
CO2	-	-	-	-	-	✓	✓	-	-	-	✓	-
CO3	-	-	-	-	-	-	-	-	-	-	✓	-
CO4	-	-	-	-	✓	-	-	-	-	✓	-	-
CO5	✓	-	-	-	-	-	-	-	✓	-	-	-

ghlj;jpl;lk;

அலகு 1 நீதி நூல்கள்

13 மணி நேரம்

- திருக்குறள் - (3 அதிகாரம்) இன்னா செய்யாமை, பொறையுடைமை, விருந்தோம்பல்
- முதுமொழிக்காஞ்சி - அறிவுப்பத்து, சிறந்து பத்து
- புழமொழி நானூறு - 21 முதல் 30 வரை (10 பாடல்கள்)
- நீதிநெறி விளக்கம் - 1- 10 முதல் பத்து பாடல்கள்

அலகு 2 பக்தி இலக்கியங்கள்

15 மணி Neuk;

- குறவஞ்சி - குறத்தி மலைவளம் கூறல் 62 – 63 (6 பாடல்கள்)

2. அபிராமி அந்தாதி – தனம் தருத் கல்வி தரும், பதினாறு பேறுகள் (2 பாடல்)
3. தேவாரம் - பொது – நின்ற திருத்தாண்டகம் - 670 (திருநாவுக்கரசு சுவாமிகள்)
4. நாலாயிரத்திவ்ய பிரபந்தம் - ஊனேறு செல்வத் துடற்பிறவி யான் வேண்டேன் (குலசேகராழ்வார் - 10 பாடல்).
5. திருமந்திரம் - கல்வி (10 பாடல்)

அலகு 3 உரைநடைத்தொகுப்பு

10 மணி நேரம்

1. நாஞ்சில் நாடன் - ஆதியில் சொல் இருந்தது. (திகம்பரம்)
2. சிற்பி - வீரத்துறவி விவேகானந்தர் (சிற்பியின் கட்டுரைகள்)
3. டாக்டர் அ. தட்சிணாமூர்த்தி - ஓவியக்கலை (தமிழர் நாகரிகமும் பண்பாடும்)
4. டாக்டர் எம்.ஆர். விஜயகுமார் - அறிவியலும் ஆன்மீகமும் (பிரபஞ்ச ரகசியம்)
5. மஞ்சை வசந்தன் - உளவியல் (பழமொழி வழங்கும் பத்துறைச் சிந்தனைகள்)

அலகு 4 இலக்கணம், பயன்பாட்டுத்தமிழ்

10 மணி நேரம்

1. சொல் வகைகள் - பெயர், வினை, இடை, உரி
2. வாக்கியம், வாக்கிய வகைகள், வினை வகைகள் - செய்வினை, செயப்பாட்டுவினை, தன்வினை, பிறவினை, உடன்பாட்டுவினை
3. மொழிபெயர்த்தல், விண்ணப்பம், மடல்கள்

அலகு 5 இலக்கிய வரலாறு

10 மணி நேரம்

1. உரைநடையின் தோற்றமும் வளர்ச்சியும்
2. சிற்றிலக்கியங்களின் தோற்றமும் வளர்ச்சியும்.
3. நாயன்மார்கள், ஆழ்வார்கள்
4. நீதி நூல்கள்
5. தன்முயற்சிப் படிப்பு : பேசும் கலை
முனைவர் கு.ஞானசம்பந்தன்
விஜயா பதிப்பகம், கோயம்புத்தூர்.

பாடநூல் - செய்யுள் திரட்டு (தொகுப்பு) தமிழ்த்துறை வெளியீடு 2019

பார்வை நூல்கள்

வ. எண்	ஆசிரியர் பெயர்	நூலின் பெயர்	வெளியீடு	ஆண்டு ∴ பதிப்பு
1	உ.வே சாமிநாதையர்	குறுந்தொகை	கழக வெளியீடு	முதற் பதிப்பு: ஜூன் - 2000
2	புலவர் நா.இராமையாபிள்ளை (உ.ஆ)	நற்றிணை	வர்த்தமானன் பதிப்பகம், சென்னை.	முதற் பதிப்பு: 1999.
3	இ.வை அனந்தராமையர்	கலித்தொகை,	கழக வெளியீடு	முதற் பதிப்பு: டிசம்பர் - 1996.
4	டாக்டர் உ.வே.வெ சாமிநாதையர்	புறநானூறு,	கழக வெளியீடு	முதற் பதிப்பு: டிசம்பர் - 1996.
5	புலியூர்கேசிகன்	திருக்குறள்	பூம்புகார் பதிப்பகம்	பிப்ரவரி 2010
6	மதுரைக் கூடலூர்க் கிழார்	முதுமொழிக்காஞ்சி	தமிழ் இணையப் பல்கலைக்கழகம்	அக்டோபர் 2016
7	முன்றுறையரையனார்	பழமொழி நானூறு	தமிழ் இணையப் பல்கலைக்கழகம்	அக்டோபர் 2016
8	குமரகுருபரர்	நீதிநெறி விளக்கம்	தமிழ் இணையப் பல்கலைக்கழகம்	அக்டோபர் 2016
9	திரிகூடராசப்பக் கவிராயர் (புலியூர் கேசிகன் உரை)	திரு குற்றாலக் குறவஞ்சி	பாரி நிலையம் வெளியீடு	2013
10	அபிராமிபட்டர்	அபிராமி அந்தாதி	தமிழ் இணையப் பல்கலைக்கழகம்	ஜனவரி 2014
11	திருநாவுக்கரசு சுவாமிகள்	தேவாரம் - 6 ஆம் திருமுறை (பொது – நின்றதிருத்தாண்டகம்)	கழக வெளியீடு	1996
12	குலசேகராழ்வார்	நாலாயிரத்திவ்ய பிரபந்தம்	லிட்டில் ப்ளவர் கம்பெனி – சென்னை	1996

Scheme and Regulations(SR-4) (2019-2022)B.Sc (CS)

13	திரு.அ. சிதம்பரனார்	திருமந்திரம்	தென்னிந்திய சைவசித்தாந்த நூற்பதிப்புக் கழகம், சென்னை.	செப்டம்பர் 2017
14	நாஞ்சில்நாடன்	திகம்பரம்	விஜயா பதிப்பகம்	திசம்பர் - 2010
15	டாக்டர் இரா. மோகன்	சிற்பியின் கட்டுரைகள்	மணிவாசகர் பதிப்பகம்	ஆகஸ்டு 1996
16	டாக்டர் அ. தட்சிணாமூர்த்தி	தமிழர் நாகரிகமும் பண்பாடும்	யாழ் வெளியீடு	பிப்ரவரி – 1999
17	மஞ்சை வசந்தன்	பலமொழி வழங்கும் பல்துறைச் சிந்தனைகள்	விஜயா பதிப்பகம்	ஜூன் 2010
18	டாக்டர் எம்.ஆர் விஜயகுமார்	பிரபஞ்ச ரகசியம்	ருக்மணி ஆப்செட் பிரஸ்	1997
19	கா.கோ.வெங்கட்ராமன்	தமிழ் இலக்கிய வரலாறு	கலையக வெளியீடு, திண்டுக்கல்.	இரண்டாம் பதிப்பு: ஜூன் - 2002.
20	மது.ச.விமலானந்தம்	தமிழ் இலக்கிய வரலாறு	முல்லை நிலையம், சென்னை	2014.
21	மு.பரமசிவம்	நற்றமிழ் இலக்கணம்	சைவசித்தாந்த பதிப்பகம், திருநெல்வேலி.	முதற்பதிப்பு:1995.
22	வெங்கட்ராவ் பாலு	கடிதம் எழுதும் கலை	புதிய புத்தக உலகம்	முதல்பதிப்பு 2007
23	முனைவர் கு.ஞானசம்பந்தன்	பேசும் கலை	விஜயா பதிப்பகம்	ஏப்ரல் 2008

SEMESTER-II

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U2FRLT02	Title : Language 1:French II	Batch	2019-2022
Hrs/week	5		Semester	II
			Credits	3

COURSE OBJECTIVES

To enable the students to understand the basic structure of French language.

COURSE OUTCOMES (CO)

On Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	have access to the works of great french writers.
CO2	Develop the skills of speaking and writing without flaws.
CO3	Help the learners to have a good thinking.

MAPPING WITH PROGRAMME OUTCOMES

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	-	-	-	-	-	-	-	-	-	-	-
CO2	✓	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	✓	-	-	-	-	-	-

SYLLABUS

Prescribed text : LATITUDES I

Units : 5 – 8

Authors : Régine Mérieux

Yves Loiseau

Available at : Goyal Publishers Pvt Ltd

86, University Block

Jawahar Nagar (Kamla Nagar)

New Delhi – 110007.

Tel : 011 – 23852986 / 9650597000

Question Paper Pattern

Semester II

Maximum Marks: 75 Time: 3 hrs.

(All questions to be set only from the prescribed text)

Section A (10)

1. Choisissez la meilleure réponse: (10X1=10)

Section B (25)

2. Choisissez un des trois sujets et écrivez un texte d'environ 60 mots : (5X1=5)

3. Traduisez les textes suivants en anglais:(4/5) (4X5=20)

Section C (40)

4. Compréhension (5x1=5)

5. Exercices de grammaire:(5X5=25) (either/or)

6. Remplissez le dialogue:(5X1=5)

7. Associez :(5X1=5)

SEMESTER -II

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U2HILT02	Title : Language 1 :Hindi II	Batch	2019-2022
			Semester	1
Hrs/week	5		Credits	3

COURSE OBJECTIVES

To enable the students to understand the basic structure of Hindi language.

COURSE OUTCOMES (CO)

On Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	help the learners to communicate with others in any part of India with ease.
CO2	Develop the skills of speaking and writing without flaws.
CO3	Help the learners to have a good critical thinking.

MAPPING WITH PROGRAMME OUTCOMES

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	-	-	-	-	-	-	-	-	-	-	-
CO2	✓	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	✓	-	-	-	-	-	-

SYLLABUS**1. MODERN POETRY : BHOOMIJA by NAGARJUN**

Publishers

: Rajkamal Prakashan

1B Nethaji Subash Marg,

New Delhi.

2. ONE ACT PLAY : NAVEEN EKANKI SANGRAH

By Dr. Smt. MALATI THIVARI

SUMITHRA PRAKASHAN

ASHOK NAGAR

ALLAHABAD – 1.

3. TRANSLATION : HINDI-ENGLISH ONLY

(ANUVADH ABYAS-III)

Lessons – 1-15 only

PUBLISHER : DAKSHIN BHARATH HINDI PRACHAR SABHA

CHENNAI – 600 017.

4. LETTER WRITING : (Leave Letter, Job Application, Ordering Books, Letter to Publisher, Personal Letter)**5. CONVERSATION : (Doctor & Patient, Teacher & Student, Storekeeper & Buyer,**

Two Friends, Booking Clerk & Passenger at Railway Station,

Autorickshaw driver and Passenger)

Ref : Bolchal Ki Hindi Aur Sanchar by Dr. Madhu Dhavan

Vani Prakashan, New Delhi.

SEMESTER-II

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U2MLLT02	Title :Language 1 :Malayalam II	Batch	2019-2022
Hrs/week	5		Semester	1
			Credits	3

COURSE OBJECTIVES

To enable the students to understand the basic structure of Malayalam language.

COURSE OUTCOMES (CO)

On Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	Help the learners to learn other Indian languages like Sanskrit,Tamil etc.,through Malayalam without much effort.
CO2	Develop the skills of speaking and writing without flaws.
CO3	Help the learners to have a good critical thinking.

MAPPING WITH PROGRAMME OUTCOMES

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	-	-	-	-	-	-	-	-	-	-	-
CO2	✓	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	✓	-	-	-	-	-	-

SYLLABUS

This paper will have the following five units:

Unit I & II

Autobiography

Unit III,IV & V

Travelogue

Text Books prescribed:

Unit I & II

Vazhithiruvukal-Dr.A.P.J.Abdulkalam

(D.C.Books, Kottayam)

Unit III,IV & V

Alkoottathil Thaniyae - M.T Vasudhevan Nair (D.C.Books, Kottayam)

Reference books:

1. Athmakathasahithyam Malayalathil-Dr.Vijayalam Jayakumar (N.B.S.Kottayam)
2. Sancharasahithyam Malayalathil –Prof.Ramesh chandran. V,(Kerala Bhasha Institute, Trivandrum)

SEMESTER-II

Programme Code	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U2ENLT02	Language 2-Functional English – II	Batch	2019-2022
			Semester	II
Hrs/ Week	5 Hrs		Credits	3

COURSE OBJECTIVES:

- To enable the students to understand the basic grammar in English.
- To acquaint students with the structure and strategies of conversation
- To make the students appreciate the significant works and style of prose
- To develop the skills of speaking and writing without flaws.
- To develop an interest in the minds of the students to enjoy and appreciate the literary works in English.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students will be able to

CO Number	CO Statement
CO1	Speak and Write without committing grammatical errors.
CO2	Read and appreciate simple literary works.
CO3	Deal with various conversational situations with confidence.

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	-	-	-	-	-	-	-	-	✓
CO2	✓	-	-	-	-	-	-	-	-	-
CO3	-	-	✓	-	-	-	-	-	-	-

SYLLABUS**UNIT –I-POETRY**

(Hours-12)

- 1.La Belle Dame Sans Merci - John Keats
- 2.The Ballad of Father Gilligan – William Butler Yeats
- 3.The Daffodils - William Wordsworth

UNIT- II- PROSE

(Hours-12)

1. At School - Gandhi
2. My lost Dollar - Stephen Butler Leacock
3. On The Rule of The Road- A.G. Gardiner

UNIT- III- ONE – ACT PLAY

(Hours-12)

1. A Meeting in a Forest - G. B. Shaw
2. The Dear Departed - Stanley Houghton

UNIT-IV-GRAMMAR AND COMPOSITION

(Hours-12)

1. Sentence Structure

2. Wh- Questions
3. Question Tag
4. Advertisement
5. Hints Development

UNIT- V- DIALOGUE WRITING (CONVERSATION EXERCISES) (Hours-12)
 Suggestions , Sympathy, Complaining, Agreement & Apologising

Recent editions of the following books only are recommended

TEXT BOOKS:

S. No.	Author Name	Title of the Book	Publisher
1	A.G.Xavier	An Anthology of Popular Essays and Poems	Macmillan Indian Limited.
2	Prof. A.E.Subramanian	Gifts to Posterity- An Anthology of Modern Short Stories	Chitra Publications, Chennai.

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	N.Krishnaswamy	Modern English- A Book of Grammar Usage and Composition	Macmillan Indian Limited
2	Prof.K.Ramappa, Retd.	Essential English Grammar Usage & Composition	M. I. Publications
3.	Adibah Amin, Rosemary Eravelly, Farida J Ibrahim	Grammar Builder Level Volume 1	Cambridge University Press

Means of Curriculam Delivery: Lecture, Group Learning, Seminar, Assignment, Google Class Room.

SEMESTER – II

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U2CSCT04	Title: Core 4: C++ Programming	Batch	2019-2022
			Semester	II
Hrs/Week:	4 Hrs		Credits	3

COURSE OBJECTIVES

- To provide knowledge on object oriented programming concepts using C++.
- To learn about the concepts like Abstraction, Encapsulation, Inheritance and Polymorphism.
- To enhance the students knowledge in writing C++ programs and the concepts of File Handling.
- To understand how C++ improves C with object-oriented features.
- To learn how to write inline functions for efficiency and performance.

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Observe the fundamental concepts of oops languages and control structure
CO2	Interpret about classes , functions and constructor
CO3	Solve real world problems by using inheritance concepts
CO4	Classify the Arrays and pointers concepts by developing programs.
CO5	Evaluate about the Concept Exception handling mechanism

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I****Hours: 13**

Introduction of C++ - Key Concepts – OOP advantage – OOP language – I/O in C++- C++ declarations. Control Structures : Decision Making statements: if , else ,jump, goto, break, continue, Switch case statements. Loops in C++ : for , While, do, while loops. Functions in C++ -inline function.

UNIT II**Hours: 16**

Classes and objects: Declaring Objects – defining member functions – static member

Variables and functions – arrays of objects – friend functions – overloading member functions – Bit fields and classes - Constructors And Destructors with static members.

UNIT III**Hours: 16**

Operator overloading: overloading unary, binary operators – overloading friend function – type conversion. Inheritance: Types of Inheritances – single, multilevel, multiple, hierarchical, hybrid, Multipath inheritance – virtual base classes – abstract classes.

UNIT IV**Hours: 15**

Pointers – Declarations – Pointer to class, object – this pointer – pointer to derived classes and base classes – Arrays – characteristics – arrays of classes – Memory models – new and delete operators – dynamic objects – Binding, Polymorphism and virtual Functions.

UNIT V**Hours: 15**

Files – File Stream classes – File modes – Sequential Read / Write operations – Binary and ASCII files – Random access operation – Templates – Exception handling – Strings – declaring and initializing string objects – string attributes – miscellaneous functions.

TEXT BOOKS: (Recent Edition of the following books only are recommended)

S.No.	Authors	Title	Publishers	Year of Publication
1.	Ashok N Kamthane,	Object oriented Programming with Ansi and Turbo C++	Pearson Education Publications First Edition	2003
2	Herbert Schildt	Teach Yourself C++	Tata Mcgraw Hil Third edition	2000

REFERENCE BOOKS

S.No.	Authors	Title	Publishers	Year of Publication
1.	E.Balagurusamy	Object Oriented Programming with C++	Tata Mcgraw Hill Publishing Ltd., New Delhi	2002
2	Robert Lafore	Object Oriented Programming with C++	Galgotia	1994
3	Yeswant Kanetkar	Let us C++	BPB Publications,	1999
4	John R.Hubbard	Programming with C++	Schaum's Outline Series	1996

WEBSITE REFERENCE

1.<https://www.Springpoint.com/>Programming with C++

2.<https://www.w3schools.com>

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, and Google Classroom

SEMESTER – II

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U2CSCT05	Title:Core 5:Data Structures	Batch	2019-2022
			Semester	II
Hrs/Week:	4 Hrs		Credits	3

COURSE OBJECTIVES

- To understand the abstract data types stack, queue, deque, and list.
- To understand the performance of the implementations of basic linear data structures.
- To understand prefix, infix, and postfix expression formats.
- To use stacks to evaluate postfix expressions.
- To use stacks to convert expressions from infix to postfix.

COURSE OUTCOMES

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

CO Number	Statement
CO1	Define the algorithms with basic techniques and recursive methods and familiar in the space and time complexity of the algorithms.
CO2	Intrepret the operations of Stack,Queue and Linked list
CO3	Demonstrate specific search, sort , Tree and Graph algorithms using data structures given specific user requirements.
CO4	Identify suitable algorithms with appropriate data structures for real time software requirements .
CO5	Illustrate to store and retrieve data stored in both main memory and in secondary memory.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I****Hours: 15**

Introduction - Overview - How To Create Programs and Analyse Them. Arrays - Structures - Ordered Lists- Representation of Arrays - Simple Applications-Stacks and Queues - Fundamentals – Structure-Operations - Multiple Stacks and Queues. Applications Evaluation of Expressions.

UNIT II**Hours: 15**

Linked Lists - Single Linked Lists- Linked Stacks And Queues - The Storage Pool - Applications - Polynomial Addition, Sparse Matrices. Double Linked Lists- Dynamic Storage Management -Garbage Collection And Compaction.

UNIT III**Hours: 15**

Trees:Binary Tree-Binary Tree representation-Binary Tree Traversal.Graphics:Introduction-Definition and terminology-Graph representation-Traversals,Connected Component and Spanning Tree.Activity Networks Topological Sort and Critical Paths.

UNIT IV**Hours: 15**

Searching and Sorting: Binary, Sequential, And Fibonacci - Internal Sorting Insertion, Quick, Merge, Heap, Radix Sorts - External Sorting - Sorting With Disks – K-way Merging- Sorting With Tapes - Balanced Merge - Polyphase Merge.

UNIT V**Hours: 15**

Files - Queries and Sequential Organizations - Index Techniques. File Organizations Sequential, Random, Linked Organizations - Inverted Files – Cellular Partitions.

TEXT BOOKS: (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers	Year of Publication
1.	Ellis Horowitz & Sartaj Sahani	“Fundamentals of data structure”	Galgothia book source, 1999, Latest Edition.	2011
2	Ashok N Kamthane	“Programming and Data Structures”,	Pearson Education, Latest Edition	2004,

REFERENCE BOOKS

S.No	Authors	Title	Publishers	Year of Publication
1.	Malik,D,S.,	Data structures using C++ [1st Edition]	Cengage learning	2003
2	Vaughan H.Patil,	Data Structures Using C++[1st Edition]	Oxford Higher Education	2012

WEBSITE REFERENCE

1.<https://www.Springpoint.com>/Data structures using C++

2.<https://www.w3schools.com>

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, and Google Classroom

SEMESTER – II

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U2CSCP06	Title:Core 6:C++ Programming - Practical	Batch	2019-2022
			Semester	II
Hrs/Week:	3 Hrs		Credits	3

COURSE OBJECTIVES

- To develop the applications using C++ Programming language.
- To apply the concepts like looping, control statements arrays, function overloading and file concepts.

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Choose the loops and decision making statements to solve the problems in C++
CO2	Examine C++ code to demonstrate practical experience in developing solutions for real time applications.
CO3	Manipulate about Compilation and debug programs in C++ language
CO4	Write programs in C++ using special functions, constructor and destructor.
CO5	Use the file handling concepts

MAPPING WITH PROGRAMME OUTCOMES

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

PROGRAM LIST

1. To write a program using looping and control statements
2. To write a program using Arrays
3. To write a program using inline functions
4. To write a program using Class and Array of objects
5. To write a program using Objects as function arguments and Function that return objects
6. To write a program using Friend function
7. To write a program using Function Overloading
8. To write a program using constructors
9. To write a program using operator overloading
10. To write a program for Overloading friend functions
11. To write a program using inheritance
12. To write a program using virtual function.
13. To write a program using run time polymorphism
14. To write a program using Pointer to members
15. To write a program using Files.

WEBSITE REFERENCE

1.<https://www.programiz.com/c++-programming/examples>

2.<https://fresh2refresh.com/c++-programming/c++-programs>

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, and Google Classroom

SEMESTER-II

Programme Code :	B.Sc. CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U2CSAT02	Title : Allied 2:Discrete Mathematics	Batch	2019-2022
Hrs/week	5 Hrs		Semester	II
			Credits	4

COURSE OBJECTIVES

- To enable the Students to understand the concept of set theory, Logic and Relations
- To learn the concept of languages and Grammars
- To know the concept of Graph theory and its applications

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Define the concepts of set theory, partition of sets, inclusion and exclusion principles.
CO2	Write an argument using logical notation and determine if the argument is valid or invalid.
CO3	Describe the binary relations between two sets and determine if the relation is partial order relation or equivalence relation using set operations.
CO4	Explain the concepts of formal languages and construct the finite state automata.
CO5	State the concept of graphs, enumerate the types of graphs and their applications practical situations.

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO2	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO3	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO4	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO5	-	-	-	✓	✓	✓	✓	-	-	-	-	-

SYLLABUS**UNIT I****(Hours:12)**

Set Theory - Types of sets - Venn - Euler Diagrams - Set operations & Laws of set theory - Fundamental Products - Partitions of Sets – Minsets - Algebra of sets and Duality - Inclusion and Exclusion Principle.

UNIT II**(Hours:12)**

Mathematical Logic – Introduction - Propositional Calculus – Basic logical Operations - Tautologies – Contradiction – Argument - Predicate Calculus.

UNIT III**(Hours:12)**

Relations – Binary Relations – Set operation on relations - Types of Relations – Partial order relation – Equivalence relation – Functions – Types of functions – Invertible functions.

UNIT IV

(Hours:12)

Languages – Operations on Languages – Grammar – Types of Grammars – Finite State Machine – Finite State Automata.

UNIT V

(Hours:12)

Graph Theory – Basic terminology – Paths, Cycle & Connectivity – Sub graphs – Types of Graphs – Representation of Graphs in Computer Memory - Trees – Properties of Trees – Binary trees- Traversing Binary Tree.

Recent editions of the following books only are recommended

TEXT BOOK

S. No	Author Name	Title of the Book	Publisher
1	J.K. Sharma	Discrete Mathematics	Macmillan India Ltd

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1	J. P Tremblay R Manohar	Discrete Mathematics Structures with Applications to Computer Science	Mc Graw Hill International Publications
2	Dr.M.K. Venketaramen, Dr.N.Sridharan, N.Chandarasekaran	DiscreteMathematics	The National publishing Company
3	V.Sundaresan	Discrete Mathematics	A.R.Publications
4	M.K.Chandborthy	Introduction to Discrete Mathematics	Books and Allied Pvt.Ltd.

WEBSITE REFERENCE

1.www.coursera.com

2.www.tutorialpoint.com

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google classroom.

SEMESTER II

Programme Code	B.Sc.CS	Programme Title	Bachelor of Computer Science	
Course Code	19U2VBET02	Value Based Education 2: Yoga for Youth Empowerment **	Batch	2019-2022
Hrs/week	2		Semester	II
			Credits	4

Objectives

Providing the value education to improve the students' good character - Understanding yogic life and physical health - Maintaining youthfulness - Moderation in five aspect of life - Methods of concentration - Personality Development – Sublimation - Understanding the law of nature and yogaasanas.

Syllabus**Unit 1: Philosophy of Life Science****(Hours:06)**

Life – Purpose of life – Philosophy of Life- Law of Nature-Kindness towards living beings
Preserving Natural resources.

அலகு 1: வாழ்வியல் தத்துவம்

வாழ்க்கை - வாழ்வின் நோக்கம் -வாழ்க்கைத் தத்துவம் -இயற்கை நியதி -பிற உயிர் பேணல்
-இயற்கை வளம் காத்தல்

Unit 2: Human values**(Hours:06)**

Culture –Analysis of thought- Moralization of Desire- Neutralization of Anger- Eradication of Worry- Blessings and Benefits- Harmonious Friendship- Love and Compassion-Individual Peace.

அலகு 2: தனிமனித பண்புகள்

பண்பாடு -எண்ணம் ஆராய்தல் -ஆசை சீரமைத்தல் -சினம் தவிர்த்தல் -கவலை ஒழித்தல் -
வாழ்த்தும் பயனும - நட்பு நலம் - அன்பும் கருணையும் - தனிமனித அமைதி.

Unit 3: Social Values**(Hours:06)**

Family- Family Peace- Society-Life style- World Brotherhood- Greatness of Women- Five Duties- Economics- Hygiene and Health Care- Education – Politics- Responsibilities of people.

அலகு 3: சமுதாய மதிப்புகள்

குடும்பம் - குடும்ப அமைதி - சமுதாயம் - வாழ்க்கை முறை - உலக சகோதரத்துவம் -
பெண்ணின் -பெருமை - ஐவகைக் கடமைகள் -பொருளாதாரம் -சுகாதாரம் -கல்வி -அரசியல் -
மக்களின் பொறுப்பு -உலக அமைதி

Unit 4: Development of Mental prosperity**(Hours:06)**

Prosperity of Mind- Life force- Bio-Magnetism and Mind – Functions of Mind- Mental Frequency – Ten Stages of Mind-Genetic Centre- Meditation- Value spirituality-Universal Magnetism and Bio-Magnetism.

அலகு 4 : மனிதவள மேம்பாடு

மனவளம் - உயிரும் மனமும் - உயிரின் இயக்க மையம் - மனத்தின் செயல்கள் - மன

அலைச்சுழல் - மன இயக்கப் படி நிலைகள் - கருமையம் - தவம்(தியானம்) - ஆன்மீக மதிப்பு -
வான்காந்தம் - சிவகாந்தம்

Unit 5: Maintenance of Physical Health

(Hours:06)

Structure of Human Body- Three Functional Bodies-Harmony Between Body and Life force-
Pain, Disease and Death- Reasons for Disease - Limit and Method in Five Factors- Simplified
Physical Exercises- Practice for Simplified Physical Exercises.

~~செய்யவேண்டிய நூல்கள்~~

Recent editions of the following books only are recommended

Text books:

S. No	Author Name	Title of the Book	Publisher
1	Vethathri maharish	Journey of Consciouness,	Vethathri Publications
2	Vethathri maharish	Simplified Physical Exercise	Vethathri Publications
3	Vethathri maharish	Unified Force	Vethathri Publications
4	Thathuvagnani Vethathri maharish	Yoga for modern age	Vethathri Publications
5	Dr. Chandrasekaran	Sound Health through yoga	Prem Kalyan Publications
6	Ntjhj;jpup kfup\p	vsps Kiw clw;gapw;rp	Ntjhj;jpup gjpg;gfk;

SEMESTER II

Programme Code	B.Sc.CS	Programme Title	Bachelor of Computer Science	
Course Code	19U2VBET03	Value Based Education 3: Ethics and Culture **	Batch	2019-2022
Hrs/week	2		Semester	II
			Credits	1

Ethics and Culture (மனிதவள மாண்பு - தனிமனித விழுமியங்கள்/சமுதாய விழுமியங்கள்)

அறவியலும் பண்பாடும் - (தனிமனித விழுமியங்கள்/குடும்ப விழுமியங்கள், சமுதாய விழுமியங்கள், பணிசார்ந்த விழுமியங்கள், தேசிய விழுமியங்கள், உலகளாவிய விழுமியங்கள்)

நோக்கம்

- ஒவ்வொருவரும் தன்னை உயர்த்திக் கொண்டு சமுதாய மக்களுடன் இணக்கமாக வாழ்ந்து சமுதாயத்தை உயர்த்த வேண்டும். உன்னத இலட்சியத்திற்காக தமது வாழ்க்கையை அர்ப்படுத்திக் கொள்ள வேண்டும்.
- குடும்ப அமைதி, ஐந்தொழுக்கப் பண்பாடு, உணவே மருந்து, ஆளுமைப்பண்பு, தலைமைப்பண்பை மாணவர்களிடம் உருவாக்குதல்.
- உலக நாடுகளுடன் ஒற்றுமை, புரிந்துணர்வு ஆகியவற்றின் மூலம் இந்தியாவின் வலிமையை உணரச்செய்தல்.
- வளர்ந்துவரும் இந்தியா, உலகிற்கு வழங்கும் செய்தி, வேற்றுமையில் ஒற்றுமை, இந்தியாவும் ஆன்மீகமும், பற்றி மாணவர்களை உணரச்செய்தல்.

பாடப்பகுதி கற்றலின் வெளிப்பாடு - ஊழரசனா முரவஉழுஅந (ஊழு)

ஊழு ரேஅடிநச	ஊழு ஞவயவநஅநவெ
ஊழு1	தன்னை, உள்நோக்க அறிவால் ஆராய்ந்து தன்னிடமுள்ள உணர்ச்சி வயப்பட்ட குணங்களை எல்லாம் மாற்றியமைத்துக் கொள்ளச் செய்தல்.
ஊழு2	குடும்ப அமைதி, ஐந்தொழுக்கப் பண்பாட்டை அறிந்து, அதன்படி வாழ்ந்து தன்னை உயர்த்திக் கொள்ளச் செய்தல்.
ஊழு3	வாழ்க்கையின் இலக்கை அடையத் தேவையான தகுதியை வளர்த்துக் கொள்ளல்.
ஊழு4	பிற நாடுகளோடு இந்தியா கொண்டுள்ள தொடர்பின் மூலம் நமது நாட்டினுடைய கலாச்சாரம், பண்பாட்டினை உணரச்செய்தல்.
ஊழு5	வளர்ந்துவரும் இந்தியா, உலகிற்கு வழங்கும் செய்தி, வேற்றுமையில் ஒற்றுமை, இந்தியாவும் ஆன்மீகமும் பற்றி மாணவர்களை உணரச்செய்தல்.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்

CO /PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	✓	✓	-	-	✓	-	-	-
CO2	-	-	-	-	✓	-	-	-	✓	-	-	-
CO3	-	-	-	-	-	-	-	-	✓	-	-	-
CO4	✓	-	✓	-	-	-	-	-	-	-	-	-
CO5	✓	-	-	-	-	-	-	-	-	-	-	-

பாடத்திட்டம்

SEMESTER II

Programme Code :	B.Sc.CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U2SBST03	Title : Skill Based Subject 3 Mathematics for Competitive Examinations –II	Batch	2019-2022
Hrs/week	2 Hours		Semester	II
			Credits	1

COURSE OBJECTIVES

- To enable the Students to know about concept of Interest and Profit and loss.
- To know about methods of calculation concept of Interest and Profit and loss.
- To develop the ability in solving problems involving Permutation , Combinations and Bankers Discount.
- To Solve Problems of Permutations and combinations

COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to achieve the following outcomes.

CO Number	CO Statement
CO1	Explain the basic concepts of mathematics of finance.
CO2	Solve the problems on time and distance, time and work.
CO3	Apply the concept of permutation and combinations to solve problem.

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO2	-	-	-	✓	✓	✓	✓	-	-	-	-	-
CO3	-	-	-	✓	✓	✓	✓	-	-	-	-	-

SYLLABUS**UNIT I****(Hours : 06)**

Profit and Loss – Ratio and Proportion

UNIT II**(Hours : 06)**

Partnership – Chain Rule

UNIT III**(Hours : 06)**

Time and Distance – Time and work

UNIT IV

(Hours : 06)

Permutation & Combinations

UNIT V

(Hours : 06)

True Discount- Bankers Discount

(Simple Problems only)

Recent editions of the following books only are recommended

TEXT BOOKS

S. No	Author Name	Title of the Book	Publisher
1	R. S. Agarwal	Quantitative Aptitude (for Competitive Examinations)	S. Chand and Company Limited

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1	R.V.Praveen	Quantitative Aptitude and Reasoning	PHI Learning pvt. Ltd
2	Abhijit Guha	Quantitative Aptitude for Competitive Examinations	ata Mc-Graw Hill Publishing Company

WEBSITE REFERENCE

- 1.<https://www.careerbless.com/aptitude/qa/home.php>
- 2.<https://www.indiabix.com/>

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google classroom.

SEMESTER-II

Programme Code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U2SBST04	Title: Skill Based Subject 4 : Communication Skills- II	Batch	2019-2022
			Semester	II
Hrs/ Week	2 Hours		Credits	1

COURSE OBJECTIVES:

- To make the students to understand the barriers in their communication and the ways to overcome the same
- To make the students to know various types of listening and the effect of enhancing the listening skills
- To encourage Group discussion and introduce to speak in different situations and the etiquette to be maintained

COURSE OUTCOMES (CO):

On Successful Completion of the course the students should be able to achieve the following outcomes.

CO Number	CO Statement
CO1	to communicate meaningfully and effectively with others
CO2	to explain various types of listening and be a careful listener
CO3	to deal with different kinds of situations by conversing effectively and maintaining the etiquette required for such situations

SYLLABUS**UNIT –I**

1. Parts of Speech
2. Tenses
3. Active voice and passive voice
4. Phrasal Verbs

UNIT- II

1. Confusable Words
2. Jumbled Sentences
3. Synonyms
4. Antonyms

UNIT- III

Reading Techniques (Skimming and Scanning)

Types of Reading - Intensive Reading and Extensive Reading

Brain Storming

Role Play

Recent editions of the following books only are recommended

TEXT BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	Meenakshi Raman	Communication Skills	Oxford University Press
2	Shalini Aggarwal	Essential Communication Skills	Ane Books Pvt.Ltd. New Delhi

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	Course team, Bharathiyar University	Communication Skills a multi-skill course	Macmillan Publishers India LTD.
2	Krishna Mohan	Developing Communication Skills	Macmillan Publishers India LTD.
3	Joyce Pereire	Technical English – II	Vijay Nicole Imprints Pvt.Ltd.

Means of Curriculam Delivery: Lecture, Group Discussion, Seminar, Assignment, Google Class Room.

SEMESTER-III

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science
Course Code:	19U3CSCT07	Title: CORE 7: OPERATING SYSTEMS	Batch:2019-2022
Hrs/Week:	5 Hrs		Semester: III
			Credits: 4

COURSE OBJECTIVES:

- To gain knowledge on OS concepts and functioning of modern OS.
- To understand the different types of operating systems concepts like shell, Multi-Tasking / Time-sharing and Distributed Operating System.
- To understand the basic structure of OS, process and threads.
- To understand the deadlock & Memory management concepts.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Explain the basics of operating systems like kernel,shell, types and views of operating systems
CO2	Implement operating system functions.
CO3	Describe the various CPU scheduling algorithms and remove deadlocks
CO4	Explain various memory management techniques and concept of thrashing
CO5	Recognize file system interface, protection and security mechanisms.

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	✓	✓	-	-	-	-	-	-	-	-	✓
CO2	-	✓	✓	-	-	-	-	-	-	-	-	✓
CO3	-	✓	✓	-	-	-	-	-	-	-	-	✓
CO4	-	✓	✓	-	-	-	-	-	-	-	-	✓
CO5	-	✓	✓	-	-	-	-	-	-	-	-	✓

SYLLABUS**UNIT I****(Hours:12)**

Introduction: Basic OS functions, types of operating systems–simple batch systems-multi programmed batched systems , time sharing systems; personal computer systems, parallel systems, Distributed Systems, real time systems. OS Concepts - Processes, files, system calls

and the shell.

UNIT II

(Hours:11)

OS Structure: Layered Systems-Virtual Machines-Client Server Models. Processes-System view of the process model, process hierarchy, process states, implementation of processes. Process Synchronization-critical section problem, semaphores. Thread-motivation for threads, thread states, threading models.

UNIT III

(Hours:13)

Inter process Communication: Race Condition-Critical Regions-Mutual Exclusion With Busy Waiting-Sleep & Wakeup-Semaphores-Message Passing- Mutexes-Monitors-Barriers. Classical IPC Problems: The Dining Philosophers Problem-The Readers and writers Problems-The Sleeping Barber Problem. Process Scheduling- round robin scheduling, priority Scheduling, multiple queues Scheduling, shortest job first Scheduling, shortest process first Scheduling policy versus Mechanism, First-in-First-out Scheduling, Scheduling in Real-Time Systems, Thread Scheduling.

UNIT IV

(Hours : 10)

Deadlocks: Introduction, Deadlock Detection And Recovery: Deadlock Detection With One Resource of Each Type- Deadlock Detection With Multiple Resources of Each Type-Recovery From Deadlock. Deadlock Avoidance: Bankers Algorithm for Single Resource, Bankers Algorithm for Multiple Resources. Dead Prevention: Attacking the Mutual Exclusion Condition- Attacking the Hold and wait Condition- Attacking the No Preemption Condition- Attacking the Circular Wait Condition.

UNIT V

(Hours : 14)

Memory Management: Physical and virtual address space; memory allocation strategies, segmentation. Virtual Memory Organization-Paging-Page Tables-Page Replacement Algorithm: The Optimal Page Replacement Algorithm-The Not Recently Used Page Replacement Algorithm- The First In First Out. File Systems: Files-File Naming- File Structure-File Types-File Attributes-File Operation Directories: Single Level Directory Systems-Two Level Directory Systems-Hierarchical Directory Systems, Directory operations.

Text Book

S.NO.	Author Name	Title of the Book	Publishers	Year/Edition
1.	Abraham SilberschatzPeter BaerGalvin and Greg Gagne	Operating System Concepts	John Wiley & Sons (ASIA) Pvt. Ltd	Seventh Edition 2004
2.	Andrew STanenbaum	“Modern Operating Systems”	Prentice Hall of India Pvt. Ltd	Fourth Edition 2014
3.	Harvey M. Deitel	Operating Systems	Pearson Education Pvt. Ltd	Nineth Edition 2018

Reference Books

S.NO.	Author Name	Title of the Book	Publishers	Year/Edition
1	Pramod chandra P.Bhatt	An Introduction to Operating systems	PHI Learning Pvt. Ltd	Fourth Edition 2014
2	William Stallings	Operating systems	PHI Learning Pvt. Ltd	Seventh Edition 2014
3	Sathe S R	Operating systems	Mac Millan	Fourth Edition 2014

WEBSITE REFERENCES

1. https://en.wikipedia.org/wiki/Operating_system
2. https://www.tutorialspoint.com/computer.../computer_operating_system.htm
3. https://www.webopedia.com/TERM/O/operating_system.html
4. <https://www.geeksforgeeks.org/operating-systems-need-and-functions/>
5. <https://www.lifewire.com › How To › Windows › Key Concepts › Computer Concepts>

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Case studies, Google Classroom

SEMESTER-III

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U3CSCT08	Title: Core 8: JAVA PROGRAMMING	Batch	2019-2022
			Semester	III
Hrs/Week:	5 Hrs		Credits	3

COURSE OBJECTIVES

- Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- To be able to use the Java SDK environment to create, debug and run simple Java programs.
- To understand the Java Programming concepts so as to enable the students to create wide range of Applications and Applets using Java.

COURSE OUTCOMES

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

CONumber	CO Statement
CO1	Explain the fundamental structure of java program and to develop different programs in java language.
CO2	Understand in detail about branching ,looping and arrays in java program using the development environment.
CO3	Solve problems using methods and interface
CO4	Identify the errors and develop the Applet program
CO5	Evaluate the file management in java language.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I****Hours:20**

Fundamentals of Object-Oriented Programming : Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. **Java Evolution:** History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers. **Overview of Java:** simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine.

UNIT II**Hours: 20**

Constants, Variables, Data Types - Operators and Expressions **Decision Making and**

Branching: if, if ..else, nested if, switch, ? : Operator - Decision Making and Looping: while, do, for – Jumps in Loops - Labelled Loops – Classes, Objects and Methods.

UNIT III**Hours: 20**

Arrays, Strings and Vectors – **Interfaces:** Multiple Inheritance. **Packages:** Putting Classes together – Multithreaded Programming.

UNIT IV**Hours: 15**

Managing Errors and Exceptions – Applet Programming – Graphics Programming.

UNIT V**Hours: 15**

Managing Input / Output Files in Java : Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive data Types – Random Access Files.

TEXT BOOKS: (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers	Year / Edition
1.	E.Balagurusamy	PROGRAMMING WITH JAVA	TMH.	2019

REFERENCE BOOKS

S.No.	Authors	Title	Publishers	Year / Edition
1.	Ivan Bayross	WebEnabled CommercialApplication Development Using Html, Dhtml,javascript, Perl Cgi	BPB Publications	Fourth Edition 2010
2	Cay Horstman	BIG Java	Wiley Publication ,	Fifth Edition 2015
3	Herbert Schildt	Java 7, The Complete Reference,	Oracle Press	Tenth Edition 2018

WEBSITE REFERENCE

1.<https://beginnersbook.com/2017/09/java-examples/>

2.<https://www.javapoint.com>

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment,Case studies

SEMESTER-III

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U3CSCT09	Title: Core 9: Data Communications And Networks	Batch	2019-2022
			Semester	III
Hrs/Week:	6 Hrs		Credits	3

Course Objectives

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

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

Course Outcomes

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

CO Number	CO Statement
CO1	Independently understand basic computer network technology. And Understand and explain Data Communications System and its components.
CO2	To Apply the different types of network topologies and protocols.
CO3	Analyse the layers of the OSI model, TCP/IP and the function(s) of each layer.
CO4	To Evaluate and building the skills of subnetting and routing mechanisms.
CO5	To Create the basic protocols of computer networks and how they can be used to assist in network design and implementation.

Mapping Outcome

CO&PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	✓	✓	-	-	✓	-	✓	-	-	-	✓
CO2	-	✓	✓	-	-	✓	-	✓	-	-	-	✓
CO3	-	✓	✓	-	-	✓	-	✓	-	-	-	✓
CO4	-	✓	✓	-	-	✓	-	✓	-	-	-	✓
CO5	-	✓	✓	-	-	✓	-	✓	-	-	-	✓

Syllabus**UNIT I****Hours : 14**

INTRODUCTION -Data communications – Networks – Network Types – Internet History – Standards and Administration – Network models: Protocol layering – TCP/IP Protocol Suite – OSI model.

UNIT II**Hours:16**

PHYSICAL LAYER -Data and Signals – Periodic analog signals – Digital signals – Transmission Impairment – Data rate limits – Performance – Digital transmission : Digital to Digital Conversion – Analog to Digital conversion - Transmission modes - Analog transmission : Digital to analog conversion – Analog to Analog conversion .

UNIT III**Hours:15**

DATA LINK LAYER-Error detection and correction : Block coding – Cyclic coding – Checksum – Forward error correction - Data Link Control (DLC) : DLC services – data link layer protocols – HDLC – Point to point Protocol(PPP) – Media Access Control(MAC) : Random Access – Controlled Access – Channelization.

UNIT IV**Hours:15**

NETWORK LAYER-Network Layer services - Packet switching – Network layer performance – IPV Address – Forwarding of IP packets – Network layer protocols : Internet protocol (IP) – ICMPv4 – Mobile IP – Next generation IP :IPv6 Addressing – The IPv6 Protocol – The ICMPv6 Protocol – Transition from IPv4 to Ipv6.

UNIT V**Hours:15**

TRANSPORT LAYER and APPLICATION LAYER-Transport layer protocols - User Datagram Protocol – Transmission Control Protocol – SCTP – Application Layer : Standard client server protocols : WWW and HTTP – FTP _ Electronic mail – Telnet – Secure Shell – Domain Name System – SNMP – ASN.1.

Text Books (Recent Edition of the following books only are recommended)

S.	Authors	Title	Publishers	Year/ Edition
1.	Behrouz .Forouzan	Data Communications and Networking	McGraw Hill Education pvt ltd	Fifth Edition 2015

Reference Books

S.No	Authors	Title	Publishers	Year/ Edition
1.	AchyutS Godbole	Data Communications and Networks	Tata McGraw Hill Education Ltd	Second Edition 2017
2.	Uyless d. Black	Data Communications and Networks	Tata McGraw Hill Education Ltd	Second Edition 2004

SEMESTER – III

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U3CSCP10	Title:Core 10: Java Programming Practical	Batch	2019-2022
Hrs/Week:	6 Hrs		Semester	III
			Credits	3

COURSE OBJECTIVES:

- To develop the applications using Java Programming language.
- To apply the concepts like looping, methods, interface, applets and file concepts.

COURSE OUTCOMES:

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

CO Number	CO Statement
CO1	Observe Java to demonstrate practical experience in developing solutions
CO2	Evaluating different methods, interface, applets and file concepts.
CO3	Distinguish about Compile and debug programs in Java language
CO4	Evaluating different controls in java
CO5	Evaluating the file handling functions

MAPPING WITH PROGRAMME OUTCOMES:

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

PROGRAM LIST

1. Write a Java program to generate a Pascal Triangle.
2. Write a Java program for counting letter frequencies in a given string
3. Write a Java Program to implement the concept of multiple inheritance using Interfaces.
4. Write a Java Program to create an Exception called payout-of-bounds and throw the exception.
5. Write a Java program that counts the number of lines, words and characters in a given text file
6. Write a Java Program to implement the concept of multithreading with the use of any three

multiplication tables and assign three different priorities to them.

7. Write a Java Program to draw several shapes in the created windows.
8. Write a Java Program to demonstrate the Multiple Selection List-box.
9. Write a Java Program to create Menu Bars and pull down menus.
10. Write a Java Program to create frames which respond to the mouse clicks. For each events with mouse such as mouse up, mouse down, etc., the corresponding message to be displayed.
11. Write a Java Program to draw circle, square, ellipse and rectangle at the mouse click positions.
12. Write a Java Program which open an existing file and append text to that file.

WEBSITE REFERENCE

- 1.<https://www.programiz.com/java-programming/examples>
- 2.<https://fresh2refresh.com/java-programming/java-programs>

SEMESTER III

Programme Code	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U3CSAT03	Title: Allied 3: Operations Research	Batch	2019-2022
Hrs/week	5		Semester	III
			Credits	4

COURSE OBJECTIVES

To enable the Students

- To Know Operation Research and LPP, solving LPP
- To solve transportation and assignment problems
- To acquire knowledge of queueing theory, PERT and CPM

COURSE OUTCOME

CO Number	CO Statement
CO1	Define Operations Research, Linear Programming Problem and explain the methods of solving Solution of LPP using Graphical Method simplex method and Big M method
CO2	Solve Transportation and Assignment problems
CO3	Explain the concepts of Game Theory
CO4	Study the concepts of Queueing theory and solving simple problems
CO5	Know distinction between PERT & CPM

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	✓	-	✓	-	-	-	-	-
CO2	-	-	-	✓	-	✓	-	-	-	-	-
CO3	-	-	-	✓	-	✓	-	-	-	-	-
CO4	-	-	✓	✓	-	✓	-	-	✓	✓	✓
CO5	-	-	✓	✓	-	✓	-	-	-	✓	✓

Syllabus**UNIT I**

(Hours:12) Linear

Programming-Mathematical Model assumption of Linear programming Graphical Method-Simplex method- Big-M Method-Problems

UNIT II

(Hours:12)

The Transportation Problems- Initial Basic Feasible Solution by North West Corner rule-Least Cost Method-Vogel's Approximation Method-The Assignment Problems-Assignment Algorithm-Optimum Solution-Unbalanced Assignment problem-Travelling Salesman Problem.

UNIT III

(12 Hrs)

Game Theory-Concept of pure and Mixed Strategies-Solving 2x2 matrix with and without saddle point- nx2-2xm games-Dominance Property.

UNIT IV

(12 Hrs)

(Derivations Not included) Queuing Theory- definition of waiting line model- Queue discipline- Traffic Intensity- Poisson Arrival- Birth Death process- Problems from single server: finite population model- Problems from multi server: finite population model.

UNIT V

(12 Hrs)

PERT and CPM- Network representation- Backward pass- forward pass- Computation- PERT network.

Text Book:

Recent editions of the following books only are recommended

S. No.	Author Name	Title of the Book	Publisher	Year/Edition
1	Prof. V. Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan	Resource Management Techniques	A.R. Publications, Chennai.	

REFERENCE BOOK

S. No.	Author Name	Title of the Book	Publisher	Year/Edition
1	Kanti Swarup, P.K. Gupta and Man Mohan	Operation Research	Sultan Chand & sons, New Delhi	
2	Prof. V. Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan	Resource Management Techniques	A.R. Publications, Chennai	
3	Prem Kumar Gupta D.S, Hira S	Operation Research	Chand & Company Ltd, Ram Nagar, New Delhi	

WEBSITE REFERENCE

1. <https://www.nptel.ac.in/courses-Webcourse-contents-OPTIMIZATION-METHODS-pdf-Module>
2. <https://www.mech.iitm.ac.in/nspch.pdf>
3. <https://www.shodhganga.inflibnet.ac.in/bitstream/10603/11449/.pdf>

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google classroom.

SEMESTER III

Programme Code :	B.Sc CS	Programme Title:	Bachelor of Computer Science	
Course Code :	19U3SBST05	Skill based subject 3: Mathematics for competitive Examinations III	Batch Semester	2019-2022 III
Hrs/week	2 Hours		Credits	1

COURSE OBJECTIVES

To enable the Students

- To make the students to know the concept of Pipes, Cistern and Probability.
- To solve problem related to Problems on Boats and Streams .
- To make the students to know the concept of Alligation or mixture, Problem of Heights and distance, odd man out series.

COURSE OUTCOME (CO)

CO Number	CO Statements
C01	Several tricks and formulas for pipes and cisterns are available which reduces the effort to solve the problem.
C02	Solve the problems on time and distance train, boats and stream.
C03	Apply the concept of Alligation and height & distance to solve problem.

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	✓	-	✓	-	-	-	-	-
CO2	-	-	-	✓	-	✓	-	-	-	-	-
CO3	-	-	-	✓	-	✓	-	-	-	-	-

SYLLABUS

UNIT I (6Hrs)
Pipes and cistern – Probability

UNIT II (6Hrs)
Problems on trains

UNIT III (6Hrs)
Problems on Boats and Streams

UNIT IV (6Hrs)
Alligation or mixture

UNIT V (6Hrs)
Heights & Distance- Odd Man Out & Series (Simple Problems only)

TEXT BOOK

Recent editions of the following books only are recommended

S. No.	Author Name	Title of the Book	Publisher	Year/Edition
1	R. S.Agarwal	Quantitative Aptitude (for Competitive Examinations)	S. Chand and Company Limited	

REFERENCE BOOKS

S.No	Author Name	Title of the Book	Publisher	Year/Edition
1	R.V.Praveen	Quantitative Aptitude and Reasoning,	PHI Learning pvt. Ltd	
2	Abhijit Guha	Quantitative Aptitude for Competitive Examinations	Tata Mc-Graw Hill Publishing Company	

WEBSITE REFERENCE

- 1.<https://www.careerbless.com/aptitude/qa/home.php>
- 2.<https://www.indiabix.com/>

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google classroom.

SEMESTER-III

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U3SBST06	Skill Based Subject 6: Communication Skills-III	Batch Semester	2019-2022 III
Hrs/week	2 Hrs		Credits	1

COURSE OBJECTIVES:

- To make the students to understand the barriers in their communication and the ways to overcome the same.
- To make the students to know various types of listening and the effect of enhancing the listening skills.
- To encourage Group discussion and introduce to speak in different situations and the etiquette to be maintained.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students will be able to achieve the following outcomes.

CO Number	CO Statement
CO1	To communicate meaningfully and effectively with others
CO2	To explain various types of listening and be a careful listener
CO3	To deal with different kinds of situations by conversing effectively and maintaining the etiquette required for such situations

SYLLABUS**UNIT –I**

- 1.Parts of Speech
- 2.Tenses
3. Active voice and passive voice
- 4.Phrasal Verbs

UNIT- II

1. Confusable Words
2. Jumbled Sentences
3. Synonyms
4. Antonyms

UNIT- III

1. Reading Techniques (Skimming and Scanning)
2. Types of Reading - Intensive Reading and Extensive Reading
3. Brain Storming
4. Role Play

TEXT BOOKS:

Recent editions of the following books only are recommended

S. No	Author Name	Title of the Book	Publisher
1	Meenakshi Raman	Communication Skills	Oxford University Press
2	Shalini Aggarwal	Essential Communication Skills	Ane Books Pvt.Ltd. New Delhi

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	Course team, Bharathiyar University	Communication Skills a multi- skill course	Macmillan Publishers India LTD.
2	Krishna Mohan	Developing Communication Skills	Macmillan Publishers India LTD.
3	Joyce Pereire	Technical English – II	Vijay Nicole Imprints Pvt.Ltd.

Means of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Google Class Room.

SEMESTER : III

Programme Code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U3NMET 01	Non Major Elective 1 : Food Science and Nutrition	Batch	2019-2022
			Semester	III
Hrs/week	2 Hrs		Credits	2

COURSE OBJECTIVE

- To understand the importance of Nutrition and the role of food in the maintenance of good health.
- To know about the functions, deficiency and toxicity of nutrients.
- To understand Malnutrition and its prevention
- To know about various adulterants in food and the methods of detecting them.
- To have an awareness on the prevailing laws, hygiene and sanitation relating to food safety.

COURSE OUTCOME (CO)

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

CO Number	CO Statement
CO1	Identify the properties of various food components.
CO2	Explain the role of nutrition in the maintenance of good health.
CO3	Explain about classification, sources, functions, requirements, health hazards due to deficiency and excess of these vitamins.
CO4	Explain the problem of malnutrition and measures to overcome the same.
CO5	Explain the various laws, available for food safety and find out whether the food is adulterated.

MAPPING WITH PROGRAMME OUTCOMES

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	✓	-	-	-	✓	-
CO2	-	-	-	-	-	✓	-	-	-	✓	-
CO3	-	-	-	-	-	✓	-	-	-	✓	-
CO4	-	-	-	-	-	✓	-	-	-	✓	-
CO5	-	-	-	-	-	✓	-	-	-	✓	-

SYLLABUS

Unit	Content
Unit-I	(6 Hours) Introduction to Nutrition: Terms used in Nutrition and Health. Definitions - Health, Nutrition, Nutrients, Foods, Diet, R.D.A., Balanced diet, Malnutrition, Under nutrition, Over nutrition, Optimum nutrition. Five Food Groups and Food guide, relationship between food and nutrition, functions of food, classification of nutrients, factors affecting food consumption and food acceptance. Elementary idea of probiotics, prebiotics and organic food.
Unit-II	(6 Hours) Basic Nutrition: WATER- Functions, sources, requirements, water balance, dehydration (ORS) and toxicity. CARBOHYDRATE - Composition and classification, source, functions, requirements. LIPIDS- composition, sources, functions, requirements, deficiency and excess; fatty acids- essential and non-essential, SFA, USFA, MUFA, PUFA, significance of fatty acids, Rancidity. PROTEINS- composition, classification sources, functions, requirements, deficiency. ENERGY- unit of energy, food as a source of energy, definition of calorie and joules, energy requirement and factors affecting it- BMR, RMR, SDA.
Unit-III	(6 Hours) VITAMINS- classification, sources, functions, requirements, deficiency and excess of the following: Vitamin A, D, E, K, C, Thiamin, Riboflavin, Niacin and B Complex. MINERALS - distribution in body, functions and sources, requirement, deficiency and excess of the following. Calcium, Phosphorus, Iron and Iodine. FIBRE- definition, types, sources, functions, importance in disease prevention
Unit-IV	(6 Hours) Ecology of malnutrition- Definition, causes and consequences of malnutrition Ecological factors leading to malnutrition such as income, family size, dietary pattern, occupation, customs, food fads, fallacies and other factors. Measures to overcome malnutrition (only introduction)- Increased agricultural production through food technology, food fortification and enrichment, Nutrition education, Nutrition intervention programme genesis, objectives and operation of school lunch programme and ICDS, Organizations that combat malnutrition- International organization – FAO, WHO, UNICEF National Organizations – ICMR, NIN, CFTRI, DFRL, ICAR
Unit-V	(6 Hours) Food Adulteration and Food Laws- Definition, Types, Common adulterants and home scale methods of detecting adulterants; Food Laws (only introduction) – PFA, BIS, AGMARK, FPO, HACCP. Food toxicants- Naturally occurring toxicants in canned foods, Alcoholic and non alcoholic beverages Sugars, preservatives, mushrooms Carcinogens in heated foods.

TEXT BOOKS:

Recent editions of the following books only are recommended

S. No	Author Name	Title of the Book	Publisher	Year/ Edition
1	Dr.A.Indhuleka	Healthy Vittles and Bits		

S. No	Author Name	Title of the Book	Publisher	Year/ Edition
1	Guthrie Helen.	Introductory Nutrition	Mirror/ Mosby College Publishing Times	
2	Mudambi, S.R., Rajgopal, M.V.	Fundamentals of Foods and Nutrition	NewAge International Pvt. Ltd	

REFERENCE BOOKS:

Means of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Google Classroom

SEMESTER III

Programme Code :	12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு	Programme Title	Bachelor of Computer Science	
Course Code :	19U3BTLT01	Basic Tamil-I Title : அடிப்படைத் தமிழ்	Batch Semester	2019-2022 III
Hrs/week	-		Credits	-

அகமதிப்பீட்டுத் தேர்வு மட்டும்

நோக்கம் :

- தமிழ் எழுத்துக்களை எழுத, படிக்க தெரிந்து கொள்ளுதல்.
- சொற்களின் வகைகளைத் தெரிந்து கொள்ளுதல்.
- தொடர் அமைப்புகளைத் தெரிந்து கொள்ளுதல்.
- வாக்கியங்களைப் பிழையின்றி எழுதக் கற்றுக் கொள்ளுதல்.

பாடப்பகுதி கற்றலின் வெளிப்பாட – Course Outcome (CO)

CO Number	CO Statement
CO1	தமிழ் எழுத்துக்களைத் தெளிவாக எழுதுதல்.
CO2	சொற்கள் கொடுக்கப்பட்டால் அவைகள் எச்சொற்கள் என வகைகளைக் கூறுதல்.
CO3	ஒரு சொற்றொடரில் எழுவாய், செயப்படுபொருள், பயனிலை எனவ என கண்டறிந்து கூறுதல்.
CO4	வாக்கியங்களைப் பிழையின்றி எழுதுதல்.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்

CO /PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	✓	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	✓	-	-	-

தமிழ் மொழியின் அடிப்படைக் கூறுகள்.

- எழுத்துக்கள் : முதலெழுத்துக்கள் (உயிர் எழுத்து, மெய் எழுத்து, உயிர்மெய் எழுத்து)
- சொற்கள் : வகைகள் (பெயர்ச்சொல், வினைச்சொல், இடைச்சொல், உரிச்சொல்)

தொடர் : தொடரமைப்பு (எழுவாய், செயப்படுபொருள், பயனிலை)

குறிப்பு எழுதுதல் : பத்துப் பதினைந்து தொடர்களில் குறிப்பு வரைதல்

பிழைநீக்கி எழுதுதல் : (ஒற்றுப்பிழை, எழுத்துப்பிழை)

	அக மதிப்பீட்டுத் தேர்வு மதிப்பெண் வழங்கும் முறை	மதிப்பெண்கள்
1	வகுப்புத்தேர்வு – 1	10
2	வகுப்புத்தேர்வு – 2	10
3	மாதிரித்தேர்வு	10
4	பயிற்சிக் கட்டுரை	10
5	வாய்மொழித் தேர்வு	10
	மொத்த மதிப்பெண்கள்	50

குறிப்பு : வாய்மொழித் தேர்வில் தமிழ்ச் செம்மொழி வரலாறு
தொடர்பான வினாக்கள் மட்டுமே கேட்கப்பட வேண்டும்.

SEMESTER III

Programme Code :	12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு	Programme Title	Bachelor of Computer Applications	
Course Code :	19U3ATLT01	Advanced Tamil I: கு சிறப்புத் தமிழ்	Batch	2019-2022
Hrs/week	-		Semester	III
			Credits	-

அகமதிப்பீட்டுத் தேர்வு மட்டும்
நோக்கம்:

- மேல்நிலைக் கல்வியில் தமிழ் மொழி பயின்ற மாணவர்களுக்கு இளங்கலை பட்ட வகுப்பில் தமிழ் இலக்கியத்தின் சிறப்பினை எடுத்துக் கூறுதல்.
- மரபுக் கவிதைகள், புதுக்கவிதைகள் வேறுபாடு பற்றி மாணவர்கள் அறியச் செய்தல்.
- சொற்களை உச்சரிக்கும் போது ஒலி வேறுபாடு அறிந்து வாக்கியங்களில் பிழை நீக்கி எழுதச் செய்தல்.
- பயன்பாட்டுத் தமிழில் கடிதங்கள் மற்றும் மடல்கள் எழுதுவதற்குப் பயிற்சியளித்தல்.
- பாடப்பகுதியோடு இணைந்த இலக்கிய வரலாற்றுச் செய்திகளை அறியச் செய்தல்.

பாடப்பகுதி கற்றலின் வெளிப்பாடு - Course Outcome (CO)

CO Number	CO Statement
CO1	மரபுக்கவிதை, புதுக்கவிதைகளுக்கு இடையில் உள்ள வேறுபாடுகள் அறிதல்.
CO2	மொழித்திறன் பயிற்சியின் மூலம், மாணவர்கள் பிழைநீக்கி எழுதுதல்.
CO3	இன்றைய சூழலுக்கு ஏற்ப, விண்ணப்பங்கள், மடல்கள் மற்றும் கடிதங்கள் எழுதச்செய்தல்
CO4	இலக்கியங்களின் வாயிலாக படைப்புகளின் வரலாறுகள், நோக்கம் உணர்தல்.
CO5	சொற்களைக் கொண்டு வாக்கியங்கள் அமைப்பதற்குப் பயிற்சி எடுத்தல்.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	✓	-	-	-	-	-	-
CO2	✓	-	-	-	-	-	-	-	-	-	-	-
CO3	✓	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	✓	-	-	-
CO5	-	-	-	-	-	-	-	-	-	✓	-	-

பாடத்திட்டம்

கூறு - 1 : பாரதியார் கவிதைகள்
கண்ணன் என் சேவகன்
பாரதிதாசன் - அழகின் சிரிப்பு (முழுவதும்)

மீரா (கவிஞர்) - குக்கூ (புதுக்கவிதை)

கூறு - 2 மொழித்திறன்

பிழைநீக்கி எழுதுதல் - றன, ரண வேறுபாடு அறிதல்
என, ழன, லன வேறுபாடு அறிதல்
ன, ண, ந வேறுபாடு அறிதல்
குறில் நெடில் வேறுபாடு அறிதல்

கூறு - 3 : கடிதங்கள் எழுதுதல் - பாராட்டுக் கடிதம், நன்றிக்கடிதம், அழைப்புக்கடிதம், அலுவலக விண்ணப்பம்.

கூறு - 4 சொற்களைத் தந்து தொடர்களை அமைக்கும் பயிற்சி அளித்தல், வல்லினம் மிகும் இடங்கள்.

கூறு - 5 பாடந்தழுவிய வரலாறு.

	அக மதிப்பீட்டுத் தேர்வு மதிப்பெண் வழங்கும் முறை	மதிப்பெண்கள்
1	வகுப்புத்தேர்வு - 1	10
2	வகுப்புத்தேர்வு - 2	10
3	மாதிரித்தேர்வு	10
4	பயிற்சிக் கட்டுரை	10
5	வாய்மொழித் தேர்வு	10
	மொத்த மதிப்பெண்கள்	50

குறிப்பு : வாய்மொழித் தேர்வில் தமிழ்ச் செம்மொழி வரலாறு தொடர்பான வினாக்கள் மட்டுமே கேட்கப்பட வேண்டும்.

SEMESTER – III

Programme Code :	B.Sc CS	Programme Title	Bachelor of Science (Computer Science)	
Course Code :	19U3SSCT01	Self Study Course1:Manitha azhklayum Gandhiadigalum	Batch	2019-2022
Hrs/week	2 Hours	Self Study Course 1:மனித வாழ்க்கையும் காந்தியடிகளும்மூழு	Semester	III
			Credits	-

நோக்கம்

1. மானிட வாழ்வில் பின்பற்ற வேண்டிய நடைமுறைச் செயல்பாடுகளை உணர்த்துதல்.
2. இன்றைய நவீன வாழ்க்கைச் சூழலில் ஏற்படும் சிக்கல்கள், பிரச்சனைகளை காந்திய தீர்வுகளை அறியச் செய்தல்.
3. மகாத்மாவின் வாழ்க்கை முறை, கல்வி, வாழ்வு பற்றிய கருத்துக்களை கற்று உணர்தல்.
4. நடைமுறை வாழ்வில் அகிம்சையைப் பின்பற்றுவதால் ஏற்படும் நன்மைகளைப் புரிந்து கொள்ளச் செய்தல்.
5. காந்தியடிகள் இந்திய விடுதலைக்காகப் பின்பற்றிய கொள்கைகளை மாணவர்கள் கற்று அறிதல்.

பாடப்பகுதி கற்றலின் வெளிப்பாடு - Course Outcome (CO)

CO Number	CO Statement
CO1	மானிட பிறப்பின் நோக்கம், வாழ்க்கை இரகசியம், தன்னலம் இல்லா வாழ்க்கை, இல்லா வாழ்க்கையின் சிறப்பு, உடலைப் பாதுகாத்தல் ஆகியவற்றை புரிந்து கொள்ளல்.
CO2	வாய்மையினால் இணைந்த மெய்யறிவு, இயற்கையுடன் இணைந்த மெய்யறிவு, சத்தியாகிரகிகளாக ஆத்ம சக்தியுடன் வாழ்ந்த பெரியோர்களின் வாழ்வை உணர்ந்து அவர்கள் வழியில் வாழ முயற்சித்தல்.
CO3	காந்தியடிகள் வாழ்க்கை மூலம் கல்வி, இல்லறம், பெற்றோரைப் பேணல், தியாகம், இயற்கை வாழ்வு, செல்வம், உண்மை, அஞ்சாமை மாணவர்கள் அறிதல்.
CO4	இயற்கையின் நோக்கம், அகிம்சையை பின்பற்றுவதால், ஊன் உண்ணாமை, தீண்டாமை, சுயராஜ்யத்தின் தன்மைகள், மக்களின் வாழ்க்கையில் சுதேசியம், சுதேசிய உரிமை, காந்தியடிகளின் வாழ்க்கை மூலம் மாணவர்கள் அறிதல்.
CO5	சத்தியாகிரகம் விளக்கம், காந்தியும் சத்தியாகிரகமும், காந்தியும் தென்னாப்பிரிக்கப் பயணம், ரௌலட் சட்டம், காந்தியின் சிறை வாழ்வு, சமய வாழ்வு, சமரச சன்மர்கம், சமரச வாழ்வின் பயன் போன்றவற்றை மாணவர்கள் அறிதல்.

MAPPING WITH PROGRAMME OUTCOMES

CO /PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	-	✓	-
CO2	-	-	-	-	-	-	-	-	-	✓	✓	-
CO3	-	-	-	-	-	-	-	✓	-	-	✓	-
CO4	-	-	-	-	-	-	-	✓	-	-	✓	-
CO 5	✓	-	-	-	-	-	-	✓	-	-	-	✓

பாடத்திட்டம் : மனித வாழ்க்கையும் காந்தியடிகளும்

அலகு 1 பக்க எண் (1 – 40)

மனிதன் - மனிதப் பிறவியின் விழுப்பம் - மக்கள் - மனிதன் எவன் - வாழ்க்கை – கீதா ரகசியம் - கருத்து வேற்றுமை – உரை கண்டவர் - போர்களத்தில் இல்லறத்தானுக்கு அறிவுறுத்தல் - பயன் கருதா அருளறம் - அருச்சுனன் தெளிவு - இரு பிறப்பு - இல்லற நோக்கம் - திருக்குறள் நுட்பம் - இல்லற மாண்பு – அருளறம் - நாட்டு அறநூல்கள் -சில முறைகள் உடலோம்பல் - ஞானிகள் நோக்கம் - உடம்பின் அருமை.

அலகு 2 பக்க எண் (41 – 73)

வாய்மை - வாய்மையில் பிற அறங்கள் - வாய்மை உயிர் மெய்யறிவு - விலங்கும் மனிதனும் - இயல்பு - மனச்சான்று - இயற்கை வாழ்வில் மெய்யறிவு - பொறுமை - நான்கு குணங்கள் - அடக்கம் - உள்ளறிதிறை - உண்மை - பொறுமை - பொறுமை ஆன்ம சக்தி - உள் ஒளி - ஆத்ம சக்தி - ஆத்ம சக்தியும் பூத சக்தியும் - சத்யாகிரகம் - இயல்பு - துராக்கிரகம் - அச்சுறுத்தல் - தியாகம் - சத்யாகிரகிகள் - ஊடல் - மார்க்கண்டேயர் - பிரகலாதன் - அரிச்சந்திரன் - வசீடன் - புத்தர் - ஸோகர்தர் - கிருஸ்து - முகம்மது - கீதை - சாவித்திரி - திருநாவுக்கரசர் - மெய்பொருள் - பிரான்சிஸ் முனிவர் - தால்தாய் - தோரி - முதலியோர் - இயற்கையறம் சத்தியாகிரகம், சாதுநிலை - சாது எவன்.

அலகு 3 பக்க எண் (75 – 200)

காந்தியடிகள் - பொருள் - மகாத்மா - மகான் - சில அடி கண்மார் புது உலகம் - காரல் மார்க்ஸ் - சிறியவுடலில் பெரிய ஒளி - பிறப்பு - கல்வி - பெற்றோர்ப் பேணல் - இல்லறம் - தியாகம் - இயற்கை வாழ்வு - செல்வம் நல்குரவு - வாழ்க்கைக் கூறுகள் - கிறிஸ்து மொழிகள் - உண்மையும் அஞ்சாமையும் - அடிகளின் அஞ்சா வினைகள் - மெய்யறிவு.

அலகு 4 பக்க எண் (200 – 257)

அம்சை - அம்சையும் சமயமும் - ஊன் எண்ணாமை - தீண்டாமை - இயற்கை அறம் அம்சை - நவகாளி நிகழ்ச்சி - மார்க்ஸியம் - சுயராஜ்யமும் சுதேசியமும் - பன்மையில் ஒருமை - பாரத மக்களும் சுதேசியமும் - சுதேசியமும் உரிமையும் - சுயராஜ்யம் கடவுள் படைப்பு நோக்கம் - சாதி சமயப்போர் - நாட்டுத்தொண்டு.

அலகு 5 பக்க எண் (257 – 364)

பொருள் - காலம் தோற்றம் - சத் விளக்கம் - சத்யாக்கிரகியார் - குறைபாடுகள் - உயிர் உடல் வாழ்வு - சத்யாகிரகமும் அடிகளும் - கூர்ஜரப் பாட்டு - தென்னாப்பிரிக்கா - சாம்யராண் - செய்தா - ரௌலட் சட்டம் - சத்யாகிரக நாள் - சட்டமும் அறமும் - சட்ட வரம்பு - சிறைப்பாகுபாடுகள் - சமயவாழ்வு - உண்மை மனிதன் - முழுமுதற் பொருளுண்மை - அம்சையே சமயம் - சமயப்போர் - சமய வாழ்வின் இயல்பு - அடிகள் சமயம் சமரச சன்மார்க்கம் - சாதுநிலை - சமய வாழ்வின் பயன் சாதுநிலை - சாதுக்களால் உலகம் நடைபெறல் - பிறர்க்குரிய வாழ்வு - பெரியோர் வருகை - அடிகள் வாழ்வு நூலின் பெரும் பிரிவுகள் - அடிகள் அறவுரைச் சுருக்கம் - இன்பப்பேறு - வாழ்த்து.

பாடநூல்

வ. எண்	ஆசிரியர் பெயர்	நூலின் பெயர்	வெளியீடு	ஆண்டு - பதிப்பு
1	திரு. வி. கலியாணசுந்தரனார்	மனித வாழ்க்கையும் காந்தியடிகளும்	பூம்புகார் பதிப்பகம் சென்னை - 600013	ஏப்ரல் - 2004

பார்வை நூல்

வ. எண்	ஆசிரியர் பெயர்	நூலின் பெயர்	வெளியீடு	ஆண்டு - பதிப்பு
1	மோகன்தாசு கரம்சந்த் காந்தி (தமிழாக்கம் - வேங்கடராஜலு)	மகாத்மா காந்தியின் சுய சரிதை	நவஜீவன் பிரசுராலயம் அகமதாபாத் - 380014	ஜூலை - 2000
2	தொகுப்பு - பேராசிரியர் முனைவர் மா.ரா.போ. குருசாமி	மகாத்மா நூல்கள் (காந்தி முன்னோடிகள்)	வர்த்தமானர் பதிப்பகம் - சென்னை - 17	2005
3	மோகன்தாசு கரம்சந்த் காந்தி (தமிழாக்கம் - ஆவினாசிலிங்கம்)	மகாத்மா நூல்கள் (தென்னாப்பிரிக்காவில் சத்தியாகிரகம்)	வர்த்தமானர் பதிப்பகம் - சென்னை - 17	2005

SEMESTER – IV

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U4CSCT11	Title:Core 11:WEB ESIGNING	Batch	2019-2022
Hrs/Week:	5 Hrs		Semester	IV
			Credits	4

COURSE OBJECTIVES

- To get practiced with creating the schemas, HTML and XML Document.
- To acquire knowledge on creating web page to deploy the web applications.
- To understand scripting language in java script

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Observe the fundamental concepts of network and internet
CO2	Develop the web page by using HTML elements
CO3	Develop the web page by using HTML with Style sheet
CO4	Classify the XML and DTD concepts by developing webpages.
CO5	Assess about the Concept object oriented mechanism

MAPPING WITH PROGRAMME OUTCOMES:

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

SYLLABUS**UNIT I****Hours:15****Internet** : Introduction to the Internet – Internet Technologies- Internet Browser -**HTML**: HTML command tags- Head and Body section – Designing the Body Section**UNIT II****Hours:15****HTML** -Ordered and Unordered Lists Creating Links – Table Handling – DHTML and Style sheets – Frames – A Web Page Design Project. - Forms.**UNIT III****Hours:15****Cascading Style sheets** : Introduction to CSS – Creating Style Sheets- Common Tasks with CSS - Colours – The Font Family – Assigning Classes – The Layer Tag – Css Tags**UNIT IV****Hours:15**

Extensive Markup Language (XML) : Introduction – Features of XML – Support and usage – Compatibility of XML with others:-CSS and XSL-Xlinks and Xpointers-URLs Verurs URIs -XML and SGML - Structure of a XML Documnets - Common Errors - Structure in XML:- well formed Xml Documents-Logical Structures-Physical structures- Mark-Up and Character data-White spaces - Xml Declaration -Tags and Elements-Tag Name.

UNIT V**Hours:15**

VB Script : Introduction – Adding VB Script code to HTML – Data Types of Visual Basic - Arrays in Script- Example of VB Script.

Java Script: Introduction – operators – starting with Java Scripts – Browser objects – data objects – math objects – defining objects – Handling Events in JavaScripts - Document Objects – Navigation Objects – Example of JAVA Script.

TEXT BOOKS: (Recent Edition of the following bools only are recommended)

S.No.	Authors	Title	Publishers	Year/Edition
1.	C Xavier	WorldWide WebDesign with HTML	Tata McGraw HillEducation Private Limited,New Delhi	Second Edition 2017
2	Ramesh Bangia	Web Technology (Including HTML, CSS,XML,ASP,JavaScript,VB Script),	Firewall Media	Fourth Edition 2010

REFERENCE BOOKS

S.No.	Authors	Title	Publishers	Year/Edition
1.	L.Mathu Krithigha Venkatesh	Web Technology	Margham Publications.	First Edition 2002

WEBSITE REFERENCE

- 1.<https://www.w3schools.com/Html>
2. <https://www.w3schools.com/Xml/Dtd>
- 3..<https://www.w3schools.com/CSS>

SEMESTER-IV

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U4CSCT1 2	Title: CORE 12: Network Security and Cryptography	Batch	2019-2022
			Semester	IV
Hrs/Week:	6 Hrs		Credits	4

Course Objectives

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

- Build an understanding of the fundamental concepts of Network Security
- Familiarize the student with the basic network security technology.
- Introduce the student to advanced cryptography concepts, preparing the student for entry Advanced courses in network security.
- Allow the student to gain expertise in some specific areas of cryptography and network security.

Course Outcomes

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

CO Number	CO Statement
CO1	Independently understand basic computer security technologies and the model.
CO2	To study the different types of Symmetric ciphers.
CO3	Analyse the Public-Key Encryption And Hash Functions.
CO4	To Evaluate and building the skills in Network Security Applications.
CO5	To assist in System Security network design and implementation malicious software.

Mapping Outcome

CO & PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	✓	✓	-	-	✓	-	✓	-	-	-	✓
CO2	-	✓	✓	-	-	✓	-	✓	-	-	-	✓
CO3	-	✓	✓	-	-	✓	-	✓	-	-	-	✓
CO4	-	✓	✓	-	-	✓	-	✓	-	-	-	✓
CO5	-	✓	✓	-	-	✓	-	✓	-	-	-	✓

Syllabus**UNIT I****Hours : 12**

INTRODUCTION -Security trends-The OSI Security Architecture-Security attacks-Security services-Security mechanisms-A model for Network security .

UNIT II**Hours:16**

SYMMETRIC CIPHERS- Symmetric cipher Model-Substitution techniques-Transposition techniques-Block cipher and the data encryption standard:Block cipher principles-the strength of DES-Differential and linear cryptanalysis-Block cipher design principles -Evaluation criteria for AES 135-the AES cipher-Multiple Encryption and triple DES-Block cipher Modes of operation- Stream cipher and RC4-Placement of encryption and function -Traffic confidentiality -Key distribution-Random key generation

UNIT III**Hours:15**

PUBLIC-KEY ENCRYPTION AND HASH FUNCTION-Introduction to number theory- Prime numbers-Fermat's and Euler's theorems-Testing for primality- principles of public-key cryptosystems-The RSA algorithm -Key management - Diffie-hellman key exchange-Elliptic curve arithmetic-Elliptic curve cryptography-Message authentication code-Hash function-Security of hash functions and MAC-Secure hash algorithm-Whirlpool-HMAC-CMAC-Digital signature-Authentication protocols-Digital signature standard

UNIT IV**Hours:15**

NETWORK SECURITY APPLICATION:X.509 Authentication Service- Public-key infrastructure-Pretty good privacy-S/MIME-IP SECURITY: IP Security overview- IP Security architecture-Authentication header-Encapsulation security payload-Combining security associations-WEB SECURITY: Web security considerations-Secure socket layer and transport layer security-Secure electronic transaction

UNIT V**Hours:15**

SYSTEM SECURITY: Intruders-Intrusion detection- Password Management-MALICIOUS SOFTWARE-Viruses and related threats-Virus countermeasures-Distributed denial of service attacks-FIREWALL-Trusted systems-Common criteria for information technology security evaluation.

Text Books (Recent Edition of the following books only are recommended)

S. No	Authors	Title	Publishers	Year/ Edition
1.	William Stallings	Cryptography and Network Security	Pearson Education Pvt Ltd	Seventh Edition 2017

Reference Books

S. No	Authors	Title	Publishers	Year/ Edition
1.	Arul Kahate	Cryptography and Network Security	Tata McGraw Hill Education Pvt Ltd	Third Edition/2017
2.	William Stallings	Cryptography and Network Security principles and practices	Prentice-Hall of India private limited	Seventh Edition/2016

SEMESTER - IV

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science
Course Code:	19U4CSCT13	Title: Core 13:Software Engineering	Batch:2019-2022
Hrs/Week:	5 Hrs		Semester: IV
			Credits: 3

COURSE OBJECTIVES

- To learn the basics Concepts of Software Engineering .
- To Understand the Phases of Software Engineering Life Cycle.
- To learn about various types of Testing.

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Explain a planning for a software project Development.
CO2	Prepare the SR analysis and Analysis Modelling Approaches. Apply Project Requirement analysis , Verification and validation
CO3	Generate designing Models
CO4	Developing Component based Software
CO5	Generate test cases using various testing techniques.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I****Hours:15**

Introduction to Software Engineering : The Evolving Role of Software – Software – The Changing Nature of Software. The Software Process : Software Engineering – A Process Framework – Process Models : The Waterfall Model – Evolutionary Process Model. Software Engineering Practice : The Essence of Practice – Core Principles. System Engineering : Computer Based System – The System Engineering Hierarchy.

UNIT II**Hours:15**

Software Requirements : Functional and Non-functional Requirements – User Requirements – System Requirements. Requirement Engineering Process: Feasibility Studies - Requirements Elicitation and Analysis – Requirements validation – Requirements Management. Building the Analysis Model : **Analysis Modelling Approaches** – Data Modelling Concepts – Creating a Behavioural Model.

UNIT III**Hours:15**

Design : Design Process and Design quality – Design Concepts – The Design Model. Creating an Architectural Design : Software Architecture – Data Design – Architectural Design – Mapping Data Flow into a Software Architecture . Performing User Interface Design : User Interface Analysis and Design. Real-time Software Design

UNIT IV**Hours:15**

Development : Rapid Software Development : Agile Methods – Extreme Programming – Rapid Application Development – Software Prototyping. Software Reuse : The Reuse Landscape – Design Patterns. Component Based Software Engineering : Components and Component Models.

UNIT V**Hours:15**

Testing : Testing Strategies : A Strategic approach to Software Testing – Test Strategies for Conventional Software -Validation Testing – System Testing – Black-Box and White-Box Testing – Debugging Strategies.

Text books: (Recent Edition of the following books only are recommended)

S. No	Authors	Title	Publishers	Year / Edition
1.	Roger S.Pressman	Software engineering- A practitioner's Approach	McGraw-Hill,	Seventh Edition 2012
2	Ian Sommerville	Software engineering	Pearson education Asia	10 Edition /2018

REFERENCE BOOKS

S.No.	Authors	Title	Publishers	Year / Edition
1.	Pankaj Jalote	An Integrated Approach to Software Engineering	Springer Verlag	Third Edition 2005
2	James F Peters and Witold Pedrye	Software Engineering – An Engineering Approach	John Wiley and Sons, New Delhi	First Edition 2010
3	Ali Behforooz and Frederick J Hudson	Software Engineering Fundamentals	Oxford University Press, New Delhi,	First Edition 1997
4	Carlo Ghezzi, Mehdi Jazayari and Dino Mandrioli	Fundamentals of Software Engineering	Prentice Hall of India, New Delhi	Second Edition 2007
5	Pfleeger	Software Engineering	Pearson Education India, New Delhi,	Fourth Edition 2010

WEBSITE REFERENCE

1. [http://dinus.ac.id/repository/docs/ajar/RPL-](http://dinus.ac.id/repository/docs/ajar/RPL-7th_ed_software_engineering_a_practitioners_approach_by_roger_s._pressman_.pdf)

7th_ed_software_engineering_a_practitioners_approach_by_roger_s._pressman_.pdf

2. https://edisciplinas.usp.br/pluginfile.php/2150022/mod_resource/content/1/1429431793.203Software%20Engineering%20by%20Somerville.pdf

3. <https://www.slideshare.net/SaqibRaza21/introduction-to-software-engineering-71622253>

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Case studies and Google Classroom

SEMESTER – IV

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U4CSCP14	Title:Core 14:WEB DESIGNING PRACTICAL	Batch Semester	2019-2022 IV
Hrs/Week:	6 Hrs		Credits	3

COURSE OBJECTIVES

- To develop the webpage using HTML,CSS ,XML with DTD and Java Script
- To apply the concepts like looping, control statements and document object

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Choose HTML elements to develop the static webpage
CO2	Estimate HTML, CSS, Xml with DTD to demonstrate practical experience in web developing solutions
CO3	Manipulate about dynamic webpage in javascript language
CO4	Estimate HTML controls using web developing applications
CO5	Manipulate about XLINK in DTD

MAPPING WITH PROGRAMME OUTCOMES

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

PROGRAM LIST

1. Create Tables using colspan and rowspan
2. Linking using Image map
3. Embedding flash file in Html

4. Create web page in Html using frames
5. Apply effects to text and image using CSS
6. Change the font text color and background picture.
7. Changing the background color using onmouseover, on click, on change events.
8. Displaying the radio button and combo box elements in the text box
9. Moving text or image with mouse
10. Checking the shift key, Right mouse button, Left mouse button is pressed or not and finding X, Y co,ordinates.
11. Changing the background of the button in the tables using mouse over.
12. Displaying the text in the status bar

WEBSITE REFERENCE

1. <https://www.w3schools.com/Html>
2. <https://www.w3schools.com/Xml/Dtd>
<https://www.w3schools.com/>

SEMESTER – IV

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U4CSAT04	Title: ALLIED 4: BUSINESS ACCOUNTING	Batch	2019-2022
			Semester	IV
Hrs/week	5 Hrs		Credits	4

COURSE OBJECTIVE

- To make the students understand the accounting principles, branches of accounting and journal, ledger and trial balance.
- To enable the students to prepare the final accounts.
- To enlighten the students of various methods of costing.
- To make the students to calculate the stock level and differentiate between cost, management and financial accounting.
- To provide knowledge on various types of budgets.

COURSE OUTCOMES(CO)

On successful completion of the course, students should be able to achieve the following outcomes

CO Number	CO Statement
CO1	Explain the basic Accounting concepts and the procedure to prepare journal and ledger.
CO2	Prepare Final Accounts of sole proprietor concern.
CO3	Prepare the cost sheet.
CO4	Calculate the Pricing of Material Issues.
CO5	Explain the Budgetary control system and Prepare the various types of budgets.

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	✓	-	-	-	-	-	-	-	✓
CO2	-	-	-	✓	-	-	-	-	-	-	-	✓
CO3	-	-	-	✓	-	-	-	-	-	-	-	✓
CO4	-	-	-	✓	-	-	-	-	-	-	-	✓
CO5	-	-	-	✓	-	-	-	-	-	-	-	✓

SYLLABUS**UNIT –I****(Hours:12)**

Introduction – Accounting Principles – Branches of accounting – accounting rules - Journalising –

Ledger – Subsidiary book including cash books – Trial balance

UNIT – II**(Hours:12)**

Preparation of Final accounts: Trading, Profit and Loss Account and Balance sheet with simple adjustments – Outstanding Expenses and Income, Prepaid expenses, Pre received Income, Depreciation – Provision for bad debts

UNIT – III**(Hours:12) Cost**

Accounting: Meaning and elements of cost – Preparation of cost sheet with simple adjustments

UNIT – IV**(Hours:12) Cost**

Accounting: Meaning and Importance - Stores Ledger: FIFO – LIFO – Weighted average and Simple average method. Management Accounting: Its meaning and objectives – Difference between management accounting, financial accounting and cost accounting.

UNIT – V**(Hours:12) Budget**

and Budgetary control – Preparation of various budgets: Flexible budget – Production budget – Cash budget – Sales budget.

Text Books:

Recent editions of the following books only are recommended

S. No.	Author Name	Title of the Book	Publishers
1.	T. S. Reddy & A. Murthy	Financial Accounting	Margham Publication, Chennai
2.	K.L.Nagarajan, N.Vinayakam, P.L. Nagarajan	Principles of Accountancy S. Chand & Sons Company Limited	S. Chand & Sons Company Limited
3.	N.P.Srinivasan & Sakthivel Murugan	Accounting for management	S. Chand & Company Limited
4.	T.S.Reddy & Y Hari Prasad Reddy	Cost Accounting	Margham publications
5.	S.Reddy & Y Hari Prasad Reddy	Management Accounting	Margham publications

SEMESTER-IV

Programme Code:	All II- Year UG	Programme Title	Bachelor of Computer Science	
Course Code:	19U4SBST07	Skill Based Subject 7: Mathematics for Competitive Examinations -IV	Batch	2019-2022
			Semester	IV
Hrs/ Week	2 Hrs		Credits	1

COURSE OBJECTIVES

To enable the Students

To make the students to know the concept of Problems of Interest and Venn Diagrams

To solve problem related to Problems on Sequence and series.

To develop the skills in solving problems in Mental Ability and Logical reasoning.

COURSE OUTCOME (CO)

CO NO	CO Statements
CO1	Explicate the concept of finance and discover the inference using Venn- diagram.
CO2	Solve the problems on logarithms, area, Volume, Sequence and series.
CO3	Find solution to the problems on Tabulation, graphs and puzzles.

SYLLABUS**UNIT I****(6Hrs)**

Simple Interest-Compound Interest -Logical Venn Diagram

UNIT II**(6Hrs)**

Logarithms – Sequence and series

UNIT III**(6Hrs)**

Area-Volume and Surface areas

UNIT IV**(6Hrs)**

Tabulation-Bar Graphs-Puzzles

UNIT V**(6Hrs)**Pie Charts-line Graphs- Mental Ability and Logical reasoning
(Simple Problems only)**TEXT BOOK**

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	R. S. Agarwal	Quantitative Aptitude (for Competitive Examinations)	S. Chand and Company Limited	7 th Revised Edition - 2007

REFERENCE BOOK

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	R.V.Praveen	Quantitative Aptitude and Reasoning	PHI Learning pvt. Ltd	2012
2	Abhijit Guha	Quantitative Aptitude for Competitive Examinations	ata Mc-Graw Hill Publishing Company	7 th reprint-2003

WEBSITE REFERENCE

1. <https://www.careerbless.com/aptitude/qa/home.php>

2. <https://www.indiabix.com/>

Means of Curriculum Delivery : Lecture, Group Discussion, Seminar, Assignment, Google classroom

SEMESTER-IV

Programme Code:	B.Sc CS	Programme Title		
Course Code:	19U4SBST08	Skill Based Subject 8: Communication Skills -IV	Batch	2019-2022
			Semester	IV
Hrs/ Week	2 Hrs		Credits	1

COURSE OBJECTIVES:

- To know clearly the use of various symbols for pronouncing the words with proper sounds.
- To make aware of various techniques of reading and writing different reports.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students will be able to achieve the following outcomes.

CO Number	CO Statement
CO1	To be able to pronounce the words clearly with proper pronunciation.
CO2	Read the given materials properly and to write meaningful reports

SYLLABUS**UNIT-I : READING & WRITING**

1. Resume Preparation
2. Report Writing
3. Minutes of a Meeting
4. Data Representation and Interpretation
5. Memos

UNIT- II : SOUNDS & SYMBOLS

1. Vowels
2. Consonants
3. Diphthongs
4. Stress and Intonation

TEXT BOOKS:

Recent editions of the following books only are recommended

S. No	Author Name	Title of the Book	Publisher
1	Meenakshi Raman	Communication Skills	Oxford University Press
2	Shalini Aggarwal	Essential Communication Skills	Ane Books Pvt.Ltd. New Delhi

REFERENCE BOOKS:

S.No	Author Name	Title of the Book	Publisher
1	Course team, Bharathiyar University	Communication Skills a multi- skill course	Macmillan Publishers India LTD.
2	Krishna Mohan	Developing Communication Skills	Macmillan Publishers India LTD.
3	Joyce Pereire	Technical English – II	Vijay Nicole Imprints Pvt.Ltd.

Means of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Google Classroom.

SEMESTER – IV

Programme Code:	B.SC CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U4NMET02	NON MAJOR ELECTIVE 2 : FLORICULTURE	Batch	2019-2022
			Semester	IV
Hours/Week	2		Credits	2

COURSE OBJECTIVES:

- To learn about the cultivation of flowers and ornamental crops from the time of planting to the time of harvesting.
- To focus on the promotional and awareness aspects by motivating them to grow traditional as well as non-traditional floral crops and houseplants for commercial purpose.
- To learn the basics of growing and fertilizing plants and flowers.
- To learn design techniques and work on dried and live bouquets, arrangements, corsages and boutonnieres.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	Identify the basic classification of floricultural crops.
CO2	Understand the techniques and practices of production and use of floricultural crops.
CO3	Implement the techniques in gardening, arranging bouquets and shipping the cut flowers in Export & Import marketing

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	-	✓	✓	-	-	-	✓	-	-	-	-
CO2	✓	-	✓	✓	-	-	-	✓	-	-	-	-
CO3	✓	-	✓	✓	-	-	-	✓	-	-	-	-

SYLLABUS**UNIT I****(Hours: 6)**

Floriculture – Definition, Introduction and Scope of Floriculture. Status of floriculture in India. Development of Floriculture

UNIT II**(Hours: 6)**

Cut Flowers- Types of cut flowers, Arranging bouquets, Using floral design tools. Loose Flowers
Scope of loose flower trade, Significance in the domestic market/export.

UNIT III**(Hours: 6)**

Design- Types of design Flower choice for design, Corsages/Boutonnieres, Vase design, Basket/mug design.

UNIT IV**(Hours: 6)**

Propagation-Types of propagation, Annuals & Perennials, Varieties, Growing seasons, Potting techniques.

UNIT V**(Hours: 6)**

Careers in Floriculture. Export/Import and marketing in floriculture. Government Incentives and Schemes. The role of supporting agencies and how to start business.

TEXT BOOKS:

Recent editions of the following books only are recommended

S. No	Author Name	Title of the Book	Publisher
1	Dr.S.N.Suresh, Dr. V. subha <u>Priya and Dr. C. Initha</u> <u>LebanonEbency</u>	<u>Introduction to Floriculture</u>	Teachers Publishing House, First Edition, 2017

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	JacobVarghese Kunthara	<u>Know your Garden Plants</u>	H and C Books
2	Dr.B.Hemlanaik, Profess or & Head (Hort.) cum <u>Coordinator (PPMC)</u>	<u>Production Technology of Ornamental Crops and Landscape Gardening</u>	UAHS, Shimoga

Means of Curriculum Delivery: Lecture, Group Learning, Seminar, Assignment, Google Classroom.

SEMESTER IV

Programme Code :	B.SC CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U3BTLT02	Non Credit Course:2 Basic Tamil-II Title : அடிப்படைத் தமிழ்	Batch	2019-2022
Hrs/week	-		Semester	IV
			Credits	-

அகமதிப்பீட்டுத் தேர்வு மட்டும்

நோக்கம்:

- ஆத்திச்சூடி, கொன்றை வேந்தன், திருக்குறள் போன்ற நூல்களில் கூறப்பட்டுள்ள நீதிகளைத் தெரிந்து கொள்ளுதல்.
- தடையில்லாமல், பிழையில்லாமல் படிப்பதற்கு எளிமையான கதைகளைப் படித்துப் பழகுதல்.
- தமிழ் இலக்கியங்களின் வரலாறு மற்றும் சிறப்புகளை அறிந்து கொள்ளச்செய்தல்.
- தமிழக மக்களின் வாழ்க்கை முறை உணவுமுறை, கலாச்சாரம், பண்பாடு பற்றி அறிந்துகொள்ளச் செய்தல்.

பாடப்பகுதி கற்றலின் வெளிப்பாடு (Course Outcome)

CO Number	CO Statement
CO1	ஆத்திச்சூடி, கொன்றை வேந்தன், திருக்குறள் போன்ற நூல்களின் வழி அக்கால மக்கள் பின்பற்றிய நீதிகளை அறிந்து அதன்படி வாழ்தல்.
CO2	எளிமையான நூல்களைப் படிப்பதன் மூலம், பிழையில்லாமல், தெளிவான உச்சரிப்போடு கதைகளைப் படித்துப் பழகுதல்.
CO3	தமிழ் இலக்கியங்களின் வரலாறு மற்றும் அதன் சிறப்புகளை அறிந்து கொள்ளுதல்.
CO4	பழங்கால மக்களின் வாழ்க்கை முறை, பண்பாடு, கலாச்சாரம் ஆகியவற்றை அறிந்து கொள்ளுதல்.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	✓	-	-	-	-	-	-	-
CO2	-	-	-	-	-	✓	-	-	✓	-	-	-
CO3	-	-	-	-	✓	-	-	-	-	-	✓	-
CO4	✓	-	✓	-	-	-	-	-	-	-	-	-

நீதி நூல்கள் : ஆத்திச்சூடி (முதல் 12) “அறம் செய விரும்பு”, முதல் “ஒளவியம் பேசேல்” வரை.

கொன்றை வேந்தன் - “அன்னையும் பிதாவும் முன்னறி தெய்வம்” முதல் “எண்ணும் எழுத்தும் கண்ணெனத்தகும்” வரை (7)

திருக்குறள் (5) 1. அகர முதல... (1)

2. செயற்கரிய... (26)

3. மனத்துக் கண்... (34)

4. கற்க கசடறக்... (391)

5. எப்பொருள் யார் யார்... (423)

எளிய நீதிக் கதைகள் - (தெனாலிராமன் கதைகள், பீர்பால் கதைகள், கிராமியக் கதைகள், ஈசாப் கதைகள்)

தமிழ் இலக்கியங்கள் : வரலாறு – குறிப்பு – அறிமுகம்

எடுத்துக்காட்டு : குறள் பற்றி எளிய தொடர்களில் அறிமுகம்

தமிழகம் - உணவுமுறை, விழாக்கள், கலைகள் பற்றியக் குறிப்புகள்

	அக மதிப்பீட்டுத் தேர்வு மதிப்பெண் வழங்கும் முறை	மதிப்பெண்கள்
1	வகுப்புத்தேர்வு – 1	10
2	வகுப்புத்தேர்வு – 2	10
3	மாதிரித்தேர்வு	10
4	பயிற்சிக் கட்டுரை	10
5	வாய்மொழித் தேர்வு	10
	மொத்த மதிப்பெண்கள்	50

குறிப்பு : வாய்மொழித் தேர்வில் தமிழ்ச் செம்மொழி வரலாறு

தொடர்பான வினாக்கள் மட்டுமே கேட்கப்பட வேண்டும்.

SEMESTER IV

Programme Code :	12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு	Programme Title	Bachelor of Computer Science	
Course Code :	19U3ATLT02	Advanced Tamil-II # Title : சிறப்புத் தமிழ்;	Batch	2019-2022
Hrs/week	-		Semester	IV
			Credits	-

அகமதிப்பீட்டுத் தேர்வு மட்டும்

நோக்கம்:

- இளங்கலை பட்ட வகுப்பில் தமிழ் - பயிலாதவர்களுக்கு, தமிழ் இலக்கியத்தின் சிறப்பினை எடுத்துக்கூறுதல்.
- திருக்குறளின் சிறப்பை அறியச் செய்தல்.
- சொற்களைப் பயன்படுத்தும் முறைகளையும், வாக்கியப் பிழைகள் ஏற்படுவதைத் தவிர்க்கும் முறைகளையும் அறியச் செய்தல்.
- பேச்சு வழக்குகளில் நாம் பயன்படுத்தும் சொற்களையும், சொற்களில் உள்ள பிழைகளையும், சரியாகப் பயன்படுத்தும் சொற்களையும் தெரிந்து கொள்ளச் செய்தல்.
- மாணவர்களின் கற்பனைத்திறன், படைப்பாற்றல் திறமை மேம்படுத்த பயிற்சி அளித்தல்.

பாடப்பகுதி கற்றலின் வெளிப்பாடு (Course Outcome)

CO Number	CO Statement
CO1	தமிழ் இலக்கியங்களின் சிறப்பினை உணரச் செய்தல்
CO2	திருக்குறளின் வாயிலாக மக்களின் வாழ்க்கைமுறைகளை அறிதல்
CO3	வாக்கியங்களை பிழையில்லாமல் சரியான முறையில் எழுதுதல்.
CO4	பேச்சு வழக்கில் நாம் பேசும் போது ஏற்படும் மரபுபிழைகளைத் தவிர்த்தல் மற்றும் தகுதியான வழக்குச் சொற்களைப் பயன்படுத்துதல்.
CO5	திறமையான மாணவர்களை ஊக்குவித்து படைப்பாளர்களாக, கவிஞர்களாக உருவாக்குதல்.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	✓	-	-	-	✓	-	✓	✓
CO2	-	-	-	-	✓	-	-	-	-	-	-	-
CO3	-	-	-	-	✓	-	-	-	-	-	-	-
CO4	-	-	-	-	✓	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	✓	-	✓	✓	-	-

பாடத்திட்டம்

கூறு – 1 திருக்குறள் - ஒழிபியல் முதல் 5 அதிகாரங்கள் மட்டும்.

கூறு - 2 உரைநடை : (கட்டுரை)

(இளைஞர்களின் ஒளிமயமான எதிர்காலத்திற்கு - கு.வெ. பாலசுப்பிரமணியம்)

கூறு - 3 எழுத்துப்பிழை நீக்க வழிகள் - பிழையும் திருத்தமும், சொற்களைச் சரியாகப் பயன்படுத்தும் பாங்கு - வினைச்சொற்கள் துணை வினைகள் (எடுத்துக்காட்டுகளுடன் விளக்குதல்)

கூறு - 4 வழக்கறிதல் : மரபு வழக்கு - இயல்பு வழக்கு - தகுதி வழக்கு அறிதல்

கூறு - 5 படைப்பாற்றல் பயிற்சி - கட்டுரை எழுதுதல்.

	அக மதிப்பீட்டுத் தேர்வு மதிப்பெண் வழங்கும் முறை	மதிப்பெண்கள்
1	வகுப்புத்தேர்வு - 1	10
2	வகுப்புத்தேர்வு - 2	10
3	மாதிரித்தேர்வு	10
4	பயிற்சிக் கட்டுரை	10
5	வாய்மொழித் தேர்வு	10
	மொத்த மதிப்பெண்கள்	50

குறிப்பு : வாய்மொழித் தேர்வில் தமிழ்ச் செம்மொழி வரலாறு தொடர்பான வினாக்கள் மட்டுமே கேட்கப்பட வேண்டும்.

SEMESTER – IV

Programme Code:	B.Sc CS	Programme Title	Bachelor of Science (Computer Science)	
Course Code:	19U4SSCT02	Self Study Course 2: Women Rights**	Batch	2019-2022
			Semester	IV
Hours/ Week	-		Credits	1

COURSE OBJECTIVES:

- To make the women students understand the legal systems, constitutional frame work and human rights in India.
- To understand and appreciate the women's claims to land and their right to property.
- To make the women students to know fully about the laws enacted to protect women against violence, harassment sexual abuse and the loopholes in practice.
- To give a knowledge to the students about the various acts enacted relating to marriage validation, Hindu widow re- marriage, dowry prohibition, imortal traffic prevention, and women development and empowerment.

COURSE OUTCOMES (CO):

In Successful Completion of the course the students will be able to

CO Number	CO Statement
CO1	Explain clearly about the legal systems costitutional frame work and human rights.
CO2	Tell about their claims to land and right to property.
CO3	To explain about the various laws and acts enacted for protection of women from various kinds of violence and abuse, and for validating their marriage
CO4	Explain various acts available for women development and empowerment.

SYLLABUS**UNIT I**

Laws, Legal Systems and Change: Definition - Constitutional law, CEDAW and International Human Rights – Laws and Norms – Laws and Social Context – Constitutional and Legal Framework.

UNIT II

Politics of land and gender in India: Introduction – Faces of Poverty – Land as Productive Resources – Locating Identities – Women's Claims to Land – Right to Property - Case Studies.

UNIT III

Women's Rights: Access to Justice: Introduction – Criminal Law – Crime Against Women – Domestic Violence – Dowry Related Harassment and Dowry Deaths – Molestation – Sexual Abuse and Rape – Loopholes in Practice – Law Enforcement Agency.

UNIT IV

Women's Rights: Violence Against Women – Domestic Violence - The Protection of Women from Domestic Violence Act, 2005 - The Marriage Validation Act, 1982 - The Hindu Widow Re-marriage Act, 1856 - The Dowry Prohibition Act, 1961

UNIT V

Special Women Welfare Laws: Sexual Harassment at Work Places – Rape and Indecent Representation – The Indecent Representation (Prohibition) Act, 1986 - Immoral Trafficking – The Immoral Traffic (Prevention) Act, 1956 - Acts Enacted for Women Development and Empowerment - Role of Rape Crisis Centers.

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher	Year /Edition
1	Nitya Rao	Good Women do not Inherit Land	Social Science Press and Orient Blackswan	2008
2	Monica Chawla	Gender Justice	Deep and Deep Publications Pvt Ltd.	2006
3	<u>Preeti Mishra</u>	<u>Domestic Violence Against Women</u>	<u>Deep and Deep Publications Pvt Ltd.</u>	<u>2007</u>
4	P.D.Kaushik	Women Rights	Bookwell Publication	2007
5	Aruna Goal	Violence Protective Measures for Women Development and Empowerment	Deep and Deep Publications Pvt	2004

Means of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Google Class Room.

SEMESTER – V

Programme Code :	B.Sc	Programme Title	Bachelor of Computer Science	
Course Code :	19U5CSCT15	Core 15. ASP.Net and C# Programming	Batch	2019-2022
Hrs/week	5		Semester	V
			Credits	4

COURSE OBJECTIVES

To enable the students

- To learn about the basic concepts of ASP .NET.
- To learn about the ASP .NET object model and its architecture.
- To learn about the C# and its functions.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Understand about ASP.Net environment and its applications.
CO2	Know about the various forms in Visual Basic and Session controls.
CO3	Write various applications using C# Language in the .NET Framework.
CO4	Develop distributed applications using .NET Framework.
CO5	Create various applications using C#.Net framework

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**Unit I****(Hours - 15)**

Getting set up: ASP .NET? Setting up, environment, overview. Programming basics: basics, program flow, coding techniques, designing applications, dynamic website application, processing ASP .NET applications, visual basic .NET.

Unit II**(Hours - 15)**

Programming ASP .NET with Visual Basic .NET Web Forms and ASP .NET: web forms. ASP .NET configuration, Scope and State: Configuration, state, Application object, ASP Sessions, Session object and sample project.

Unit III**(Hours - 15)**

ASP .NET objects and components: scripting object model, components and controls, project example, more active components. Web services and ASP .NET: web service development, WSDL and SOAP, web services background. ASP .NET and SQL Server: using SQL server, using databases in ASP .NET, ActiveX data objects, ADO .NET object model, Coding SQL and Project.

Unit IV**(Hours - 15)**

Understanding .NET: C# framework - .Net strategy, origins, framework, CLR, base classes, Visual Studio .Net, languages, and benefits. Overview of C#: simple program, namespaces, main returning value, passing string objects, command line arguments, mathematical functions, compile time errors, structure. Literals, Variables and Data types.

Unit V**(Hours - 15)**

Operators and Expressions, Decision making and branching, Decision making and looping, Handling Arrays, Functions, Strings, File I/O.

TextBooks

Recent editions of the following books only are recommended

S. No	Author Name	Title of the Book	Publisher
1.	Dave Marcer	ASP .NET – A Beginner's Guide	Third Edition, McGraw Hill Education India Private Limited.
2.	E. Balagurusamy	Programming in C# - A Primer	Third Edition, Tata McGraw Hill Pvt Ltd.

Reference Books

S. No	Author Name	Title of the Book	Publisher
1.	Stephen C. Perry	Core C# and .NET	Pearson EduCStion.
2.	Karli Watson, Christian Nagel, Jacob Hammer Pedersen, Jon Reid, and Morgan Skinner	BEGINNING VISUAL C#	Wiley Publishing, Inc.

WEBSITE REFERENCES

1. <https://www.quora.com/What-is-the-difference-between-C-and-ASP-net>
2. <https://docs.microsoft.com/en-us/visualstudio/get-started/csharp/tutorial-aspnet-core>
3. <https://softwareengineering.stackexchange.com/.../relationship-between-c-net-asp-asp->
4. <https://stackoverflow.com/questions/.../whats-the-difference-between-asp-net-and-c>

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google Classroom

SEMESTER V

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	19U5CSCT16	Title : Core 16: PHP & MYSQL	Batch	2019-2022
			Semester	V
Hrs/week	5 hrs		Credits	4

COURSE OBJECTIVES

- Develops skills to create server-side scripts using PHP.
- Introduces server-side programming concepts and terminology.
- Explores a variety of server-side techniques and MySQL database manipulation.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Describe and use the features and syntax of programming language PHP
CO2	Create, translate, and process HTML information using the Common Gateway Information (CGI) protocol.
CO3	Apply PHP code to produce outcomes and solve problems.
CO4	Display and insert data using PHP and MySQL. Retrieve, insert, update, and delete data from the relational database MySQL
CO5	Test, debug, and deploy web pages containing PHP and MySQL.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I****Hours:15**

What is PHP? Why use PHP? Embedding PHP with HTML, Enhancing further, PHP Language Basics: Using variable in PHP, understanding Data types, operator and expressions. Making decisions: simple decision with if statements, switch, ternary operator, do..while loop, for statement, break, loop

skip iteration, nested loop, Function: calling functions, working with variable functions, own functions references, recursive functions.

UNIT II**Hours:15**

Arrays: creating and accessing array elements, looping through arrays, multidimensional array, manipulating array Strings: creating and accessing strings, searching strings, replacing text within strings and formatting strings.

UNIT III**Hours:15**

Handling HTML forms with PHP: HTML forms work, capture form data with PHP, multi value fields, web forms with PHP, storing PHP variables in forms, create file upload forms, redirecting PHP.

UNIT IV**Hours:15**

Introducing Database and SQL: Deciding how to store data, quick play with MYSQL, connecting to MYSQL from PHP, retrieving data from MYSQL with PHP.

UNIT V**Hours:15**

Manipulating MYSQL data with PHP insert, update, delete records- Working with files and directories: understanding files and directories, getting information on files, opening and closing files, reading files and writing files, file permissions, Copying, renaming and deleting files, working with directories. Case Study: Building a text editor (to be given as assignment).

Text books: (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	Matt Doyle	Beginning PHP 5.3	TataMcgraw Hill,2009.

Reference books:

S.No	Authors	Title	Publishers
1.	VikramVaswani	PHP: A Beginners guide	TataMcgraw Hill,2009.
2.	Lawpoint	Guide to PHPLP Computer series	2007.
3.	Larry Ullman	PHP 6 and MySQL 5	Pearson Education,2000

SEMESTER V

Programme Code :	B.Sc	Programme Title	Bachelor of Computer Science	
Course Code :	19U5CSCP17	Core 17 : ASP .NET AND C# - PRACTICAL	Batch	2019-2022
Hrs/week	6		Semester	V
			Credits	4

Course Objectives

To enable the students to gain knowledge about the teaching methodologies useful for the implementation and console based application and web based application.

Course Outcomes (CO)

At the end of the practical session, students would be well-versed in

CO Number	CO Statement
CO1	Design, create, build, and debug arithmetic operations for displaying numeric output using .NET applications.
CO2	Developing a console application in ASP .NET.
CO3	Compute different operations using looping statements.
CO4	Developing applications using C#

MAPPING WITH PROGRAM OUTCOMES

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	✓	✓	-	-	-	-	-	-	-	✓
CO2	-	✓	✓	-	-	-	-	-	-	-	✓
CO3	-	✓	✓	-	-	-	-	-	-	-	✓
CO4	-	✓	✓	-	-	-	-	-	-	-	✓
CO5	-	✓	✓	-	-	-	-	-	-	-	✓

Syllabus

S.No	Program List
1	Write a ASP .NET program to perform arithmetic operation.
2	Write a ASP .NET program for conversion of numbers
3	Write a ASP .NET program to develop a simple calculator.
4	Write a ASP .NET program to demonstrate the text control
5	Write a ASP .NET program to demonstrate the checkbox control.
6	Write a C# program using arrays.
7	Write a C# program for converting numbers into words.
8	Write a C# program for arithmetic operations
9	Write a C# program to check whether given string is a palindrome or no
10	Write a C# program to read number and check ODD or EVEN.
11	Write a C# program that prints out Fibonacci Series.
12	Write a C# program to convert from Fahrenheit to Celsius and Celsius to Fahrenheit

WEBSITE REFERENCES

www.codingfusion.com/Asp--Net-Practice-Questions

www.corporatebpl.com/cistuploads/DotNetMEAssignment.pdf

tusharkant.com/2013/04/asp-net-lab-manual-programs.html

<https://www.sanfoundry.com/csharp-programming-examples/>

<https://www.w3resource.com/csharp-exercises/>

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation

SEMESTER V

Programme Code :	B.Sc	Programme Title	Bachelor of Computer Science	
Course Code :	19U5CSCP18	CORE 18 : PHP & MY SQL Practical	Batch	2019 – 2022
Hrs/week	6 Hours		Semester	5
			Credits	3

• COURSE OBJECTIVES

- To develop the applications using PHP and MYSQL.
- To apply the concepts like looping, control statements arrays, function overloading and Database Management concepts.

• COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Choose the loops and decision making statements to solve the problem in PHP and MYSQL
CO2	Estimate PHP and MYSQL to demonstrate practical experience in developing solutions
CO3	Manipulate about viewing results by localhost in browser.
CO4	Manipulate about web server in browser
CO5	Manipulate about cookie and session

MAPPING WITH PROGRAMME OUTCOMES

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

PROGRAM LIST

1. Write a program to create different variables.
2. Develop a PHP program using controls and functions
3. Develop a PHP program to design a college application form using MYSQL table.
4. Write a program to send an HTML formatted Email in PHP.

5. Develop a PHP program to display student information using MYSQL table.
6. Write a program to do different types of Sorting in PHP.
7. Write a program to do String Manipulation in PHP.
8. Write a PHP program to get color code from the user which displays the color name.
9. Write a PHP program to do calculator functions
10. Write a program to upload a file in PHP.
11. Write a program for login authentication using PHP and MySQL
12. Create a Pay slip for an employee using PHP and MySQL
13. Write a program to demonstrate how a web page can communicate with a web server while a user type characters in an input field
14. Develop a PHP program using session
15. Develop a PHP program using cookie and session

WEBSITE REFERENCE

https://www.tutorialspoint.com/php/php_and_mysql.htm

https://www.w3schools.com/php/php_mysql_intro.asp

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Case studies and Google Classroom

SEMESTER-V

Programme Code :	B.Sc.	Programme Title	Bachelor of Computer Science
Course Code :	19U5NCCT01	Non Credit Course 1 : Aptitude and Soft Skills I	Batch 2019-2022
Hrs/week	3 Hours		Semester V
			Credits -

COURSE OBJECTIVES

To enable the Students

- To acquire inter personal skills, problem solving skills and be an effective goal oriented team player.
- To equip the students with the required soft skills that would instill confidence and courage in them, to take up new opportunities for their career.
- To know about improving various soft skills required while working in a team.
- To understand the various methods of solving problems involving numerical and logical reasoning.
- To understand the methods of solving certain problems not using calculations but using only mental ability.
- To know how to face the personal interview effectively.

COURSE OUTCOME (CO)

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

CO NO	CO Statements
C01	Apply the inter personal and problem solving skills in the placement drive.
C02	To apply the behavioural skills required for promoting individual competence by implementing the principles of interpersonal communication and value – based living to meet the market expectations.
C03	Grasp the approaches and strategies to solve problems with speed and accuracy.
C04	Ability to reason critically by analyzing , elevating and extending arguments.
C05	Explain the concepts deal with graphs, tables, number sequence and texts.

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	✓	✓	✓	-	✓	✓	-	-	✓	-	✓
CO2	-	✓	✓	✓	-	✓	✓	-	-	✓	-	✓
CO3	-	✓	✓	✓	-	✓	✓	-	-	✓	-	✓
CO4	-	✓	✓	✓	-	✓	✓	-	-	✓	-	✓
CO5	-	✓	✓	✓	-	✓	✓	-	-	✓	-	✓

Unit I: Soft Skills

1. Empathy
2. Intrapersonal Skills
3. Interpersonal Intelligence
4. Problem Solving Skills
5. Critical Thinking
6. Aptitude and Assessment Test

Unit II: Aptitude

Numerical Reasoning
Mental Ability
Logical Reasoning

Text Books:

Recent editions of the following books only are recommended

S. No.	Author Name	Title of the Book	Publisher
1	Prof .N. Lakshmana Perumal	Technical English – I	Sri Krishna Hitech Publishing Company (P) Ltd
2	R. S. Aggarwal	Quantitative Aptitude for Competitive Examinations,	English, Paperback

REFERENCE BOOK

S. No.	Author Name	Title of the Book	Publisher
1	Joyce Pereire	Technical English – II	Vijay Nicole Imprints Pvt.Ltd.

WEBSITE REFERENCE

1.*<http://www.indiabix.com>*

2.*<http://placement.freshersworld.com>*

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google classroom.

SEMESTER-V

Programme Code	B. Sc	Programme Title	Bachelor of Computer Science	
Course Code:	19U5SSCT03	Self Study Course III: General Awareness	Batch	2019-2022
			Semester	V
Hrs/ Week	–		Credits	1

COURSE OBJECTIVES:

- It aims at testing the candidates' general awareness and knowledge of current affairs occurring around the world and in India.
- Develops a commitment to citizenship, through the ability to make informed decisions about public issues.
- Create an awareness of the achievements and perspectives of people of different nations and cultures, and of different races, genders and ethnicities.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students will be able to:

CO Number	CO Statement
CO1	get familiar with general awareness of the environment around him and its apply it to the society.
CO2	reason logically, abstractly and understand numerical data comprehend arguments and positions that depend on numbers and statistics.
CO3	have a critical understanding of one's own values and of others, and of their role in making ethical choices.

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	✓	–	✓	✓	–	✓	–	✓	–	✓	✓
CO2	–	✓	✓	–	–	✓	–	–	–	✓	–	✓
CO3	–	✓	–	–	✓	–	–	✓	–	–	✓	✓

SYLLABUS

Unit I

Verbal Aptitude

History and Freedom Struggle

Unit II

Abstract Reasoning

Tamil and other Literature

Unit III

General Science and Technology

Computer

Unit IV

Economics and Commerce

Social Studies

Unit V

Sports

Current Affairs

TEXT BOOKS:

S. No	Author Name	Title of the Book	Publisher	Year /Edition
1	Compiled By Faculty, Department of English	General Awareness, Question Bank	KovaiKalaimagal College of Arts and Science, Coimbatore- 09	First Edition: 2021

Means of Curriculum Delivery : The students can study by themselves with the prescribed material.

SEMESTER-VI

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U6CSCT19	Title:Core 19: GRAPHICS AND MULTIMEDIA	Batch	2019-2022
			Semester	VI
Hrs/Week:	5 Hrs		Credits	3

COURSE OBJECTIVES

- To provide thorough knowledge to the students the basic concepts of Graphics & Multimedia .

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Explain two and three dimensional concepts and their applications
CO2	Identify all techniques related to modern graphics programming concepts
CO3	To understand 2D and 3D graphics and their transformations
CO4	To understand various clipping techniques
CO5	To understand various illumination and color models

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I****Hours:15**

Overview of Graphics Systems: Video Display Devices – Raster Scan Systems – Random Scan Systems – Graphics Monitors and Workstations – Input devices.

UNIT II**Hours:15**

Output Primitives: Points and Lines – Line-Drawing algorithms – Loading frame Buffer – Line function – Circle-Generating algorithms – Ellipse-generating algorithms. Attributes of Output Primitives: Line Attributes – Curve attributes – Color and Grayscale Levels – Area-fill attributes – Character Attributes.

UNIT III**Hours:15**

2D Geometric Transformations: Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations. 2D Viewing: The Viewing Pipeline – Viewing Co-ordinate Reference Frame – Window-to-Viewport Co-ordinate Transformation - 2D Viewing Functions – Clipping Operations.

UNIT IV**Hours:15**

Text: Types of Text – Unicode Standard – Font – Insertion of Text – Text compression – File formats. Image: Image Types – Seeing Color – Color Models – Basic Steps for Image Processing – Scanner – Digital Camera – Interface Standards – Specification of Digital Images – CMS – Device Independent Color Models – Image Processing software – File Formats – Image Output on Monitor and Printer.

UNIT V**Hours:15**

Audio: Introduction – Acoustics – Nature of Sound Waves – Types and Properties of Sound – Components of an Audio Systems – Digital Audio – Synthesizers – MIDI. Video: Introduction – Motion Video – Analog Video Camera – Analog Video Signal Representation – Television Systems – Video Color Spaces . Compression: Basic Concepts – Lossless Compression Techniques – Lossy Compression Techniques – Image Compression – Audio Compression.

TEXT BOOKS: (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers	Year of Publication
1.	Donald Hearn, M.Pauline Baker	Computer Graphics, UNIT-I: 3.1-3.6,4.1-4.5 & UNIT-II: 5.1-5.4,6.1-6.5)	2 nd edition, PHI	
2	Ranjan Parekh	Principles of Multimedia (UNIT III: 4.1-4.7,5.1-5.16 UNIT-IV:7.1-7.3,7.8-7.14,7.18-7.20,7.22,7.24,7.26-28 UNIT-V: 9.5-9.10,9.13,9.15,10.10-10.13)	2007, TMH	2007

REFERENCE BOOKS

S.No.	Authors	Title	Publishers	Year of Publication
1.	Amarendra N Sinha, Arun D Udai	Computer Graphics,,	TMH	
2	Tay Vaughan	Multimedia: Making it Work,	7 th edition, TMH	2002

WEBSITE REFERENCE

- 1.<https://www.Springpoint.com>/Java-Programming
- 2.<https://www.google.com>
- **Means Of Curriculum Delivery:** Lecture, Group Discussion, Seminar, Assignment, Case studies and Google Classroom

SEMESTER VI

Programme Code :	B.Sc	Programme Title	Bachelor of Computer Science	
Course Code :	19U6CSCT20	Core 20: SOFTWARE TESTING	Batch	2019-2022
			Semester	VI
Hrs/week	5		Credits	3

Course Objectives

- To make the students to understand Software Testing principles.
- To discuss the distinctions between types of testing.
- To understand the essential characteristic of tool used for test automation.

Course Outcomes (CO)

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

CO Number	CO Statement
CO1	List a range of different software testing techniques and strategies and be able to apply specific (automated) unit testing method to the projects.
CO2	Distinguish characteristics of structural testing methods
CO3	Demonstrate the integration testing which aims to uncover interaction and compatibility problems as early as possible
CO4	Discuss about the functional and system testing methods.
CO5	Demonstrate various issues for object oriented testing with planning, Management, Execution and Reporting.

Mapping With Program Outcomes

CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	✓	✓	-	-	-	-	-	-	-	✓
CO2	-	✓	✓	-	-	-	-	-	-	-	✓
CO3	-	✓	✓	-	-	-	-	-	-	-	✓
CO4	-	✓	✓	-	-	-	-	-	-	-	✓
CO5	-	✓	✓	-	-	-	-	-	-	-	✓

Syllabus**UNIT I****Hours:13**

Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. White-Box Testing: Static Testing – Structural Testing – Challenges in White-Box Testing.

UNIT II**Hours:12**

Black-Box Testing: What is Black-Box Testing? - Why Black-Box Testing? – When to do Black-Box Testing? – How to do Black-Box Testing? – Challenges in White Box Testing - Integration Testing: Integration Testing as Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash.

UNIT III**Hours:11**

System and Acceptance Testing: system Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing – Summary of Testing Phases.

UNIT IV**Hours:13**

Performance Testing: Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. Regression Testing: What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

UNIT V**Hours:11**

Test Planning, Management, Execution and Reporting: Test Planning – Test Management – Test Process – Test Reporting –Best Practices. Test Metrics and Measurements: Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.

TextBooks

Recent editions of the following books are only recommended

S.No.	Author Name	Title of the Book	Publisher
1.	Srinivasan Desikan, Gopalsamy Ramesh	Software Testing Principles and Practices	Pearson EduCStion

Reference Book s

S.NO	Author Name	Title of the Book	Publisher	Year
1.	William E Perry	Effective Methods of Software Testing	Wiley India	2015
2.	Renu Ranjani, Pradeep Oak	Software Testing	TMH	2007

Website References

- 1.<https://www.softwaretestingmaterial.com/software-testing/>
- 2.<https://www.guru99.com/software-testing-introduction-importance.html>
- 3.https://en.wikipedia.org/wiki/Software_testing
- 4.https://www.tutorialspoint.com/software_testing
- 5.<https://www.softwaretestinghelp.com/types-of-software-testing>

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google Classroom

SEMESTER – VI

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U6CSCP21	Title: CORE 21 : GRAPHICS AND MULTIMEDIA PRACTICAL	Batch	2019-2022
Hrs/Week:	6 Hrs		Semester	VI
			Credits	3

COURSE OBJECTIVES:

- To implement various graphics drawing algorithms, 2D-3D transformations and clipping techniques.
- To learn the basic principles of 3-dimensional computer graphics.
- This is an introductory course on principles of computer graphics. We will consider both 2D and 3D graphics.

COURSE OUTCOMES:

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

CO Number	CO Statement
CO1	To create interesting scenes. In particular, you will learn how to use lighting, shading, and animation to enhance scenes
CO2	Understand the Concepts of 2D & 3D object representation
CO3	Understand the 3D transformations to create a target practice game.
CO4	Develop an animation using GIMP
CO5	Develop to create Game using C++ program.

MAPPING WITH PROGRAMME OUTCOMES:

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

PROGRAM LIST

Multimedia

- Create Sun Flower using Photoshop.
- Animate Plane Flying in the Clouds using Photoshop.
- Create Plastic Surgery for the Nose using Photoshop.
- Create See-through text using Photoshop.
- Create a Web Page using Photoshop.
- Convert Black and White Photo to Color Photo using Photoshop.
- Design a Visiting Card containing at least One Graphic and Text Information.
- Take a photographic image, Give a title for the Image. Put the border. Write your names and the name of the institution and place.

Animation

- Changing the color
- Shape Animations
- Twinkle a star
- Simple games
- Graphics
- Moving a car
- rotate an image
- DDA Algorithms

WEBSITE REFERENCE

1. <https://www.google.com>

SEMESTER- VI

CORE 22: PROJECT VIVA - VOCE

Subject Code: 19U6CSCV22

Total Hours:75

No. of Credits: 4

Objective: To enable the students to apply practically in a specific area using any specific domain knowledge he/she possesses and get the results.

GUIDELINES FOR PROJECT WORK

1. The aim of the project work is to acquire practical knowledge on the implementation of the programming concepts studied.
2. Each student should carry out individually one project work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea focusing on application oriented concepts.
3. The project work should be compulsorily done in the college only under the supervision of the department staff concerned.

FINAL VIVA-VOCE

- Project work carries 100 marks with 4 credits.
- Internal Assessment: 80 marks (60 marks for 3 reviews and 20 marks for record)
- External Assessment : 20 marks (Viva-Voce).
- For awarding a pass, a candidate should have obtained 40% of the total 100 Marks.
- The evaluation would be done jointly by both the examiners (Internal and External). Students who fail in the project work and viva-voce examination or who are absent for the project viva-voce who fail to submit the project report before the due date will have to re-submit the project work and appear for the viva-voce examination during the subsequent year.

PROJECT WORK

TITLE OF THE DISSERTATION

**Bonafide Work Done by
STUDENT NAME
REG. NO.**

Dissertation submitted in partial fulfillment of the requirements
for the award of Bachelor of Information Technology Of
Bharathiar university, Coimbatore-46

College emblem

GUIDE

HOD

Submitted for the Viva-Vice Examination held on _____

Internal Examiner

External Examiner

MONTH – YEAR

CONTENTS

ACKNOWLEDGEMENT

CONTENTS

SYNOPSIS

1. INTRODUCTION

1.1 ORGANIZATION PROFILE

1.2 SYSTEM SPECIFICSTION

1.2.1 HARDWARE CONFIGURATION

1.2.2 SOFTWARE SPECIFICSTION

2. SYSTEM STUDY

2.1 EXISTING SYSTEM

2.1.1 DRAWBACKS

2.2 PROPOSED SYSTEM

2.2.1 FEATURES

3. SYSTEM DESIGN AND DEVELOPMENT

3.1 FILE DESIGN

3.2 INPUT DESIGN

3.3 OUTPUT DESIGN

3.4 DATABASE DESIGN

3.5 SYSTEM DEVELOPMENT

3.5.1 DESCRIPTION OF MODULES

(Detailed explanation about the project work)

4. TESTING AND IMPLEMENTATION

5. CONCLUSION

BIBLIOGRAPHY

APPENDICES

A. DATA FLOW DIAGRAM

B. TABLE STRUCTURE

C. SAMPLE CODING

D. SAMPLE INPUT

E. SAMPLE OUTPUT

F. REPORTS

SEMESTER VI

Programme Code :	B.Sc	Programme Title	Bachelor of Computer Science	
Course Code :	19U6SBST04	Non Credit Course 4 : Aptitude and Soft Skills II	Batch	2019-2022
			Semester	VI
Hrs/week	3 Hrs.		Credits	-

COURSE OBJECTIVES

To enable the students

- To acquire inter personal skills, problem solving skills and be an effective goal oriented team player.
- To equip the students with the required soft skills that would instill confidence and courage in them, to take up new opportunities for their career.
- To know about improving various soft skills required while working in a team.
- To understand the various methods of solving problems involving numerical and logical reasoning.
- To understand the methods of solving certain problems not using calculations but using only mental ability.
- To know how to face the personal interview effectively.

COURSE OUTCOMES (CO)

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

CO Number	Statements
C01	Apply the inter personal and problem solving skills in the placement drive.
C02	To apply the behavioural skills required for promoting individual competence by implementing the principles of interpersonal communication and value – based living to meet the market expectations.
C03	Grasp the approaches and strategies to solve problems with speed and accuracy.
C04	Ability to reason critically by analyzing , elevating and extending arguments.
C05	Explain the concepts deal with graphs, tables, number sequence and texts.

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	✓	✓	✓	-	✓	✓	-	-	✓	-	✓
CO2	-	✓	✓	✓	-	✓	✓	-	-	✓	-	✓
CO3	-	✓	✓	✓	-	✓	✓	-	-	✓	-	✓
CO4	-	✓	✓	✓	-	✓	✓	-	-	✓	-	✓
CO5	-	✓	✓	✓	-	✓	✓	-	-	✓	-	✓

SYLLABUS**Unit I: E- Materials**

Interactive Exercises for Grammar and Vocabulary

Audio/Video Excerpts of different Accents

Interpreting Posters

Unit II: Aptitude

1. Numerical Reasoning
2. Mental Ability
3. Logical Reasoning

Text Book:

Recent editions of the following books only are recommended

S. No.	Author Name	Title of the Book	Publisher
1	Prof .N. Lakshmana Perumal	Technical English – I	Sri Krishna Hitech Publishing Company (P) Ltd
2	R. S. Aggarwal	Quantitative Aptitude for Competitive Examinations,	English, Paperback

Reference Books:

S. No.	Author Name	Title of the Book	Publisher
1	Joyce Pereire	Technical English – II	Vijay Nicole Imprints Pvt.Ltd.

WEBSITE REFERENCE

- 1.<http://www.indiabix.com>
- 2.<http://placement.freshersworld.com>

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google classroom.

SEMESTER-V

Programme Code	B.Sc	Programme Title	Bachelor of Computer Science	
Course Code	19U5CSET1A	ELECTIVE 1: DATA MINING AND WAREHOUSING	Batch	2019-2022
Hrs/week	4		Semester	V
			Credits	3

COURSE OBJECTIVES

To enable the students

- To know the basics of data mining and warehousing.
- To Understand various techniques in data mining.
- To learn about architecture of data warehouse and its applications

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	To present survey on different learning, classification and data mining foundations.
CO2	To and methods for data Mining application.
CO3	To solve problems for multi-core or distributed, concurrent/Parallel environments.
CO4	To survey and use latest trends and advances in data mining and warehousing.

MAPPING WITH PROGRAMME OUTCOMES

CO /POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	✓	✓	-	-	-	-	-	-	-	-	-
CO2	-	✓	✓	-	-	-	-	-	-	-	-	-
CO3	-	✓	✓	-	-	-	-	-	-	-	-	-
CO4	-	✓	✓	-	-	-	-	-	-	-	-	-

Syllabus**UNIT I****(Hours: 10)**

Introduction –what Data mining – definition-KDD VS data mining DBMS VS Data mining-DM Techniques-Issues and challenges in data mining DM Application Area-DM Applications.

Association rules: Introduction –What is association rules-Methods for discovering association rules-A-priori algorithm-partition algorithm-Rapid association rule mining-incremental algorithm.

UNIT II**(Hours: 10)**

Classification: Introduction –statistical based algorithm-distance based algorithm-decision tree based algorithm-neural network based algorithm.

UNIT III**(Hours: 10)**

Clustering – Introduction-similarity and distance measures-outliers-hierarchical algorithms-Partition algorithms.

Decision Trees – What is Decision Tree – Tree construction principal – Best Split – Splitting Indices – Splitting Criteria.

UNIT IV**(Hours: 9)**

Data warehousing : An introduction – Characteristics of a data warehouse- Data marts - Other aspects of data marts – Online Analytical Processing.

UNIT V**(Hours: 9)**

Developing a Data Warehouse – Applications of Data Warehouse and Data Mining in Government – case Study.

TEXT BOOK S

Recent editions of the following books only are recommended

S.No.	Author Name	Title of the Book	Publisher
1.	Margaret H.dunhum	Data mining	Pearson publisher
2.	Arun K.Pujar	Data Mining Techniques	Universities Press (India) Limited

REFERENCE BOOKS

S.No.	Author Name	Title of the Book	Publisher
1.	George M. Marakas	Modern Data warehousing, Mining and Visualization	Printice Hall
2	Jiwei Han, Michelien Kamber	“Data Mining Concepts and Techniques”	Morgan Kaufmann Publishers an Imprint of Elsevier

WEBSITE REFERENCES

- 1.www.vssut.ac.in/lecture_notes/lecture1428550844.pdf
- 2.https://www.tutorialspoint.com/dwh/dwh_overview.htm
- 3.<https://www.educba.com/Data Science/Blog/Head to Head Differences>
- 4.<https://www.trifacta.com/data-warehousing-and-data-mining/>

Means of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Google Classroom

SEMESTER – V

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U5CSET1B	TITLE: ELECTIVE : 1 MOBILE COMPUTING	Batch:	2019-2022
			Semester:	V
Hrs/Week:	4 Hrs		Credits:	3

COURSE OBJECTIVES

- On Successful Completion of this subject the students should have knowledge on Mobile Computing.
- To introduce the mobile communication fundamentals.
- To enable the students to know about GSM and GPRS Technologies.
- To make the students learn and understand 3G, 4G and 5G Technologies.

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Explain the fundamentals of mobile computing.
CO2	Describe Mobile Computing through Telephony.
CO3	Enumerate the Emerging Technologies with GSM.
CO4	Elucidate on GPRS and WAP Technologies.
CO5	Determine CDMA and 3G Concepts and Implementation.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I****Hours: 12**

Introduction: Mobility of Bits and Bytes –Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services- Developing Mobile computer Applications – security in mobile computing – Standards - Why is it necessary – Standard bodies. **MOBILE COMPUTING ARCHITECTURE:** History of computers and Internet – Architecture for mobile computing – Three-tier architecture – Design considerations for mobile

computing – Mobile computing through Internet – Making existing applications mobile enabled

UNIT II**Hours: 12**

MOBILE COMPUTING THROUGH TELEPHONY: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI

UNIT III**Hours: 12**

EMERGING TECHNOLOGIES: Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 – Java Card. **GSM** : Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations – Authentications and Security.- **SMS**

UNIT IV**Hours: 12**

GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Application for GPRS- Limitations – Billing and Charging. **WAP** : MMS – GPRS Applications

UNIT V**Hours: 12**

CDMA and 3G: Spread spectrum technology – IS-95 – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G **WIRELESS LAN:** Wireless LAN advantages – IEEE 802.11 standards – Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile adhoc networks and sensor networks – Wireless LAN Security – WiFi vs 3G

TEXT BOOKS (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	Asoke K Talukder , Roopa R Yavagal	MOBILE COMPUTING	TMH, 2005 , 2nd Edition.

REFERENCES BOOKS

S.No	Authors	Title	Publishers
1.	J.Schiller.	Mobile Communications,	Second Edition, Second Impression, Pearson Education Limited

WEBSITE REFERENCE

1. <https://www.tutorialpoint.com/mobile computing.>
2. <https://www.mobilecomputing.com.ar>
3. <https://www.cebsworldwide.com/mobile computing.>

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Case studies and Google Classroom.

SEMESTER:V

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U5CSET1C	ELECTIVE 1 : EMBEDDED SYSTEMS	Batch	2019-2022
Hrs/Week:	4 Hrs		Semester	V
			Credits	3

COURSE OBJECTIVES

- To make the students to have basic Knowledge and understanding of fundamental embedded systems design paradigms, architectures, possibilities and challenges, both with respect to software and hardware
- Ability to analyze a system both as a whole and in parts and their interaction in the functionality and properties of the system.
- To make the students to have a clear understanding on industrial embedded systems and intelligent embedded system development.

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Understand what is a microcontroller, microcomputer, embedded system
CO2	Understand different components of a micro-controller and their interactions
CO3	Become familiar with programming environment used to develop embedded systems
CO4	Understand key concepts of embedded systems like IO ,timers, interrupts, interaction with peripheral devices
CO5	Learn debugging techniques for an embedded system

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I****Hours: 12**

Introduction To Embedded System: Embedded System - Processor Embedded Into a System - Embedded Hardware Units And Devices In a System - Embedded Software In a System - Examples Of Embedded System - Embedded System-On-Chip(Soc)And Use Of VLSI Circuit Design Technology. Memory Organization: Processor And Memory Organization – Memory Types - Memory Maps And Address – Processor Selection - Memory Selection.

UNIT II**Hours: 12**

Devices And Communication Buses For Devices Network: IO Types And Examples - Serial Communication Devices - Parallel Device Ports - Sophisticated Interfacing Features In Device Ports - Wireless Devices - Timer And Counting Devices - ISR Concept - Interrupt Sources - Interrupt Servicing(Handling)Mechanism - Multiple Interrupt.

UNIT III**Hours: 12**

Programming Concept And Embedded Programming In C, C++ & Java: Software Programming In Assembly Language(Alp) and In High Level Language 'c' – C Program Element: Header and Source File And Preprocessor Directives - Program Elements: Macro And Functions - program Elements : Data Types, Data Structures, Modifiers, Statements, Loops And Pointers - Object - Oriented Programming - Embedded Programming In C++ - Embedded Programming In Java.

UNIT IV**Hours: 12**

Inter Process Communication And Synchronization Of Process,Threads And Tasks: Multiple Processes In An Application - Multiple Threads In An Application – Tasks - Inter Process Communication - Message Queue Function - Mailbox Function - Pipe Function - Socket Function – RPC Function.

UNIT V**Hours: 12**

Real Time Operating System: OS Services - Process Management - Timer Function - Event Function - Memory Management – Devices, Files and IO Sub System Management - Interrupt Routines RTOS Environment And Handling Of Interrupt Source Calls - Real-Time Operating System -Basic Design Using An RTOS - RTOS Task Scheduling Models, Interrupt Latency And Response Of The Task As Performance Metrics.

Text books: (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	Raj Kamal	Embedded Systems – Architecture , Programming and Design	TATA McGRAW-HILL EDITION, New Delhi.2007.

WEBSITE REFERENCE

- <https://www.elprocus.com/basics-of-embedded-system-and-applications/>
- <https://www.electronics-notes.com/articles/digital-embedded-processing/embedded-systems/basics-primer.php>
- https://www.tutorialspoint.com/embedded_systems/

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment,Case studies andGoogleClassroom

SEMESTER:V

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U5CSET2A	ELECTIVE 2 : E-COMMERCE	Batch	2019-2022
Hrs/Week:	4 Hrs		Semester	V
			Credits	3

COURSE OBJECTIVES

To enable students

- To have knowledge on concepts of e-Commerce.
- To enhance the knowledge in business strategy and inter organisational transactions.
- To understand the concepts of E-Markets, Electronic Data Interchange and E-Business.

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Understand the basic concepts and technologies used in the field of management information systems;
CO2	Have the knowledge of the different types of management information systems
CO3	Understand the processes of developing and implementing information systems
CO4	Be aware of the ethical, social, and security issues of information systems
CO5	Understand the E-Wallet operation

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT – I****(Hours - 15)**

Introduction to E-Commerce : Electronic Commerce – The Scope of Electronic Commerce – Definition of Electronic Commerce - Electronic Commerce and the Trade Cycle - Electronic Markets - Electronic Data Interchange – Internet Commerce – e-Commerce in perspective. **Business Strategy in an Electronic Age:** The Value chain – Supply Chains Porter's Value Chain Model – Inter Organisational Value Chains.

UNIT – II**(Hours - 15)**

Business Strategy: Introduction to Business Strategy – Strategic Implications of IT – Technology – Business Environment – Business Capability – Existing Business Strategy – Strategy Formulation & Implementation Planning – e-Commerce Implementation – e-Commerce Evaluation. **Inter-organisational Transactions:** Inter-organisational Transactions – The Credit Transaction Trade Cycle – A Variety of Transactions.

UNIT – III**(Hours - 15)**

Electronic Markets: Markets - Electronic Markets – Usage of Electronic Markets – Advantages and Disadvantages of Electronic Markets. **Electronic Data Interchange:** Introduction to EDI – EDI Definition – The Benefits of EDI – EDI Example – EDI Implementation – EDI Agreement – EDI Security.

UNIT – IV**(Hours - 15)**

The Internet: The Internet – The Development of the Internet – TCP/IP – Internet Components – Uses of Internet. **A Page on the Web:** HTML Basics – Introduction to HTML – Further HTML – Client Side Scripting – Server Side Scripting – HTML Editors and Editing. **The Elements of E-Commerce :** Elements – e-Visibility – The e-Shop – Online Payments – Delivering Goods – Internet e-Commerce Security.

UNIT – V**(Hours - 15)**

Introduction to E-Wallet operation: What is an e-wallet-benefits of Wallet-risks-types of ewallet:paytm,MobiKwik,oxigenWallet,CitrusWallet,ItsCash,FreeCharge,AirtelMoney,Jiomoney,mRuppee,S BIBuddy,Vodafone M-Pesa.Advantages and disadvantages of digital Wallet.

TEXT BOOKS: (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	David Whitely	E-Commerce Strategy, Technologies, and Applications	McGraw Hill Education (India) Edition 2001 32 nd reprint 2013

REFERENCE BOOKS:

S.No	Authors	Title	Publishers
1.	Dr C.S. Rayudu	E-Commerce E- Business	SHimalaya Publishing House, First Edition 2004, Reprint 2012
2.	Nidhi Dhawan	E-Commerce Concepts and Applications	<i>International Book House Pvt Ltd First Edition 2011</i>
3.	Efrain Turban, David King	Electronic Commerce	Pearson Education, 2009

WEBSITE REFERENCE

<https://en.wikipedia.org/wiki/E-commerce>

<https://ecommerceguide.com/guides/what-is-ecommerce/>

<https://www.youtube.com/watch?v=AhgtoQIfuQ4>

SEMESTER – V

Programme Code	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U5CSET2B	ELECTIVE 2 :CLIENT SERVER TECHNOLOGY	Batch	2019-2022
			Semester	V
Hrs/ Week	4 Hrs		Credits	3

COURSE OBJECTIVES

- To understand the concepts of client/server
- To learn the components of client and server application-Client & Server
- To learn the components of client and server application-Connectivity
- To learn the components of client and server application-Software & Hardware

COURSE OUTCOMES (CO):

In Successful Completion of the course the students will be able to

CONumber	CO Statement
CO1	Use Human/Computer Interaction design principles and best practices for graphical user interface design and development.
CO2	Design and implement advanced graphical user interfaces using basic and advanced Swing components such as JTable and JTree.
CO3	Manage components using advanced layout techniques of Group Layout and Grid Bag Layout.
CO4	Use I/O Object serialization.
CO5	Use the Components of Client/Server Applications–Hardware

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	✓	-	-	-	-	-	-	-	✓	-
CO2	-	-	✓	-	-	✓	-	-	-	✓	✓	-
CO3	-	-	✓	-	-	✓	-	✓	-	-	✓	-
CO4	-	-	✓	-	-	✓	-	✓	-	-	✓	-
CO5	-	-	✓	-	-	✓	-	✓	-	-	✓	-

SYLLABUS**UNIT I****Hours:12**

Client/Server Computing :Mainframe -Centric Client/Server Computing-Downsizing and

Client/Server Computing .Advantages of Client / Server Computing -Connectivity –Ways to improve Performance –How to reduce network Traffic

UNIT II**Hours:12**

Components of Client/Server Applications –The Client: Role of a Client –Client Services – Request for Service-RPC. Components of Client/Server Applications –The Server: The Role of a Server –Server Functionality in Detail –The Server Operating system.

UNIT III**Hours:12**

Components of Client/Server Applications –Connectivity: Open System Interconnect – Communications Interface Technology – Inter process communication –WAN Technologies.

UNIT IV**Hours:12**

Components of Client/Server Applications–Software: Factors Driving demand for application software development –Rising Technology Staff costs –Need to improve Technology –Need for Common Interface across Platforms –Client/Server System Development Methodology-OOP.

UNIT V**Hours:12**

Components of Client/Server Applications–Hardware: Hardware/Network Acquisition –PC-Level Processing Units –Macintosh, notebooks, Pen –UNIX Workstation –x-terminals –Disk, Tape, Optical Disks, NIC and UPS. The Future of Client/Server Computing: Enabling Technologies – Transformational Systems.

TEXT BOOKS: (Recent Edition of the following books only are recommended)

S.No	Author Name	Title of the Book	Publisher	Year /Edition
1	Patrick N.Smith with Steve L.Guengerich	Client/Server Computing	PHI	2012

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher	Year /Edition
1	Robert Orfali, Dan Harkey, Jeri Edwards	The Essential Client/Server Survival Guide	PHI	2014

Means of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Case Studies, Google Classroom.

SEMESTER – V

Programme Code	B.Sc	Programme Title	Bachelor of Computer Science	
Course Code	19U5CSET2C	ELECTIVE 2: Software Project Management	Batch	2019-2022
Hrs/week	4		Semester	V
			Credits	3

COURSE OBJECTIVES

- To get knowledge of how to handle project development activities
- To understand the threats and opportunities in Project managements
- To study various project cost, time estimation models.
- To study how to make quality software products.
- To Appreciate management issues like team structure and group dynamics

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Apply project management concepts and techniques to an IT project.
CO2	Identify issues that could lead to IT project success or failure.
CO3	Explain project management in terms of the software development process.
CO4	Describe the responsibilities of IT project managers.
CO5	Apply project management concepts through working in a group as team leader or active team member on an IT project

Mapping With Programme Outcomes

CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	✓	□	-	-	-	-	-	-	-	✓	-
CO2	-	✓	□	-	-	✓	-	-	-	✓	✓	-
CO3	-	✓	□	-	-	✓	-	✓	-	-	✓	-
CO4	-	✓	□	-	-	✓	-	✓	-	-	✓	-
CO5	-	✓	□	-	-	✓	-	✓	-	-	✓	-

SYLLABUS

UNIT I

Hours:10

SOFTWARE PROJECT MANAGEMENT: Introduction, Need for Software Project Management – Software Project versus other projects – Overview of Project planning – SDLC Models –Waterfall model, Iterative model, Spiral model, V-model, Big Bang model.

UNIT II**Hours:10**

PROJECT EVALUATION : Introduction, Strategic assessment, Technical Assessment, Cost benefit Analysis, cash flow forecasting, Cost benefit Evaluation Techniques Risk Evaluation – Selection of appropriate project planning.

UNIT III**Hours:14**

ACTIVITY PLANNING: Objectives of activity planning, Project schedules, Projects and activities, Sequencing and scheduling activities, Network Planning models – Formulating network models, Using dummy activities, Identifying critical path, identifying critical activities. Risk Analysis and Management: Nature of risk, Managing risk, Risk identification, Risk analysis, reducing the risks, evaluating the risks.

UNIT IV**Hours:14**

SOFTWARE EFFORT ESTIMATION: Problems with over and under estimate, the basis for software estimation, software estimation Techniques. Expert judgments, Estimating by analogy, Function point analysis. Resource Allocation: Identifying resource requirements, Scheduling resources, Monitoring and control, Managing people and organization teams.

UNIT V**Hours:12**

PROJECT MANAGEMENT : Project Management in the Testing phase – Introduction, test scheduling, test types, issues, management structures for testing, metrics for testing phase, Project Management in the Management phase – Introduction, activities, management issues, configuration management, estimating size, effort and people resources, advantages, metrics.

TEXT BOOK

S.No.	Authors	Title	Publishers	Year of Publication
1.	Bob Hughes and Mike Cotterell,	Software Project Management	Tata McGraw Hill 5th Edition	Nil
2	Dr. Gopalaswamy Ramesh	Managing Global Software Projects	TMH.	2001

REFERENCE BOOKS

S.No	Authors	Title	Publishers	Year of Publication
1.	Walker Royce	Software Project Management	Addison Wesley	1998
2.	Stellman & Greener	Applied software project management	SPD	nil

WEBSITE REFERENCE

- <https://www.google.com>

SEMESTER-VI

Programme Code	B.Sc	Programme Title	Bachelor of Computer Science	
Course Code	19U6CSET3A	Elective 3 : Artificial Intelligence and Expert System	Batch	2019-2022
Hrs/week	4		Semester	V
			Credits	3

Course Objectives

To enable the students

- To Understand different planning problems and have the basic knowledge how to design and implement AI planning systems
- Understand the strengths and limitations of various state-space search algorithms and choose the appropriate algorithms for a problem.

Course Outcomes (CO)

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

CO Number	CO Statement
CO1	Explain the strengths and limitations of various state-space search algorithms and choose the appropriate algorithms for a problem
CO2	Learn the basics of the theory and practice of Artificial Intelligence as a discipline about intelligent agents capable of decision making.
CO3	Apply knowledge representation techniques and problem solving strategies to common AI applications
CO4	Design simple software to experiment with various AI concepts and analyze results
CO5	Build self-learning and research skills to be able to tackle a topic of interest on his/her own or as part of a team

Mapping With Programme Outcomes

CO\ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	□	□	-	-	-	-	-	-	-	-	-
CO2	-	□	□	-	-	✓	✓	-	-	-	✓	✓
CO3	-	□	□	✓	-	✓	✓	-	-	-	✓	✓
CO4	-	□	□	✓	-	✓	✓	-	-	-	✓	✓
CO5	-	□	□	✓	-	✓	✓	-	-	-	✓	✓

SYLLABUS

UNIT - I

(Hours : 10)

Artificial Intelligence : The AI Problems, What is an AI Technique, Criteria for success, Problem Characteristics, Issues in the design of search programs, Components of AI, AI Evolution, Application areas of AI, History of AI, The Turing Test, The Revised Turing Test.

UNIT -II

(Hours : 10)

Knowledge Representation: Knowledge Representation Issues, Representations and Mappings,

Approaches to Knowledge Representation, Issues in Knowledge Representation, The Frame problem, Procedural versus Declarative Knowledge, Matching, Control Knowledge.

UNIT -III**(Hours : 10)**

Expert System: Components of Expert System: Knowledge Base, Inference Engine, User Interface, Features of Expert System, Expert System Life Cycle, categories of Expert System, Rule Based vs. Model Based Expert Systems, Advantages/Limitations of Expert System

UNIT -IV**(Hours : 10)**

AI and Search Process: Brute Force Search –Depth First/Breadth First Search, Heuristic Search: Hill Climbing, Constraint Satisfaction, Mean End Analysis, Best First Search, A* Algorithm, AO* Algorithm, Beam Search.

UNIT -V**(Hours : 10)**

Natural Language Processing: Introduction, Need, Goal, Fundamental Problems in Natural Language Understanding, How People overcome Natural Language Problems. Speech Recognition: Introduction, Advantages and Approaches, Introduction to Robotics: Parts of a Robot, Controlling a Robot, Intelligent Robots, Mobile Robots.

Text Books

Recent editions of the following books are only recommended

S. No	Author Name	Title of the Book	Publishers
1.	Elaine Rich, Kevin Knight, Shivashankar B Nair	Artificial Intelligence	Tata McGraw Hill , 3 rd Edition
2.	Stuart Russell, Peter Norvig	Artificial Intelligence A Modern Approach	Tata McGraw Hill , 2 nd Edition

Reference Books

S. No	Author Name	Title of the Book	Publishers
1.	V S Janakiraman K Sarukesi P Gopalakrishnan	Artificial Intelligence and Expert Systems	Macmillan India Ltd, 2001
2.	Elaine Rich, Kevin Knight,	Artificial Intelligence	Tata McGraw Hill , 2 nd Edition

WEBSITE REFERENCES

1. <https://www.techopedia.com/definition/190/artificial-intelligence-ai>
2. https://en.wikipedia.org/wiki/Artificial_intelligence
3. <https://www.techopedia.com/definition/190/artificial-intelligence-ai>
4. https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_overview.h
5. <https://www.britanniCS.com/technology/artificial-intelligence>

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google Classroom

SEMESTER – VI

Programme Code :	B.Sc	Programme Title	Bachelor of Computer Science	
Course Code :	19U6CSET3B	Elective 3: Software Testing- Practical	Batch	2019-2022
			Semester	VI
Hrs/week	5		Credits	3

Course Objectives

- To understand software test automation problems and solutions.
- To learn how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.
- To gain the techniques and skills on how to use modern software testing tools to support software testing projects.

Course Outcomes (CO)

Upon successful completion of this lab Course, student should be able to

CO Number	CO Statement
CO1	Find practical solutions to the problems.
CO2	Solve specific problems alone or in teams manage a project from beginning to end
CO3	Define, formulate and analyze a problem
CO4	Developing applications and Test them
CO5	Find practical solutions to the problems.

Mapping With Programme Outcomes

CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	✓	✓	-	-	-	-	-	-	-	✓
CO2	-	✓	✓	-	-	-	-	-	-	-	✓
CO3	-	✓	✓	-	-	-	-	-	-	-	✓
CO4	-	✓	✓	-	-	-	-	-	-	-	✓
CO5	-	✓	✓	-	-	-	-	-	-	-	✓

Program list

S.No	Programs
1	Performing a test in the Apache JMeter Testing Tool to implement the factorial concepts.

Scheme and Regulations (SR -4) -2019-2022 –CS

2	Performing a test in the Apache JMeter Testing Tool to analyze the suitable problem and displaying the results.
3	Performing a test in the Apache JMeter Testing Tool to find the fibonaaci series.
4	Creating test cases and testing the functionality of calculator.
5	Creating test cases and testing the java Program which generates sum of a individual digit of a 5-digit number until a single digit is produced.
6	Testing the java program: Sort and store the elements two arrays of integers into the third list.
7	Testing the java program: multiple inheritance.
8	Testing the java Program: Palindrome string checking program.
9	Testing the java Program: String Manipulation.
10	Testing the java Program: Employee details using constructors.

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation

SEMESTER V

Programme Code :	B.Sc CS	Programme Title	Bachelor of Science (Computer Science)	
Course Code :	19U6CSET3C	ELECTIVE 3 :ENTERPRISE RESOURCE PLANNING	Batch	2019-2022
			Semester	VI
Hrs/week	4		Credits	3

COURSE OBJECTIVES

- To develop the capability to streamline the different organizational processes and work flows in ERP and to understand the ways of Improving efficiency, performance, and productivity levels of ERP Projects.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Understanding the challenges associated with managing extant ERP systems.
CO2	Learn the forces and organizational conditions leading to the acquisition of such enterprise wide systems.
CO3	The opportunity to identify extant and missing organizational competencies that may be drawn upon to create an appropriate ERP implementation method.
CO4	Understanding of issues and decisions that must be made when embarking upon a ERP selection and implementation journey.
CO5	Understand and implement the ERP tools for integrated system

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I****Hours:12**

ERP: Introduction : Define – Functional Module in ERP System – Evolution of ERP Systems - Characteristics of ERP – Process Intergration With ERP Systems. Benefits of ERP Applications – Technology Behind ERP Systems. **ERP Market and Vendors:** ERP Market – ERP Vendors – Service Oriented Architecture - ERP Package features.

UNIT II**Hours:12**

Extended ERP Services: Defining Extended ERP – SCM and ERP – ERP and BI – ERP and E-Commerce. **Business Process Re-engineering And ERP:** Defining Business Process Reengineering- Enterprise redesign principles – Business process reengineering - BPR and Change Management – Different Approaches BPR Implementaion – Methodology for BPR Implementaion – Role of IT in BPR – BPR and EPR Systems – BPR sucess / failure factors.

UNIT III**Hours:12**

Planning for ERP – Planning for ERP Implementaion – Understanding Organizational Requirements. - Understanding Economic and Strategies Justification – Analysing Project Scope – Determing Resources – Creating Budget for ERP Implementaion – Selecting the Right ERP Package- Preparing Organizations for ERP Implementaion. **Implementation of ERP:** Designing for ERP systems – ERP implementaion approaches – ERP implementaion Life cycle.

UNIT IV**Hours:12**

Managing ERP Projects: Risk Failure factors in ERP Implementaion – Examples of ERP Failure- Mitigating implementaion risks – Management and complexity of Large scale ERP Projects- Training users to use ERP Systems. - Evaluating ERP Projects.

UNIT V**Hours:12**

ERP Going live and post implementaion: Preparing to go live – Strategies for migration – to new ERP systems – Go live performance surprises – Managing ERP after go live – Maintenance of ERP Systems. **Expanding ERP Boudaries:** Service oriented architecture – Enterprises application integration – Application Services provider – Model for ERP implementaion.

TEXT BOOKS: (Recent Edition of the following bools only are recommended)

S.No	Authors	Title	Publishers
1.	Ashim raj singla	Enterprise Resource Planning	Cengage Learning india Pvt . Ltd., 2008.

REFERENCE BOOKS:

S.No	Authors	Title	Publishers
1.	Alexis Leon	ERP Demystified	II Edition , Tata McGraw Hill, New Delhi, 2000Alexis Leon," Enterprise Resource Planning: II Edition, Tata McGraw Hill.

WEBSITE REFERENCE

https://www.tutorialspoint.com/management.../enterprise_resource_planning.htm

<https://www.saponlinetutorials.com/what-is-erp-systems-enterprise-resource-planning/>

SEMESTER – VI

Programme code:	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code:	19U6CSET4A	ELECTIVE 4: COMPILER DESIGN	Batch	2019-2022
			Semester	VI
Hrs/Week:	4 Hrs		Credits	3

COURSE OBJECTIVES

- To learn the fundamentals of Compiler Designs
 - To gain knowledge on High level Programming languages
 - To gain an insight into the lexical Analysis components viz. the algorithms for implementation of finite automata
- To know the components and management aspects of parsing tables, types of Error and the methods Detection and Recovery

COURSE OUTCOMES

- On the successful completion of the course, students will be able to achieve the following Outcomes

CO Number	CO Statement
CO1	Specify and analyse the lexical, syntactic and semantic structures of advanced language features
CO2	Separate the lexical, syntactic and semantic analysis into meaningful phases for a compiler to undertake language translation
CO3	Write a scanner, parser, and semantic analyser without the aid of automatic generators
CO4	Describe techniques for intermediate code and machine code optimisation
CO5	Design the structures and support required for compiling advanced language features.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS

UNIT I**Hours:12**

Introduction to Compilers: Compilers and Translators – The Structure of a Compiler Lexical Analysis – Syntax analysis – Intermediate Code generation – Optimization – Code generation- Book keeping – Error handling – Compiler writing tools. **Programming languages:** High level Programming languages- Definitions – lexical and Syntactic structure of a language – data elements data structures – operators – assignment – statements.

UNIT II**Hours:12**

Finite Automata and lexical Analysis: The role of the lexical analyzer – simple approach – regular expressions -finite automata – from regular expressions to finite automata – minimizing the number of states – implementation of lexical analyzer.**The Syntactic Specifications of programming languages :** Context free Grammers – Derivations and Parse Trees – Capabilities of Context free Grammers.

UNIT III**Hours:12**

Basic Parsing Techniques: Parsers – Shift – reduce parsing – operator- precedence parsing – Top down parsing – Predictive parsers. **Automatic Constuction of Effective parsers :** LR parsers – Canonical Collection of LR (0) items - Constructing SLR parsing tables – Constructing Canonical LR paqrsing tables – Constructing LALR parsing tables.

UNIT IV**Hours:12**

Symbol tables : the Contents of a symbol tables – data structures – Representing scope information.**Error Detection and Recovery :** Errors – Lexical phase errors – Syntactic phase errors – Semantic errors.

UNIT V**Hours:12**

Introduction to Code Optimization :The principal sources of optimization – Loop Optimization – DAG representation of basic blocks – Value numbers and algebraic laws- global data flow analysis.**Loop Optimization:**Dominators – Reducible Flow graphs – depth first search – Loop invariant computations – Induction variable elimination – Some other loop optimizations.

TEXT BOOKS: (Recent Edition of the following bools only are recommended)

S.No.	Authors	Title	Publishers	Year of Publication
1.	lfred V. Aho, Jeffrey D.Ullman	Principles of Compiler Design	Narosa publishing house	

REFERENCE BOOKS

S.No.	Authors	Title	Publishers	Year of Publication
1.	fred V.Aho and Monica S.Lam,	SCompilers : Principles, Techniques and Tools	2nd Edition	ep 10 , 2006.

WEBSITE REFERENCE

[.https://www.google.com](https://www.google.com)

SEMESTER – VI

Programme code:	B.Sc	Programme Title	Bachelor of Computer Science	
Course Code:	19U6CSET4B	ELECTIVE 4: ANDROID OPERATING SYSTEM	Batch	2019-2022
Hrs/Week:	4 Hrs		Semester	VI
			Credits	3

COURSE OBJECTIVES

To enable the students

To understand the process of developing software for the mobile and create mobile applications on the Android Platform

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Understand the limitations and challenges of working in a mobile and wireless environment.
CO2	Describe and apply the different types of application models/architectures used to develop mobile software applications.
CO3	Describe the components and structure of a mobile development frameworks (Android SDK and Eclipse Android Development Tools)
CO4	To learn how and when to apply the different components to develop a working system
CO5	Design, implement and deploy mobile applications using an appropriate software development environment.

MAPPING WITH PROGRAMME OUTCOMES

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	✓	✓	-	-	-	-	-	-	-	-
CO2	-	✓	✓	-	-	-	-	-	-	-	-
CO3	-	✓	✓	✓	✓	-	-	-	-	-	-
CO4	-	✓	✓	✓	✓	-	-	-	-	-	-
CO5	-	✓	✓	✓	✓	-	-	-	-	-	-

SYLLABUS**UNIT - I****(Hours : 10)**

Introduction to ANDROID: Android System Architecture, Creating and Running Android Applications, Types of Android Applications, Building blocks. Android OS Concepts: Mobile technology : Overview of Android - An Open Platform for Mobile development Open Handset Alliance. Use Android for mobile app development- Android Marketplaces - Android Development Environment setup.

UNIT -II**(Hours : 10)**

Android development Framework -Android-SDK, Eclipse Emulators /Android AVD.

Creating & setting up custom Android emulator .Android Project Framework and its applications- Application Manifest, Application Life Cycle, Application Priority and Process States, Creating and Using Resources, The Activity Life Cycle.

UNIT -III**(Hours : 8)**

Android Architecture : Linux Kernel –Libraries- Android Runtime- Application Framework –Applications. Android Startup and Zygote. Android Debug bridge.Android Permission model - Android Manifest File.

UNIT -IV**(Hours : 10)**

Using Bluetooth and Managing Networks in ANDROID: Using Bluetooth -Introducing the Bluetooth Service, Controlling the Local Bluetooth Device, Discovering and Bonding with Bluetooth Devices, Managing Bluetooth Connections, Communication with Bluetooth. Managing Networks - Monitoring and Managing Your Internet Connectivity, Managing Active Connections, Managing Your Wi-Fi .

UNIT -V**(Hours : 10)**

Event driven Programming in Android- Creating a splash screen- Introduction to threads in Android- Develop application with menus and dialog boxes- Menu: Custom Vs. System Menus - Creating and Using Handset menu Button (Hardware)- Android Themes, Dialog, create an Alter Dialog- SQLite: Open Helper and create with database- Open and close a database.

TEXT BOOKS

Recent editions of the following books only are recommended

S. No	Author Name	Title of the Book	Publisher
1.	Reto Meier:	Professional Android 2 Application Development	Wiley
2	Ed Burnette	Hello, Android	Shroff
3	Pradeep Kothari	Android AppliCStion Development	Dreamtech

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1.	Mark L Murphy	Beginning Android	Wiley India Pvt Ltd,
2	Sayed Y Hashimi and Satya Komatineni	Professional Android	Wiley India Pvt Ltd.
3	Marko Garaenta	Learning Android	O'ReillyPublication

WEBSITE REFERENCES

1. https://en.wikipedia.org/wiki/Mobile_operating_system
2. [https://en.wikipedia.org/wiki/Android_\(operating_system\)](https://en.wikipedia.org/wiki/Android_(operating_system))
3. https://www.webopedia.com/TERM/M/mobile_operating_system.html
4. <https://www.webopedia.com/.../mobile-operating-systems-mobile-os-explained.html>
5. <https://searchmobilecomputing.techtarget.com/definition/mobile-operating-system>

Means of Curriculum Delivery: Lecture, Group Learning, Seminar, Assignment,Google Classroom

SEMESTER-VI

Programme code:	B.Sc	Programme Title	Bachelor of Computer Science	
Course code:	19U6CSET4C	Elective 4 : Cloud Computing	Batch	2019-2022
Hrs/Week	4 Hrs		Semester	5
			Credits	3

COURSE OBJECTIVES

To enable the students

To Understand the Cloud computing architectures, applications and challenges and learn about various cloud storages

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Understand History and Benifits in cloud computing
CO2	Analyse the Cloud Computing Architecture and Models
CO3	Identify the cloud data center and visualization technologies.
CO4	Analyse the visualization technology and security issues of cloud Computing
CO5	Evaluate various advanced cloud computing platforms

MAPPING WITH PROGRAMME OUTCOMES

CO /POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	✓	✓	-	-	-	-	-	-	-	-	-
CO2	-	✓	✓	-	-	✓	✓	-	-	✓	✓	✓
CO3	-	✓	✓	-	-	✓	✓	-	-	✓	✓	✓
CO4	-	✓	✓	-	-	✓	✓	-	-	✓	✓	✓
CO5	-	✓	✓	-	-	✓	✓	-	-	✓	✓	✓

SYLLABUS**UNIT - I****(Hours : 12)**

Overview of the computing-History of Cloud Computing- Benifits of Cloud Computing- How to develop Cloud Infrastructure-Vendors of Cloud Computing-Elastic Computing-Social Networking-Enterprise Cloud Computing.

UNIT -II**(Hours : 12)**

Cloud Computing Architecture: Introduction-Grid Framework Overview-Grid Architecture-Cloud Computing Architecture-Key Design aspects of Cloud Architecture, Cloud Services and Cloud Applications-Similarities and Difference between Grid and Cloud Computing- Characteristics of Cloud Computing. **Models of Cloud Computing** :Introduction-Cloud Service

Models-Cloud Computing Sub Service Models-Cloud Deployment Models-Alternative Deployment Model.

UNIT -III

(Hours : 12)

Cloud Data Center: Introduction- Cloud Data Centre core elements-Storage Network Technologies and Virtualization-Object Based Storage Technology-Cloud Backup-Information Life Cycle Management-Cloud Analytics-Computing on Demand. **Virtualization Technologies** :Introduction-Virtualization Reference Model-Advantages of Virtualization-Server/Compute Virtualization-Need of Server/Compute Virtualization-Virtual Clusters-Advantages of Server/Compute Virtualization-Virtual Machine and Hardware Components-Types of Virtualization.

UNIT -IV

(Hours : 12)

Virtualization Technology at Desktop and Application: Introduction-Understanding Desktop Virtualization -Drivers used in Virtualization -Techniques used for desktop virtualization-Components for Desktop Virtualization-Application Virtualization-Hardware Virtual Machine-Understanding Machine Imaging-Porting Applications-Virtual Machine Provisioning. **Security Issues of Cloud Computing:** Introduction-Security concerns of Cloud Computing-Cloud Information security objectives-Cloud security design principles-Security services-Secure Cloud Software Testing-Software Requirement Practices-Risk Issues-VM Security.

UNIT -V

(Hours : 12)

Cloud Computing Platforms-Advanced Technologies in Cloud Computing: Introduction-Cloud Computing Trends-Understanding Cloud Computing Tools-Security Cloud-Green Computing-Intercloud-Bigtable-Cloud Usage for Big Data Analytics and Internet of Things.

TEXT BOOKS

S. No	Author Name	Title of the Book	Publisher	Year/Edition
1.	Shailendra Singh	Cloud Computing	Oxford Univeristy Press	2018-First Edition

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher	Year/Edition
1.	Arshdeep Bahga	Cloud Computing: A Hands-On Approach	Paperback-Import,	9 Dec 2013.
2	Anthony T. Velte	Cloud Computing A PractiCS! Approach	Tata Mcgraw Hill EduCStion Private Limited	1 st Edition 2009

WEBSITE REFERENCES

1. https://en.wikipedia.org/wiki/Cloud_computing
2. <https://searchcloudcomputing.techtarget.com/definition/cloud-computing>
3. <https://www.salesforce.com/what-is-cloud-computing/>
4. <https://aws.amazon.com/what-is-cloud-computing>
5. <https://www.techopedia.com/definition/2/cloud-computing>

Extra Credit Course

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science
Course Code :	2019ECC001	Title : சுற்றுலா வளர்ச்சி	Batch 2019-2022
			Credits 2

பாடத்திட்டம் :

அலகு ஐ

1. சுற்றுலா – ஒரு விளக்கம்
2. உலக நாடுகளில் சுற்றுலா வளர்ச்சி
3. பாரதத்தில் சுற்றுலா வளர்ச்சி

அலகு ஐஐ

1. தமிழ்நாட்டில் சுற்றுலா வளர்ச்சி
2. பன்னாட்டு பலவகைப் பயணிகள்
3. சுற்றுலாவின் சமூக பொருளாதார விளைவுகள்

அலகு ஐஐஐ

1. சுற்றுலாப் பயணிகள் பற்றிய புள்ளி விவரங்கள்
2. சுற்றுலாவைத் திட்டமிடுதலும் மேம்படுத்தலும்
3. சுற்றுலா விடுதிகள்

அலகு ஐஐ

1. சுற்றுலாப் பயணிகளின் பல்வேறு போக்குவரத்துகள்
2. சுற்றுலாக் கழகங்கள்
3. சுற்றுலாப் பயண முகவர்கள்

அலகு ஏ

1. சுற்றுலாவின் வணிகச் சந்தைகள்
2. சுற்றுலாவின் வழிகாட்டிகள்
3. தமிழ் இலக்கியத்தில் பயணநூல்கள்

பாடநூல் : சுற்றுலா வளர்ச்சி

ஆசிரியர் - வெ. கிருட்டிணசாமி

மணிவாசகர் பதிப்பகம்

சென்னை, ஆகஸ்டு – 2009

Extra Credit Course

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	2019ECC002	Title : ,தமிழியல் கலை	Batch	2019-2022
			Credits	2

பாடத்திட்டம் :

அலகு ஐ இதழியல் - இயல்பும் பரப்பும்

1. இதழியல் விளக்கம்.
2. இதழ்களின் பணிகள், கடமைகள், பொறுப்புகள்.
3. இதழ்கள் வகைகளும் இயல்புகளும்.
4. மக்களாட்சியில் இதழியல்.
5. இதழ்களின் சுதந்திரம்.
6. இதழியல் நடத்தையறக் கட்டளைகள்.
7. இதழியல் தொழில் வாய்ப்புகள்.

அலகு ஐஐ இதழியல் தோற்றமும் வளர்ச்சியும்

1. இதழியல் வளர்ச்சி
2. தமிழகத்தில் இதழியல் வளர்ச்சி
3. பத்திரிக்கைச் சட்டங்கள்
4. பத்திரிக்கை மன்றம்

அலகு ஐஐஐ இதழ்களின் அமைப்பு முறை

1. இதழ்கள் தொடங்குவதற்கான வழிமுறைகள்
2. செய்தித்தாள் நிர்வாக அமைப்பு

அலகு ஐஐ செய்திகள், சேகரித்தல், எழுதுதல்

1. செய்தியாளர்
2. செய்தி
3. செய்தியின் உள்ளடக்கங்கள்
4. செய்தி திரட்டுதல்
5. செய்தி நிறுவனங்கள்
6. பேட்டி
7. குற்றச் செய்திகள்
8. பல்வேறு வகையான செய்திகள்
9. செய்திகளும் சிறப்புத்தனி இயல்புகளும்
10. படங்களும் இதழ்களும்

அலகு ஏ செப்பனிடுதல் (பதிப்பித்தல்)

1. செய்திகளைச் செப்பனிடுதல் - நுட்பங்கள்
2. ஆசிரியர்
3. செய்தி ஆசிரியர்
4. துணை ஆசிரியர்
5. செய்தியின் கட்டமைப்பு
6. பக்க வடிவமைப்பு
7. அச்சுப்படி திருத்துதல்
8. இதழியல் கலைச் சொற்கள்

பாடநூல் : இதழியல் கலை

ஆசிரியர் : டாக்டர் மா.பா. குருசாமி

ஸ்ரீ சக்தி .:பைன் ஆர்ட்ஸ், சிவகாசி, ஜனவரி – 2009.

Extra Credit Course

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	2019ECC003	Title : இதழியல் கலை	Batch Credits	2019-2022 2

பாடத்திட்டம் :

அலகு ஐ

நாட்டுப்புற இயல் என்றால் என்ன?
நாட்டுப்புற இயலின் வரலாறு
நாட்டுப்புற அயல் கல்வி – ஒரு விளக்கம்

அலகு ஐஐ

நாட்டுப்புற ஆடல்கள்
நாட்டுப்புற கூத்துகள்
நாட்டுப்புற கைவினைக் கலைகள்

அலகு ஐஐஐ

நாட்டுப்புற விளையாடல்கள்
நாட்டுப்புற மருத்துவம்
நாட்டுப்புற நம்பிக்கைகள்

அலகு ஐஐ

நாட்டுப்புற வழிபாடுகள்
நாட்டுப்புறக் கதைகள்
நாட்டுப்புறப் பாடல்கள்
கதைப்பாடல்கள்

அலகு ஏ

விடுகதைகள்
பழமொழிகள்
புராணங்கள்

பாடநூல் : நாட்டுப்புறவியல்

ஆசிரியர் : சு. கண்முக சுந்தரம்

காவ்யா பதிப்பகம்,
ஏப்ரல் - 2017.

Extra Credit Course

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science
Course Code :	2019ECC004	Title : கணிப்பொறியில் தமிழ்	Batch 2019-2022
			Credits 2

பாடத்திட்டம் :

அலகு ஐ

கணிப்பொறியில் தமிழ்
விசைப்பலகை அமைப்பு முறைகள்
எழுத்துருவின் வகைகள்

அலகு ஐஐ

தமிழ் எழுத்துருக்கள்
எழுத்துரு ∴ விசைப்பலகை இயக்கியை நிறுவுதல்

அலகு ஐஐஐ

தமிழில் தட்டச்சு செய்யும் முறை
சிக்கல்களும் தீர்வுகளும்

அலகு ஐஐ

இணையத்தில் தமிழ்
தமிழ் இணையப் பல்கலைக்கழகம்
மின்னஞ்சல்

அலகு ஏ

யூனிக்கோடு
வின்டோஸ் எக்ஸ்பீயில் தமிழ்
தமிழ் இணையதளங்கள்

ஆசிரியர் : த. பிரகாச்

பெரிகாம் நூல் வெளியீடு மற்றும் விற்பனை
ஆகஸ்டு – 2007.

Extra Credit Course

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	2019ECC005	Title : தமிழக வரலாறும் மக்கள் பண்பாடும்	Batch Credits	2019-2022 2

பாடத்திட்டம் :

அலகு ஐ

1. தமிழக வரலாற்றுக்கான அடிப்படை ஆதாரங்கள்
2. தமிழகத்தின் இயற்கை அமைப்புகள்.
3. வரலாற்றுக் காலத்துக்கு முந்திய தமிழகம்.
4. சிந்து வெளி அகழ்வாராய்ச்சி.

அலகு ஐஐ

1. பண்டைய தமிழரின் அயல்நாட்டு தொடர்புகள்
2. தமிழ் வளர்த்த சங்கம்
3. சங்க இலக்கியம்
4. பண்டைய தமிழரின் வாழ்க்கை

அலகு ஐஐஐ

1. களப்பிரர்கள்
2. பல்லவர்கள்
3. தமிழகத்தில் நான்காம் நூற்றாண்டு முதல் ஒன்பதாம் நூற்றாண்டு வரையில் சமூக நிலை.

அலகு ஐஐஐ

1. சோழப் பேரரசின் தோற்றம்.
2. சோழப் பேரரசின் வளர்ச்சியும் வீழ்ச்சியும்.
3. சோழர் காலத்தில் தமிழரின் சமுதாயம்.
4. பாண்டியரின் ஏற்றமும் வீழ்ச்சியும்.

அலகு ஏ

1. மதுரை நாயக்கர்கள்.
2. தமிழகத்தில் 13 முதல் 18 ஆம் நூற்றாண்டு வரை சமூகநிலை
3. ஐரோப்பியரின் வரவு.
4. 19 ஆம் நூற்றாண்டின் அரசியலும் தமிழகத்தின் சமூக நிலையும்.
5. 20 ஆம் நூற்றாண்டில் தமிழகம் மேற்கோள் நூல்கள்.

பாடநூல் : தமிழக வரலாறும் மக்கள் பண்பாடும்

ஆசிரியர் - கே. கே. பிள்ளை.

உலகத் தமிழாராய்ச்சி நிறுவனம். செப்டம்பர் -

2016.

Extra Credit Course

Programme Code :	B.Sc CS	Programme Title	Bachelor of Computer Science	
Course Code :	2019ECC006	Title : தமிழ் இலக்கிய வரலாறு	Batch	2019-2022
			Credits	2

பாடத்திட்டம் :

அலகு ஐ

1. காலப்போக்கில் கன்னித்தமிழ் ஒரு கண்ணோட்டம்
2. தமிழ்ச்சங்கம்
3. அகத்தியர்
4. தொல்காப்பியர்
5. சங்க இலக்கியம்
6. பதினெண் கீழ்கணக்கு

அலகு ஐஐ

1. இரட்டைக் காப்பியங்கள்
2. நாயன்மார்கள்
3. ஆழ்வார்கள்
4. சமயமும் தமிழும் (பௌத்தம், சமணம், சைவம், வைணவம்)
5. கன்னித் தமிழ் காப்பிய வளர்ச்சி
6. புராணங்களும் பிறவும்.

அலகு ஐஐஐ

1. சிற்றிலக்கியங்கள்.
2. பதினெண் சித்தர்கள்.
3. உரையாசிரியர்கள்.
4. பிற்காலப் புலவர்கள்.
5. கிருத்துவமும் தமிழும்.
6. இஸ்லாமியமும் இந்தமிழும்.

அலகு ஐஐ

1. சோழப் பேரரசின் வளர்ச்சியும் வீழ்ச்சியும்.
2. கவிஞர் பெருமக்கள்.
3. புதக்கவிதை.
4. உரைநடை இலக்கியம், சிறுகதை இலக்கியம்.

அலகு ஏ

1. தமிழ் நாவல் இலக்கியம்.
2. தாளிகைகள்.
3. இசைத்தமிழ் வரலாறு.
4. நாடகத் தமிழ் வரலாறு
5. 20 ஆம் நூற்றாண்டில் இந்தமிழ் வளர்ச்சி.
6. பிற நாடுகளில் பைந்தமிழ்

பாடநூல் : தமிழ் இலக்கிய வரலாறு

ஆசிரியர் : பேராசிரியர் மது.சா. விமலானந்தம்

முல்லைநிலையம்,

சென்னை, 2018

EXTRA CREDIT COURSE

NEW MEDIA

Course Code: 2019ECC007

No. of Credits: 2

Course Objectives :

To enable the students to understand the new age media sources.

UNIT I:

Spread of Internet; Salient features and advantage over traditional media;
History and spread of internet in India, reach and problem of access; Internet and Knowledge Society; Convergence and Multi-media: Print, radio, TV, internet and mobile.

UNIT II:

Online journalism; Earlier websites of newspapers, E-books and E-publishing
Status of online journalism today.

UNIT III:

Digital storytelling: Tools of multimedia journalists; Learn to report, write and produce in a manner that is appropriate for online media; Feature writing for online media: Story idea, development and news updates.

UNIT IV:

Open source journalism: Responding to the audience, Annotative reporting; Citizen Journalists, Problem of verification, accuracy and fairness.

UNIT V:

Use of blogs, tweets, etc. for story generation and development; Protecting copyright, Exploring Cyberspace: Individual Blog; Group weblog

TEXT BOOKS:

Recent editions of the following books only are recommended

- 1.Jagdish Chakravarthy, Net, Media and the Mass Communication,Authors press, New Delhi,2004.
2. Gopal Bhargava ,Mass Media and Information Revolution,Isha Books, New Delhi ,2004.

REFERENCE BOOKS:

- 1.Nath, Shyam ,Assessing the State of Web Journalism ,Authors Press, New Delhi,2002.
- 2.Narayana Menon, The Communication Revolution.National Book Trust ,1976.

EXTRA CREDIT COURSE

PROOFREADING AND COPYEDITING

Course Code: 2019ECC008

No. of Credits: 2

Course Objectives

To enable the students to proofread and edit texts.

UNIT I:

Introduction to Proofreading and Copyediting, The use of style sheets and style guides in Proofreading and copyediting, finding the appropriate style guides, how to create and use a style sheet.

UNIT II:

Proofreaders' marks and how they are used to copyedit and proofread, your job as a proofreader.

UNIT III:

How to proofread, Proofreading practice.

UNIT IV:

The job of copyediting, how to copyediting, copyediting practice.

UNIT V:

How to copyedit or proofread one's own Work, copyediting or proofreading as a career.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. [Laura Anderson](#) ,Proofreading Handbook ,McGraw-Hill ,2nd Edition2006.
2. [Elsie Myers Stainton](#), The Fine Art of Copyediting ,Columbia University Press ,2002.

REFERENCE BOOKS:

1. [Suzanne Gilad](#) ,Copyediting and Proofreading For Dummies ,1st Edition 2011
2. [Peter Ginna](#) ,What Editors Do: The Art, Craft, and Business of Book Editing (Chicago Guides to Writing, Editing, and Publishing) ,University of Chicago Press ,2017

EXTRA CREDIT COURSE

PERSONALITY DEVELOPMENT

Course Code: 2019ECC009

No. of Credits: 2

Course Objectives :

To make students groom their personality and prove themselves as good Samaritans of the society

UNIT I:

Introduction to Personality Development ; The concept of personality, Theories of Freud & Erickson, Significance of personality development; The concept of success and failure: What is success-Hurdles, What is failure- Causes of failure.

UNIT II:

Attitude & Motivation, Factors affecting attitudes-Positive attitude, Advantages, Negative attitude Disadvantages - Concept of motivation - Significance – Internal and external motives -Importance of self- motivation-Factors leading to de-motivation

UNIT III:

Term self-esteem, Symptoms, Advantages - Do's and Don'ts to develop positive self-esteem, Low self-esteem, Symptoms - Personality having low self esteem - Positive and negative self esteem. Interpersonal Relationships.

UNIT IV:

Other Aspects of Personality Development, Body language - Problem-solving - Conflict and Stress Management - Decision-making skills -Leadership and qualities of a successful leader – Character building -Team-work – Time management - Work ethics –Good manners and etiquette.

UNIT V:

Employability Quotient , Resume building- The art of participating in Group Discussion – Facing the Personal (HR & Technical), Interview, Psychometric Analysis, Mock Interview Sessions.

TEXT BOOKS:

Recent editions of the following books only are recommended

1.E.B. Hurlock ,Personality Development ,Tata McGraw Hill ,28th Reprint. New Delhi: 2006

2. Stephen P. Robbins and Timothy A. Judge ,Organizational Behavior ,Prentice Hall. 16th Edition, 2014.

REFERENCE BOOKS:

1. Sudhir Andrews , How to Succeed at Interviews, New Delhi.Tata McGraw-Hill ,21st (rep.) 1988

2. Heller, Robert., Effective leadership, Essential Manager series. Dk Publishing,2002.

EXTRA CREDIT COURSE

TECHNICAL WRITING

Course Code: 2019ECC010

No. of Credits: 2

Course Objectives :

- To enable the students to practice professional writing.

UNIT I:

Technical Writing Basics, Technical Communication: Definition & Purpose.

UNIT II:

Characteristics of Technical Communication, Audience, Centered Communication.

UNIT III:

Legal and Ethical Communication: Description & Importance, Implicit and Explicit Rules of Communication: Definitions & Examples.

UNIT IV:

Types of Technical Documents.

UNIT V:

The Technical Writing Process: Prewriting, Writing & Rewriting, Spread of Internet; Salient features and advantage over traditional media.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Kieran Morgan , Technical Writing Process: The simple, five-step guide that anyone can use to create technical documents such as user guides, manuals, and procedures , Better on paper publications ,2015
2. Thomas Arthur Rickard ,A Guide to Technical Writing ,Bibliolife, 2008.

REFERENCE BOOKS:

1. [Gerald J. Alred, Charles T. Brusaw & Walter E. Oliu , Handbook of Technical Writing ,Bedford/St. Martin's ,2008.](#)
2. [Mike Markel, Technical Communication, Palgrave MacMillan ,2012](#)

EXTRA CREDIT COURSE

AN INTRODUCTION TO PSYCHOLOGY

Course Code: 2019ECC011

No. of Credits: 2

Course Objectives :

- To enable the students to articulate how psychological research adheres to ethical and scientific principles, and communicate the difference between personal views and scientific evidence in understanding behavior.

UNIT I:

Introducing Psychology, Psychological Science, Brain, Body and Behavior.

UNIT II:

Sensing and Perceiving Remembering and Judging, Intelligence and Language.

UNIT III:

States of Consciousness, Growing and Developing, Learning.

UNIT IV:

Emotions and Motivation, Personality

UNIT V:

Defining Psychological Disorders, Treating Psychological Disorders, Psychology in Our Social Lives.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. David Myer , David Myer's Psychology , Worth Publishers ,(7th ed.) 2004.
2. Daniel Kahneman, Thinking Fast and Slow , Farrar , Straus and Giroux , 2011

REFERENCE BOOKS:

1. Roger R. Hock, Forty Studies That Changed Psychology , Prentice hall ,2008.
2. [Robert Feldman, Understanding psychology, McGraw Hill Education, 2017](#)
3. [Thomas E. Ludwig , Psychsims ,WortSh Publishers ,2004](#)

EXTRA CREDIT COURSE

ASTRONOMY

Course Code: 2019ECC012

No. of Credits: 2

Course Objectives:

- On successful completion of this course the students should gain knowledge about Astronomy.

UNIT I:

General description of the Solar system. Comets and meteorites – Spherical trigonometry.

UNIT II:

Celestial sphere – Celestial co – ordinates – Diurnal motion – Variation in length of the day.

UNIT III:

Dip – Twilight – Geocentric parallex.

UNIT IV:

Refraction – Tangent formula – Cassinis formula.

UNIT V:

Kepler's laws – Relation between true eccentric and mean anamolies.

TEXT BOOK

Recent editions of the following books only are recommended

“ASTRONOMY” by S.Kumaravelu and Susheela Kumaravelu.

EXTRA CREDIT COURSE

FUZZY MATHEMATICS

Course Code: 2019ECC013

No. of Credits: 2

Course Objective:

- To know the basic concepts of fuzzy sets and its characteristics.
- To understand the concept of various operations on fuzzy sets.
- To learn the concept of fuzzy relations and its applications.

UNIT 1 From classical sets to Fuzzy sets: Introduction-Crisp Sets: An overview-Fuzzy set: Basic types-Fuzzy sets: Basic Concepts-Characteristics and significance of the paradigm Shift

UNIT 2

Fuzzy sets versus crisp sets: Additional properties of \square - Cuts- Representations of fuzzy sets- Extension Principle of Fuzzy sets.

UNIT 3

Operations on fuzzy sets: Types of Operations-Fuzzy complements-Fuzzy Intersections: t-Norms-Fuzzy unions: t-conorms

UNIT 4

Fuzzy Arithmetic: Fuzzy Numbers-Linguistic Variables-Arithmetic Operations on intervals

UNIT 5

Fuzzy Relations: Crisp versus Fuzzy Relations-Projections and Cylindric Extensions-Binary Fuzzy Relations-Binary relations on a single set-Fuzzy Equivalence Relations-Fuzzy Compatibility Relations.

TEXT BOOK:

Fuzzy Sets Uncertainty and Information, George, J.Klir and Tina A, Folger, Printice Hall of India Pvt Ltd, New Delh, 2006

UNIT 1: Page no: 1-30 **UNIT 2:** Page no: 35-48

UNIT 3: Page no: 50-96

UNIT 4: Page no: 97-102

UNIT 5: Page no: 119-135

Reference Book:

1. Fuzzy Logic Intelligence, Control and information, John Yuan, Reza Langari, Pearson Education, New Delh, 1999
2. Fuzzy logic and Neural Networks, M.Amirthavalli, Scitech Publications Pvt Ltd, Chennai and Hyderabad, 2007
3. Fuzzy Logic with Engineering Applications, Timothy, Jo Ross, McGraw-Hill INC, New York, 1996.

EXTRA CREDIT COURSE

OPERATION RESEARCH

Course Code: 2019ECC014

No. of Credit :2

Course Objectives:

- To understand the basic concepts of Operations Research and Solving LPP
- To solve Transportation and Assignment problems
- To understand the concept of Game theory , Queuing theory PERT and CPM.

UNIT I

Introduction to Operations Research - Meaning - Scope – Models - Limitation. Linear Programming - Formulation – Graphical method only.

UNIT II

Transportation (Non- degenerate only) - Assignment problems - Problems.

UNIT III

CPM - Principles - Construction of Network for projects – Types of Floats – Slack- crash programme.

UNIT IV

PERT - Time scale analysis - critical path - probability of completion of project - Advantages and Limitations.

UNIT V

Game Theory: Graphical Solution – $mx2$ and $2xn$ type. Solving game by Dominance property fundamentals - problems . Replacement problem – Replacement of equipment that deteriorates gradually (value of money does not change with time).

Text Book:

Recent editions of the following books only are recommended

Prof. V. Sundaresan., K.S. Ganapathy Subaramanian ., K.Ganesan: Resource Management Techniques (Operations Research) A.R.Publications- 2002

Unit I : Chapter 1 – Section 1.1,1.2,1.4,1.9, Chapter 2 – Section 2.1- 2.5

Unit II : Chapter 7 – Section 7.1- 7.2, Chapter 8 – Section 8.1 ,8.2,8.4,8.5

Unit III : Chapter 15 – Section 15.1,15.2,15.5,15.8

Unit IV : Chapter 15 – Section 15.6

Unit V : Chapter 16 – Section 16.6, 16.7, Chapter 11 – Section 11.1, 11.2

ReferenceBook :

1. Kanti Swarup, Gupta P.K, Man Mohan : Operations Research, Sultan Chand & Sons- 1997
2. P.R. Vittal and V.Malini : Operations Research, Margham Publications -2011.
- 3.P.K.Gupta.,ManMohan: Problems in Operations Research,Sultan Chand &sons-2004
- 4.V.K.Kapoor: Operations research, Sultan Chand&sons-2007

EXTRA CREDIT COURSE

MATHEMATICS FOR PROFESSIONAL COURSES

Course Code: 2019ECC015

No. of Credits: 2

COURSE OBJECTIVES

- To understand the fundamental concepts of Set Theory and Linear Equations.
- To solve the problems in Mathematics of Finance, sequence and series.
- To acquire the knowledge of correlation, regression and problem solving.

UNIT 1:

Sets, Functions and Relations -Equations Linear equations–Homogeneous linear equations .

UNIT 2:

Sequence and Series–Arithmetic progression-Geometric progression; Mathematics of Finance: Simple interest-Compound interest.

UNIT 3:

Limits — Basic concepts of Differentiation - Integration

UNIT 4:

Measures of Central Tendency and Dispersion, Arithmetic Mean, Median – Mode, Geometric Mean and Harmonic Mean, Standard deviation, Quartile deviation

UNIT 5:

Correlation and Regression.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Discrete Mathematics, B.S. Vatssa, Wishwa Prakashan Private Limited, 3rd Edition.
2. Business Mathematicsc and Statistics, P.A. Navanitham, Jai Publisher, June 2004.

Reference Book:

- 1 .Dr.M.K.Venketaramen,Dr.N.Sridharan,N.Chandarasekaran: DiscreteMathematics,The National publishing Company – 2006.
- 2.P.R.Vittal :Business Mathematics and Statistics, Margham Publications.-2011
3. Sanchetti, D.C and Kapoor, V.K: Business Mathematics, Sultan chand Co & Ltd-2002.

Unit 1: Chapter 2 and 3, chapter 7, 7.1-7.4 (Text Book 1)

Unit 2: Chapter 1 and 2 (Text Book 2, Part 1)

Unit 3: Chapter 5, 6 and 8 (Text Book 2, Part 1)

Unit 4: Chapter 7 (Text Book 2, Part 2)

Unit 5: Chapter 12 and 13 (Text Book 2, Part 2)

Chapter 3 , Section 3.1-3.4 and Chapter 6, Section 6.1-6.3 (Text Book 3)

EXTRA CREDIT COURSE

MULTIMEDIA AND ITS APPLICATIONS

Course Code: 2019ECC016

No.of Credits: 2

Course Objectives:

- To enable the students learn the overview of Multimedia systems.
- To provide knowledge about the Basic concepts of Sound and Image Processing.
- To enhance the knowledge about the Multimedia Applications.

UNIT I

Media and Data Streams : Medium – Main Properties of a Multimedia Systems – Multimedia – Traditional Data Streams Characteristics – Data Streams characteristics for continuous media.

UNIT II

Sound / Audio: Basics sound Concepts – Music – Speech . Video and Animation : Basics concepts – Television – Computer Based Animations.

UNIT III

Images and Graphics : Basics concepts – Computer Image Processing – Data Compression : Storage space – coding requirement – source entropy and hybrid coding – some basic compression techniques – JPEG – MPEG – DVI.

UNIT VI

Multimedia Communication system : Application subsystem – Transport subsystem – quality of services and resource management.

UNIT V

Multimedia Applications : Introduction – Media Preparation – Media Composition – Media Integration – Media Communication – Media Entertainment.

Reference Books:

1. Ralf Steinmetz and Klara Nahrstedt , Multimedia : Computing , Communication & Applications. ,Pearson Education.

EXTRA CREDIT COURSE

MANAGEMENT INFORMATION SYSTEM

Course Code: 2019ECC017

No. of Credits: 2

Course Objectives:

- To familiarise the students with Business Information through Computers.
- To enable the students aware of utilization of business information for decision making.
- To bestow knowledge about Database Management System

UNIT I

Management information system: meaning – features – requisites of effective MIS – MIS Model – components – subsystems of an MIS – role and importance – corporate planning for MIS – growth of MIS in an organization – centralization vs decentralization of MIS - Support – Limitations of MIS.

UNIT II

System concepts – elements of system – characteristics of a system – types of system – categories of information system – system development life cycle – system enhancement.

UNIT III

Information systems in business and management: Transaction processing system: Information repeating and executive information system.

UNIT IV

Database management systems – conceptual presentation – client server architectures networks.

UNIT V

Functional management information system: Financial – accounting – marketing – production – Human resource – business process outsourcing.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Gorden B.Davis and Margrethe H.Olson: “Management Information System”, Tata McGraw Hill Publication, New Delhi, 1st Edition, 2005.
2. Aman Jindal: “Management Information system”, Kalyani Publishers, New Delhi, First Edition, 2004.

REFERENCE BOOKS:

1. Kenneth C. Laudon: “Management Information System”, Pearson Education, New Delhi, First Edition, 2004.
2. Stephen Haag: “Management Information System”, Tata McGraw Hill Publication, New Delhi, First Edition, 2008.

EXTRA CREDIT COURSE

THEORY OF COMPUTATION

Course Code: 2019ECC018

No. of Credits: 2

Course Objectives:

- To learn about the basic of theory of computing
- To understand the concept of finite automata and push down automata
- To acquire knowledge in formal language
- To enhance the concept of conversion of deterministic automata to non deterministic automata.

UNIT- I

Introduction to theory of Computing – Why Study the theory of Computing- What is Computation- Set theory-Alphabets-Strings and Languages-Relations-Functions-Graphs and Trees.

UNIT -II

Finite Automata: Introduction-Finite state Machines -Deterministics Finite Automata(DFA)-Finite Automata with and without Epsilon Transitions-Language of Deterministic Finite Automata-Acceptability of a String by a Deterministic Finite Automata-Processing of Strings by Deterministic Finite Automata;Non-Deterministic Finite Automata(NFA)- Language of Non- Deterministic Finite Automata-Equivalence between DFA and NFA-Non Deterministic Automata with or without Epsilon Transitions.

UNIT -III

Formal Language: Introduction-Theory of Formal Language-Kleene and positive Closure-Defining Language-Recursive Definition of Language-Arithmetic Expression-Grammar-Classification of Grammar and Language-Language and their Relation-Operations On Language-Chomsky Hierarchy.

UNIT- IV

Regular Language: Introduction-Regular Language and Expression-Operations of Regular Expression-Identity Rules-Algebraic Laws for Regular Expression-Finite Automata and Regular Expression- Kleene's Theorem-Problems-Context Free Grammar and Context Free Language: Introduction-Derivation Tree-Parse Tree-Right Most and Left most Derivation -Ambiguity-problems

UNIT- V

Push Down Automata: Description and Definition-Language of PDA-Graphical Notation of PDA-Acceptance by Final State and Empty Stack, From Empty Stack to Final State and Vice versa-Deterministic Pushdown Automata and Non deterministic Pushdown Automata-Language-Problems.

TEXT BOOKS:

1. Theory of Computing-A Gentle Introduction, Efi Kinber, Carl Smith, published by Pearson Education.(UNIT 1)
2. Theory of Automata, Language & Computation, Rajendra Kumar, Tata McGraw Hill Education Private Limited, New Delhi. (UNIT 1 to 5)

REFERENCE BOOK:

A Textbook Automata Theory, S.F.B.Nasir, P.K.Srimani, Published by Cambridge University Press India Pvt, Ltd, New Delhi.

UNIT 1: Chapter 1: Section 1.1, 1.2 (Text Book 1)

Chapter 1: Section 1.1-1.6 (Text Book 2)

UNIT 2: Chapter 2: Section 2.1-2.11

UNIT 3: Chapter 3: Section 3.1-3.10

UNIT 4: Chapter 4: Section 4.1-4.5, 4.6, 4.6.1, 4.6.2

Chapter 6: Section 6.1-6.10

UNIT 5: Chapter 7: Section 7.1-7.10

EXTRA CREDIT COURSE

OOPS WITH JAVA PROGRAMMING

Course Code: 2019ECC019

No. of Credits: 2

Course Objectives :

- To Understand fundamentals of object – oriented programming in Java, including defining classes,invoking methods,using class libraries,etc.
- To be able to use the Java SDK enviroment to create, debug and run simple Java programs.
- To understand the Java Programming concepts so as to enable the students of Applications and Applets using Java

UNIT I

Introduction to Object-Oriented Programming : Fundamentals – Object oriented Paradigm – Elements of the OOP – Abstraction – Encapsulation – Modularity – Hierarchy –Concurrency Persistence – Inheritance – Polymorphism – Benefits of OOP – Applications of OOP.

UNIT II

Java Evolution : History – Features – Difference between Java,C,C++ - Java and Internet – Java and WWW – Web Browsers . Overview : Simple Java Program - Structure – Java Tokens- Statements -JVM - Constants – Variables – Data types – Operators and Expresions.

UNIT III

Decision Making and Branching :if,if...else, nested if, switch – Decesion making and looping : while,do,for – Jumps in Loops – Labeled loops – Classes, Objects and Methods.
Arrays, Strings and vectors - Interfaces :Multiple Inheritance – Packages : Putting classes together – Multithreaded programming – Thread exceptions – Life cycle of Thread - Thread priority – Synchronization.

UNIT IV

Managing Errors and Exceptions – Types of Errors – Exceptions – Applet Programming – Applet life cycle – Graphics Programming.

UNIT V

Managing Input / Output Files in Java: Concepts of Streams – Stream classes – Byte stream classes – Character stream classes - Using streams – I/O classes – File classes - I/O Exceptions – Creation of files – Reading / Writing characters, Byte - Handling Primitive data types – Random Access Files

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Grady Booch: “Object Oriented Analysis & Design with Applications”, Second Edition, Pearson Education.
2. E.BalaGurusamy: “Programming with Java”, Third edition, Tata McGraw Hill Pvt Ltd.

Reference Books:

1. Patrick Naughton & Hebert Schildt: “The Complete Reference Java 2”, Third edition, Tata McGraw Hill Pvt Ltd.
2. Programming with Java – John R.Hubbard, Second Edition, Tata McGraw

EXTRA CREDIT COURSE

PROGRAMMING IN C

Course Code: 2019ECC020

No. of Credits: 2

Course Objectives: To enable the students

- To know about problem solving techniques and algorithm fundamentals.
- To know about the basics of C Programming and its various computation logics.

UNIT I

Overview of C - Introduction – Structure of C - Character set - C tokens - Keyword & Identifiers - Constants - Variables - Data types - Declaration of variables - Assigning values to variables - Defining Symbolic Constants - Operators – Arithmetic Expressions: - Evaluation of expression - Type conversion in expression - operator precedence .

UNIT II

Decision Making and Branching - Decision making with IF statement - simple IF statement - The IF ELSE Statement - Nesting of IF ...ELSE statements - The ELSE IF ladder - The switch statement – The GOTO statement -- Decision Making and Looping - The WHILE statement - The DO statement - The FOR statement – Jumps in Loop.

UNIT III

Arrays - One Dimensional - Two Dimensional - Multidimensional arrays - Character string Handling - Declaring and initializing string variables - String:Introduction- Standard Functions. Functions: User - defined Functions - Need for user Defined functions - Types of Functions :No Arguments and no return values - Arguments with return values - Recursion.

UNIT IV

Structure : Structure definition - Giving values to members – Structure initialization - comparison of structure variables - Structures within structures- size of structures.

UNIT V

Pointers to structures. Pointers – Introduction-Features of Pointers - Declaring and initializing pointers - Accessing a variable through its pointers - pointers and arrays - pointers and character strings

TEXT BOOKS:

Recent editions of the following books only are recommended

1. E. Balagurusamy: “Programming in ANSI C” , Tata Mc. Graw Hill, 5th Edition (reprint), 2011. (Unit II, Unit III, Unit IV, Unit V)
2. R.G.Dromey: ”How to Solve it by Computer”, Prentice Hall of India, Delhi,2000 (Unit-I)

Reference Books:

1. Byron Gottfried: “Programming with C”(Schaum's Outline Series), Tata Mc.Graw Hill,2nd Edition,1998.
2. Ashok. N. Kamathane: “Programming with ANSI and Turbo C”, Pearson Education Asia,4th Edition,2002 .
3. Yeswanth Kanethkar: “Let us C” Tata Mc. Graw Hill, 3rd Edition,1992.

EXTRA CREDIT COURSE

INTERNET OF THINGS

Course Code: 2019ECC021

No. of Credits: 2

Course Objectives:

- To get the vision and introduction to IoT .
- To Understand IoT Market perspective, Data and Knowledge Management and use of devices in IoT Technology.
- To understand state of the art IoT architecture,real world IoT deisgn constraints,industrial automation and commercial building automation in IoT.

UNIT I

Introduction- Concepts behind the Internet of Things- The IoT Paradigm- Smart Objects- Creative Thinking Techniques – Modifications- Combination Scenarios- Breaking Assumptions- Solving Problems.

UNIT II

M2M to IoT – A Market Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies.

UNIT III

M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management Introduction, Technical Design constraints-hardware is popular again.

UNIT IV

Introduction, State of the art, **Architecture Reference Model**- Introduction, Reference Model and architecture, IoT reference Model**IoT Reference Architecture**- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. **Real-World Design Constraints**.

UNIT V

Service-oriented architecture-based device integration, SOCRADES: realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things, Commercial Building Automation- Introduction, Case study: phase one-commercial building automation today.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle:
“From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”, First Edition, Academic Press, 2014.

REFERENCE BOOKS:

1. Vijay Madiseti and Arshdeep Bahga: “Internet of Things (A Hands-on-Approach)”, First Edition, VPT, 2014.
2. Francis daCosta: “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, First Edition, Apress Publications, 2013.
3. **Hakima chaouchi,”The Internet Of Things Connecting Objects,2010.**

EXTRA CREDIT COURSE

WEB TECHNOLOGY AND ITS APPLICATIONS

CourseCode: 2019ECC022

No. of Credits: 2

Course Objectives: To enable the students

- To learn about the basic concepts of various networking model and its layers.
- To learn about the concepts of protocol and its architecture.
- To learn about the Java Scripts and XML.

UNIT I

Networking Protocols and OSI Model: OSI Model, Layer functions. Internetworking concepts, devices, internet basics: why internetworking, problems, virtual network, repeaters, bridges, routers, gateways, history of internet, growth.

UNIT II

TCP/IP Part I: basics, addressing, IP addressing, logical addresses, concept of IP address, ARP, RARP, BOOTP, DHCP, ICMP. TCP / IP Part II: TCP, UDP – basics, features, relationship, ports and sockets, connections, TCP segment format, UDP, differences.

UNIT III

DNS, Email, FTP, TFTP – DNS, Email, FTP, TFTP. TCP / IP Part IV : WWW, HTTP, TELNET – history, basics, HTML, common gateway interface, remote login (TELNET).

UNIT IV

Java Script and AJAX. PHP / MySQL – scripting language, client side vs Server side, Features of PHP, reference, MySQL basics, using MySQL with PHP.ASP.NET: overview of .NET framework, Details, Server controls and web controls, validation controls.

UNIT V

Java Web Technologies – Java servlets and JSP, Creating and testing, servlet, session management, introduction to JSP, JSP and JDBC, EJB, architecture, overview, types of EJB, session beans. Web Security: principles, cryptography, plain text and cipher text, digital certificates, signatures, secure socket layer. XML – what is XML? XML versus HTML, EDI, Terminology, Document-Type Declaration, Element-Type declarations.

TEXT BOOK:

Recent editions of the following books only are recommended

1. Achyut Godbole and Atul Kahate :”Web Technologies – TCP / IP, Web / Java Programming and Cloud Computing”, Third Edition, McGraw Hill Education India Private Limited.

REFERENCE BOOKS:

1. Behrouz A. Forouzan : “TCP / IP – Protocol Suite”, McGraw Higher Education, Sixth Edition.
2. Paul Deitel, Harvey Dietel and Abbey Dietel: “Internet & World Wide Web – How to Program”, Fifth Edition, Tata McGraw Hill.

EXTRA CREDIT COURSE

NETWORK SECURITY

Course Code: 2019ECC023

No. of Credits: 2

Course Objectives: To enable the students

- To know about cryptography and its various functions.
- To understand the concepts of hashes and public key algorithm.
- To have a knowledge on different types of authentication.
- To know about the standards, IP security and their applications.

UNIT I

Cryptography - Introduction – Primer on Networking –Active and Passive Attacks –Layers and Cryptography – authorization Viruses, worms, Trojan Horses – The Multi level Model of Security. Cryptography – Breaking an Encryption Scheme – Types of Cryptographic functions – secret key Cryptography – Public key Cryptography – Hash algorithms.

UNIT II

Secret Key Cryptography - Secret Key Cryptography – Generic Block Encryption – Data Encryption Standard – International Data Encryption Algorithm (IDEA) – Advanced Encryption Standard.

UNIT III

Hashes and Public Key Algorithms - Hashes and Message Digests: Introduction – Things to do with hash – MD2 – MD4 – MD5. Public Key Algorithms: Modular arithmetic – RSA – Diffie-Hellman – Digital Signature Standard – Elliptic Curve Cryptography.

UNIT IV

Authentication - Overview of Authentication Systems: Password-Based Authentication – Address-Based Authentication – Cryptographic Authentication Protocols –Eavesdropping and Server Database Reading – Trusted Intermediaries – Session Key Establishment.

UNIT V

Standards, IP Security and Applications - Standards: Kerberos V4: Introduction – Tickets and Ticket-Granting Tickets – Configuration – Logging into the Network – Replicated KDCs. IP Security: Overview of IPSec – IP and IPv6 – Authentication Header – ESP.

Reference Books:

- 1.Charlie Kaufman, Radia Perlman and MikeSpeciner : “Network Security Private Communication in a Public World”, Pearson Education, New Delhi, 2nd Edition,2008 .
- 2.Stallings William : “Cryptography and Network Security Principles and Practices”, Prentice Hall India, New Delhi, 4th Edition 2007.
- 3.Stallings William : “ Network Security Essentials Applications and Standards “ Prentice Hall India, New Delhi, 2004.
- 4.Atul Kahate : “Cryptography and Network Security “ Tata Mc.Graw Hill , 2nd Edition, 2008.

EXTRA CREDIT COURSE

MOBILE AND WIRELESS TECHNOLOGY

Course Code: 2019ECC024

No. of Credits: 2

Course Objectives:

- To learn the wireless communication on digital mobile communication system and integration of services and applications from fixed networks into networks supporting mobility of end user and wireless access.

UNIT - I

Introduction: Applications – A Simplified Reference Mode. Wireless Transmission: Cellular System. Medium Access Control : Motivation for a Specialized MAC : Hidden and exposed terminals – Near and far terminals – SDMA – FDMA – TDMA : Fixed TDM –Classical Aloha – Slotted Aloha – Carrier Sense Multiple Access – Demand assigned Multiple Access – PRMA Packet Reservation Multiple Access – Reservation TDMA – Multiple Access With Collision Avoidance – Polling – Inhibit Sense Multiple Access. CDMA: Spread Aloha multiple access.

UNIT -II

Telecommunication Systems: GSM: Mobile Services – System Architecture – Radio Interface – Protocols - Localization And Calling – Handover – Security – New Data Services. DECT: System Architecture – Protocol Architecture – TETRA.

UNIT -III

UMTS and IMT 2000: UMTS Releases and Standardization – UMTS System Architecture -UMTS Radio Interface – UTRAN – Core Network – Handover. Satellite System: History –Applications – Basics: GEO – LEO – MEO . Routing – Localization – Handover.Broadcast Systems: Overview – Cyclical Repetition Of Data – Digital Audio Broadcasting –Digital Video Broadcasting – Convergence of Broadcasting and Mobile Communication.

UNIT -IV

Wireless LAN: Infra Red Vs Radio Transmission – Infrastructure and Ad-Hoc Network –IEEE 802.11: System Architecture – Protocol Architecture – Physical Layer – MediumAccess Control Layer – MAC Management – HIPERLAN: HIPERLAN1 -WATM – BRAN– HiperLAN2. Bluetooth: User scenarios – Architecture – Radio layer – Base band layer –Link manager protocol

UNIT -V

Mobile Network Layer: Mobile IP – Dynamic Host Configuration Protocol – Mobile Ad- Hoc Networks. Mobile Transport Layer: Traditional TCP-Classical TCP Improvement-TCP Over 2.5/3G Wireless Networks – Performance Enhancing Proxies.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Asoke K Talukder and Roopa R Yavagal ,Mobile Computing,Tata McGraw-Hill,,Eleventh Reprint 2009.
2. John Schiller , Mobile communication, Pearson Edition ,2 nd Edition.

REFERENCE BOOKS:

1. William C.Y.Lee, Mobile Communication Design Fundamentals ,John Wiley,1993
2. Ivan Stojmenoric , Wireless network & Mobile communication,1st Editio

EXTRA CREDIT COURSE

CLOUD COMPUTING

Course Code: 2019ECC025

No. of Credits: 2

Course Objectives:

- To Understand the Cloud computing architectures, applications and challenges and learn about various cloud storages

UNIT - I

(12 Hours)

INTRODUCTION: Cloud Computing Introduction, From, Collaboration to cloud, Working of cloud computing, pros and cons, benefits, developing cloud computing services, Cloud service development, discovering cloud services.

UNIT -II

(12 Hours)

CLOUD COMPUTING FOR EVERYONE: Centralizing email communications, cloud computing for community, collaborating on schedules, collaborating on group projects and events, cloud computing for corporation, mapping schedules managing projects, presenting on road.

UNIT -III

(12 Hours)

USING CLOUD SERVICES: Collaborating on calendars, Schedules and task management, exploring on line scheduling and planning, collaborating on event management, collaborating on contact management, collaborating on project management, collaborating on word processing, spreadsheets, and databases.

UNIT -IV

(12 Hours)

OUTSIDE THE CLOUD : Evaluating web mail services, Evaluating instant messaging, Evaluating web conference tools, creating groups on social networks, Evaluating on line groupware, collaborating via blogs and wikis

UNIT -V

(12 Hours)

STORING AND SHARING: Understanding cloud storage, evaluating on line file storage, exploring on line book marking services, exploring on line photo editing applications, exploring photo sharing communities, controlling it with web based desktops.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Michael Miller, Cloud Computing, Pearson Education, New Delhi,2009.
2. Anthony T. Velte, Cloud Computing A Practical Approach, Tata Mcgraw Hill Education Private Limited, 1st Edition 2009

REFERENCE BOOKS:

1. Arshdeep Bahga, Cloud Computing: A Hands-On Approach, Paperback-Import,, Dec 2013..

EXTRA CREDIT COURSE

CROSS CULTURE MANAGEMENT

Course Code: 2019ECC026

No. of Credits: 2

Course Objective:

- To provide a thorough understanding
- The impact of an international context on management practices based on culture.
- Frameworks for guiding cultural and managerial practice in international business.

UNIT-I

Basic framework of Cross Cultural Management: Factors influencing Decision Making – Using Culture – Cross Cultural and International Management – Implications for the Manager. Comparing Cultures. Shifts in the Culture – Organizational Culture – Culture and Communication –Needs and Incentives – Dispute Resolution and Negotiation.

UNIT-II

Structure of Cross Cultural Management: Formal Structures – Functions – Bureaucracy – Culture and Bureaucracy – Implications. Informal Systems – Informal Relationships – Patronage, Society and Culture –Government-Business Patronage – Guanxi – Managing Informal Systems – Implications.

UNIT-III

Globalization & Cross Cultural Management: Planning Change: Meaning – Planning for Change – Planning in Different Culture – Planning in an Unstable Environment – Implications. International Strategies –Globalization and Localization – Defining Globalization – Roots – Global-Local Contradictions – Implications.

UNIT-IV

Models of Cross Cultural Management: Family Companies: The Anglo Model: Environment, Culture and Management. The Chinese Model: Environment and Culture. The Chinese Model: Management. Changes in the Chinese model – Implications.

UNIT-V

Strategy of Cross Cultural Management: Designing and Implementing Strategy: Formal Strategy Planning – Analyzing Resources and the Competition – Positioning the Company – Implementation – Emergent Strategy – Implications. Head Quarters and Subsidiary: Risk for the Multinational – Control – Implications.

TEXT BOOK:

Recent editions of the following books only are recommended

Jean-Francois Chanlat, Cross Culture Management, T&F publication, Edition-2013.

REFERENCE BOOKS:

1. Neal Mark, The Culture Factor: Cross-national Management and Foreign Venture, Macmillan, Edition-1998.
2. Prashant Faldu, Cross Culture Management, Presence Institute of Image Consulting Pvt.Ltd., Edition-2015.
- 3.Dipak Kumar, Cross Culture Management: Text and Case, PHI Publication, Edition-2010.
- 4.Richard R.Gesteland, Cross-Culture Business Behaviour, Copenhagen Business School Press, Edition-1999.

EXTRA CREDIT COURSE

INDIAN ECONOMY AND TRADE DEPENDENCIES

Course Code: 2019ECC027

No. of Credit :2

Course Objectives: On successful completion of the course, the students should have understood

- The diversity of issues prevalent in the Indian Economy.
- Trade related issues of the Indian Economy.
- The importance of trade in the present globalized era.

UNIT- I

Introduction to Indian Economy : Alternative Development Strategies – Trends in National Income, Growth and Structure since 1991 - New Industrial Policy 1991 – Recent changes in Trade Policy - Competition Policy - Public Sector Reform - Privatization and Disinvestments – Progress of Human Development in India.

UNIT-II

Planning and Economic Development : Redefining the Role of the State –Human Capital Formation in India – Problem of Foreign Aid – Economic Reforms and Reduction of Poverty –Measures to Remove Regional Disparities.

UNIT-III

Indian Industries : Review of Industrial Growth under 10th and 11th Five year plan - Growth and present state of IT industry in India – Outsourcing, Nationalism and Globalization – Small Sector Industrial Policy.

UNIT-IV

Foreign Trade: Trends of Exports and Imports of India – Composition of India's Foreign Trade - Direction of India's Foreign Trade – Growth and Structure of India's Foreign Trade since 1991 – Balance of Payments since the New Economic Reforms of 1991. Foreign Capital : Need for Foreign Capital – Foreign Investment Inflows –Role of Special Economic Zones (SEZ)

UNIT-V

India in the Global Setting : India in Global Trade – Liberalization and Integration with the Global Economy – Globalization Strategies – India's Foreign Exchange Reserves –Convertibility of the Rupee – WTO and India.

TEXT BOOK:Recent editions of the following books only are recommended

1.Ramesh Singh, Indian Economy, Mcgraw Hill Education, Edition-7, 2015.

REFERENCE BOOKS:1.P.Arunachalam-Indian Economy and Trade, Serial Publication, Edition-1,2011.

2.Sankarganesh,Indian Economy Key concepts, Kavin Mukhil Publications, Edition- ,2016

3.Gaurav Kumar, Indian Economy, Kd Publication, Edition-1, 2016.

4.Puri Misra, Indian Economy, Himalaya Publication, Edition-26, 2008.

EXTRA CREDIT COURSE
EXPORT MARKETING

Course Code: 2019ECC028

No. of Credits: 2

Course Objectives:

- To gain knowledge on Export distribution channels.
- To enable the students to understand Export and Import Procedures.
- To create awareness regarding the export promotion and export finance.

UNIT I

Export marketing – an overview -export marketing – meaning difference between export marketing and domestic marketing – basic function of export marketing.

UNIT II

Export distribution channels – direct export – indirect export – channel; small manufacturer.

UNIT III

Export promotion – characteristics of foreign buyers – forms of export promotion-importance of Promotional Activities.

UNIT IV

Export and Import Procedure Documents used in Foreign Trade.

UNIT V

Export Finance- Needs- Short terms, Medium and long term Source of Finance types of Credit.

Text Book

1.Rathor. BS-Export Marketing - Himalaya publishing House 2006

EXTRA CREDIT COURSE
INTERNATIONAL TRADE & FOREX

Course Code: 2019ECC029

No. of Credits: 2

Course Objectives:

- To learn the overview of International Trade and Globalisation.
- To make the students to understand the concepts of foreign exchange management.
- To gain the knowledge on the basic regulation of FEMA.

UNIT I

International trade- Meaning- Scope- Challenges- Theories of International Trade- Balance of Payment- Trade Barriers

UNIT II

Competition Law and International Trade- Competition and Consumer Protection- Regulation of anti competition activity

UNIT III

Export Policy and Procedure- features- Export Promotion Schemes- SEZs , EOU- Deemed Export- Export Promotion Council

UNIT IV

Import Policy and Procedure- Import of Goods- Import on Import basis- Procedure for customs clearance- Warehousing- Canalised import

UNIT V

Introduction to FEMA- Forex Management-Nature- Forex Manager- Foreign Exchange Market- Foreign Exchange Rate- Types- Present status of Foreign exchange Market in India

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Francis cherunilam -International trade-Himalaya publication House 2010

EXTRA CREDIT COURSE

BRAND MANAGEMENT

Course Code: 2019ECC030

No. of Credits: 2

Course Objective:

- To understand the methods of managing brands and strategies for brand management.
- To successfully establish and sustain brands and lead to extensions

UNIT I

Basics Understanding of Brands – Definitions - Branding Concepts – Functions of Brand - Significance of Brands – Different Types of Brands – Co branding – Store brands.

UNIT II

Strategic Brand Management process – Building a strong brand – Brand positioning – Establishing Brand values – Brand vision – Brand Elements – Branding for Global Markets – Competing with foreign brands.

UNIT III

Brand image Building – Brand Loyalty programmes – Brand Promotion Methods – Role of Brand ambassadors, celebrities – On line Brand Promotions.

UNIT IV

Brand Adoption Practices – Different type of brand extension – Factors influencing Decision for extension – Re-branding and re-launching.

UNIT V

Measuring Brand Performance – Brand Equity Management - Global Branding strategies - Brand Audit – Brand Equity Measurement – Brand Leverage -Role of Brand Managers– Branding challenges & opportunities.

TEXT BOOKS:

Recent editions of the following books only are recommended

- 1.Keller/ Parameswaran & Jacob, Strategic Brand Management: Building, Measuring, and
- 2.Managing Brand Equity, Pearson Education India; 4 Edition 2015.

REFERENCE BOOKS:

- 1.Y.L.R. Moorthi, Brand Management, Vikas Publishing House, 1st Edition 2003.
- 2.Sagar Mahim, D. P. Agrawal, Brand Management, ANE Books Edition 2009.
- 3.Kirti Dutta, Brand Management: Principles and Practices, Oxford University Press, Edition 2012.
- 4.Ranjeet Verma, Brand Management, Laxmi Publications, 1st Edition 2009.

EXTRA CREDIT COURSE

STRESS MANAGEMENT

Course Code: 2019ECC031

No. of Credits: 2

Course Objectives:

- To provide a broad physical, social and psychological understanding of stress.
- To understand the management of work related stress
- To develop and implement effective strategies to prevent and manage stress at work.

UNIT I

Meaning – Symptoms – Works Related Stress – Individual Stress – Reducing Stress – Burnout.

UNIT II

Time Management – Techniques – Importance of planning the day – Time management schedule – Developing concentration – Organizing the Work Area – Prioritizing – Beginning at the start – Techniques for conquering procrastination – Sensible delegation – Taking the right breaks – Learning to say ‘No’.

UNIT III

Implications – People issues – Environmental issues –Psychological fall outs – Learning to keep calm – Preventing interruptions – Controlling crisis – Importance of good communication – Taking advantage of crisis – Pushing new ideas – Empowerment.

UNIT IV

Developing a sense of Humour – Learning to laugh – Role of group cohesion and team spirit – Using humour at work – Reducing conflicts with humour.

UNIT V

Improving Personality – Leading with Integrity – Enhancing Creativity – Effective decision Making – Sensible Communication – The Listening Game – Managing Self – Meditation for peace – Yoga for Life.

TEXT BOOK:

Recent editions of the following books only are recommended

1.D M Pestonjee, Stress and Work: “Perspectives on Understanding and Managing Stress”, SAGE Response, First Edition 2013.

REFERENCE BOOKS:

1.Kamlesh Jani, Ratish Kakkad, Stress Management, Pothi Publishers, Edition 2008.

2.Aarti Gurav , Time Management , Buzzing stock Publishing House, First Edition 2014.

3.Sanjay Kumar, Pushp Lata, Communication Skills, Oxford University Press, Second Edition 2015.

Barun Mitra, Personality Development and Soft Skills, Oxford University Press, Second Edition 2017.

EXTRA CREDIT COURSE

RISK AND INSURANCE IN INTERNATIONAL TRADE

Course Code: 2019ECC032

No. of Credit :2

Course Objective: On successful completion of this course, the students should have understood basic principles of insurance and risk management

- Understanding contemporary issues related to insurance

UNIT-I

Nature and History of Insurance Business - Insurance Business in India Europe, UK and USA - insurance Act 1938 -General insurance business -Nationalisation - Insurance as a social security tool – Insurance and economic development - IRDA- Entry of private players into Insurance business -Actuarial profession -Global Trends and developments in Insurance Business

UNIT-II

Principles of Legal aspects of Insurance - Principles of Insurable Interest – Principles of Utmost Good Faith – Principles of Indemnity - Principles of Subrogation -Doctrine of Proximate Cause - Tariff Advisory Committee – Legal Aspects of Life Assurance - Global Insurance Regulatory Frame work.

UNIT-III

Global Non-life Insurance: Principles & Practices Fire insurance – Standard fire policy; Marine - Cargo and Hull insurance – Types; Motor insurance – Liability insurance, Types of policies; Engineering insurance – Electronic equipment insurance, Burglary insurance – Underwriting Practices – Claims settlement in International Perspectives.

UNIT-IV

Risk management process – Risk identifications: perception of risk, Threat analysis, Even analysis, Safety Audit – Risk evaluation – Concept of probability –Statistical methods of risk evaluation – Value at Risk (VaR)

UNIT-V

Risk Management Methods – Contingency Planning – Risk Transfer – Captive Insurance agreements – Reinsurance – Catastrophe covers – Legal Aspects of Reinsurance – Reinsurance Markets – Lloyds Markets – Risk Management techniques for global insurance market players.

TEXT BOOK:

Recent editions of the following books only are recommended

- 1.Mishra, M.N,Insurance principles and practices, S. Chand and Co, Delhi, Edition 4, 2007 .

REFERENCE BOOKS:

- 1.Tripathy N.P,Insurance principles and practices,Prentice Hall India Learning Private Limited Edition 3, 2009
- 2.Ghanashyam Panda & Monika Mahajan,Principles and Practice of Insurance,Kalyani Publishers Edition 4, 2011.
- 3.Insurance Regulatory and Development Authority Act, 1999 ,Universal Law Publishing - An imprint of LexisNexis Edition 1, 2016.
- 4.S K Sarvaria,Commentary on the Insurance Regulatory and Development ,Universal Law Publishing - An Imprint of Lexis Nexis; Edition 1, 2016

EXTRA CREDIT COURSE

RETAIL MARKETING

Course Code: 2019ECC033

No.of Credits: 2

Course Objective:

- To enable the students to understand about Global Retailing.
- To provide knowledge on Visual Merchandise Management.
- To familiarise the students with the Retail shoppers' behaviour.

UNIT I

An overview of Global Retailing – Challenges and opportunities – Retail trends in India – Socio economic and technological Influences on retail management – Government of India policy implications on retails.

UNIT II

Organized and unorganized formats – Different organized retail formats – Characteristics of each format – Emerging trends in retail formats – MNC's role in organized retail formats.

UNIT III

Choice of retail locations - internal and external atmospherics – Positioning of retail shops – Building retail store Image - Retail service quality management – Retail Supply Chain Management – Retail Pricing Decisions. Merchandising and category management – buying.

UNIT IV

Visual Merchandise Management – Space Management – Retail Inventory Management – Retail accounting and audits - Retail store brands – Retail advertising and promotions – Retail Management Information Systems - Online retail – Emerging trends .

UNIT V

Understanding of Retail shopper behavior – Shopper Profile Analysis – Shopping Decision Process - Factors influencing retail shopper behavior – Complaints Management - Retail sales force Management – Challenges in Retailing in India.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. A.Sivakumar, Retail Marketing, Excel Books, Edition-1, 2007.
2. David Gilbert, Retail Marketing Management, Pearsons Education, Edition-2006.

REFERENCE BOOKS:

1. Dr.L.Natarajan, Retail Marketing, Margham Publications, Edition-1,2013.
2. S.Banumathi, Retail Marketing, Himalaya Publishing House, Edition-2015.
3. B.B.Mishra, Retail Marketing, Vrinda Publication, Edition-2010

EXTRA CREDIT COURSE
EXPORT AND IMPORT PROCEDURES

Course Code: 2019ECC034

No.of Credits: 2

Course Objective:

- To enable the students to understand about export and import procedures
- To provide adequate knowledge on export and import documentation.
- To impart knowledge on export and import procedures.

UNIT I

Introduction to Export Management : Meaning – objectives – scope – Need for and importance of export trade – Distinction between internal trade and international trade – Problems faced by exporters.

UNIT II

Features and Functions of export marketing – Sources of market information – Product planning – Quality control – Export pricing – Export marketing channels – Strategy formulation.

UNIT III

Steps involved in export – Confirmation of order – Production of goods – Shipment – Negotiation – Documents used for export – Commercial documents
– Regulatory documents – ISO Certificate.

UNIT IV

Import Trade law in India – Preliminaries for starting Import Business – Registration of Importers – arranging finance for Import – Arranging letter of Credit for Imports – Balance of Payments – Liberalization of Imports.

UNIT V

Retirement of Import Documents and RBI's directives for making payment for Imports – Customs clearance of Imported Goods and payments of customs Duty – Imports under special schemes.

TEXT BOOKS:

Recent editions of the following books only are recommended

- 1.Subramanian Balagopal.T.A.S", Export Marketing",Himalaya Publication House,Mumbai,Edition 1,2010.
- 2.Francis Cherunilam,"International Trade & Export Management",Himalaya Publication House,Mumbai,Edition 1,2012.

REFERENCES BOOKS :

- 1.Veera Reddy.P,"Import made Easy",Commercial Law Publication,New Delhi",Edition 5,2001.
- 2.Mahajan.M.I,"Export Policy Procedure & Documentation",Snow White Publication,Mumbai,Edition 24,2011.
- 3.A Nabhi : "How to Import 2005-2006",A Nabhi Publications, 1st Edition 2006.

EXTRA CREDIT COURSE

LOGISTICS AND SUPPLYCHAIN MANAGEMENT

Course Code : 2019ECC035

No. of Credits: 2

Course Objective: The objective of the subject is to explore

- The interlinking between Logistics and supply chain management.
- The course seeks to provide the key concepts and solution in the design, operation, control and management of supply chain as integrated systems.
- The impact of supply chain in gaining competitive advantage.

UNIT I

Introduction to logistics – Business logistics – marketing logistics – objectives –importance – logistics and customer services – physical supply and distribution –elements and evolution of purchasing and integrated logistics – Integrated logistical activities – strategic integrated logistics management.

UNIT II

Transportation – types – transportation decision making service selection – sea transport, Air, Courier, road and pipe lines – infrastructure – vehicle routing and scheduling – MTO / Intermodal transportation – regulation.

UNIT III

Warehousing – concepts & development – types – operations location analysis –storage – need – functionality and principles – materials handling considerations – packaging – perspectives – purposes – functions – design and costs –Traffic inventory management models – pull and push methods – EOQ – assumptions –policies and control – methods of improved inventory management.

UNIT IV

Logistics information system – system design – Information functionality and principles of information architecture – application of new information technology – EDI standards.

UNIT V

Future management of logistics – logistics and outsourcing – Benefits – third party logistics – value added services – reverse logistics.

TEXT BOOKS:

Recent editions of the following books only are recommended

- 1.Donald J. Bowersox & David J. Closs, Supply Chain Logistics Management, McGraw Hill Education , 3rd Edition 2016.

REFERENCE BOOKS:

- 1.Raghuram, Logistics And Supply Chain Management: Cases and Concepts, Laxmi Publications, Edition 2015.
- 2.Janat Shah, Supply Chain Management, Pearson Education, 1st Edition 2009
- 3.Ballou, Business Logistics/Supply Chain Management, Pearson Education India, 5th Edition 2007
4. Chopra & Kalra, Supply Chain Management, Pearson Education India; 6th Edition 2016.

EXTRA CREDIT COURSE

QUALITY MANAGEMENT

Course Code : 2019ECC036

No. of Credits: 2

Course Objective: On successful completion of the course the students should have understood

- To introduce the fundamental concepts of total quality management, statistical process control, six sigma and the application of these concepts
- To provide a basic understanding of "widely-used" quality analysis tools and techniques.

UNIT I

Definitions – TOM framework, benefits, awareness and obstacles. Quality – vision, mission and policy statements. Customer Focus – customer perception of quality, Translating needs into requirements, customer retention. Dimensions of product and service quality. Cost of quality.

UNIT II

Overview of the contributions of Deming, Juran Crosby, Masaaki Imai, Feigenbaum, Ishikawa, Taguchi techniques – introduction, loss function, parameter and tolerance design, signal to noise ratio. Concepts of Quality circle, Japanese 5S principles and 8D methodology.

UNIT III

Meaning and significance of statistical process control (SPC) – construction of control charts for variables and attributed. Process capability – meaning, significance and measurement – Six sigma concepts of process capability. Reliability concepts – definitions, reliability in series and parallel, product life characteristics curve. Total productive maintenance (TMP) – relevance to TQM, Terotechnology. Business process re-engineering (BPR) – principles, applications, reengineering process, benefits and limitations.

UNIT IV

Quality functions development (QFD) – Benefits, Voice of customer, information organization, House of quality (HOQ), building a HOQ, QFD process. Failure mode effect analysis (FMEA) – requirements of reliability, failure rate, FMEA stages, design, process and documentation. Seven old (statistical) tools. Seven new management tools. Bench marking and POKA YOKE.

UNIT V

Introduction to IS/ISO 9004:2000 – quality management systems – guidelines for performance improvements. Quality Audits. TQM culture, Leadership – quality council, employee involvement, motivation, empowerment, recognition and reward.

TEXT BOOK:

Recent editions of the following books only are recommended

1.R. Janakiraman and R,K Gopal, Total Quality Management, PHI Learning, 1st Edition 2009.

REFERENCE BOOKS:

1. Howard S.Taylor and Francis, Quality Management Systems, New century Publications, Edition 2000
2. L.Suganthi Anand Samuel, Total Quality Management, PHI learning, 1st Edition 2009,
3. Joseph M.Juran, Quality Handbook, Mc Grawhill, 6th Edition .
4. Bell Desmond Heivemann, Managing Quality, Butterworth Publications, Edition 1994.

EXTRA CREDIT COURSE

MANAGEMENT OF SMALL AND NEW ENTERPRISES

Course Code : 2019ECC037

No. of Credits: 2

Course Objective: On successful completion of the course the students should have understood

- Identification, organization and building of new enterprise
- To prepare, analyze and execute business plan
- The logical decision making in business

UNIT I

Entrepreneurship: Small Scale Introduction Institutional- Small scale Enterprises –Infrastructure- Entrepreneurial Competencies for Small Scale Enterprises -Institutional Interface

UNIT II

Establishing small scale enterprises -opportunities scanning—choice of enterprise - market assessment for sse - choice of technology and selection of site

UNIT III

Small scale enterprises — getting organized- financing the new/small enterprise - preparation of the business plan - ownership structure and organization framework

UNIT IV

Operating the small scale enterprise - financial management issues in SSE -operations management issues in SSE- Marketing management issues in SSE - organizational relations in SSE

UNIT V

Performance appraisal and growth strategies - management performance lessons growth and Assessment and control from stabilization - strategies for stabilization and successful strategies Growth entrepreneurs of small - managing family enterprises

TEXT BOOK:

Recent editions of the following books only are recommended

1.Prof.Nirali Pandt, Management of new and small Enterprise, Dotcom Publications, 5th Edition,2016.

REFERENCE BOOKS:

- 1.C.S.Prasad, Small and Medium Enterprise in global Perspective, New Century Publications, I Edition, 2009
- 2.Taxmann, Small and Medium Enterprises in India, Tax mann Publication, Edition 2013.
- 3.Karen Patten Ayman, Information Technology for small business, Sprnger publications, Edition 2012.
- 4.Sarika Lohana, Medium, Micro and Small Enterprises, New century Publications, 1st Edition 2014.

EXTRA CREDIT COURSE

TOURISM MANAGEMENT

CourseCode : 2019ECC038

No. of Credits: 2

Course Objective: On successful completion of the course the students should have understood

- The handling of human resource in the context of complex work situations of the tourism industry.
- The complexities of marketing the tourism product
- The challenges and rewards of Tourism industry

UNIT I

History of Tourism both International and National, Definition, nature, importance, components and typology of tourism.

UNIT II

Concepts of domestic and international tourism, recent trends. Organization of both national and international in world in promotion and development – WTO, IATA, UPTAA, AI, IATO, etc.

UNIT III

Growth and development of tourism in India, National Action Plan 1992.

UNIT IV

Impacts of tourism-economics, social, physical and environmental, Tourism trends world over and its futuristic study.

UNIT V

Emerging trends in tourism—health tourism, adventure tourism, ecotourism .

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Rajan chauhan, Tourism Management, APH Publishing Corporation- Edition-2012.

REFERENCE BOOKS:

1. David Weaver Laura Lawton, Tourism Management, Jhon Wiley & Sons Inc., Edition-2, 2006.
2. Ratandeep Singh, Tourism and Transport Management, Kanishka Publishiners, Edition-1, 2008.
3. Atul Shrivastava, Tourism Planning & Management, Anmol Publications Pvt., Ltd., Edition-2010.
4. Vandhana Joshi, Achana Biwal, Tourism Operations & `Management, Oxford University Press, Edition-1, 2009.

EXTRA CREDIT COURSE

EVENT MANAGEMENT

Course Code: 2019ECC039

No. of Credits: 2

Course Objective: On successful completion of the course the students should have understood Organization and management of events

- The management of accounting and financial aspects in organizing an event
- Planning the logistics and coordinating the technical aspects

UNIT I

Why Event Management, Requirement of Event Manager, Analyzing the events, Scope of the Event, Decision-makers, Technical Staff, Developing Record-Keeping Systems, Establishing Policies & Procedures

UNIT II

Preparing a Planning Schedule, Organizing Tasks, Assigning Responsibility, and Communicating, Using the Schedule Properly, The Budget, Overall Planning tips, Checklists, Expert Resources, Computer Software Required.

UNIT III

Who are the people on the Event, Locating People, Clarifying Roles, Developing content Guidelines, Participant Tips, Reference Checks, Requirement Forms, Introduction, Fees & Honorariums, Expense Reimbursement, Travel Arrangements, Worksheets.

UNIT IV

Types of Events, Roles & Responsibilities of Event Management in Different Events, Scope of the Work, Approach towards Events

UNIT V

Introduction to PR – Concept, Nature, Importance, Steps, Limitations, Objectives Media – Types of Media, Media relations, Media Management PR strategy and planning – identifying right PR strategy, Brain Storming sessions, Event organization, writing for PR

TEXT BOOKS:

Recent editions of the following books only are recommended

1.Sita Ram Singh , Event Management, Aph Publishing Corporation , Edition 2009.

REFERENCE BOOKS:

1.Wagen, Event Management, Pearson, 1st edition 2005.

2.C.P. Harichandan, Event Management, Global Vision Publishing House, 1st edition 2010.

3.Tony Rogers, A Global Industry (Events Management), S.Chand (G/L) & Company Ltd, 3rd Edition 2013.

4. D. G. Conway, The Event Manager's Bible: The Complete Guide to Planning and Organising a Voluntary or Public Event, Viva Books 1st Edition 2010.

EXTRA CREDIT COURSE

HOSPITALITY MANAGEMENT

CourseCode: 2019ECC040

No. of Credits: 2

Course Objective : On successful completion of the course the students should have understood

- To plan and execute hospitality events in coordination with back-of-the-house managers
- To Design and evaluate a hospitality operations plan, employing control systems and technologies, with guest preferences
- To Supervise and coordinate personnel, demonstrating clear communication and cultural sensitivity
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UNIT I

The World of Hospitality: Introduction to Hotel, Travel and tourism Industry - Nature of Hospitality: Communication, Turnover, Demands and Rewards - Economic and Other Impacts of Hotel, Tourism, and Travel Industry - Early History of Lodging - Globalization of the Lodging Industry - Franchising

UNIT II

The Organization and Structure of Lodging Operations : Size and Scope of the Industry - Classifications of Hotels - Hotel Market Segments - Organization of Hotels - Food Service Industry : Composition and Size of Food Service Industry - Organization of Hotel and Restaurant Food Service - Management and Operation of Food Services

UNIT III

The Rooms Division: The Front Office Department - The Reservation Department - The Telecommunications Department - The Uniformed Service Department

UNIT IV

Functional areas: Engineering and Maintenance Division - Marketing and Sales Division - Accounting Division - Human Resources Division - Security Division

UNIT V

Hospitality Marketing: Distinctive characteristics - Seven Ps of Marketing – Segmentation., Targeting and Positioning - Future trends in Hospitality Industry: Usage of CRS in Hotel Industry, Chain of hotels- Role of Associations in hospitality management

TEXT BOOKS:

Recent editions of the following books only are recommended

- 1.Jhon R.Walker, Introduction to Hospitality Management, Pearson India, Edition-2, 2008.

REFERENCE BOOKS:

- 1.Teason.D, Principles of Management for Hospitality Industry, Routledge, Edition 2009.
2. Dr.Saurabh Dixit, Tourism & Hospitality Management, APH Publishing Corporation, Edition-2013.
3. Gajanan Shirke, Hospitality Management, Shorff Publishers, Edition-2011.
4. Aadesh Sinha, Hospitality Operation Management, Centrum Press, Edition-2012

EXTRA CREDIT COURSE

CONSUMER BEHAVIOUR

Course Code : 2019ECC041

No. of Credits: 2

Course Objective: On successful completion of the course the students should have understood

- Consumer motivation and perception
- Learning and attitude
- Consumer decision making

UNIT-I

Introduction - Consumer Behaviour — definition - scope of consumer behaviour — Discipline of consumer behaviour — Customer Value Satisfaction — Retention — Marketing ethics.

UNIT –II

Consumer research — Paradigms — The process of consumer research - consumer motivation — dynamics — types — measurement of motives — consumer perception

UNIT – III

Consumer Learning — Behavioural learning theories — Measures of consumer learning — Consumer attitude — formation — Strategies for attitude change

UNIT – IV

Social class Consumer Behaviour — Life style Profiles of consumer classes — Cross Cultural Customers Behaviour Strategies.

UNIT-V

Consumer Decision Making — Opinion Leadership — Dynamics — Types of consumer decision making — A Model of Consumer Decision Making

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Leon G. Schiffman, Joseph Wisenblit, Consumer Behaviour, Pearson publication, 11th Edition, 2015.

REFERENCE BOOKS:

1. Sathis K Batra, Shhkazmi, Consumer Behaviour, Excel publication, 2nd Edition, 2008.
2. Suja R.Nair, Consumer Behaviour, Himalaya publication, 1st Edition, 2016.
3. Majumdar, Ramanuj, Consumer Behaviour, Prentice Hall India Learning Pvt Ltd, 7th Edition, 2009.
4. Rajneesh Krishna, Consumer Behaviour, Oxford University Press, 1st Edition, 2014.

EXTRA CREDIT COURSE

HUMAN RESOURCE MANAGEMENT

Course Code : 2019ECC042

No. of Credits: 2

Course Objectives:

- To understand the nature of human resources and its significance to the organization
- To familiarise students with the various techniques in HRM that contribute to the overall effectiveness of an organization.
- To bring the attention of the students on the latest trends in managing human resources in an organization.

UNIT I

Human Resource Management:Definition – Objectives – Functions - Evolution And Growth Of HRM– Qualities Of A Good HR Manager – Changing Roles of a HR Manager– Problems And Challenges of a HR Manager.

UNIT II

Planning The Human Resources :definitions Of Human Resource Planning – Objectives – Steps In Human Resources Planning – Dealing With Surplus And Deficient Man Power - Job Analysis – Job Description – Job Specification.

UNIT III

Recruitment & Selection : Recruitment And Selection – Objectives of Recruitment – sources – Internal And External Recruitment – Application Blank – Testing – Interviews.

UNIT IV

Training & Development :Training and development – Principles of Training – Assessment Of Training Needs – on the Job Training methods - off the Job Training Methods – Evaluation of Effectiveness of Training Programmes.

UNIT V

Performance Appraisal :Performance Appraisal– process – Methods of Performance Appraisal – Appraisal Counseling – Motivation process – Theories of motivation – Managing Grievances and Discipline.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Tripathi: “Personnel Management”, Sultan Chand & Sons, New Delhi, 2000.
2. L M Prasad: “Human Resource Management”, Sultan Chand & Sons, New Delhi, 2005.

REFERENCES BOOKS:

1. Aswathappa: “Human Resource Management”, Tata Mc Graw Hill Publishing Company, New Delhi, 1999.
2. Davis and Werther: “Human Resource Management”, Tata Mc Graw Hill Publishing Company, New Delhi, 2000

EXTRA CREDIT COURSE

PRINCIPLES AND PRACTICE OF MARKETING SERVICES

CourseCode: 2019ECC043

No. of Credits: 2

Course Objectives:

- To enable the students to gain knowledge on marketing of various services.
- To enlighten the students' knowledge on marketing services.
- To make the students understand about practice of marketing services.

UNIT I

Meaning of Services Marketing – Definitions – Its importance – characteristics of services – Growth of Services Marketing – Types of services – Comparative analysis between services and products.

UNIT II

Concept of services marketing – Societal concept – Buyer behaviour concept – Factors influencing buyer behaviour – Decision making process of buyer.

UNIT III

Services Marketing Mix – Product Strategy – Product Life Cycle concept – Strategic during the P.L.C. – Product Planning Strategy – Development of new products – its simplification – Diversification and elimination.

UNIT IV

Services Marketing – I : Bank Marketing – Insurance Marketing – Transport Marketing.

UNIT V

Services Marketing – II: Tourism and Hotel Marketing - Education Marketing – Communication Services Marketing.

REFERENCE BOOKS:

1. S.M.Jha,: “Services Marketing”, Himalaya Publication House, Mumbai, Sixth Edition, 2003.
2. Christopher love lock: “Services Marketing”, Person Education Chennai, Sixth Edition, 2010.
3. Philip Kotler: “Marketing Management”, Person Education Chennai, Sixth Edition, 2013
4. S.Sherlekar: “Marketing Management”, Himalaya Publication House, Mumbai, Sixth Edition, 1997.

EXTRA CREDIT COURSE

CONSUMER MARKETING

Coursecode: 2019ECC044

No. of Credits: 2

Course Objectives:

- To make the students to understand the concepts of consumer marketing and the motivation theories.
- To understand the customer value chain and their demography.
- To understand market segmentation and their uses.

UNIT I

Introduction- Definition of Consumer Marketing- Need and importance- Scope- Consumer Needs- Theories of Motivation and their application- Process Theories— Content theories- Personality and Self Concept- Theories of Personality – Trait Theory

UNIT II

Building Customer Value and Satisfaction- Delivering Customer Value- Value Chain – Value Delivery Network- Attracting and Retaining Customer Retention- Relationship Marketing- Customer Demand- Demography- Market Segmentation- Benefits- Criteria for Market Segmentation.

UNIT III

Learning Theories and their application- Brand Loyalty- Brand Extension- Conditioning Theories- Cognitive Learning Theory- Attitude and Attribution theory- Cognitive Dissonance- Self Concept- Development of Self- Fashion – Cosmetics- and Conspicuous Consumption

UNIT IV

Perception- Threshold of perception- Subliminal of Perception- Perception- Perceptual Process- Dynamics- Positioning Methods- and Measurement- Perceptual Mapping- Multidimensional Scaling- Consumer Imaginaries

UNIT V

Advertising- Role in Marketing Process- Legal and Ethical Process- Social Aspects- Function and Types of Advertising- Integrated Marketing Communication- Brand Management- Brand Equity- Image in Brand Equity Building- Ethics in Advertisement

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Schiffman L.G and Kanuk L: “Relationship Marketing”, Tata MC Graw Hill, Twelfth Edition 2009.
2. R.S.N Pillai and Bhavathi : “Modern Marketing Principles and Practices”, S.Chand & Co., Ltd., New Delhi, Seventh Edition, 2011.
3. Paul green Berg: “Customer Relationship Management”, Tata MC Graw Hill, Seventh Edition, 2009.

REFERENCE BOOKS:

1. Philip Kotler and Gray Armstrong: “Principles of Marketing”, Pearson Education Pvt Ltd., Seventh Edition, Reprinted 2011.
2. Dr.Rajan Nair: ”Marketing Management”, Sulthan Chand & Sons, Eleventh Edition, NewDelhi

EXTRA CREDIT COURSE

MARKETING OF HEALTH SERVICES

CourseCode: 2019ECC045

No. of Credits: 2

Course Objectives:

- To enable the students understand about health services.
- To make the students aware of different marketing mix in health industry.
- To confer knowledge about online health services .

UNIT – I

Marketing plans for services: process, strategy formulation, resource allocation and monitoring services communications- customer focused services- service quality- SERV QUAL model

UNIT – II

Hospital services- Selecting Health Care Professionals- Emerging trends in Medicare- Marketing Medicare – Thrust areas for Medicare services.

UNIT – III

Marketing Mix for Hospitals- Product Mix- Promotion Mix- Price Mix- Place Mix- Strategic Marketing for Hospitals.

UNIT – IV

Online Health Services- Organization of Online Health Care Business- On-line Marketing and On-line financial & clinical transaction.

UNIT – V

Legal system: Consumer Rights & Protection, medicine safety rules- Food & Nutrition Security in India - Health Promotion Agencies

Note: Question paper shall cover 100% Theory

REFERENCE BOOKS:

1. Richard K. Thomas, Health Services Marketing, A Practitioner's Guide, Edition-2, 2008.
2. Zeithaml, Services Marketing, Mcgraw Hill Education, Edition-6, 2013.
3. Lovelock, Services Marketing, Pearson India, Edition-7, 2011.
4. Er.I.C. N.Berkowitz, Essentials of Health care Marketing , Jones & Bartlett Learning, Edition-3, 2010.

EXTRA CREDIT COURSE

INTERNATIONAL BANKING

Course Code: 2019ECC046

No. of Credits: 2

Course Objectives:

- The course aims to provide the students with a sound grasp of the practices of modern international banking the central themes and issues will be examined in an international and comparative context.

UNIT-I

Global trends and development in international banking – Outline of international banking and finance. Wholesale banking – Retail banking – Private banking – Interbank business – Regulatory framework – BASEL-II.

UNIT-II

International financial centers – Offshore banking units – Special Economic Zones – Foreign exchange management control – International loan agreements – International debt management.

UNIT-III

Asset liability management – Profitability of international banking operations – Investment banking – Correspondent banking – Bank Regulation: Regulation and prudential supervision of banks in the UK and EU. International regulatory and supervisory convergence. Regulating the multifunctional bank.

UNIT-IV

International financial institutions – IMF, IBRD, BIS, IFC, ADB, WTO – international competitiveness – implications and effectiveness and country risk.

UNIT-V

Treasury and risk management – bank risk management – letters of credit mechanism – buyers and sellers credit – bilateral and counter trade.

TEXT BOOKS:

Recent editions of the following books only are recommended

1.Indian Institute of Banking and Finance, International Banking, Macmillan, Edition-2011.

REFERENCE BOOKS:

1.Ruonarayan Bose, Fundamentals of International Banking, Laxmi Publications, Edition-2014.

2.Indian Institute of Banking and Finance, International Banking Operations, Macmillan, Edition-2017.

3.Yoon S. Park, International Banking and Financial Centers, Springer Publications, Edition-2011.

4.Emmanuel N Roussakis, International Banking, Greenwood Press, Edition-1983.

EXTRA CREDIT COURSE

E-COMMERCE

Course Code: 2019ECC047

No. of Credits: 2

Course Objectives:

- To provide knowledge about Electronic Commerce.
- To enable the students understand the technology of e-Commerce for Business Application.
- To make the student aware of the Techniques in the Application of e-Commerce.
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UNIT I

E-commerce – framework – classification of electronic commerce – Anatomy of E-Commerce Applications – components of the I way –network access equipment – internet terminology.

UNIT II

Electronic Data Interchange – Benefits – EDI Legal, Security & privacy issues – DEI software implementation – value added networks – internal information systems – work flow atomization and coordination – customization and internal commerce.

UNIT III

Network security and firewalls – client server network security – emerging client server security threats – firewalls and network security – data and message security – encrypted documents and electronic mail – hypertext publishing – technology behind the web – security and the web.

UNIT IV

Consumer oriented electronic commerce: consumer oriented applications – mercantile process models – mercantile models from the consumer's perspective – mercantile models from the merchant's perspective.

UNIT V

Electronic payment systems – types – digital token based electronic payment system – smart cards & credit card electronic payment systems – risk designing electronic payment.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Ravi Kalakota and Andrew B. Whinston: "Frontiers of Electronic Commerce", Pearson Education, First Edition, 2006.
2. Elias M Awand: "Electronic Commerce", Phi Learning Pvt Ltd, Third Edition, 2007.

REFERENCE BOOKS:

1. Daniel Minoli and Emma Minoli: "Web Commerce Technology Handbook", Tata McGraw Hill Publishing, New Delhi, First Edition, 2006.
2. Efrain Turban and David King: "Electronic Commerce", Pearson Education, First Edition 2009.
3. Pete Loshin: "Electronic Commerce", Firewall Media, Fourth Edition, 2005.

EXTRA CREDIT COURSE

INTERNATIONAL ACCOUNTING

CourseCode: 2019ECC048

No. of Credits: 2

Course Objective: To make the students understand

- the concept and nuances of international accounting standards and practices for international business firms the importance of financial reporting in international environment.

UNIT-I

Objective of International Financial Reporting – Concept International Accounting Practices, introduction to inter corporate investments – inter company transaction – Global Joint Venture Accounting, Foreign Currency Translation accounting

UNIT-II

Financial instruments – Presentation and disclosure – Convertible securities – recognition and measurement of financial instruments –comprehensive income – settlement Date Vs Trade Date Accounting.

UNIT-III

Inter corporate investment – Temporary and Portfolio investments –Business combination and reporting methods – consolidation procedures –Financial statements disclosure.

UNIT-IV

Global mergers & acquisitions accounting – consolidating wholly, non wholly owned subsidiary under equity and cost recording – Inter company revenue, expenses & inter company profit & expenses.

UNIT-V

Financial reporting in an international environment – Integrated Vs Self Sustaining foreign subsidiary – GAAP for public sector organizations.

TEXT BOOKS: Recent editions of the following books only are recommended

1. **A. K. Das Mohapatra,International Accounting,Prentice Hall India Learning Private Limited , Edition 2, 2012.**

REFERENCE BOOKS:

1. Med ,Accounting and Finance for Bankers,Macmillan Education Edition 3, 2012.
2. Timothy Doupnik,International Accounting,McGraw-Hill Higher Education; Edition 3, 2011
3. Frederick D.S. Choi,International Accounting,Pearson Education; Edition **5, 2007**
4. Shirin Rathore ,International Accounting,PHI, Edition 2,2011.

EXTRA CREDIT COURSE

CORPORATE SOCIAL RESPONSIBILITY AND GOVERNANCE

Course Code: 2019ECC049

No. of Credits: 2

Course Objectives:

- To make the students to understand the concepts of corporate governance
- To gain knowledge on legislative framework of corporate governance and Corporate Social Responsibility and good corporate citizenship.
- To understand the Business Ethics and Genesis.

UNIT-I:

Evolution -Concept-Principles and development-Management structure for corporate governance- Board structure-Stake holder's relationship committee-Appraisal of Board performance- Transparency and disclosure.

UNIT-II:

Legislative framework of corporate governance:UK,USA,India-Corporate communication-Art and Craft of investors relation-Shareholders activism-Investor protection-changing role of Institutional Investors

UNIT-III:

Corporate social responsibility and good corporate citizenship:Various governance forums- Common Wealth Association for Corporate Governance-Organization for Economic Cooperation Development (OECD)-International Corporate Governance Network (ICGN)-National Foundation for Corporate Governance(NFCG)

UNIT-IV:

Business Ethics-Business dilemma versus decision-Dilemma resolution process-Business ethics as a strategic management tool-stakeholders protection-corporate leadership

UNIT-V:

Genesis-Meaning-Nature-Objectives-Scope of Corporate Sustainability.Legal framework - conventions and treaties on environmental- Health and safety-Social security issues.

TEXT BOOKS:

1. Corporate Governance in India : An Evaluation by Das,Subash Chandra.
2. Baxi CV-Corporate Social Responsibility And Governance – Excel books 2006.

EXTRA CREDIT COURSE

ENTERPRISE RESOURCE PLANNING

Course Code: 2019ECC050

No.of Credits: 2

Course Objectives:

- To enable the students understand about the different organizational processes and work flows in ERP.
- To bestow knowledge on ERP services and Business Process Re-engineering .
- To give knowledge on ERP project and its implementation.

UNIT 1

ERP: Introduction : Define – Functional Module in ERP System – Evolution of ERP Systems - Characteristics of ERP – Process Intergration With ERP Systems. Benefits of ERP Applications – Technology Behind ERP Systems. **ERP Market and Vendors:** ERP Market – ERP Vendors – Service Oriented Architecture - ERP Package features.

UNIT II

Extended ERP Services: Defining Extended ERP – SCM and ERP – ERP and BI – ERP and E-Commerce. **Business Process Re-engineering And ERP:** Defining Business Process Reengineering- Enterprise redesign principles – Business process reengineering - BPR and Change Management – Different Approaches BPR Implementation – Methodology for BPR Implementation – Role of IT in BPR – BPR and ERP Systems – BPR success / failure factors.

UNIT III

Planning for ERP – Planning for ERP Implementation – Understanding Organizational Requirements. - Understanding Economic and Strategies Justification – Analysing Project Scope – Determining Resources – Creating Budget for ERP Implementation – Selecting the Right ERP Package-Preparing Organizations for ERP Implementation. **Implementation of ERP:** Designing for ERP systems – ERP implementation approaches – ERP implementation Life cycle.

UNIT IV

Managing ERP Projects: Risk Failure factors in ERP Implementation – Examples of ERP Failure- Mitigating implementation risks – Management and complexity of Large scale ERP Projects- Training users to use ERP Systems. - Evaluating ERP Projects.

UNIT V

ERP Going live and post implementation: Preparing to go live – Strategies for migration – to new ERP systems – Go live performance surprises – Managing ERP after go live – Maintenance of ERP Systems. **Expanding ERP Boundaries:** Service oriented architecture – Enterprises application integration – Application Services provider – Model for ERP implementation.

TEXT BOOKS:

Recent editions of the following books only are recommended

1. Ashim raj singla – Enterprise Resource Planning – Cengage Learning india Pvt . Ltd 2008