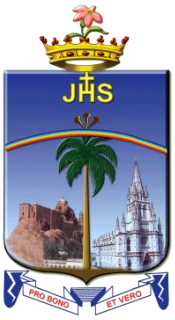
BCA

LOCF SYLLABUS – 2021

SCHOOLS OF EXCELLENCE

WITH CHOICE BASED CREDIT SYSTEM (CBCS)



DEPARTMENT OF INFORMATION TECHNOLOGY
SCHOOL OF COMPUTING SCIENCES
ST. JOSEPH'S COLLEGE (AUTONOMOUS)
Special Heritage Status Awarded by UGC
Accredited at A^{++} Grade (IV Cycle) by NAAC
College with Potential for Excellence by UGC
DBT-STAR & DST-FIST Sponsored College
Tiruchirappalli - 620 002, Tamil Nadu, India

SCHOOLS OF EXCELLENCE WITH CHOICE BASED CREDIT SYSTEM (CBCS)
UNDERGRADUATE COURSES

St. Joseph's College (Autonomous), a pioneer in higher education in India, strives to maintain and uphold the academic excellence. In this regard, it has initiated the implementation of five "Schools of Excellence" from the academic year 2014 – 15, to meet and excel the challenges of the 21st century.

Each School integrates related disciplines under one roof. The school system enhances the optimal utilization of both human and infrastructural resources. It also enhances academic mobility and enriches employability. The School system preserves the identity, autonomy and uniqueness of every department and reinforces Student centric curriculum designing and skill imparting. These five schools adhere to achieve and accomplish the following objectives.

Optimal utilization of resources both human and material for the academic flexibility leading to excellence.

Students experience or enjoy their choice of courses and credits for their horizontal mobility.

The existing curricular structure as specified by TANSCHE and other higher educational institutions facilitate the Credit-Transfer Across the Disciplines (CTAD) - a uniqueness of the choice based credit system.

Human excellence in specialized areas

Thrust in internship and / or projects as a lead towards research and

The multi-discipline nature of the School System caters to the needs of stake-holders, especially the employers.

Credit system:

Weightage to a course is given in relation to the hours assigned for the course. Generally one hour per week has one credit. For viability and conformity to the guidelines credits are awarded irrespective of the teaching hours. The credits and hours of each course of a programme is given in the table of Programme Pattern. However, there could be some flexibility because of practical, field visits, tutorials and nature of project work.

For UG courses, a student must earn a minimum of 130 credits as mentioned in the programme pattern table. The total number of minimum courses offered by the Department is given in the Programme Structure.

OUTCOME-BASED EDUCATION (OBE)
LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK (LOCF)

OBE is an educational theory that bases each part of an educational system around goals (outcomes). By the end of the educational experience, each student should have achieved the goal. There is no single specified style of teaching or assessment in OBE; instead, classes, opportunities and assessments should all help the students achieve the specific outcomes

Outcome Based Education, as the name suggests depends on Outcomes and not Inputs. The outcomes in OBE are expected to be measurable. In fact each Educational Institute can state its own outcomes. The ultimate goal is to ensure that there is a correlation between education and employability

Outcome –Based Education (OBE): is a student-centric teaching and learning methodology in which the course delivery, assessment are planned to achieve, stated objectives and outcomes. It focuses on measuring student performance i.e. outcomes at different levels.

Some important aspects of the Outcome Based Education

Course: is defined as a theory, practical or theory cum practical subject studied in a semester.

Course Outcomes (COs): are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course. Generally three or more course outcomes may be specified for each course based on its weightage.

Programme: is defined as the specialization or discipline of a Degree.

Programme Outcomes (POs): Programme outcomes are narrower statements that describe what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes.

Programme Specific Outcomes (PSOs):

PSOs are what the students should be able to do at the time of graduation with reference to a specific discipline.

Programme Educational Objectives (PEOs): The PEOs of a programme are the statements that describe the expected achievement of graduates in their career, and also in particular, what the graduates are expected to perform and achieve during the first few years after Graduation.

Some important terminologies repeatedly used in LOCF.

Core Courses (CC)

A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course. These are the courses which provide basic understanding of their main discipline. In order to maintain a requisite standard certain core courses must be included in an academic program. This helps in providing a universal recognition to the said academic program.

Discipline Specific Elective Courses (DSE)

Elective course may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective (DSE). These courses offer the flexibility of selection of options from a pool of courses. These are considered specialized or advanced to that particular programme and provide extensive exposure in the area chosen; these are also more applied in nature.

DSE: Four courses are offered, two courses each in semester V and VI

Note: To offer **one DSE**, a minimum of two courses of equal importance / weightage is a must.

A department with two sections must offer two courses to the students.

One DSE Course may be offered as interdisciplinary course among the departments in a School (Common Core Course) at the PG level.

Generic Elective Courses

An elective course chosen generally from an **unrelated discipline/subject,** with an intention to seek exposure is called a Generic Elective.

Generic Elective courses are designed for the students of **other disciplines**. Thus, as per the CBCS policy, the students pursuing particular disciplines would have to opt Generic Elective courses offered by other disciplines, as per the basket of courses offered by the college. The scope of the Generic Elective (GE) Courses is positively related to the diversity of disciplines in which programmes are being offered by the college.

Two GE Courses are offered one each in semesters V and VI.

(open to the students of other Departments)

The Ability Enhancement Courses (AEC)

"AECC" are the courses based upon the content that leads to Knowledge enhancement; Communicative English, Environmental Science. These are mandatory for all disciplines.

AECC-1: Communicative English: It is a 4 credits compulsory course offered by the Department of English in the first semester of the Degree Programme, Classes are conducted outside the regular class hours.

AECC-2: Environmental Science: is a 2 credit course offered as a compulsory course during the second semester by the Department of Human Excellence.

Skill Enhancement Courses (SECs)

These courses focus on developing skills or proficiencies in the student, and aim at providing hands-on training. Skill enhancement courses can be opted by the students of any other discipline, but are highly suitable for students pursuing their academic programme.

These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge**.**

There are four courses under this category

SEC-1 is offered in semester **III as a course** Within the Department **(WD)** it is More of main discipline related skills.

SEC-2is offered in semester **IV as a course** Between schools **(BS)** Offered to students of other schools (Except the school offering the course)

SEC-3 is offered in semester **V as** a compulsory course on Soft Skills offered by the Department of Human Excellence, common to all the students of UG programme.

SEC-4 is offered in semester **VI** as a course **Within School (WS)** Open to all the students within the same school (including the students of the parent department)

Self–paced Learning: It is a course for two credits. It is offered to promote the habit of independent/self learning of Students. Since it is a two credit course, syllabus is framed to complete within 45 hours. It is not taught in the regular working hours.

Field Study/Industrial Visit/Case Study: It has to be completed during the fifth semester of the degree programme. Credit for this course will be entered in the fifth semester's marks statement.

Internship: Students must complete internship during summer holidays after the fourth semester. They have to submit a report of internship training with the necessary documents and have to appear for a viva-voce examination during fifth semester. Credit for internship will be entered in the fifth semester's mark statement.

Comprehensive Examinations: A detailed syllabus consisting of five units to be chosen from the courses offered over the five semesters which are of immense importance and those portions which could not be accommodated in the regular syllabus.

Extra Credit Courses: In order to facilitate the students, gaining knowledge/skills by attending online courses MOOC, credits are awarded as extra credits, the extra credit are at three semesters after verifying the course completion certificates. According to the guidelines of UGC, the students are encouraged to avail this option of enriching their knowledge by enrolling themselves in the Massive Open Online Courses (MOOC) provided by various portals such as SWAYAM, NPTEL and etc.

Undergraduate Programme:

Programme Pattern:

The Under Graduate degree programme consists of **FIVE** vital components. They are as follows:

Part -I : Languages (Tamil / Hindi / French / Sanskrit)

Part-II : General English

Part-III : Core Course (Theory, Practicals, Discipline Specific Electives, Compulsory and Optional Allied courses, Project, Self paced courses, Internship , Comprehensive Examinations and field visit /industrial visit/Case Study)

Part-IV: Value Education, Ability Enhancement Courses, Skill Enhancement Courses/ Soft Skills , Generic Electives/ National Cadet Corps etc.

Part-V: Outreach Programme (SHEPHERD).

Ability Enhancement Courses (AEC): There are two Ability Enhancement courses viz AECC and SEC.

Value Education Courses:

There are four courses offered in the first four semesters for the First & Second UG Programme.

Course Coding

The following code system (11 alphanumeric characters) is adopted for Under Graduate courses:

21	UXX	N	N	XX	NN/NNX
Year of Revision	UG Department Code	Semester number	Part specification	Part Category	Running number/with choice

N:- Numeral X :- Alphabet

Part Category

GL - Languages (Tamil / Hindi / French / Sanskrit)

GE - General English

CC - Core Theory; CP- Core Practical

WS- Workshop

SP- Self Paced Learning

IS- Internship

FV- Field visit

CE- Comprehensive Examination

PW- Project Work& viva-voce

Electives Courses

ES – Department Specific Electives

EG- Generic Electives

Allied Courses

AC - Allied Compulsory

AO- Allied Optional

EC - Additional Core Courses for Extra Credits (If any)*

Ability Enhancement Courses

AE – Ability Enhancement Compulsory Courses; Bridge Course and Environment Science

SE – Skill Enhancement (WD), (BS), (WS) and Soft skills

VE - Value Education/ Social Ethics/Religious Doctrine

OR – Outreach SHEPHERD & Gender Studies (Outreach)

SU - AICUF / Nature Club / Fine Arts / NCC / NSS /etc. (Service Unit)

CIA AND SEMESTER EXAMINATION

Continuous Internal Assessment (CIA):

Distribution of CIA Marks	
Passing Minimum: 40 Marks	
Library Referencing	5
3 Components	35
Mid-Semester Test	30
End-Semester Test	30
Total CIA	100

MID-SEM & END – SEM TEST

Centralised – Conducted by the office of COE

1. Mid-Sem Test & End-Sem Test: (2 Hours each); will have Objective and Descriptive elements; with the below mentioned question pattern PART-A; PART-B; PART-C and PART D.
2. One of the CIA Component II/III for UG & PG will be of 15 marks and compulsorily a online objective multiple choice question type.
3. The online CIA Component must be conducted by the Department / faculty concerned at a suitable computer centre.
4. The 7 marks of PART-A of Mid-Sem and End-Sem Tests will comprise only: OBJECTIVE MULTIPLE CHOICE QUESTIONS.
5. The number of hours for the 5 marks allotted for Library Referencing/ work would be 30 hours per semester. The marks scored out of 5 will be given to all the courses (Courses) of the Semester.
6. English Composition once a fortnight will form one of the components for UG general English

Duration of Examination must be rational; proportional to teaching hours 90 minute-examination / 50 Marks for courses of 2/3 hours/week (all Part IV UG Courses) 3-hours examination for courses of 4-6 hours/week.

Knowledge levels for assessment of Outcomes based on Blooms Taxonomy

S. No.	Level	Parameter	Description
1	K1	Knowledge/Remembering	It is the ability to remember the previously learned
2	K2	Comprehension/Understanding	The learner explains ideas or concepts
3	K3	Application/Applying	The learner uses information in a new way
4	K4	Analysis/Analysing	The learner distinguishes among different
5	K5	Evaluation/Evaluating	The learner justifies a stand or decision
6	K6	Synthesis /Creating	The learner creates a new product or point of view

WEIGHTAGE of K – LEVELS IN QUESTION PAPER

(Cognitive Level) K- LEVELS	Lower Order Thinking			Higher Order Thinking			Total %
	K1	K2	K3	K4	K5	K6	
SEMESTER EXAMINATIONS	15	20	35	30			**100**
MID / END Semester TESTS	12	20	35	33			**100**

QUESTION PATTERN FOR SEMESTER EXAMINATION	
SECTION	**MARKS**
SECTION–A (No choice ,One Mark) **THREE** questions from each unit **(**15x1 =15)	**15**
SECTION-B (No choice ,2-Marks) **TWO** questions from each unit (10x2 =20)	**20**
SECTION-C (Either/or type) (7- Marks) **ONE** question from each unit (5x7 =35)	**35**
SECTION-D (3 out of 5) (10 Marks) **ONE** question from each unit (3x10 =30)	**30**
Total	**100**

BLUE PRINT OF QUESTION PAPER FOR SEMESTER EXAMINATION							
DURATION: 3. 00 Hours.							**Max Mark : 100**
K- LEVELS / **SECTIONS**	**K1**	**K2**	**K3**	**K4**	**K5**	**K6**	**Total Marks**
SECTION–A (One Mark, No choice) (15x1=15)	15						**15**
SECTION-B (2-Marks, No choice) (10x2=20)		10					**20**
SECTION-C (7- Marks) (Either/or type) (5x7=35)			5				**35**
SECTION-D (10 Marks) (3 out of 5) (3x10=30) Courses having only **K4** levels				3			**30**
Courses having **K4** and **K5** levels **One K5 level question is compulsory**				2	1		
(Courses having **all the 6** cognitive levels **One K5 and K6 level questions can be compulsory**				1	1	1	
Total	**15**	**20**	**35**	**30**			**100**

QUESTION PATTERN FOR MID/END TEST			
SECTIONS			**MARKS**
SECTION–A	(No choice, One Mark)	(7x1 =7)	**7**
SECTION-B	(No choice , 2-Marks)	(6x2 =12)	**12**
SECTION-C	(Either/or type) (7- Marks)	(3x7 =21)	**21**
SECTION-D	(2 out of 3) (10 Marks)	(2x10=20)	**20**
		Total	**60**

BLUE PRINT OF QUESTION PAPER FOR MID/END TEST							
DURATION: 2. 00 Hours.							**Max Mark: 60.**
K- LEVELS / **SECTIONS**	**K1**	**K2**	**K3**	**K4**	**K5**	**K6**	**Total Marks**
SECTION –A (One Mark, No choice) (7 x 1 = 7)	7						**07**
SECTION-B (2-Marks, No choice) (6 x 2 = 12)		6					**12**
SECTION-C (Either/or type) (7- Marks) (3 x 7 =21)			3				**21**
SECTION-D (2 out of 3) (10 Marks) (2x10=20) Courses having only **K4** levels				2			**20**
Courses having **K4** and **K5** levels **One K5 level question is compulsory**				1	1		
Courses having **all the 6** cognitive levels **One K6 level question is compulsory**					1	1	
Total Marks	**07**	**12**	**21**	**20**			**60**
Weightage for 100 %	**12**	**20**	**35**	**33**			**100**

Assessment pattern for two credit courses.

S. No.	Course Title	CIA	Semester Examination	Total Marks
1	Self Paced Learning Course	25 + 25 = 50	50 Marks (MCQ) (COE)	100
2	Comprehensive Examinations	25 +25 = 50	50 Marks (MCQ) (COE)	100
3	Internship	100	--	100
4	Field Visit	100	--	100
5	Ability Enhancement Course (AEC) for PG	50 (Three Components)	50 (COE) (Specific Question Pattern)	100
Assessment Pattern for Courses in Part - IV				
6	Value Education Courses and Environmental Studies	50	50 Marks (For 2.00 hours) (COE)	100
7	Skill Enhancement Courses(SECs)	50 marks (by Course in-charge) 50 Marks (by an External member from the Department)		100
8	SEC: SOFT SKILLS (For UG and PG)	100 (Fully Internal)		100

EVALUATION

GRADING SYSTEM

Once the marks of the CIA and the end-semester examination for each of the courses are available, they will be added and converted as final mark. The marks thus obtained will then be graded as per the scheme provided in Table-1.

From the second semester onwards, the total performance within a semester and the continuous performance starting from the first semester are indicated by semester Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) respectively. These two are calculated by the following formulae:

$GPA = \frac{\sum_{i=1}^{n} C_i G_i}{\sum_{i=1}^{n} C_i}$	$WAM\,(Weighted\,Average\,Marks) = \frac{\sum_{i=1}^{n} C_i M_i}{\sum_{i=1}^{n} C_i}$
Where, C_i is the Credit earned for the Course i G_i is the Grade Point obtained by the student for the Course i M_i is the marks obtained for the course i and n is the number of Courses **Passed** in that semester.	

CGPA: Average GPA of all the Courses starting from the first semester to the current semester.

CLASSIFICATION OF FINAL RESULTS:

i) For each of the first three parts, there shall be separate classification on the basis of CGPA, as indicated in Table-2.
ii) For the purpose of declaring a candidate to have qualified for the Degree of Bachelor of Arts/Science/Commerce/Management/Literature as Outstanding/Excellent/Very Good/Good/Above Average/Average, the marks and the corresponding CGPA earned by the candidate in Part-III alone will be the criterion, provided the candidate has secured the prescribed passing minimum in the all the Five parts of the Prgoramme.
iii) Grade in Part –IV and Part-V shall be shown separately and it shall not be taken into account for classification.
iv) A Pass in SHEPHERD will continue to be mandatory although the marks will not count for the calculation of the CGPA.
v) Absence from an examination shall not be taken an attempt.

Table-1: Grading of the Courses

Marks Range	Grade Point	Corresponding Grade
90 and above	**10**	**O**
80 and above and below 90	**9**	A+
70 and above and below 80	**8**	**A**
60 and above and below 70	**7**	**B+**
50 and above and below 60	**6**	**B**
40 and above and below 50	**5**	**C**
Below 40	**0**	**RA**

Table-2: Final Result

CGPA	Corresponding Grade	Classification of Final Result
9.00 and above	**O**	**Outstanding**
8.00 to 8.99	A+	Excellent
7.00 to 7.99	**A**	**Very Good**
6.00 to 6.99	**B+**	**Good**
5.0 0 to 5.99	**B**	**Above Average**
4.00 to 4.99	**C**	**Average**
Below 4.00	**RA**	**Re-appearance**

Credit based weighted Mark System is adopted for the individual semesters and cumulative semesters in the column 'Marks secured' (for 100)

Declaration of Result

Mr./ MS. _____ has successfully completed the Under Graduate in _____programme. The candidate's Cumulative Grade Point Average (CGPA) in Part – III is _____ and the class secured is _____ by completing the minimum of 130 credits. The candidate has acquired _____ (if any) more credits from SHEPHERD / AICUF/ FINE ARTS / SPORTS & GAMES / NCC / NSS / NATURE CLUB, ETC. The candidate has also acquired _____ (if any) extra credits by attending MOOC courses.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

The Programme Outcomes (POs)/Programme Specific Outcomes(PSOs) are the qualities that must be imbibed in the graduates by the time of completion of their programme. At the end of each programme the PO/PSO assessment in done from the CO attainment of all curriculum components. The POs/PSOs are framed based on the guidelines of LOCF. There are five POs UG programme and five POs for PG programme framed by the college. PSOs are framed by the departments and they are five in numbers.

For each Course, there are five Course Outcomes to be achieved at the end of the course. These Course outcomes are framed to achieve the POs/PSOs. All course outcomes shall have linkage to POs/PSOs in such a way that the strongest relation has the weight 3 and the weakest is 1. This relation is defined by using the following table.

Mapping	<40%	≥ 40% and < 70%	≥ 70%
Relation	Low Level	Medium Level	High Level
Scale	1	2	3

Mean Scores of COs $= \frac{\text{Sum of values}}{\text{Total No.of POs \& PSOs}}$		**Mean Overall Score** $= \frac{\text{Sum of Mean Scores}}{\text{Total No.of COs}}$	
Result	**Mean Overall Score**	**< 1.2**	**# Low**
		≥ 1.2 and < 2.2	**# Medium**
		≥ 2.2	**# High**

If the mean overall score is low then the course in charge has to redesign the particular course content so as to achieve high level mean overall score.

VISION

Forming globally competent, committed, compassionate and holistic persons, to be men and women for others, promoting a just society.

MISSION

- Fostering learning environment to students of diverse background, developing their inherent skills and competencies through reflection, creation of knowledge and service.
- Nurturing comprehensive learning and best practices through innovative and value-driven pedagogy.
- Contributing significantly to Higher Education through Teaching, Learning, Research and Extension.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

- Graduates will be able to accomplish professional standards in the global environment.
- Graduates will be able to uphold integrity and human values.
- Graduates will be able to appreciate and promote pluralism and multiculturalism in working environment.

PROGRAMME OUTCOMES (POs) UG

1. Graduates will be able to comprehend the concepts learnt and apply in real life situations with analytical skills.
2. Graduates with acquired skills and enhanced knowledge will be employable/ become entrepreneurs or will pursue higher Education.
3. Graduates with acquired knowledge of modern tools communicative skills and will be able to contribute effectively as team members.
4. Graduates are able to read the signs of the time analyze and provide practical solutions.
5. Graduates imbibed with ethical values and social concern will be able to understand and appreciate social harmony, cultural diversity ensure sustainable environment.

Programme Specific Outcomes (PSOs)	
PSO1	Understand and analyze the fundamental knowledge in the domain of computer applications.
PSO2	Enhance the logical and analytical thinking to understand the computational systems.
PSO3	Ability to comprehend the structure, development methodologies of software systems and to design the software solutions.
PSO4	Explore the developing areas in the sphere of computer applications and to enrich themselves to be skillful to meet the diverse expectations of the industry.
PSO5	Equip them to be competent to provide optimal and ethical solutions to the technological challenges laid by the professional societies.

B.C.A. BACHELOR OF COMPUTER APPLICATIONS						
PROGRAMME STRUCTURE						
Part	**Sem.**	**Specification**	**No. of Courses**	**No. of Hours**	**Credits**	**Total Credits**
I	I-IV	Languages (Tamil / Hindi/ French/ Sanskrit)	4	16	12	12
II	I-IV	General English	4	20	12	12
	I –VI	Core course : Theory	12	50	31	84
III	I –VI	Core course : Practical	08	24	16	
	I-IV	Core course- Allied	04	18	12	
	I-IV	Core course- Practical	02	06	04	
	V-VI	Discipline Specific Elective	4	20	12	
	VI	Project Work	1	-	2	
	V	Self-paced learning	1	--	2	
	V	Field study/ Industrial visit/ Case study	1	-	1	
	V	Internship	1	-	2	
	VI	Comprehensive Exam	1	--	2	
	II,III ,V	Extra Credit courses (MOOC)	(3)	--	(6)	(6)
IV	V,VI	Generic Elective	2	8	4	18
	I	AECC-1Communicative English	1	--	4	
	II	AECC-2 Environmental studies	1	2	2	
	III	SEC -1 Within Dept. (WD)	1	2	1	
	IV	SEC -2 Between Schools (BS)	1	2	1	
	V	SEC -3 Soft skill	1	2	1	
	VI	SEC -4 within school (WS)	1	2	1	
	I-IV	Value Education	4	8	4	
V	1-V	Outreach Programme /NCC	-	-	-	4
		Total		180	130(6)	130(6)

B.C.A. BACHELOR OF COMPUTER APPLICATIONS								
PROGRAMME PATTERN								
Course Details						Scheme of Exams		
Sem	Part	Course Code	Course Title	Hrs	Cr	CIA	SE	Final
I	1	21UTA11GL01	General Tamil - I	4	3	100	100	100
		21UFR11GL01	French-I					
		21UHI11GL01	Hindi-I					
		21USA11GL01	Sanskrit-I					
	2	21UEN12GE01	General English -I	5	3	100	100	100
	3	21UBC13CC01	Information Systems	5	2	100	100	100
	3	21UBC13CC02	C Programming	5	2	100	100	100
	3	21UBC13CP01	Software Lab -1: C Programming	3	2	100	100	100
	3	21UBC13AC01	**Allied:** Mathematics -I	6	4	100	100	100
	4	21UHE14VE01	Essentials of Humanity	2	1	50	50	50
	4	21UEN14AE01	**AECC-1** : Communicative English	(6)	4	100	-	100
			Total	**30**	**21**			
II	1	21UTA21GL02	General Tamil - II	4	3	100	100	100
		21UFR21GL02	French-II					
		21UHI21GL02	Hindi-II					
		21USA21GL02	Sanskrit-II					
	2	21UEN22GE02	General English-II	5	3	100	100	100
	3	21UBC23CC03	Digital Computer Fundamentals	4	2	100	100	100
	3	21UBC23CC04	Relational Database Management Systems	4	2	100	100	100
	3	21UBC23CP02	Software Lab - 2: Relational Database Management Systems	3	2	100	100	100
	3	21UBC23AC02	**Allied:** Mathematics -II	6	4	100	100	100
	4	21UHE24VE02	Techniques of Social Analysis: Fundamentals of Human Rights	2	1	50	50	50
	4	21UHE24AE02	**AECC-2:** Environmental Studies	2	2	50	50	50
			Extra Credit courses (MOOC)-1	-	(2)	-	-	-
			Total	**30**	**19(2)**			
III	1	21UTA31GL03	General Tamil - III	4	3	100	100	100
		21UFR31GL03	French-III					
		21UHI31GL03	Hindi-III					
		21USA31GL03	Sanskrit-III					
	2	21UEN32GE03	General English -III	5	3	100	100	100
	3	21UBC33CC05	Data Structures and Algorithms	4	2	100	100	100
	3	21UBC33CC06	C# .NET	4	3	100	100	100
	3	21UBC33CP03	Software Lab -3: C# .NET	3	2	100	100	100
	3	21UBC33AO03A	**Allied Optional :** Financial Accounting Package – Tally Prime	3	2	100	100	100
	3	21UBC33AP01A	**Allied Optional Practical** : Software Lab I : Financial Accounting Package – Tally Prime Basic	3	2	100	100	100
		21UBC33AO03B	**Allied Optional:** Accounts -1	(6)	(4)	100	100	100
	4	21UBC34SE01	**SEC -1** (WD): Numerical Aptitude	2	1	100	-	100
	4	21UHE34VE03A	Professional Ethics–I: Social Ethics - I	2	1	50	50	50
		21UHE34VE03B	Professional Ethics I: Religious Doctrine- I					
			Extra Credit courses (MOOC)-2		(2)	-	-	-
			Total	**30**	**19(2)**			
IV	1	21UTA41GL04B	Scinetific Tamil (SBS, SPS,SCS)	4	3	100	100	100
		21UFR41GL04	French- IV					
		21UHI41GL04	Hindi-IV					
		21USA41GL04	Sanskrit-IV					
	2	21UEN42GE04	General English – IV	5	3	100	100	100

	3	21UBC43CC07	Software Engineering	4	2	100	100	100
	3	21UBC43CC08	Java Programming	4	2	100	100	100
	3	21UBC43CP04	Software Lab – 4: Java Programming	3	2	100	100	100
	3	21UBC43AO04A	**Allied Optional** : Financial Accounting Package – Tally Prime Advanced	3	2	100	100	100
	3	21UBC43AP02A	**Allied Optional Practical** : Software Lab II: Financial Accounting Package – Tally Prime Advanced	3	2	100	100	100
		21UBC43AO04B	**Allied Optional:** Accounts -II	(6)	(4)	100	100	100
	4	21UBC44SE02	**SEC -2** (BS): Digital Artwork	2	1	100	-	100
	4	21UHE44VE04A	Professional Ethics–II: Social Ethics - II	2	1	50	50	50
		21UHE44VE04B	Professional Ethics II: Religious Doctrine-II					
			Total	**30**	**18**			
V	3	21UBC53CC09	Programming with ASP.Net	4	3	100	100	100
		21UBC53CC10	Web Technologies	4	3	100	100	100
	3	21UBC53CP05	Software Lab-5 : Programming with ASP.Net	3	2	100	100	100
	3	21UBC53CP06	Software Lab-6 : Web Technologies	3	2	100	100	100
	3	21UBC53ES01A	**DSE -1: Operating Systems**	5	3	100	100	100
		21UBC53ES01B	**DSE -1:** Linux Programming					
	3	21UBC53ES02A	**DSE -2:** Communication Networks	5	3	100	100	100
		21UBC53ES02B	**DSE -2 :** Software Testing					
	3	21UBC53IS01	Internship	-	2	100	-	100
	3	21UBC53SP01	**Self-paced learning:** Cloud Computing	-	2	50	50	50
	3	21UBC53FV01	Field study/ Industrial visit/ Case study	-	1	100	-	100
	4	21USS54SE03	**SEC -3** : Soft Skills	2	1	100	-	100
	4	21UBC54EG01	**GE-1**: Fundamentals Of Data Science	4	3	100	100	100
			Extra Credit courses (MOOC)-3	-	(2)			
			Total	**30**	**25(2)**			
VI	3	21UBC63CC11	Python Programming	4	3	100	100	100
	3	21UBC63CC12	Mobile Application Development Using Android	4	3	100	100	100
	3	21UBC63CP07	Software Lab - 7 : Python Programming	3	2	100	100	100
	3	21UBC63CP08	Software Lab - 8 : Android	3	2	100	100	100
	3	21UBC63ES03A	**DSE-3:** Information Security	5	3	100	100	100
		21UBC63ES03B	**DSE -3:** Business Intelligence					
	3	21UBC63ES04A	**DSE-4 :** Fundamentals of IoT	5	3	100	100	100
		21UBC63ES04B	**DSE-4 :** Cross Platform App Development					
	3	21UBC63PW01	Project Work and Viva Voce	-	2	100	100	100
	3	21UBC63CE01	Comprehensive Examination	-	2	50	50	50
	4	21UBC64SE04A	**SEC-4** (WS): Web Design	2	1	100	-	100
		21UBC64SE04B	**SEC-4** (WS): 3D Animation					
	4	21UBC64EG02	**GE-2 :** Industry 4.0	4	3	100	100	100
			Total	**30**	**24**			
I-VI	5	21UCW65OR01	Outreach programme (SHEPHERD)		4			
			Total(three years)	**180**	**130(6)**			

*The courses with a scheme of Exam 50 in CIA and SE will be converted to 100 for grading.

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SEC-2: BETWEEN SCHOOL 4th Semester							
Between schools (BS)- Offered to students of other schools (Except the school offering the course)							
Course Details					Scheme of Exams		
Offering Department	**Course Code**	**Course Title**	**Hr**	**Cr**	**CIA**	**SE**	**Final**
SBS							
Botany	21UBO44SE02	Mushroom Technology	2	1	100	-	100
SCS							
Computer Science	21UCS44SE02	Data Analysis Using Spreadsheet	2	1	100	-	100
Mathematics	21UMA44SE02	Numerical Ability	2	1	100	-	100
Statistics	21UST44SE02	Quantitative Methods	2	1	100	-	100
Information Technology	21UBC44SE02	Digital Artwork	2	1	100	-	100
SLAC							
English	21UEN44SE02	English for Competitive Examinations	2	1	100	-	100
History	21UHS44SE02	Historical Monuments in Tiruchirappalli	2	1	100	-	100
Tamil	21UTA44SE02A	மேடைப் பேச்சுக்கலை	2	1	100	-	100
Tamil	21UTA44SE02	திரைப்படத் திறனாய்வும் குறும்பட உருவாக்கம்	2	1	100	-	100
SMS							
Commerce	21UCO44SE02A	Personal Finance Management	2	1	100	-	100
Commerce	21UCO44SE02B	Marketing Skills	2	1	100	-	100
Commerce	21UCO44SE02C	Event Planning and Management	2	1	100	-	100
Economics	21UEC44SE02	Financial Economics	2	1	100	-	100
BBA	21UBU44SE02A	Entrepreneurial Skills Enhancement	2	1	100	-	100
BBA	21UBU44SE02B	Practical Stock Trading	2	1	100	-	100
Commerce CA	21UCC44SE02	Practical Banking in India	2	1	100	-	100
SPS							
Chemistry	21UCH44SE02A	Health Chemistry	2	1	100	-	100
Chemistry	21UCH44SE02B	Industrial Chemistry	2	1	100	-	100
Physics	21UPH44SE02A	Weather Physics	2	1	100	-	100
Physics	21UPH44SE02B	Electrical Wiring	2	1	100	-	100
Electronics	21UEL44SE02	PC Assembling and Servicing	2	1	100	-	100

GENERIC ELECTIVE -1: 5th Semester							
Generic Elective Courses are designed for the students of other disciplines. (open to the students of other departments)							
Course Details					**Scheme of Exams**		
Offering Department	**Course Code**	**Course Title**	**Hrs**	**Cr**	**CIA**	**SE**	**Final**
SBS							
Botany	21UBO54EG01	Landscape Designing	4	3	100	100	100
SCS							
Computer Science	21UCS54EG01	Ethical Hacking	4	3	100	100	100
Mathematics	21UMA54EG01	Mathematics for Competitive Examinations	4	3	100	100	100
Statistics	21UST54EG01	Actuarial Statistics	4	3	100	100	100
Information Technology	21UBC54EG01	Fundamentals Of Data Science	4	3	100	100	100
SLAC							
English	21UEN54GE01	Film Studies	4	3	100	100	100
History	21UHS54EG01	Tamil Heritage and Culture	4	3	100	100	100
Tamil	21UTA54EG01	தமிழிலயக்கத்தில் மனித உரிமைகள்	4	3	100	100	100
SMS							
Commerce	21UCO54EG01A	Computerised Accounting	4	3	100	100	100
Commerce	21UCO54EG01B	Basics of Excel	4	3	100	100	100
Commerce	21UCO54EG01C	Personal Investment Planning	4	3	100	100	100
Economics	21UEC54EG01	Principles of Economics	4	3	100	100	100
Commerce CA	21UCC54EG01	E-commerce and E Business Management	4	3	100	100	100
BBA	21UBU54EG01A	Global Supply Chain Management	4	3	100	100	100
BBA	21UBU54EG01B	Start – Ups and Small Business Management	4	3	100	100	100
SPS							
Chemistry	21UCH54EG01A	Chemistry for Competitive Examinations	4	3	100	100	100
Chemistry	21UCH54EG01B	Everyday Chemistry	4	3	100	100	100
Physics	21UPH54EG01A	Everyday Physics	4	3	100	100	100
Physics	21UPH54EG01B	Renewable Energy Physics	4	3	100	100	100
Electronics	21UEL54EG01A	Everyday Electronics	4	3	100	100	100
Electronics	21UEL54EG01B	Wireless Communication	4	3	100	100	100

GENERIC ELECTIVE -2: 6th Semester							
Generic Elective Courses are designed for the students of other disciplines. (open to the students of other departments)							
Course Details					**Scheme of Exams**		
Offering Department	**Course Code**	**Course Title**	**Hrs**	**Cr**	**CIA**	**SE**	**Final**
SBS							
Botany	21UBO64EG02	Solid Waste Management	4	3	100	100	100
SCS							
Computer Science	21UCS64EG02	3D Printing and Design	4	3	100	100	100
Mathematics	21UMA64EG02	Analytical Skill for Competitive Examinations	4	3	100	100	100
Statistics	21UST64EG02	Applied Statistics	4	3	100	100	100
Information Technology	21UBC64EG02	Industry 4.0	4	3	100	100	100
SLAC							
English	21UEN64EG02	English for the Media	4	3	100	100	100
History	21UHS64EG02	Intellectual Revivalism in Tamil Nadu	4	3	100	100	100
Tamil	21UTA64EG02	சித்த மருத்துவம்	4	3	100	100	100
SMS							
Commerce	21UCO64EG02A	Rural Marketing	4	3	100	100	100
Commerce	21UCO64EG02B	Entrepreneurship Development	4	3	100	100	100
Commerce	21UCO64EG02C	Digital Marketing	4	3	100	100	100
Economics	21UEC64EG02	Economics for Competitive Exams	4	3	100	100	100
Commerce CA	21UCC64EG02	Total Quality Management	4	3	100	100	100
BBA	21UBU64EG02A	Personality Development	4	3	100	100	100
BBA	21UBU64EG02B	NGO Management	4	3	100	100	100
SPS							
Chemistry	21UCH64EG02A	Food And Nutrition	4	3	100	100	100
Chemistry	21UCH64EG02B	Waste Management	4	3	100	100	100
Physics	21UPH64EG02A	Laser Technology and its Application	4	3	100	100	100
Physics	21UPH64EG02B	Physics of Earth	4	3	100	100	100
Electronics	21UEL64EG02A	CCTV and Smart Security System	4	3	100	100	100
Electronics	21UEL64EG02B	Entrepreneurial Electronics	4	3	100	100	100

Semester	Course Code	Title of the Course	Hours	Credits
I	21UTA11GL01	General Tamil - I	4	3

CO No.	CO–Statements இப்பாடத்தின் நிறைவில் மாணவர்கள்	Cognitive Levels (K –Levels)
CO–1	இக்கால இலக்கிய வகைகளைக் கண்டறிவர்	K1
CO–2	எழுத்து,சொல் இலக்கணங்களின் அடிப்படைகளைக் கண்டறிவர்	K1
CO–3	அயலகக் கவிதை வடிவங்களை விளங்கிக் கொள்வர்	K2
CO–4	மொழிபெயர்ப்புக் கவிதைகளின் வாயிலாக மொழிபெயர்ப்புத் திறனை வளர்த்தெடுப்பர்	K3
CO–5	புதுக்கவிதை வாயிலாக வெளிப்படும் சமூக, அரசியல் விழுமியங்களை மதிப்பிடுவர்	K4

அலகு - 1 **(12 மணிநேரம்)**

பாரதியார் கவிதைகள் - குயில்பாட்டு (குயில் தன் பூர்வ ஜன்மக் கதை உரைத்தல்)
பாரதிதாசன் கவிதைகள் - சஞ்சீவி பர்வதத்தின் சாரல்
உரைநடை - முதல் மூன்று கட்டுரைகள்

அலகு - 2 **(12 மணிநேரம்)**

வெ.இராமலிங்கனார் - சொல், தமிழன் இதயம்
முடியரசனார் - உயிர் வெல்லமோ, மனத்தூய்மை
பெருஞ்சித்திரனார் - அஞ்சாதீர், மொழி இனம் நாடு,
பட்டுக்கோட்டை
கல்யாணசுந்தரனார் - வருங்காலம் உண்டு, உழைக்காமல் சேர்க்கும் பணம்.
இலக்கணம் - எழுத்து
இலக்கிய வரலாறு - மூன்றாம் பாகம் - தண்டமிழ்த் தொண்டர்கள்

அலகு - 3 **(12 மணிநேரம்)**

சுரதா - நல்ல தீர்ப்பு
கண்ணதாசன் - ஒரு பானையின் கதை
அப்துல் ரகுமான் - வீடு
மேத்தா - ஒரே குரல்
இலக்கிய வரலாறு - மூன்றாம் பாகம் - இருபதாம் நூற்றாண்டு
இலக்கியவளர்ச்சி
சிறுகதை - முதல் ஐந்து சிறுகதைகள்

அலகு – 4 : அரசியல் கவிதைகள் **(12 மணிநேரம்)**

ஈரோடு தமிழன்பன் - அகல் விளக்காக இரு

ஆதவன் தீட்சண்யா - இன்னும் இருக்கும் சுவர்களின் பொருட்டு
சுகிர்தராணி - என் கண்மணியே இசைப்பிரியா
சக்தி ஜோதி - யுகாந்திர உறக்கம்
பழநிபாரதி - வெள்ளைக்காகிதம்
லிவிங் ஸ்மைல் வித்யா - நினைவில் பால்யம் அழுத்தம்
இலக்கணம் - சொல்

அலகு - 5 அயலகக் கவிதைகள் (12 மணிநேரம்)

ஓசே ரிசால் - விடைகொடு என் தாய் மண்ணே
ஹைபுன் கவிதைகள் - அறுவடை நாளின் மழை (மூன்று கவிதைகள்)
சிறுகதை - ஆறு முதல் பத்து சிறுகதைகள்
உரைநடை - நான்கு முதல் ஆறு கட்டுரைகள்

பாட நூல்கள்

1. **பொதுத்தமிழ்,** *செய்யுள் திரட்டு, தமிழாய்வுத்துறை, தூய வளனார் தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி, முதற்பதிப்பு, 2021*
2. **சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு,** *தமிழாய்வுத்துறை, தூய வளனார் தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி, பத்தாம் பதிப்பு, 2017*
3. **நற்றமிழ்க் கோவை** (கட்டுரைத் தொகுப்பு). *தமிழாய்வுத்துறை, தூய வளனார் தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி, முதற்பதிப்பு, 2021*
4. **சிறுகதைத் தொகுப்பு** - ஒவ்வொரு கல்வியாண்டிற்கும் ஒவ்வொரு சிறுகதைத்தொகுப்பு
5. *(2021–2022* கல்வியாண்டுக்கு மட்டும்): **நல்லாசிரியர்**, சிறுகதைத் தொகுப்பு, - *தமிழாய்வுத்துறை, நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை, முதற்பதிப்பு, 2021*

Relationship matrix for Course outcomes, Programme outcomes / Programme Specific Outcomes

Semester	Course code	Title of the Course	Hours	Credits
I	21UTA11GL01	General Tamil - I	4	3

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos
	PO–1	PO–2	PO–3	PO–4	PO–5	PSO–1	PSO–2	PSO–3	PSO–4	PSO–5	
CO–1	2	1	2	2	3	3	3	2	3	2	2.3
CO–2	2	1	2	2	2	3	2	2	2	2	2.0
CO–3	2	1	2	2	3	3	3	2	3	2	2.3
CO–4	1	2	1	2	2	3	2	2	3	2	2.0
CO–5	1	1	2	2	3	3	3	2	3	2	2.2
Mean overall Score											2.16 (High)

Semester	Course Code	Title of the Course	Hours	Credits
I	**21UFR11GL01**	**FRENCH – I**	**4**	**3**

CO No.	CO–Statements	Cognitive Levels (K –Levels)
	On successful completion of this course, students will be able to	
CO–1	recall and spell the alphabets, numbers, colours, days of the week and months in French.	**K1**
CO–2	compare the definite and indefinite articles and its usages.	**K2**
CO–3	construct simple phrases by using 'er' verbs in present tense.	**K3**
CO–4	make use of correct terminology and introduce oneself in French.	**K3**
CO–5	distinguish between affirmative and negative phrases and take part in role play - conversation.	**K4**

Unit – I **(12 hours)**

TITRE:BONJOUR CA VA?

GRAMMAIRE : Les pronoms personnels sujets, les articles définis et indéfinis, Etre et avoir (verbes auxiliaires)

LEXIQUE : Saluer, Entrer en contact, demander et dire comment ça va ?, L'alphabet, les couleurs, les pays et les nationalités, les animaux domestiques.

PRODUCTION ORALE : Epeler son nom et son prénom, Comprendre des personnes qui se saluent.

PRODUCTION ECRITE : Les formules de politesse

Unit – II **(12 hours)**

TITRE:SALUT ! JE M'APPELLE AGNES

GRAMMAIRE : La conjugaison du 1er groupe, les adjectifs possessifs, la formation du féminin, la formation du pluriel.

LEXIQUE : Se présenter, Présenter quelqu'un, Remercier, Les jours de la semaine, les mois de l'année, les nombres de 0 à 69, la famille

PRODUCTION ORALE : Comprendre des informations essentielles

PRODUCTION ECRITE : Présentez –vous

Unit - III **(12 hours)**

TITRE:QUI EST-CE?

GRAMMAIRE : La phrase interrogative : Qu'est-ce que… ?/Qu'est-ce que c'est ?/Qui est-ce ?, quelques indicateurs du temps, la formation du féminin, les verbes aller et venir

LEXIQUE : Demander et répondre poliment,les professions

PRODUCTION ORALE : Parler de ses projets

PRODUCTION ECRITE : Ecrire de brefs messages

Unit - IV **(12 hours)**

TITRE:DANS MON SAC, J'AI?

GRAMMAIRE : la phrase négative, c'est/il est, les articles contractes, les pronoms personnels toniques

LEXIQUE : Demander des informations personnelles, Quelques objets, la fiche d'identité, les

nombres à partir de 70
PRODUCTION ORALE : Comprendre un message sur un répondeur téléphonique
PRODUCTION ECRITE : Remplir une fiche d'identité

Unit - V **(12 hours)**

TITRE:IL EST COMMENT? / ALLO?
GRAMMAIRE : les adverbes interrogatifs, les prépositions de lieu, les verbes du deuxième groupe, le verbe faire
LEXIQUE : Parler au téléphone, décrire quelqu'un, l'aspect physique, le caractère
PRODUCTION ORALE : Un jeu de rôle – la conversation téléphonique
PRODUCTION ECRITE : Décrivez votre aspect physique et votre caractère en quelques lignes

Book for Study

P. Dauda, L.Giachino and C.Baracco, *Generation A1*, Didier, Paris 2016.

Books for Reference

1. J.Girardet and J.Pecheur, *Echo A1*, CLE International, 2^{e}edition, 2017
2. Régine Mérieux and Yves Loiseau, *Latitudes A1*, Didier, 2012.
3. Isabelle Fournier, *Talk French*, Goyal Publishers,2011

Web Resources

1. https://www.wikihow.com/Pronounce-the-Letters-of-the-French-Alphabet
2. https://francais.lingolia.com/en/grammar/tenses/le-present
3. https://www.lawlessfrench.com/grammar/articles/
4. https://www.frenchpod101.com/french-vocabulary-lists/10-lines-you-need-for-introducing-yourself
5. https://www.tolearnfrench.com/exercises/exercise-french-2/exercise-french-3295.php

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course code			Title of the Course				Hours		Credits
I	21UFR11GL01			FRENCH – I				4		3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO–1	3	1	2	3	2	3	2	1	2	3	2.2
CO–2	3	3	3	2	2	2	1	2	2	3	2.3
CO–3	3	1	2	3	2	3	2	1	2	2	2.1
CO–4	2	2	3	2	1	3	2	1	2	3	2.1
CO–5	3	2	3	2	2	3	2	2	3	2	2.4
Mean overall Score											2.22 (High)

Semester	Course Code	Title of the Course	Hours	Credits
I	21UHI11GL01	HINDI- I	4	3

CO. No.	CO–Statements	Cognitive Levels (K –Levels)
	On successful completion of the course, students will be able to	
CO -1	list out the literary works in Hindi during the period of 12th century in India.	K1
CO -2	compare the vocabulary & expressions related to day-to-day conversation.	K2
CO -3	use simple Phrases from English to Hindi.	K3
CO -4	investigate the values of Indian society & summarize the duties of a citizen for his/her country.	K4
CO -5	identify the sentences in Hindi using basic grammar.	K4

Unit - I **(12 Hours)**

Dr. Abdul Kalam
Ling
Kabir Ke Dohe
Baathcheeth - Aspathal mein
Adhikal - Namakarn

Unit - II **(12 Hours)**

Vachan Badaliye
Thulasi ke Dohe
Adhikal - Samajik Paristhithiyam
Moun Hee Mantra Hai

Unit - III **(12 Hours)**

Sangya
Soordas ke Pad
Baathcheeth - Hotel mein
Adhikal - Sahithyik Paristhithiyam

Unit - IV **(12 Hours)**

Sarvanam
Rahim ke Dohe
Bathcheeth - Kaksha mein
Adhikal - Salient Features, Main Divisions

Unit - V **(12 Hours)**

Anuvad - 1
Visheshan
Bihari - Dohe
Bathcheeth - Kariyalay mein
Adhikal - Visheshathayem

Books for Study

1. M.kamathaprasad Gupth, *Hindi Vyakaran*, Anand Prakashan, Kolkatta,2020.
   Unit-I *Chapters 2 and 3*
2. Viswanath Tripaty, *Kuchh Kahaniyan*, Rajkamal Prakashan Pvt. Ltd, New Delhi,2018.
   Unit-II, III and IV *Chapters 4 and 5*
3. Dr. Sanjeev Kumar Jain, *Anuwad: Siddhant Evam Vyavhar*, Kailash Pustak Sadan, Madhya Pradesh 2019.
   Unit-V *Chapter 1*

Books for Reference

1. Dr.A.P.J.Abdul Kalam, Mere sapnom ka Bharath, Prabath Prakashan, Noida, 2020,
2. Lakshman prasad singh, Kavya ke sopan, Bharathy Bhavan Prakashan, 2017.
3. Aravind Kumar, Sampoorna Hindi Vyakaran our Rachana, Lucent publisher, 2019.
4. Adhunik Hindi Vyakaran our Rachana, bharati bhawan publishers & distributors, 2018.
5. Acharya ramchandra shukla, Hindi Sahitya Ka Itihas, Prabhat Prakashan, 2021.

Web Resources

1. https://youtu.be/LrdrcP2oiyU
2. https://youtu.be/Cib2FNv8KyA
3. https://youtu.be/aXARykpYCxA
4. https://youtu.be/RUDFis-tdg4
5. https://youtu.be/upivTmLTPQA

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course				HINDI - I			Hours	Credits
I	21UHI11GL01										4	3
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)						Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	2	3	1	3	1	3	3	2		2.3
CO-2	2	2	3	3	1	3	2	3	3	2		2.4
CO-3	3	2	2	1	2	3	2	3	2	3		2.3
CO-4	3	2	1	3	2	3	2	3	3	2		2.4
CO-5	2	3	3	2	3	2	3	3	3	1		2.5
										Mean Overall Score		2.38 (High)

Semester	Course Code	Title of the Course	Hours	Credits
I	21USA11GL01	SANSKRIT - I	4	3

CO No.	CO–Statements On successful completion of the course, the student will be able to	Cognitive Levels (K –Levels)
CO-1	remember and Recall words relating to objects.	K1
CO-2	understand classified vocabulary.	K2
CO-3	apply nouns and verbs.	K3
CO-4	analyze different forms of names and verbs.	K4
CO-5	appreciate the good saying of Sanskrit Improve the self-values.	K5

Unit - I **(12 Hours)**

Samyakthakshatra pada paricaya

Unit - II **(12 Hours)**

Vartmanakala prayogaha

Unit - III **(12 Hours)**

Samskruta varathamanakalaha

Unit - IV **(12 Hours)**

Shadha priyoghaa aakaarnta ikaraantha ukarantha

Unit - V **(12 Hours)**

Subhashitani manoharani Dasaslokani

Book for Study

Shaptamanjari , K.M.,Saral Snakrit Balabodh , Bharathiya Vidya Bhavan , Munushimarg Mumbai – 4000 007 2018, 2019

Books for Reference

1. Kulapathy , K.M.,Saral Snakrit Balabodh , Bharathiya Vidya Bhavan , Munushimarg Mumbai – 4000 007 2018
2. R.S.Vadhar & Sons , Book – Sellers and publishers , Kalpathi.Palgahat 678003, Kerala South India , Shabdha Manjari 2019

3. Balasubramaniam R, Samskrita Akshatra Siksha , Vangals Publications, 14th Main road JP Nagar , Bangalore – 78

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course			Hours			Credit
I	21USA11GL01			SANSKRIT- I			4			3
Course Outcomes ↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	1	1	3	2	3	2	3	2	2	2.2
CO-2	2	2	3	3	1	2	2	3	3	2	2.3
CO-3	3	2	2	2	2	2	2	3	3	2	2.3
CO-4	3	2	2	3	2	3	3	3	2	2	2.3
CO-5	3	2	3	2	3	2	2	3	3	3	2.6
Mean Overall Score											2.34
Result											# High

Semester	Course Code	Title of the Course	Hours	Credits
I	**21UEN12GE01**	**GENERAL ENGLISH - I**	**5**	**3**

CO. No.	CO-Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	recall what they observe and experience	**K1**
CO-2	arrange different parts of a text in a coherent manner	**K2**
CO-3	examine the underlying meaning in a text	**K3**
CO-4	analyse and evaluate letters regarding the use of appropriate language and format	**K4 & K5**
CO-5	use conversational English to communicate with friends	**K6**

Unit-I **(15 Hours)**

01. Personal Details
02. Positive Qualities
03. Listening to Positive Qualities
04. Relating and Grading Qualities
05. My Ambition
06. Abilities and Skills
07. Self-Improvement Word Grid
08. What am I Doing?
09. What was I Doing?
10. Unscramble the Past Actions
11. What did I Do Yesterday?

Unit-II **(15 Hours)**

12. Body Parts
13. Actions and Body Parts
14. Value of Life
15. Describing Self
16. Home Word Grid
17. Unscramble Building Types
18. Plural Forms of Naming Words
19. Irregular Plural Forms
20. Plural Naming Words Practice
21. Whose Words?

Unit-III **(15 Hours)**

22. Plural Forms of Action Words
23. Present Positive Actions
24. Present Negative Actions
25. Un/Countable Naming Words
26. Recognition of Vowel Sounds

27. Indefinite Articles
28. Un/Countable Practice
29. Match the Visual
30. Letter Spell-Check
31. Drafting a Letter

Unit-IV **(15 Hours)**

32. Friendship Word Grid
33. Friends' Details
34. Guess the Favourites
35. Guess Your Friend
36. Friends as Guests
37. Introducing Friends
38. What are We Doing?
39. What is (S)He / are They Doing?
40. Yes / No Question
41. What was S/He Doing?
42. Names and Actions
43. True Friendship
44. Know Your Friends
45. Giving Advice/Suggestions
46. Discussion on Friendship
47. My Best Friend

Unit-V **(15 Hours)**

48. Kinship Words
49. The Odd One Out
50. My Family Tree
51. Little Boy's Request
52. Occasions for Message
53. Words Denoting Place
54. Words Denoting Movement
55. Phrases for Giving Directions
56. Find the Destination
57. Giving Directions Practice
58. SMS Language
59. Converting SMS
60. Writing Short Messages
61. Sending SMS
62. The Family Debate
63. Family Today

Book for Study

Joy, J.L., and Peter, F.M. *Let's Communicate 1*. New Delhi, Trinity P, 2014.

Books for Reference

1. Ahrens, Sönke. *How to Take Smart Notes: One Simple Technique to Boost Writing, Learning and Thinking*. New York: Create Space, 2017.
2. Aspinall, Tricia. *Test Your Listening.* London: Pearson, 2002.
3. Bailey, Stephen. *Academic Writing: A Practical Guide for Students*. New York: Routledge, 2004.

4. Fitikides, T.J. *Common Mistakes in English* (6th ed.). London: Longman, 2002.
5. Wainwright, Gordon. *How to Read Faster and Recall More: Learn the Art of Speed Reading with Maximum Recall* (3rd ed.). Oxford: How to Books, 2007.

Web Resources

1. https://learnenglish.britishcouncil.org/
2. https://oneminuteenglish.org/en/best-websites-learn-english/
3. https://www.dailywritingtips.com/best-websites-to-learn-english/

Relationship Matrix for Course Outcomes, Programme Outcomes, and Programmes Specific Outcomes

Semester	Course Code			Title of the Course				Hours		Credit
I	21UEN12GE01			GENERAL ENGLISH – I				5		3
Course Outcome (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO -1	2	3	2	2	3	2	3	2	3	2	2.4
CO -2	2	2	3	2	3	3	2	3	2	2	2.3
CO -3	2	3	2	3	2	2	3	2	3	2	2.4
CO -4	2	2	3	2	3	3	2	3	2	3	2.5
CO -5	2	2	2	3	2	2	2	3	2	2	2.2
									Mean Overall Score		2.36 (High)

Semester	Course Code	Title of the Course	Hours	Credits
I	21UBC13CC01	CORE -1: INFORMATION SYSTEMS	5	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	define the foundations of Information Systems.	K1
CO-2	classify the enterprise systems and decision support systems.	K2
CO-3	apply personal and Business Intelligence to Information Systems.	K3
CO-4	develop the basic principles of modeling in Information Systems.	K3
CO-5	analyze the real world problems in Information Systems.	K4

Unit-I: Introduction to Information Systems (15 Hours)

Information Concepts – Data, Information and Knowledge – System Performances Standards – The Value of Information – Business Information Systems - Information Systems in Organizations: Organizations and Information Systems – Competitive Advantage – Careers in Information Systems: Roles, Functions, and Careers in IS - Typical Titles and Functions.

Unit-II: Information Technology Concepts (15 Hours)

Input and Output Devices – Software - Systems-Software: Operating Systems – Current Operating Systems - Application Software: Overview of Application Software – Personal Application Software - Database Systems and Business Intelligence: Database Management Systems – Telecommunications and Networks: An overview of Telecommunications - Short Range Wireless options – Networks and Distributed Processing - Network Types.

Unit-III: Business Information Systems (15 Hours)

An Introduction to Electronic Commerce – Mobile Commerce – Electronic and Mobile Commerce Applications **–** Enterprise Systems: An Overview of Enterprise Systems-Transaction Processing Systems – Transaction Processing Activities – Information And Decision Support Systems: Decision Making and Problem Solving – Knowledge Management and Specialized Information Systems-Knowledge Management Systems.

Unit-IV: System Development (15 Hours)

Development Life Cycles - Investigation and Analysis Systems - Systems Analysis - General Considerations**.** Participants in Systems Analysis: Data Collection - Data Collection - Requirements Analysis - Systems Design: Logical and Physical Design - Object-Oriented Design - Interface Design and Controls - Systems Implementation - Acquiring Hardware from an IS Vendor - User Preparation.

Unit-V: Information Systems in Business and Society (15 Hours)

The Personal and Social Impact of Computers - Computer Waste and Mistakes - Related

Waste and Mistakes - The Computer As A Tool To Commit Crime: Cyber terrorism - Identity Theft - Internet Gambling - Preventing Computer - Related Crime: Crime Prevention by State and Federal Agencies - Crime Prevention by Corporations - Using Intrusion Detection Software - Filtering and Classifying Internet Content.

Book for Study

1. Ralph M. Stair, George W. Reynolds, *Principles of Information Systems, A Managerial Approach*, 9th Edition, Thomson Publishing, UK, 2016.
   Unit-I *Chapter 1 (Pages: 2-27), Chapter 2 (Pages: 42, 47) Chapter 2 (Pages: 66-78)*
   Unit-II *Chapter 3 (Pages: 84, 102), Chapter 5 (Pages: 180-202) Chapter 6 (Pages 222-246)*
   Unit-III *Chapter 8 (Pages: 309-329), Chapter 9 (Pages: 356-363) Chapter 10(Pages: 392-446)*
   Unit-IV Chapter *12 (Pages: 483-523) Chapter 13 (Pages: 536-547)*
   Unit-V *Chapter 14 (Pages: 573-604)*

Books for Reference

1. P. Mohan, *Management Information System*, Himalaya Publishing House, India, 2017.
2. Elizabeth Hardcastle, *Business Information Systems*, Elizabeth Hardcastle & Ventus Publishing, UK, 2015.
3. Paul Bocij Andrew Greasley Simon Hickie, *Business Information Systems*, 5th Edition, Prentice Hall, USA, 2015.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
I	**21UBC13CC01**			**CORE -1: INFORMATION SYSTEMS**						**5**	**2**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	2	3	3	2	2	3	1	3	2	3	2.4
CO-2	3	2	2	3	3	1	3	2	3	2	2.4
CO-3	2	3	2	3	1	2	1	2	2	1	1.9
CO-4	3	2	3	2	1	3	3	2	1	3	2.3
CO-5	3	3	2	3	2	3	2	3	3	3	2.7
									Mean Overall Score		2.4 (High)

Semester	Course Code	Title of the Course	Hours	Credits
I	21UBC13CC02	CORE -2 : C PROGRAMMING	5	2

CO. No.	CO–Statements On successful completion of this course, students will be able to	Cognitive Levels (K –Levels)
CO-1	relate the basic terminology of algorithm and flowchart used in programming.	K1
CO-2	explain the concepts of Structure and Union.	K2
CO-3	develop programs with various concepts like decision structures, loops and functions for simple problems.	K3
CO-4	make use of arrays and pointers in data structures.	K3
CO-5	distinguish the processing of sequential and random-access file.	K4

Unit-I: **Computer Basics** **(15 Hours)**

Algorithms – Simple Model of a Computer – Characteristics of Computers - Problem Solving Using Computers – Flow Chart – The Working of a Computer. Introduction To C Language: Identifiers, Keywords, Constants, Variables and data types, Access Modifiers, Data Type Conversions Operators - Conditional Controls - Loop Controls.

Unit-II: Arrays and Functions **(15 Hours)**

One Dimensional Array – Two Dimensional Array – Character Arrays and Strings. Function: Introduction - Elements of User Defined Function - Definition of Functions - Return Values and their Types – Function Calls - Function Declaration - Category of Function - Nesting of Function - Recursion - Passing Arrays to Function - Passing Strings to Function – The Scope, Visibility and Lifetime of variables - Library functions.

Unit-III: Structures and Unions **(15 Hours)**

Defining Structure - Declaring Structure Variable - Accessing Structure Members - Structure Initialization - Arrays of Structure - Arrays within Structures - Structures within Structures - Structures and Function - Union.

Unit-IV: Pointers **(15 Hours)**

Pointers - Declaration of Pointers - Accessing Variables through Pointers - Chain of Pointers - Pointer Expressions - Pointer Increments - Pointers with Arrays - Strings - Array of Pointers - Pointers with Functions - Pointers with Structures.

Unit-V: File Management **(15 Hours)**

Defining and Opening a File - Closing a File - Input / Output Operations on Files - Error Handling During I/O Operations - Random Access to Files - Command Line Arguments - Dynamic Memory Allocation.

Books for Study

1. V. Rajaraman, *Fundamentals of Computer,* Asoke K.Ghosh Publications, PHI Learning Limited, 5th Edition, New Delhi, 2011.

Unit-I a *Chapter 1.*

2. E. Balagurusamy, *Programming in C*, Tata McGraw Hill, 7thEdition, New Delhi, 2017.

Unit-I b – Unit-V *Chapters 2,3,5,6,7,8,9,10,11,12,13.*

Books for Reference

1. Byron S. Gottfried, *Programming with C*, McGraw Hill Education, 4thEdition, New Delhi, 2018.
2. Reema Thareja, Computer Fundamentals and Programming in C, 2nd Edition, Oxford University Press, New Delhi, 2016.
3. Yashavant Kanetkar, *Let Us C*, 17th Edition, BPB Publications, New Delhi, 2020.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course					Hours	Credits
I	21UBC13CC02			CORE-2: C PROGRAMMING					5	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	2	3	1	3	3	2	2	1	2.2
CO-2	3	3	1	3	1	2	3	2	3	3	2.5
CO-3	3	2	3	2	2	3	2	1	3	2	2.3
CO-4	2	3	1	3	2	3	2	2	3	1	2.2
CO-5	3	2	2	3	3	1	3	3	3	2	2.5
Mean Overall Score											2.3
Result											# High

Semester	Course Code	Title of the Course	Hours	Credits
I	21UBC13CP01	SOFTWARE LAB-1: C PROGRAMMING	3	2

CO No.	CO–Statements On successful completion of this course, students will be able to	Cognitive Levels (K –Levels)
CO-1	show the basic structure of C Programming.	K1
CO-2	demonstrate the role of constants, variables, operators, arrays and strings.	K2
CO-3	solve the problems with various concepts like decision structures, loops, functions, structure and union.	K3
CO-4	distinguish file access methods to solve real time problems.	K4
CO-5	analyze the concepts of arrays and pointers in data structure.	K4

List of Exercises:

1. Simple Programs
2. Control Structures
3. Arrays
4. Functions
5. String Handling
6. Structures
7. Unions
8. Pointers
9. Sequential File Access
10. Random File Access
11. Memory Management
12. Command Line Arguments

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course					Hours	Credits
I	21UBC13CP01			SOFTWARE LAB-1: C PROGRAMMING					3	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	1	2	3	2	3	2	3	3	2	2.4
CO-2	3	2	3	2	1	3	3	2	2	1	2.2
CO-3	3	2	2	3	2	2	3	1	3	2	2.3
CO-4	2	3	3	2	3	3	2	3	3	2	2.6
CO-5	1	3	2	3	2	2	1	3	1	3	2.1
									Mean Overall Score		2.3 (High)

Semester	Course Code	Title of the Course	Hours	Credits
I	21UBC13AC01	ALLIED: MATHEMATICS FOR BCA-I	6	4

CO No.	CO-Statements On successful completion of this course, students will be able to	Cognitive Levels (K-levels)
CO-1	get equipped with the knowledge of matrices matrices, Fourier series, Laplace transform and numerical methods.	K1
CO-2	understand methods and properties of matrices, Fourier series, Laplace transform and numerical methods.	K2
CO-3	apply the fundamental concepts of Fourier series, Laplace transform and numerical methods.	K3
CO-4	evaluate inverse of a matrix, inverse Laplace transforms using the method of partial fractions, Half range Fourier series and the roots of equations using numerical methods.	K4
CO-5	analyze the system of equations for consistency.	K5

Unit: I **(18 Hours)**

Matrices – Rank of a matrix of order 2 and 3 – Consistency of a system of linear non-homogeneous equations – Characteristic equation of a square matrix – evaluation of eigen values and eigen vectors – Cayley – Hamilton Theorem (without proof) and problems.

Unit: II **(18 Hours)**

Laplace Transform – Definition – Properties and results – The inverse transform –Results – Finding inverse transforms using the method of partial fractions.

Unit: III **(18 Hours)**

Fourier series – Even and Odd functions – Properties of odd and even functions – Half range Fourier series.

Unit: IV **(18 Hours)**

Solving algebraic and transcendental equations – Bisection and Newton- Raphson methods – Solving simultaneous equations – Gauss elimination – Computation of the inverse of a matrix using Gauss Elimination method – Iterative methods – Gauss Seidel methods.

Unit: V **(18 Hours)**

Interpolation – Newton Gregory forward and backward interpolation formulae – Lagrange's interpolation formula, Numerical Integration – Trapezoidal rule and Simpson's 1/3 rule. Solving differential equations (First Order differential equations only) – Euler's method – Runge-Kutta 2nd Order method only.

Books for Study:

1. S. Narayanan, R. Hanumantha Rao, T.K. Manicavachagam Pillay,"**Ancillary Mathematics (Volume I)**",S.Viswanathan (Printers and Publishers), PVT., LTD, 2010.
   Unit – I *Chapter 3: pages 104 – 126, 137 – 151, 155- 164*

2. S. Narayanan, R. Hanumantha Rao, T.K. Manicavachagam Pillay,"**Ancillary Mathematics (Volume II)**", S.Viswanathan (Printers and Publishers), PVT., LTD, 2010.
Unit – II*Chapter 7: pages 289 – 308*
Unit – III*Chapter 2: pages 121 – 149*

3. Dr. M.K. Venkatraman, MA, M.Tech., Ph.D, "**Numerical Methods in Science and Engineering**", 5th Edition.
Unit – IV*Chapter 3: Sec-2 (pages 82 – 85), sec-5 (pages 97 – 99)*
Chapter 4: Sec-2 (pages 113 – 120), sec-3 (pages 121-126),Sec-6 (pages 142-144)
Unit – V*Chapter 6: Sec-3 (pages 195-206)*
Chapter 8: Sec-4 (pages 253-259)
Chapter 9: Sec-8 (pages 281), sec-10 (pages 285-287, 290-291, 293-295)
Chapter 11: Sec-10 (pages 350-357), sec-14 (pages 357-364)

Books for Reference

1. S. Narayanan, R. Hanumantha Rao, T.K. Manicavachagom Pillay, Kandaswamy, "Ancillary Mathematics, Vol II", 2009 Edition.
2. Narayanan, Manicavachagom Pillay, "Ancillary Mathematics Book II".

Relationship Matrix for Course Outcomes, Programme Outcomes /Programme Specific Outcomes											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
I	**21UBC13AC01**			**ALLIED: MATHEMATICS FOR BCA-I**						**6**	**4**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	3	1	3	2	2	3	2	2	1	2	2.1
CO-2	2	3	3	2	1	2	3	2	2	3	2.3
CO-3	3	3	3	2	2	3	2	3	2	2	2.5
CO-4	3	3	2	2	1	2	3	3	2	3	2.4
CO-5	2	3	3	1	2	3	3	2	2	3	2.4
Mean Overall Score											**2.34 (High)**

Semester	Course Code	Title of the Course	Hours	Credits
I	21UHE14VE01	ESSENTIALS OF HUMANITY	2	1

CO.No	CO – Statements	Cognitive Levels (K –Levels)
	On completion of this course, the graduates will be able to	
CO-1	recall the prescribed values and their dimensions	K1
CO-2	examine themselves by learning the developmental changes happening in the course of their life time	K2
CO-3	apply the trained values in their day today life	K3
CO-4	analyze themselves as responsible men and women	K4
CO-5	create a constructive approach to life	K5 & K6

Unit-I Principles of Value Education (6 Hours)

Introduction to values - Characteristics and Roots of Values - Value Education & Value Clarification - Moral Characters - Kinds of Values - Objectives of Values.

Unit-II The Development of Human Personality (6 Hours)

Personality: Introduction, Theories, Integration &Factors influencing the development of personality - SEL Series - Discovering self - Defense Mechanism - Power of positive thinking - Why worry?

Unit-III The Dimensions of Human Development (6 Hours)

Areas of Development: Physical, Intellectual, Emotional, Social Development, Moral & Spiritual development

Unit-IV Responsible Parenthood (6 Hours)

Human sexuality - Marriage and Family - Sex and Love - Characteristics of Responsible parent - Causes of Marriage disharmony - Art of wise parenting.

Unit-V Gender Equality and Empowerment (6 Hours)

Historical perspective - Women in Independence struggle - Women in Independent India - Education & Economic development - Crimes against Women - Women rights - Time-line of Women Achievements in India

Books for Study:

1. Department of Human Excellence. *Essentials of Humanity*, St. Joseph's College, Tiruchirappali-02, 2021.

Books for Reference:

1. Alphonse Xavier Dr SJ. *You Shall Overcome*,(6th Ed.) Chennai: ICRDCE Publication, 2012.
2. Alex K. *Soft Skills*, New Delhi: S. Chand, 2009.
3. Kalam Abdul APJ. *You Are Unique*, Bangalore: Punya Publishing, 2012.

Web Sources:

http://livingvalues.net. Accessed 05 Mar. 2021.
https://www.apa.org/topics/personality#. Accessed 05 Mar. 2021.
https://www.peacecorps.gov/educators/resources/global-issues-gender-equality-and-womens-empowerment/. Accessed 05 Mar. 2021.

Semester	Course Code	Title of the Course	Hours	Credits
II	**21UTA21GL02**	**General Tamil - II**	**4**	**3**

CO No.	CO- Statement	Cognitive Level (K- level)
	இப்பாடத்தின் நிறைவில் மாணவர்கள்	
CO-1	தமிழிலக்கிய வரலாற்றில் சைவ, வைணவ இலக்கியங்கள் பெறும் இடத்தை அறிந்துகொள்வர்	**K 1**
CO-2	அகப்பொருள், புறப்பொருள் இலக்கணங்களின் அடிப்படை அறிவைப் பெறுவர்.	**K 1**
CO-3	காப்பியச் சுவையை மாணவர்கள் புரிந்துகொள்வர்	**K 2**
CO-4	இஸ்லாமிய இலக்கியச் சிந்தனைகளைப் பெறுவர்	**K 3**
CO-5	கிறித்தவ மதிப்பீடுகளைச் சிற்றிலக்கிய வகைகளின் வழியாகத் திறனாய்வர்.	**K 4**

அலகு - *1* ***(12 மணிநேரம்)***

சிலப்பதிகாரம் - கனாத்திறம் உரைத்த காதை
மணிமேகலை - ஆபுத்திரன் திறம் அறிவித்த காதை
இலக்கிய வரலாறு - சைவம் வளர்த்த தமிழ் முதல் புராணங்கள் முடிய.
இலக்கணம் - அகப்பொருள் இலக்கணம்

அலகு - *2* ***(12 மணிநேரம்)***

திருவாசகம் - திருச்சாழல்
சிவவாக்கியார் பாடல்கள் - *25* பாடல்கள் *(04, 14, 16, 22, 27, 33, 34, 35, 36,37, 38, 47, 81, 91, 225, 237, 242, 495, 504, 520,522, 533, 534, 536, 548.)*

அலகு - *3* ***(12 மணிநேரம்)***

நாலாயிர திவ்வியப் பிரபந்தம்- அமலானாதிபிரான் *(10* பாடல்கள்*)*
- பெருமாள் திருமொழி *(11* பாடல்கள்*)*
கம்பராமாயணம் - கைகேயி சூழ்வினைப்படலம்
உநைடை - *7* முதல் *9* முடிய உள்ள கட்டுரைகள்

அலகு - *4* ***(12 மணிநேரம்)***

சீறாப்புராணம் - உடும்பு பேசிய படலம்
இலக்கணம் - புறப்பொருள் இலக்கணம்
இலக்கிய வரலாறு - தமிழ் இலக்கண நூல்கள் முதல் சிற்றிலக்கியங்கள் முடிய

அலகு - *5* ***(12 மணிநேரம்)***

திருக்காவலூர்க் கலம்பகம் - சமூக உல்லாசம்
உரைநடை - *10* முதல் *12* வரையிலான கட்டுரைகள்

பாடநூல்கள்:

1. **பொதுத்தமிழ் - செய்யுள் திரட்டு**, தமிழாய்வுத்துறை வெளியீடு, தூய வளனார் கல்லூரி. திருச்சிராப்பள்ளி, முதற்பதிப்பு, *2021*
2. **சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு,** *தமிழாய்வுத்துறை, தூய வளனார் தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி, பத்தாம் பதிப்பு, 2017*
3. **நற்றமிழ்க் கோவை** (கட்டுரைத் தொகுப்பு). *தமிழாய்வுத்துறை, தூய வளனார் தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி,* முதற்பதிப்பு, *2021*

Semester	Course Code			Title of the Course				Hours		Credit
II	21UTA21GL02			General Tamil - II				4		3
Course Outcomes (Cos)	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO-1	PO-2	PO-3	PO-4	PO-5	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	
CO-1	2	2	1	2	3	2	2	2	3	2	2.1
CO-2	2	1	2	2	3	3	2	2	3	2	2.2
CO-3	2	1	2	2	3	3	2	2	3	2	2.2
CO-4	1	1	2	2	3	3	2	2	3	2	2.1
CO-5	1	1	2	2	3	2	2	3	3	2	2.1
Mean Overall Score											2.14 (High)

Semester	Course Code	Title of the Course	Hours	Credits
II	**21UFR21GL02**	**FRENCH – II**	**4**	**3**

CO No.	CO–Statements On successful completion of this course, students will be able to	Cognitive Levels (K –Levels)
CO–1	relate pronominal verbs in expressing one's day today activity.	**K1**
CO–2	compare the different types of articles.	**K2**
CO–3	construct texts using pronouns – passages and dialogues.	**K3**
CO–4	discover the food habits of the French culture.	**K4**
CO–5	appraise the French fashion.	**K5**

Unit - I **(12 hours)**

TITRE:LES LOISIRS
GRAMMAIRE : les adjectifs interrogatifs, les nombres ordinaux, les verbes pronominaux
LEXIQUE : les différentes activités quotidiennes,les loisirs, les activités quotidiennes, les matières
PRODUCTION ORALE : parler sur votre passe-temps
PRODUCTION ECRITE : décrire sa journée

Unit -II **(12 hours)**

TITRE:LA ROUTINE
GRAMMAIRE : les pronoms personnels COD, les verbes du premier groupe en e/er/eler/eter, le verbe prendre
LEXIQUE : exprimer ses gouts et ses préférences, le temps, l'heure, la fréquence
PRODUCTION ORALE : savoir comment dire l'heure
PRODUCTION ECRITE : écrire vos préférences en quelques lignes

Unit - III **(12 hours)**

TITRE:OU FAIRE SES COURSES?
GRAMMAIRE : les articles partitifs, le pronom en (la quantité), très ou beaucoup
LEXIQUE : inviter et répondre à une invitation, les commerces et les commerçants, demander et dire le prix, les quantités
PRODUCTION ORALE : faire des courses pour une soirée
PRODUCTION ECRITE : écrire un message en acceptant l'invitation

Unit - IV **(12 hours)**

TITRE:DECOUVREZ ET DEGUSTEZ
GRAMMAIRE : l'impératif, il faut, les verbes devoir, pouvoir, savoir,vouloir
LEXIQUE : Commander et commenter sur un plat de la carte,les aliments, les services, les moyens depaiement
PRODUCTION ORALE : Jeu de rôle – au restaurant (entre vous et le garçon)
PRODUCTION ECRITE : faire une comparaison avec la carte française et indienne

Unit - V **(12 hours)**

TITRE:TOUT LE MONDE S'AMUSE/ LES ADOS AU QUOTIDIEN
GRAMMAIRE : les adjectifs démonstratifs, le pronom indéfini on, le futur proche, le passé composé, les verbes en –yer, voir et sortir
LEXIQUE : connaitre les marques connues sur les vêtements, les sorties, situer dans le temps, les vêtements et les accessoires
PRODUCTION ORALE : décrire une tenue
PRODUCTION ECRITE : écrire une lettre amicale, une carte postale

Book for Study

P.Dauda,L.Giachino and C.Baracco, *Generation A1*, Didier, Paris 2016.

Books for Reference

1. J.Girardet and J.Pecheur, *Echo A1*, CLE International, 2^{e}edition,2017
2. Régine Mérieux and Yves Loiseau, *Latitudes A1*, Didier, 2012.
3. Isabelle Fournier, *Talk French*, Goyal Publishers, 2011

Web Resources

1. https://www.frenchtoday.com/blog/french-verb-conjugation/french-reflexive-verbs-list-exercises/
2. https://www.fluentu.com/blog/french/french-subject-pronouns/
3. https://grammarist.com/french/french-partitive-article/
4. https://www.talkinfrench.com/guide-french-food-habits/
5. https://www.fluentu.com/blog/french/talking-about-clothes-in-french/

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course code	Title of the Course	Hours	Credits
II	21UFR21GL02	FRENCH – II	4	3

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO–1	3	3	3	3	1	3	1	2	2	2	2.2
CO–2	2	1	2	3	2	3	1	2	2	2	2.0
CO–3	3	2	3	2	2	3	3	1	3	2	2.4
CO–4	3	2	2	1	3	3	3	1	1	3	2.2
CO–5	2	1	2	2	3	3	3	2	2	2	2.2
Mean overall Score											2.2 (High)

Semester	Course Code	Title of the Course	Hours	Credits
II	**21UHI21GL02**	**HINDI - II**	**4**	**3**

CO No.	CO–Statements On successful completion of the course, students will be able to	Cognitive Levels (K –Levels)
CO -1	Find out the Terms & Expressions related to letter writing	**K1**
CO -2	Explain the works of Hindi writers	**K2**
CO -3	Complete the sentences in Hindi using basic grammar	**K3**
CO -4	Analyze the social & political conditions of Devotional period in Hindi Literature	**K4**
CO -5	Justify the human values stressed on the works of the following authors “Premchand, Nirala, etc.”	**K5**

Unit - I **(12 Hours)**

Kafan
Letter Writing - Chutti Patra
Bakthikal - Namakarn
Sarkari kariyalayom ka naam

Unit - II **(12 Hours)**

Baathcheeth - Dookan mein
kriya
Letter Writing - Rishthedarom ko patra
Bakthikal - Samajik Paristhithiyam

Unit - III **(12 Hours)**

Vah Thodthi patthar
Adverb
Letter Writing - Naukari keliye Avedan Patra
Bakthikal - Sahithyik Paristhithiyam

Unit - IV **(12 Hours)**

Mukthi
Samas
Letter Writing - Kitab Maangne Keliye Patra
Bakthikal - Salient Features, Main Divisions

Unit - V **(12 Hours)**

Anuvad - 2
Sandhi
Letter writing - Nagarpalika ko Patra
Bakthikal - Visheshathayem

Books for Study

1. Viswanath Tripaty, *Kuchh Kahaniyan*, Rajkamal Prakashan Pvt. Ltd, New Delhi, 2018.
   Unit-I *Chapter 1*
2. M.kamathaprasad Gupth, *Hindi Vyakaran*, Anand Prakashan, Kolkatta, 2020.
   Unit-II, III and IV *Chapter 2*
3. Dr.Sadananth Bosalae, *kavya sarang*, Rajkamal Prakashan, New Delhi, 2020.
   Unit-V *Chapter 4*

Books for Reference

1. Adhunik Hindi Vyakaran our Rachana, bharati bhawan publishers & distributors, 2018.
2. Acharya ramchandra shukla, Hindi Sahitya Ka Itihas, Prabhat Prakashan, 2021.
3. Krishnakumar Gosamy, Anuvad vigyan ki Bhumika, Rajkamal Prakashan, 2016.
4. Aravind Kumar, Sampoorna Hindi Vyakaran our Rachana, Lucent publisher, 2019.
5. Lakshman prasad singh, Kavya ke sopan, Bharathy Bhavan Prakashan, 2017.

Web Resources

1. https://youtu.be/tE2RHQcqlbI
2. https://youtu.be/Xxvco3qa284
3. https://youtu.be/1z8x95IFGi4
4. https://youtu.be/CBMYf8NRLW4
5. https://youtu.be/h31tMLeFtHs

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Paper					Hours	Credits
II	21UHI21GL02			HINDI - II					4	3
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	3	2	2	3	3	3	2	2	2.5
CO-2	1	3	1	2	2	3	3	3	2	3	2.3
CO-3	3	2	3	2	2	3	2	3	2	2	2.4
CO-4	2	3	3	1	3	2	3	2	1	2	2.2
CO-5	3	2	2	2	3	2	3	2	3	2	2.4
Mean Overall Score											2.36 (High)

Semester	Course Code	Title of the Course	Hours	Credits
II	**21USA21GL02**	**SANSKRIT - II**	**4**	**3**

CO No.	CO–Statements On successful completion of the course, the student will be able to	Cognitive Levels (K –Levels)
CO-1	remembering names of different objects , remembering different verbal forms and sandhi.	**K1**
CO-2	contrast different verbal forms Explain good sayings , Relate good saying to life.	**K2**
CO-3	apply and build small sentences.	**K3**
CO-4	analyze different forms of Verbs and nouns.	**K4**
CO-5	appreciate subhashitas and Sanskrit poetry Expand Sanskrit vocabulary.	**K5**

Unit - I **(12 Hours)**

Asmath usmath tat kim (MFN)

Unit - II **(12 Hours)**

Sandhi Niyamaaha Abuyaasha (Guna , Visarga , Dirgha , Vrddhi)

Unit - III **(12 Hours)**

Lang lakaaraha Kriyapadaani

Unit - IV **(12 Hours)**

Raguvamsaha Pratama sargaha (1 –15)

Unit – V **(12 Hours)**

Suvachana Prayogha

Book for Study

SARALASAMKRITHAM SIKSHA, 2020 , K.M Saral sankrit Balabodh , Bharathiys Vidya Bhavan , Munshimarg Mumbai – 400007, 2018

Books for Reference

1. Paindrapuram Ashram , Srirangam – 620006 Gopalavimshanthi 2019
2. R.S.Vadhyar & Sons book Kulapthy , K.M Saral sankrit Balabodh , Bharathiys Vidya Bhavan , Munshimarg Mumbai – 400007, 2018

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course				Hours		Credit
II	21USA21GL02			SANSKRIT -II				4		2
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	1	3	2	2	2	3	3	2	1	2.1
CO-2	3	2	3	2	2	3	2	3	3	2	2.5
CO-3	2	2	3	2	2	2	2	3	3	1	2.1
CO-4	3	2	3	3	1	2	3	3	3	1	2.4
CO-5	3	2	2	2	3	2	2	3	3	1	2.3
Mean Overall Score											2.28
Result											# High

Semester	Course Code	Title of the Course	Hours	Credits
II	**21UEN22GE02**	**GENERAL ENGLISH - II**	**5**	**3**

CO No.	CO-Statements On successful completion of this course, students will be able to	Cognitive Levels (K- Levels)
CO-1	remember the use of suitable punctuation marks in appropriate places	**K1**
CO-2	describe their pictures with appropriate expressions	**K2**
CO-3	infer meaning from the given context	**K3**
CO-4	analyse real-life situations and ask open-ended questions	**K4 & K5**
CO-5	use polite expressions in appropriate ways	**K6**

Unit-I **(15 Hours)**

01. Education Word Grid
02. Reading Problems and Solutions
03. Syllabification
04. Forms for Expressing Quality
05. Expressing Comparison
06. Monosyllabic Comparison
07. Di/polysyllabic Comparison
08. The Best Monosyllabic Comparison
09. The Best Di/Polysyllabic Comparison
10. Practising Quality Words

Unit –II **(15 Hours)**

11. Wh Words
12. Yes/No Recollection
13. Unscramble Wh Questions
14. Wh Practice
15. Education and the Poor
16. Controlled Role Play
17. Debate on Education
18. Education in the Future
19. Entertainment Word Grid
20. Classify Entertainment Wordlist
21. Guess the Missing Letter
22. Proverb-Visual Description
23. Supply Wh Words
24. Rearrange Questions
25. Information Gap Questions

Unit-III **(15 Hours)**

26. Asking Questions

27. More about Actions
28. More about Actions and Uses
29. Crime Puzzle
30. Possessive Quiz
31. Humourous News Report
32. Debate on Media and Politics
33. Best Entertainment Source

Unit-IV **(15 Hours)**

34. Career Word Grid
35. Job-Related Wordlist
36. Who's Who?
37. People at Work
38. Humour at Workplace
39. Profession in Context
40. Functions and Expressions
41. Transition Fill-in
42. Transition Word Selection
43. Professional Qualities
44. Job Procedures
45. Preparing a Resume
46. Interview Questions
47. Job Cover Letter Format
48. Emailing an Application
49. Mock Interview

Unit-V **(15 Hours)**

50. Society Word Grid
51. Classify Society Wordlist
52. Rearrange the Story
53. Storytelling
54. Story Cluster
55. Words Denoting Time
56. Expressing Time
57. What Can You Buy?
58. Noise Pollution
59. Positive News Headlines
60. Negative News Headlines
61. Matching Conditions
62. What Would You Do?
63. If I were Elected
64. My Dream Country

Book for Study

Joy, J.L. & Peter, F.M. *Let's Communicate 2*, New Delhi: Trinity Press, 2014.

Books for Reference

1. Ahrens, Sönke. *How to Take Smart Notes: One Simple Technique to Boost Writing, Learning and Thinking*. New York: CreateSpace, 2017.
2. Aspinall, Tricia. *Test Your Listening.* London: Pearson, 2002.

3. Bailey, Stephen. *Academic Writing: A Practical Guide for Students*. New York: Routledge, 2004'
4. Fitikides, T.J. *Common Mistakes in English* (6th ed.). London: Longman, 2002
5. Wainwright, Gordon. *How to Read Faster and Recall More: Learn the Art of Speed Reading with Maximum Recall* (3rd ed.). Oxford: How to Books, 2007.

Web Resources

1. https://learnenglish.britishcouncil.org/
2. https://oneminuteenglish.org/en/best-websites-learn-english/
3. https://www.dailywritingtips.com/best-websites-to-learn-english/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Course Code			Title of the Course						Hours	Credits
II	21UEN22GE02			GENERAL ENGLISH - II						5	3
Course Outcomes (COs)	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	
CO-1	2	3	2	2	3	2	3	2	3	2	2.4
CO-2	2	2	3	2	3	3	2	3	2	2	2.3
CO-3	2	3	2	3	2	2	3	2	3	2	2.4
CO-4	2	2	3	2	3	3	2	3	2	3	2.5
CO-5	2	2	2	3	2	2	2	3	2	2	2.2
										Mean Overall Score	2.36 (High)

Semester	Course Code	Title of the Course	Hours	Credits
II	**21UBC23CC03**	**CORE -3: DIGITAL COMPUTER FUNDAMENTALS**	**4**	**2**

CO No.	CO–Statements	Cognitive Levels (K –Levels)
	On successful completion of this course, students will be able to	
CO-1	list the functionalities of various gates in a Digital Computer.	**K1**
CO-2	comprehend the fundamental principles of Digital Electronics Circuits used in Arithmetic Operations and 8085 Assembly Language programs.	**K2**
CO-3	utilize the concepts of Flip-Flops, Registers and Counters in the design of memory.	**K3**
CO-4	solve the expressions using Karnaugh Map to design the simplified circuits.	**K3**
CO-5	distinguish the Type of Memories used in Digital Computers.	**K4**

Unit-I: Digital Logic & Combinational Logic Circuits (12 Hours)

Binary Number System - The Basic Gates - Boolean algebra - NOR Gates - NAND Gates - Boolean Laws and Theorem - Sum of Product Method - Karnaugh Simplification - Product of Sum Method - Product of Sum Simplifications.

Unit-II: Data Processing & Arithmetic (12 Hours)

Multiplexers - De-multiplexers - Decoders: 1 of 16 encoders - BCD to decimal decoders - Seven segment decoders – Encoders - Ex-OR gates. Binary Addition – Subtraction - Unsigned Binary Numbers - 2's Complement Representation. The Adder - Subtracter - Binary Multiplication and Division.

Unit-III: Flip-Flops, Registers & Counters (12 Hours)

Flip-Flops: RS Flip-Flops - Gated Flip-Flops - Edge Triggered RS Flip-Flop - Edge Triggered D Flip-Flop - Edge Triggered JK Flip-Flops - JK Master/Slave - REGISTERS: Types of Registers – Serial-In – Serial-Out – Serial-In – Parallel-out – Parallel-In – Serial Out – Parallel-In – Parallel-Out.

Unit-IV: Counters (12 Hours)

Counters: Asynchronous Counters - Synchronous Counters. D/A and A/D Conversions: D/A Converters - A/D-converter Simultaneous Conversion. Memory: Magnetic Memory - Memory Addressing - ROMs, PROMs, and EPROMs – SRAMs – DRAMs**.**

Unit-V: Microprocessors, Microcomputers and Assembly Language (12 Hours)

Microprocessors - Microprocessor Instruction Set and Computer Languages. Introduction to 8085 Assembly Language Programming: The 8085 Programming Model – Instruction Classification – Instruction, Data Format and Storage – Data Format – Simple Assembly Language Program.

Books for Study

1. Donald P. Leach and Albert Paul Malvino, *Digital Principles and Applications*, 7th Edition, Tata McGraw Hill, New Delhi, 2011.
   - **Unit-I** *Chapter 1, Chapter 3(Sec. 3.1 – 3.8)*
   - **Unit-II** *Chapter 4 (Sec. 4.1 – 4.7), Chapter 6(Sec. 6.1 – 6.11)*
   - **Unit-III** *Chapter 8 (Sec. 8.1 – 8.5), Chapter 9 (Sec. 9.1 – 9.5)*
   - **Unit- IV** *Chapter 10 (Sec. 10.1 – 10.3), Chapter 12 (Sec. 12.4, 12.5), Chapter 13 (Sec.13.1 – 13.6)*
2. Ramesh Gaonkar, *Microprocessor Architecture, Programming and Applications with the 8085*, 5th Edition, Penram International Publishing (India) Private Limited, Mumbai, 2007.
   - **Unit – V** *Chapter 1 (Sec 1, 1.2), Chapter 2.*

Books for Reference

1. Thomas C. Bartee, *Digital Computer Fundamentals*, 6th Edition, McGraw Hill, New Delhi, 1985.
2. Thomas L. Floyd, *Digital Fundamentals*, 11th Edition, Pearson Education, Uttar Pradesh, India, 2015.
3. Reema Thareja, *Fundamentals of Computers*, 2nd Edition, Oxford University Press, New Delhi, 2019.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credits
II	21UBC23CC03	CORE -3: DIGITAL COMPUTER FUNDAMENTALS	4	2

Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	1	3	2	3	3	2	2	2	2.4
CO-2	3	3	1	3	3	3	3	2	2	2	2.5
CO-3	3	3	2	2	1	3	3	3	2	1	2.3
CO-4	3	3	2	2	1	3	3	2	2	2	2.3
CO-5	3	3	3	2	1	3	3	3	2	1	2.4
										Mean Overall Score	2.38 (High)

Semester	Course Code	Title of the Course	Hours	Credits
II	**21UBC23CC04**	**CORE-4: RELATIONAL DATABASE MANAGEMENT SYSTEMS**	**4**	**2**

CO No.	CO- Statements	Cognitive Levels (K-Levels)
	On successful completion of this course, students will be able to	
CO-1	choose the need, role, importance and uses of databases in application development.	**K1,K3**
CO-2	contrast the database approach over the file based data storage system.	**K2**
CO-3	apply the different models of file organizing, storing and using of data in software solutions.	**K3**
CO-4	analyze the relational model and relational algebra operations.	**K4**
CO-5	examine the PL/SQL procedural techniqueson relational tables as per the Industrial requirements.	**K4**

Unit – I: Introduction to Database System **(12 Hours)**

Database System Applications – Purpose of Database System. VIEW OF DATA: Data Abstraction – Instances and Schemas – Data Models – Relational Database – Database Design –The Entity Relationship model.

Unit – II: Storage and file Structure **(12 Hours)**

Overview of physical storage media – Magnetic Disks – Tertiary Storage – Storage Access. File Organization: Fixed Length Records – Variable Length Records**.** Organization of Records in Files: Sequential File Organization – Multi table Clustering File Organization – Data Dictionary Storage.

Unit – III: Relational Model **(12 Hours)**

Structure of Relational Databases - Fundamental Relational Algebra Operation. TRANSACTIONS: Transaction Concept - Transaction State – Implementation of Atomicity and Durability – Concurrent Execution - Serializability.

Unit – IV: SQL **(12 Hours)**

SQL**:** Background – Data Definition - Basic Structure of SQL Queries – Set Operations – Aggregate Functions – Nested sub queries – Views – Joined Relations. Relational Database Design: Atomic Domain and First Normal Forms. Decomposition Using Functional Dependencies: Keys and Functional Dependencies – Third Normal Form – Boyce Code Normal Form.

Unit – V: Introduction to PL/SQL **(12 Hours)**

Introduction of PL/SQL: Advantages of PL/SQL – The Generic PL/ SQL Block. PL/SQL: Data types – Variables – Constants – Control Structures – Cursors – Exception Handling – Procedures and Functions – Packages – Triggers.

Books for Study

1. Abraham Silberschatz, Henry F.Korth, S.Sudarshan, *Database System Concepts*, 8th

Edition, Tata McGraw–Hill, Singapore, 2016.

Unit-I *Chapter 1, Chapter 2*
Unit-II *Chapter 3, Chapter 5, Chapter 6*
Unit-III *Chapter 8, Chapter 9, Chapter 10*
Unit-IV Chapter *12, Chapter 13*

2. Ivan Bayross, *SQL & PL/SQL: The Programming Languages of Oracle*, 4th Revised Edition, BPB Publications, New Delhi, 2016.

Unit – V *Chapter 2, Chapter 3*

Books for Reference

1. P.S. Gill, *Database Management Systems*, DreamTech Press, New Delhi, 2019.
2. P.S.Deshpande, *SQL & PL/SQL for Oracle 10g*, Dream Tech Press, New Delhi, 2017.
3. RamezElmasri, *Fundamentals of Database Systems*, Pearson, 7th Edition, New Delhi, 2017.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credits
II	21UBC23CC04	CORE-4: RELATIONAL DATABASE MANAGEMENT SYSTEMS	4	2

Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	3	2	2	3	3	3	2	3	2.7
CO-2	3	2	3	3	2	3	2	2	3	1	2.4
CO-3	2	3	2	3	3	2	3	2	2	3	2.5
CO-4	3	2	3	2	1	3	3	2	1	2	2.2
CO-5	2	3	2	3	2	3	2	3	3	2	2.5
									Mean Overall Score		2.36
									Result		#High

Semester	Course Code	Title of the Course	Hours	Credits
II	**21UBC23CP02**	**SOFTWARE LAB-2: RELATIONAL DATABASE MANAGEMENT SYSTEMS**	**3**	**2**

CO No.	CO- Statements	Cognitive Levels (K- levels)
	On successful completion of this course, students will be able to	
CO-1	List the queries of database using DML/DDL commands.	**K1,K4**
CO-2	Demonstrate the aggregate function and set operations.	**K2**
CO-3	Apply the normalization rules for database design in business solutions.	**K3**
CO-4	Examine the effectiveness of various sub queries for a given problem	**K4**
CO-5	Analyze various PL/SQL stored procedures, stored functions, cursors and packages to provide effective database solutions	**K4**

List of Exercises

1. DDL, DML and DCL Queries
2. Aggregate Functions and Set Operations
3. Normalization
4. Joins and Views
5. Nested Sub Queries and Correlated Sub Queries

PL/SQL

6. Cursor
7. Procedures and Functions
8. Packages
9. Triggers
10. Exception Handling

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course					Hours				Credits
II	**21UBC23CP02**	**SOFTWARE LAB-II: RELATIONAL DATABASE MANAGEMENT SYSTEMS**					**3**				**2**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	2	3	3	2	2	3	1	3	2	3	2.4
CO-2	3	2	2	3	3	1	3	2	3	2	2.4
CO-3	2	3	2	3	1	2	1	2	2	1	1.9
CO-4	3	2	3	2	1	3	3	2	1	3	2.3
CO-5	2	1	2	1	2	3	2	3	3	2	2.1
									Mean Overall Score		2.25 (High)

Semester	Course Code	Title of the Course	Hours	Credits
II	**21UBC23AC02**	**ALLIED: MATHEMATICS FOR BCA-II**	**6**	**4**

CO No.	CO-Statements	Cognitive Levels (K-levels)
	On successful completion of this course, students will be able to	
CO-1	acquire knowledge of probability, statistical methods and theoretical distributions.	**K1**
CO-2	understand the fundamental concepts of measures of central tendency, dispersion, correlation, theoretical distributions & test of significance of attributes.	**K2**
CO-3	construct appropriate mathematical model to solve a variety of practical problems.	**K3**
CO-4	accurate and efficient use of different methods such as measures of central tendency, dispersion, correlation, theoretical distributions & test of significance of attributes.	**K4**
CO-5	demonstrate the competency in solving problems related to probability and statistics.	**K5**

Unit-I **(18 Hours)**

Curve fitting by least square methods - Fitting a straight line, Parabola and exponential curve - Bisection method –Newton-Raphson method.

Unit-II **(18 Hours)**

Solving simultaneous equations - Gauss elimination method - Gauss-Seidel Method. Lagrange's Interpolation formula. (Problems only)

Unit-III **(18Hours)**

Numerical Integration - Trapezoidal rule and Simpson's 1/3rd rule - Solving differential equations. Solutions by Taylor's series - Euler's Method- Runge - Kutta 4^{th} order method. (Problems only).

Unit-IV **(18 Hours)**

Averages: Mean, Median, Mode - Measures of variation: Range, Standard deviation.

Unit-V **(18 Hours)**

Measures of Skewness - computation of Karl Pearson's coefficient of skewness - Correlation analysis - types of correlation - calculation - rank correlation

Books for Study

1. Venkataraman, M. K., "**Numerical Methods in science and Engineering**",5^{th} Edition, The National Publishing Company, Chennai. 2013

Unit-I *Chapter 1 (Sec: 1.7, 1.8, 1.9), Chapter 3 (Sec 2, 5)*

Unit-II *Chapter 4 (Sec: 2, 6.2), Chapter 6 (Sec 3, 4) Chapter 8 (Sec: 4)*

Unit-III *Chapter 9 (Sec: 8, 10), Chapter 11 (Sec 6, 10, 16)*

2. R.S.N. Pillai and Bagavathi, "**Statistics Theory and Practice**", 7th Edition, S. Chand and Company Ltd., New Delhi 2009.

Unit – IV Chapter *9 (Pages 126-139,145-154,166-170,172), Chapter 10 (Pages 245,259-268)*

Unit – V*Chapter 11 (Pages 341-348) Chapter 12 (Pages 397-410,417-421)*

Books for Reference

1. S.S. Sastry, "Introductory methods of Numerical Analysis", PHI Learning Private ltd, New Delhi 2009.
2. P. Kandasamy, "Numerical methods", S. Chand & company Ltd-2008.
3. S.C.Gupta and V.K.Kapor, "Fundamentals of Mathematical Statistics", 11th edition, Sultan Chand and Sons, 2002.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**				**Hours**		**Credits**
II	**21UBC23AC02**			**ALLIED: MATHEMATICS FOR BCA-II**				**6**		**4**
Course Outcomes↓	**Programme Outcomes (PO)**					**Programme Specific Outcomes (PSO)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	3	2	2	2	1	3	3	2	2	3	2.2
CO-2	2	3	2	1	2	3	3	2	2	3	2.3
CO-3	1	2	3	2	3	2	3	2	3	2	2.3
CO-4	1	2	2	3	1	2	3	2	2	3	2.1
CO-5	1	2	2	2	3	1	3	2	2	3	2.1
Mean Overall Score											**2.2 (High)**

Semester	Course Code	Title of the Course	Hours	Credits
II	21UHE24AE02	Environmental Studies	2	2

CO No.	CO - Statements	Cognitive Levels (K-levels)
	On Completion of this course, the graduates will be able to	
CO-1	identify the concepts related to the environmental global scenario	K1
CO-2	comprehend the natural resources and environmental organizations	K2
CO-3	apply the acquired knowledge to sensitize individuals and public about the environmental crisis	K3
CO-4	analyze the causes and changes in the structure of biodiversity	K4
CO-5	enhance their skills in the society by solving the environmental problems and preserving nature by the acquired knowledge	K5

Unit I Introduction to Environmental Studies (6 Hours)

Introduction – Scope and Importance – Subsystems of Earth – Various recycling Methods – Environmental Movements in India – Eco- Feminism – Public awareness – Suggestions to conserve environment

Unit II Natural Resources (6 Hours)

Food Resources – Land Resources – Forest resources – Mineral Resources – Water Resources – Energy Resources

Unit III Ecosystems, Biodiversity and Conservation (6 Hours)

General structure of ecosystem - Functions of Ecosystem - Energy flow and Ecological pyramids – Levels of Biodiversity - Hot spots of Biodiversity - Endangered and Endemic Species - Value of Biodiversity - Threats to Biodiversity - Conservation of Biodiversity

Unit IV Environmental Pollution (6 Hours)

Air Pollution – Water Pollution – Oil Pollution – Soil Pollution – Marine Pollution – Noise Pollution - Thermal Pollution – Radiation Pollution

Unit V Environmental Organizations and Treatise (6 Hours)

United Nations Environment Program (UNEP) - International treaties on Environmental protection - Ministry of Environment, Forest and Climate Change - Important National Environmental Acts and rules– Environmental Impact Assessment.

Books for Study

Department of Human Excellence, *Environmental Studies*, St. Joseph's College, Tiruchirappali-02, 2021.

Books for Reference

1. Rathor, V.S. and Rathor B. S. *Management of Natural Resources for Sustainable Development*. New Delhi: Daya Publishing House, 2013.
2. Sharma P.D,*Ecology and Environment*, 8 ed., Meerut: Rastogi Publications, 2010.
3. Agrawal, A and C.C. Gibson. *Introduction: The Role of Community in Natural Resource*

4. *Conservation.* NJ: Rutgers University Press, 2001.
Web Sources:
https://www.unep.org/. Accessed 05 Mar. 2021.
http://moef.gov.in/en/ Accessed 05 Mar. 2021.
https://www.ipcc.ch/reports/. Accessed 05 Mar.2021.

Semester	Course Code	Title of the Course	Hours	Credits
II	**21UHE14VE02**	**TECHNIQUES OF SOCIAL ANALYSIS: FUNDAMENTALS OF HUMAN RIGHTS**	**2**	**1**

CO No.	CO - Statements	Cognitive Levels (K-levels)
	On completion of this course, the graduates will be able to	
CO-1	identify the importance and the values of human rights	**K1**
CO-2	understand the historical background and the development of Human Rights and the related organizations	**K2**
CO-3	apply the provisions of National and International human rights to themselves and the society	**K3**
CO-4	analyse the violations of human rights to the marginalized section in the society	**K4**
CO-5	animate the people to involve in the struggles and activities of the human rights organizations	**K5**

Unit-I Human Rights - An Introduction (6-Hours)

Introduction- Classification of Human Rights- Scope of Human Rights-Characteristics of Human Rights-NHRC-SHRC- Challenges for Human Rights in the 21stCentury.

Unit-II Historical Development of Human Rights (6-Hours)

Human Rights in Pre-World War Era- Human Rights in Post-World War Era- Evolution of International Human Rights Law - the General Assembly Proclamation- Institution Building, Implementation and the Post- Cold War Period. The ICC.

Unit-III India and Human Rights (6-Hours)

Introduction-Classification of Fundamental Rights-Salient Features of Fundamental Rights- and Fundamental Duties.

Unit-IV Human Rights of Women and Children (6-Hours)

Women's Human Rights- Issues related to women's rights - and Rights of Women's and Children

Unit-V Human Rights Violations and Organizations (6-Hours)

Human Rights Violations - Human Rights Violations in India - the Human Rights Watch Report, January 2012- Human Rights Organizations.

Books for Study

The Department of Human Excellence, *Techniques of Social Analysis: Fundamentals of Human Rights*, St. Joseph's college, Tiruchirappalli -02, 2021.

Books for Reference

1. Venkatachalem. Dr.*The Constitution of India,Salem:Giri Law House,* 2005.
2. NaikVarunand Mukesh Shany. *Human rights education and training,* New Delhi:crescent Publishing Corporation, 2011.

3. BhathokeNeera. *Human Rights content and extent*,New Delhi: swastika publications, 2011.

Web Sources:

https://www.un.org/en/universal-declaration-human-rights/. Accessed 05 Mar. 2021.
https://www.ilo.org/global/lang--en/index.htm. Accessed 05 Mar. 2021.
https://www.amnesty.org/en/. Accessed 05 Mar. 2021.

Semester	Course Code	Title of the Course	Hours	Credits
III	21UTA31GL03	General Tamil - III	4	3

CO No.	CO- Statement	Cognitive Level (K- level)
	இப்பாடத்தின் நிறைவில் மாணவர்கள்	
CO-1	சங்க இலக்கிய வகைகளை நினைவுகூருவர்	K 1
CO-2	இலக்கியத்தினை நுட்பமாக அறிதலின் வழியாக ஆற்றுப்படுத்தும் திறன் பெறுவர்	K 2
CO-3	இலக்கிய அறநெறிகளைத் தற்கால வாழ்வியலில் பயன்படுத்தும் திறன் பெறுவர்	K 3
CO-4	அகம் மற்றும் புற இலக்கியத் திணை, துறைகளைப் பகுத்தாராய்வர்	K 4
CO-5	யாப்பு, அணி இலக்கண நுட்பங்களை இலக்கியங்களில் மதிப்பிடுவர்	K 5

அலகு - 1 **(12 மணிநேரம்)**

பொருநராற்றுப்படை (முழுமையும்)

அலகு - 2 **(12 மணிநேரம்)**

நற்றிணை - 5 பாடல்கள் - (1, 19, 21, 70, 148)
ஐங்குறுநூறு - அன்னாய் வாழிப்பத்து.
யாப்பிலக்கணம் - வெண்பா, ஆசிரியப்பா

அலகு - 3 **(12 மணிநேரம்)**

கலித்தொகை - (குறிஞ்சிக்கலி- 62, பாலைக்கலி -22, மருதக்கலி- 87, நெய்தற்கலி-149, முல்லைக்கலி - 116)
இலக்கிய வரலாறு - முதற்பாகம் ('தமிழ் மொழியின் தொன்மையும் சிறப்பும்' முதல் 'சங்க தொகை நூல்கள்' முடிய),
புதினம் - குடும்ப அட்டை (2022-2023)

அலகு - 4 **(12 மணிநேரம்)**

பதிற்றுப்பத்து - 3 பாடல்கள் (14, 32, 61)
புறநானூறு - 5 பாடல்கள் (95, 121, 130, 204, 279)
அணியிலக்கணம்

அலகு - 5 **(12 மணிநேரம்)**

திருக்குறள் - புறங்கூறாமை, பழமை, புலவி நுணுக்கம் ஆகிய அதிகாரங்கள்
திரிகடுகம் - 5 பாடல்கள் (2, 6, 12, 15, 42)

இலக்கிய வரலாறு - சங்க இலக்கியங்களின் தனித்தன்மைகள் முதல் இரட்டைக் காப்பியங்கள் முடிய

பாடநூல்கள் :

1. **பொதுத்தமிழ்** செய்யுள் திரட்டு, தமிழாய்வுத்துறை வெளியீடு, தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2, முதற்பதிப்பு, *2021*
2. **சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு,** *தமிழாய்வுத்துறை, தூய வளனார் தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி, பத்தாம் பதிப்பு, 2017*
3. **புதினம்** (ஒவ்வொரு கல்வியாண்டிற்கும் ஒவ்வொரு புதினம்)

2022 – 2023 கல்வியாண்டுக்கு மட்டும் : வீ.செந்தில் குமார், **குடும்ப அட்டை,** தாமரை பப்ளிகேஷன்ஸ் பிரைவேட் லிமிடெட், சென்னை, முதற்பதிப்பு, *2009*

Semester	Course Code	Title of the Course					Hours	Credit			
III	21UTA31GL03	General Tamil - III					4	3			
Course Outcomes (COs)	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO-1	PO-2	PO-3	PO-4	PO-5	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	
CO-1	3	2	2	3	2	3	2	3	3	2	2.5
CO-2	2	2	2	3	3	2	2	3	3	2	2.4
CO-3	3	3	2	3	3	2	2	3	3	3	2.7
CO-4	3	2	2	3	2	3	2	3	2	3	2.5
CO-5	2	3	2	3	2	3	2	3	2	3	2.5
Mean Overall Score											2.52 (High)

Semester	Course Code	Title of the Course	Hours	Credits
III	**21UFR31GL03**	**FRENCH – III**	**4**	**3**

CO No.	CO–Statements On successful completion of this course, students will be able to	Cognitive Levels (K –Levels)
CO–1	relate colours, materials and shapes to the french clothing.	**K1**
CO–2	select appropriate prepositions in giving directions.	**K2**
CO–3	construct a text in present tense using different verbs.	**K3**
CO–4	examine the travel manners and celebrations of the French.	**K4**
CO–5	justify the usage of past tense in a biography.	**K5**

Unit – I **(12 hours)**

TITRE:VIVRE LAVILLE

GRAMMAIRE : la comparaison, les prépositions avec les noms géographiques, les pronoms personnels COI, le pronom y (le lieu)

LEXIQUE : se repérer sur un plan de ville, la ville, les lieux de la ville

PRODUCTION ORALE : demander et indiquer une direction dans un dialogue

PRODUCTION ECRITE : décrire votre ville natale, créez les affiches en appréciant votre ville

Unit - II **(12 hours)**

TITRE:VISITER UNE VILLE

GRAMMAIRE : la position des pronoms compléments, les verbes du premier groupe en – ger et – cer, les verbes ouvrir et accueillir

LEXIQUE : dire les informations sur une ville de votre choix, les transports, les points cardinaux, les prépositions de lieu

PRODUCTION ORALE : Indiquer le chemin

PRODUCTION ECRITE : Demander des renseignements touristiques

Unit - III **(12 hours)**

TITRE:ON VEND OU ON GARDE

GRAMMAIRE : la formation du pluriel, les adjectifs de couleurs, l'adjectif beau, nouveau,vieux

LEXIQUE : savoir comment s'habiller des grandes occasions, les couleurs, les formes, les matériaux

PRODUCTION ORALE : comprendre une présentation de catalogues vestimentaires en France

PRODUCTION ECRITE : adresser des souhaits à quelqu'un

Unit - IV **(12 hours)**

TITRE:VENTES D'AUTREFOIS, VENTES D'AUJOURD'HUI

GRAMMAIRE : les pronoms relatifs qui et que, l'imparfait, les verbes connaitre, écrire, mettre et vendre, la question avec inversion

LEXIQUE : comprendre la description de personnes dans un extrait de roman, les mesures, l'informatique

PRODUCTION ORALE : imaginez un dialogue avec un personnage célèbre. Utilisez l'inversion.
PRODUCTION ECRITE : écrire une biographie en utilisant les pronoms relatifs

Unit- V **(12 hours)**

TITRE:FELICITATIONS ! / ON VOYAGE!
GRAMMAIRE : les pronoms démonstratifs, les articles : particularités, les pronoms interrogatifs variables : lequel, les adverbes de manières, les verbes recevoir et conduire
LEXIQUE : les moyens de transports, les voyages, les fêtes, l'aéroport et l'avion, la gare et le train, l'hôtel
PRODUCTION ORALE : Présenter ses vœux
PRODUCTION ECRITE : Faire une réservation

Book for Study

P.Dauda,L.Giachino and C.Baracco, *Generation A2*, Didier, Paris 2016.

Books for Reference

1. J.Girardet and J.Pecheur, *EchoA2*, CLE International, 2^{e}edition,2017
2. Régine Mérieux and Yves Loiseau, *Latitudes A2*, Didier, 2012.
3. Isabelle Fournier, *Talk French*, Goyal Publishers, 2011

Web Resources

1. https://francais.lingolia.com/en/grammar/prepositions
2. https://www.lawlessfrench.com/grammar/present-tense/
3. https://www.thoughtco.com/textures-french-adjectives-and-expressions-1368980
4. https://study.com/academy/lesson/past-tense-in-french.html
5. https://absolutely-french.eu/french-celebrations/?lang=en

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course code			Title of the Course				Hours		Credits
III	21UFR31GL03			FRENCH – III				4		3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO–1	2	1	2	2	3	2	3	1	2	3	2.1
CO–2	3	2	3	3	1	2	1	2	2	3	2.2
CO–3	2	1	3	2	2	3	1	3	2	2	2.1
CO–4	3	1	3	2	3	3	3	1	2	3	2.4
CO–5	3	2	3	2	2	3	3	2	2	1	2.3
Mean overall Score											2.22 (High)

Semester	Course Code	Title of the Course	Hours	Credits
III	21UHI31GL03	HINDI - III	4	3

CO No.	CO–Statements	Cognitive Levels (K –Levels)
	On successful completion of the course, students will be able to	
CO-1	find out the dialects of Hindi language.	K1
CO-2	compare the poems of Sumithra Nandanpanth, Prasad & Bachan in Context with their experience of life.	K2
CO-3	illustrate the importance given to family ethics by the youth in the modern period according to "Bahoo Ki vidha" One Act play.	K3
CO-4	categorize the poetics in some selective poems.	K4
CO-5	justify the social & political conditions of Devotional period in Hindi Literature.	K5

Unit - I **(12 Hours)**

Tera sneh na khooon
Samband Bodak
Reethikal - Namakarn
Tense

Unit - II **(12 Hours)**

Himadri Thung Sring Se
Paribakshik shabdavali
Samuchaya Bodak
Reethikal - Samajik Paristhithiyam

Unit - III **(12 Hours)**

Insan our Kuthae
Vismayadi Bodak
Reethikal - Sahithyik Paristhithiyam
Reethikal - Salient Features

Unit - IV **(12 Hours)**

Shokgeeth
Avikary shabdh
Reethikal - Main Divisions
Social media and modern world

Unit - V **(12 Hours)**

Reethikal - Visheshathayem
Anuvad – 3
Bahoo ki vidha (one act play)

Books for Study

1. Dr. Sanjeev Kumar Jain, Anuwad: Siddhant Evam Vyavhar, Kailash Pustak Sadan, Madhya Pradesh, 2019.
   Unit-I *Chapter 1*
2. M. Kamathaprasad Gupth, *Hindi Vyakaran*, Anand Prakashan, Kolkatta, 2020.
   Unit-II, III and IV *Chapter 2*
3. Dr. Sadananth Bosalae, *kavya sarang*, Rajkamal Prakashan, New Delhi, 2020.
   Unit-V *Chapter 4*

Books for Reference

1. Ramdev, Vyakaran Pradeep, Hindi Bhavan, 2016.
2. Lakshman prasad singh, Kavya ke sopan, Bharathy Bhavan Prakashan, 2017.
3. Acharya ramchandra shukla, Hindi Sahitya Ka Itihas, Prabhat Prakashan, 2021.
4. Hindi Niband Sangrah,V&S Publishers, 2015.
5. Krishnakumar Gosamy, Anuvad vigyan ki Bhumika, Rajkamal Prakashan, 2016.

Web Resources

1. https://youtu.be/Xxvco3qa284
2. https://youtu.be/e9wK-pYfVPc
3. https://youtu.be/75tHr53f5_o
4. https://youtu.be/eFNM6y_cpjY
5. https://youtu.be/jHWXWLMxJtw

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course					Hours	Credits
III	21UHI31GL03			HINDI - III					4	3
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	3	3	2	3	2	1	3	2	2.4
CO-2	3	2	3	2	2	3	2	3	2	3	2.5
CO-3	3	2	2	3	1	3	2	3	2	3	2.4
CO-4	2	3	3	2	3	2	3	3	2	1	2.4
CO-5	3	2	2	3	3	2	1	3	2	3	2.4
Mean Overall Score											2.42 (High)

Semester	Course Code	Title of the Course	Hours	Credits
III	21USA31GL03	SANSKRIT - III	4	3

CO.No.	CO–Statements	Cognitive Levels (K –Levels)
	On successful completion of the course, the student will be able to	
CO-1	remember Characters and events of Ramayana.	K1
CO-2	understand social ethics and moral duties.	K2
CO-3	apply the values learnt , in day to day life.	K3
CO-4	analyzing the Vedic Philosophy.	K4
CO-5	evaluate and create new words with upasargas.	K5

Unit - I **(12 Hours)**

Romodantam , Balakandam (1-15)

Unit - II **(12 Hours)**

Romodantam , Balakandam (15-30)

Unit – III **(12 Hours)**

Vedas – Vedangas vivaranam

Unit - IV **(12 Hours)**

Puranas .Upanishands

Unit - V **(12 Hours)**

Upasargas , Bhavishyat Kaalah

Book for Study

VEDIC LITERATURE, 2019

Books for Reference

1. Parameshwara, Ramodantam, LIFCO Chennai 2018
2. R.S.Vadhyar & Sons , Book – sellers and publishers , Kalpathu ,Palghat – 678003 , Kerala , south India , History of Sanskrit Literature 2019
3. Kulapathy , K.M Saral Sanskrit Balabodh , Bharathita vidya bhavan , Munshimarg Mumbai – 400 007 2018

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course					Hours	Credit
III	21USA31GL03			SANSKRIT-III					4	3
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	1	2	2	3	3	3	3	3	2	1	2.3
CO-2	3	3	2	3	3	2	2	3	3	3	2.7
CO-3	3	3	1	3	3	1	1	3	3	3	2.4
CO-4	2	2	1	2	3	2	2	3	2	1	2.0
CO-5	3	3	2	3	2	2	3	3	3	2	2.6
Mean Overall Score											2.4
Result											# High

Semester	Course Code	Title of the Course	Hours	Credits
III	21UEN32GE03	GENERAL ENGLISH - III	5	3

CO No.	CO-Statements On successful completion of this course, students will be able to	Cognitive Levels (K-Levels)
CO -1	recall the meaning of familiar words in different contexts	K1
CO-2	comprehend the complex written texts by guessing meaning of unfamiliar words using contextual clues	K2
CO-3	use tenses and punctuations appropriately in sentences	K3
CO-4	analyse formal and informal letters to rewrite them meaningfully	K4
CO-5	compare different genres of writing and construct paragraphs	K5 & K6

Unit-I **(15 Hours)**

1. Suggestions to Develop Your Reading Habit
2. General Writing Skill: Letter Writing – Informal
3. Grammar: Simple Present Tense

Unit-II **(15 Hours)**

4. The Secret of Success: An Anecdote
5. General Writing Skill: Letter Writing – Formal
6. Grammar: Present Continuous Tense

Unit-III **(15 Hours)**

7. The Impact of Liquor Consumption on the Society
8. General Writing Skill: Letter to Newspaper
9. Grammar: Simple Past Tense

Unit-IV **(15 Hours)**

10. Dr. A.P.J. Abdul Kalam: A Short Biography
11. General Writing Skill: Job Application Letter
12. Grammar: Past Continuous Tense

Unit-V **(15 Hours)**

13. Golden Rule: A Poem
14. General Writing Skill: Circular-Writing
15. Grammar: Simple Future Tense and Future Continuous Tense

Book for Study

Jayraj, S. Joseph Arul et al. *Trend-Setter*: *An Interactive General English Textbook for Undergraduate Students*. Trinity, 2016.

Books for Reference

1. Malkani, Neelam. *A comprehensive Guide on General English for Competitive Exams*. Agra: Oswal Publications, 2020.
2. Jain, B. B. *Compendium General English*. Agra: Upkar Prakashan, 2010.
3. Aggarwal, R.S. *Quick Learning Objective General English*. India: S Chand, 2006.

4. T. Ferrari, Bernard. *Power Listening: Mastering the Most Critical Business Skill of All.* USA: Penguin Publishers, 2012.
5. Barry, Marian. *Steps to Academic Writing*. USA: Cambridge University Press, 2011.

Web Resources

1. https://www.nypl.org/events/classes/english
2. https://www.waywordradio.org/listen/podcast-itunes/?gclid=EAIaIQobChMIrbeRtbP12AIVCYZpCh0-XwnvEAAYAiAAEgLcjvD_BwE
3. https://eltlearningjourneys.com/2015/05/19/websites-for-learning-english/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Course Code			Title of the Course						Hours	Credits
III	21UEN32GE03			GENERAL ENGLISH - III						5	3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Scores of COs
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	
CO-1	2	3	2	2	3	2	3	2	3	2	2.4
CO-2	2	2	3	2	3	3	2	3	2	2	2.3
CO-3	2	3	2	3	2	2	3	2	3	2	2.4
CO-4	2	2	3	2	3	3	2	3	2	3	2.5
CO-5	2	2	2	3	2	2	2	3	2	2	2.2
Mean Overall Score											2.36 (High)

Semester	Course Code	Title of the Course	Hours	Credits
III	21UBC33CC05	CORE 5: DATA STRUCTURES AND ALGORITHMS	4	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	recall the fundamental concepts of Data Structures	K1
CO-2	extend the logical thinking through the use of Linked List, Stack, Queue and Trees.	K2
CO-3	apply the suitable data structures and techniques for appropriate problems	K3
CO-4	analyze various operations, searching methods, sorting techniques and different types of algorithms to provide industry level software solutions.	K4
CO-5	examine different algorithms and data structures to design Business Solutions.	K4

Unit –I: Introduction **(12 Hours)**

Introduction and Overview: Basic Terminology - Elementary Data Organization - Data Structures - Data Structure Operations. Arrays: Introduction - Linear Arrays - Representation – Traversing Insertion and Deletion. Searching**:** Linear Search - Binary Search.

Unit –II: Linked Lists **(12 Hours)**

Linked Lists: Introduction - Linked Lists - Representation of Linked List in Memory - Traversing a Linked List - Searching a Linked List – Memory Allocation, Garbage Collection - Insertion into a Linked List - Deletion from a Linked List.

Unit –III: Stacks, Queues and Recursion **(12 Hours)**

Introduction - Stacks – Array Representations of Stacks - Arithmetic Expressions - Polish Notation - Recursion: Factorial Function and Fibonacci sequence. Queues: Representation of Queues - Array Representation of Queues.

Unit –IV: Trees **(12 Hours)**

Trees: Introduction - Binary Trees - Representing Binary Tress in Memory – Traversing Binary Trees- Binary Search Tree- Searching and Inserting in Binary Search Trees - Deleting in Binary Search Trees. Sorting: Introduction - Insertion Sort - Selection Sort - Merge Sort - Heap Sort – Quick Sort.

Unit – V: Algorithm **(12 Hours)**

The Complete development of an Algorithm: Algorithms – Basic Steps. Algorithm Design Methods: Sub goals – Hill Climbing and Working Backward – Heuristics – Backtrack Programming – Branch and Bound.

Books for Study

1. Seymour Lipschutz, *Data Structures*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2014.
   Unit-I *Chapter 1 (Sec 1.1,1.2,1.3,1.4)*
   Unit-II *Chapter 5 (Sec 5.1,5.2,5.3,5.4)*
   Unit-III *Chapter 6 (Sec 6.1,6.2,6.3,6.5,6.7,6.10)*
   Unit-IV *Chapter 7 (Sec 7.1,7.2,7.3,7.4,7.7,7.8) Chapter 9 (Sec 9.1,9.3,9.4,9.6) Chapter 6(Sec 6.6) Chapter 7 (Sec 7.17)*
2. S.E. Goodman and S.T. Hedetniemi, *Introduction to the Design and Analysis of Algorithms,* Tata McGraw-Hill, International Edition, 1987.
   Unit-V *Chapter 1 (Sec 1.1, 1.2, 1.3) Chapter 3 (Sec 3.1, 3.2, 3.3)*

Books for Reference

1. Narasimha Karumanchi, *Data Structures and Algorithms Made Easy: Data Structures and Algorithmic Puzzles*, First Edition, Career Monk Publisher, India, 2016.
2. George Heineman, Gary Pollice, Stanley Selkow *Algorithms in a Nutshell*, Second Edition, O′Reilly Publication, USA, 2016.
3. RS Salaria, *Data Structures & Algorithms Using C*, 5th Edition, Khanna Publishing House, India, 2018.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credits
III	21UBC33CC05	CORE 5: DATA STRUCTURES AND ALGORITHMS	4	2

Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	3	3	3	3	3	3	3	3	3.0
CO-2	3	3	2	2	2	3	3	3	2	3	2.6
CO-3	3	3	3	2	2	3	3	3	3	3	2.8
CO-4	3	3	3	3	2	3	3	3	3	3	2.9
CO-5	3	3	2	2	3	3	3	2	2	3	2.6
										Mean Overall Score	2.78 (High)

Semester	Course Code	Title of the Course	Hours	Credit
III	**21UBC33CC06**	**CORE- 6: C# .NET**	**4**	**3**

CO No.	CO- Statements On successful completion of this course, students will be able to	Cognitive Levels (K- Levels)
CO-1	recall the fundamentals of OOP with their applications	**K1**
CO-2	explain the .NET framework Technologies	**K2**
CO-3	develop C# application for Corporate Solutions	**K3**
CO-4	construct the Database Connectivity using ADO.NET	**K3**
CO-5	analyze various XML applications in .NET for Software Solutions	**K4**

Unit – I: Introduction to C# (12 Hours)

Introduction: Object Technology - C# - Microsoft's .NET - Visual Studio Integrated Development Environment - Introduction to Visual Studio and Visual Programming: Overview of the Visual Studio Community 2015 IDE - Menu Bar and Toolbar - Navigating the Visual Studio IDE. Creating a Simple App in Visual Studio: Modifying Your Simple C# App - Another C# App: Adding Integers

Unit – II: OOPS (12 Hours)

OOPS: Introduction to Classes, Objects, Methods and strings - Control Statements - Introduction to Exception Handling - Inheritance OOP: Polymorphism and Interfaces

Unit –III: File and Streams (12 Hours)

Files and Streams – Generics - Arrays and Tuples - Strings and Regular Expressions – Collections: Language Integrated Query

Unit –IV: Core ADO.NET (12 Hours)

ADO.NET Overview - Using Database Connections - Commands - Fast Data Access: The Data Reader - Managing Data and Relationships: The Data Set Class - XML Schemas: Generating Code with XSD - Persisting Data Set Changes - Working with ADO.NET

Unit –V: XML (12 Hours)

Manipulating XML: XML - Reading and Writing Streamed XML - Using the DOM in .NET- Using XPath Navigators - XML and ADO.NET - Serializing Objects in XML - LINQ to XML and .NET - Using LINQ to Query XML Documents - More Query Techniques for XML Documents.

Books for Study

1. Paul Deitel, Harvey Deitel, *C# 6 For Programmers*, Deitel Developer Series, 2017.
   Unit- I *Chapter 1, Chapter 2, Chapter 3.3, 3.4, 3.6*
   Unit- II *Chapter 4, Chapter 5, Chapter 8, Chapter 11, Chapter 12*
   Unit-III C*hapter -17*
2. Christian Nagel, *Professional C# 2012 with .NET 4.5*, Wiley India, 2012.
   Unit-III *Chapter* 6, *Chapter* 9, *Chapter* 10, *Chapter* 11
   Unit-IV *Chapter* 32

Unit-V *Chapter* 34

Books for Reference

1. Joseph Albahari, Ben Albahari, *C# 7.0 in a Nutshell*, Fifth edition, O'Reilly Media, Inc., California, USA, 2017.
2. Jon Skeet, *C# in Depth*, Fourth Edition, O"Reilly, Manning Publications, New York, USA, 2019.
3. Ian Griffiths, *Programming C# 8.0 Programming C# 8.0 Build Cloud, Web, and Desktop Applications*, O'Reilly Media, Inc., California, USA, 2019.

Relationship matrix for Course outcomes, Programme outcomes / Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**				**Hours**		**Credits**
III	**21UBC33CC06**			**CORE- 6: C# .NET**				**4**		**3**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	3	2	2	1	3	2	2	1	3	2	2.1
CO-2	2	3	3	3	2	2	3	2	3	3	2.6
CO-3	2	3	2	1	3	3	3	2	2	1	2.2
CO-4	2	3	3	2	2	3	3	2	3	3	2.6
CO-5	3	3	2	3	2	1	2	3	3	2	2.4
Mean Overall Score											2.38 (High)

Semester	Course Code	Title of the Course	Hours	Credits
III	**21UBC33CP03**	**SOFTWARE LAB-3: C# •NET**	**3**	**2**

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	list and Demonstrate various Console Applications	**K1, K2**
CO-2	apply the concepts of array, Inheritance and String functions for manipulation.	**K3**
CO-3	build the Scientific Desktop applications using C#	**K3**
CO-4	design Database using ADO.NET for data processing	**K4**
CO-5	evaluate various applications using XML and Files & Streams	**K5, K6**

List of Exercises:

1. Simple Console Applications with Classes and Methods
2. Create a desktop application using various controls
3. Control Statements
4. Scientific Calculator
5. Arrays and Strings
6. LINQ
7. Exception Handling and Inheritance
8. Files and Streams
9. Generic Collections
10. String functions
11. ADO.NET (Connected and Disconnected approach)
12. XML

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credits
III	**21UBC33CP03**	**SOFTWARE LAB-III: C# •NET**	**3**	**2**

Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	3	3	2	3	3	2	2	1	3	2	2.4
CO-2	2	3	3	3	2	2	3	2	3	3	2.6
CO-3	2	3	2	1	3	3	3	3	2	1	2.3
CO-4	2	3	3	3	2	3	3	2	3	3	2.7
CO-5	3	3	2	3	2	1	3	3	3	3	2.6
										Mean Overall Score	2.52 (High)

Semester	Course Code	Title of the Course	Hours	Credits
III	21UBC33AO03A	ALLIED 1: FINANCIAL ACCOUNTING PACKAGE – TALLYPRIME	3	2

CO.No.	CO- Statements	Cognitive Level (K- level)
	On successful completion of this course, students will be able to	
CO-1	Create Vouchers and Final Accounts adjustments	K4
CO-2	Generate MIS reports and GST-filing Reports	K4
CO-3	Equip with skills of entering transactions in the appropriate accounting vouchers and creation and application of cost centers.	K4
CO-4	Acquaint with creation of inventory masters and use various inventory features.	K4
CO-5	Work in the real time computerized business environment as an accountant or a store keeper.	K4

UNIT-I: (09-Hours)

Need and Importance – Book –Keeping – Accounting – Accountancy- Accounting and Book-Keeping – Users of Accounting Information –Branches of Accounting – Basic accounting terms- Rules for Debiting andcrediting – Books of original entry – Journal – Ledger – Trail balance

UNIT-II: (09-Hours)

Getting Started with Tally ERP9 – Mouse/Keyboard Conventions – Company creation – Shut a Company – Select a Company – Alter Company Details – Company Features and Configuration – Ledger – Group

UNIT-III: (09-Hours)

Parts of final accounts – Trading account – profit and loss account – balancesheet – preparation of final accounts – without adjustments.

UNIT-IV: (09-Hours)

Voucher Entry in Tally ERP.9 – Accounting Vouchers – Types ofVouchers – Contra, Payment, Receipt, Journal, Sales, Purchase, Credit note,debit note, reversing journals, Memo Voucher Transactions – Display.

UNIT-V: (09-Hours)

Inventory Masters In Tally ERP9 – Creating inventory masters – creating Inventory Masters – Creation of Stock Group – Creation of Units of Measure – Creation of Stock Item – Creation of Go down – Defining of Stock Opening Balance in Tally ERP 9- Stock Category – Reports.

Book for Study

1. Lal, Jawahar and Seema Srivastava, Financial Accounting, Himalaya Publishing House.2019

2. Monga, J.R., Financial Accounting: Concepts and Applications, Mayoor Paper Backs, New Delhi.2018
3. Shukla, M.C., T.S. Grewal and S.C.Gupta. Advanced Accounts. Vol.-I. S. Chand & Co., New Delhi.2020

Reference Books

1. S. N. Maheshwari, Financial Accounting, Vikas Publication, New Delhi. T.S, Grewal, Introduction toAccounting, S. Chand and Co., New Delhi 2020
2. Compendium of Statements and Standards of Accounting. The Institute of Chartered Accountants ofIndia, New Delhi

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credit
III	21UBC33AO03A	ALLIED 1: FINANCIAL ACCOUNTING PACKAGE – TALLYPRIME	3	2

Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	2	2	1	3	3	2	2	3	2.2
CO-2	2	3	2	1	2	3	3	2	2	3	2.3
CO-3	1	2	3	2	3	2	3	2	3	2	2.3
CO-4	1	2	2	3	1	2	3	2	2	3	2.1
CO-5	1	2	2	2	3	1	3	2	2	3	2.1
									Mean Overall Score		2.2
									Result		# High

Semester	Course Code	Title of the Course	Hours	Credits
III	21UBC33AP01A	SOFTWARE LAB: FINANCIAL ACCOUNTING PACKAGES – TALLY PRIME BASIC	3	2

CO No	CO- Statements	Cognitive Level (K- level)
	On successful completion of this course, students will be able to	
CO-1	Extract profit and loss account and balance sheet through ledger account balances and adjustment entries.	K3
CO-2	Pass entries for transactions in accounting vouchers with or without stock items.	K3
CO-3	Carry out order processing and maintain accounting records along with inventory records and generate reports.	K3
CO-4	Work as an accountant or a storekeeper in the computerized environment of business organizations.	K3
CO-5	Pass entries for transactions requiring special features such as Single and multiple Ledger creations.	K3

Exercises

1. Company creation, alteration and deletion of companies and user defined Accounting groups
2. Creation, alteration and deletion of ledgers and final accounts and Balance sheet Preparations.
3. F11: Company Features, F12: Configuration
4. Single Ledger Creation, Multi Ledger Creation
5. Altering and Displaying Ledgers
6. Group Creation, Single Group Creation, Multiple Group Creation
7. Displaying Groups an Ledgers
8. Creation of Stock Item ,Go down
9. Trading and Profit and Loss Account, Balance sheet
10. Types of Assets and Liabilities included in a Balance Sheet

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credit
III	21UBC33AP01A	Practical ALLIED 1: FINANCIAL ACCOUNTING PACKAGES – TALLY PRIME BASIC	03	02

Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	2	2	1	3	3	2	2	3	2.2
CO-2	2	3	2	1	2	3	3	2	2	3	2.3
CO-3	1	2	2	3	1	2	3	2	2	3	2.1
CO-4	2	3	2	1	2	3	3	2	2	3	2.3
CO-5	1	2	2	2	3	1	3	2	2	3	2.1
Mean Overall Score											2.2
Result											# High

Semester	Course Code	Title of the Course	Hours	Credits
III	**21UBC33AO03B**	**ALLIED ACCOUNTS -1**	**6**	**4**

CO No.	CO- Statements	Cognitive Level (K- level)
	On successful completion of this course, students will be able to	
CO-1	Know the concepts of financial accounting	**K1**
CO-2	Understand the consignment and joint venture accounts	**K2**
CO-3	Explain the concepts of branch accounting and departmental accounting	**K2**
CO-4	Apply the hire purchase accounts and fire insurance claims methods in business	**K3**
CO-5	Analyze and prepare the financial statements of partnership firm	**K4**

UNIT - 1

INTRODUCTION TO ACCOUNTING

Need and Importance – Book –Keeping – Accounting – Accountancy, Accounting and Book-Keeping – Users of Accounting Information – Branches of Accounting – Basic accounting terms- Rules for Debiting and crediting – Books of original entry – Journal – Illustrations.

UNIT – 2

BASIC ACCOUNTING PROCEDURES

Ledger – Meaning – Utility – Format – Posting – Balancing an account – Distinction between journal and Ledger.

UNIT – 3

SUBSIDIARY BOOKS -1 SPECIAL PURPOSE BOOKS

Need – Purchase book – sales book – Returns books – Bills of exchange – bills book – Journal proper. - cash book – Kinds of cash books.

UNIT – 4

BANK RECONCILIATION STATEMENT

Pass book – difference between cash book and pass book – Bank Reconciliation statement – procedure for preparing bank reconciliation statement

UNIT – 5

FINAL ACCOUNTS

Parts of final accounts – Trading account – profit and loss account – balance sheet – preparation of final accounts – without adjustments.

Book for Study

Shukla &Grewel, 2015 - Advanced Accounts, Vol. I, 1st edition, published by Sultan & Chand PublishingCo., New Delhi.

Books for Reference

1. Reddy and A. Moorthy.T.S, (2016) - Financial Accounting, 1st edition Published by Marghampublishers , Chennai.

2. Jain & Narang, (2015), Advanced accounting, 1st edition, published by Kalyani Publishers, New Delhi.
3. Nagarajan, Vinaykarn&Mani , (2012)– Principles of Accountancy – 1st edition Published by Eurasia Publishing House, New Delhi,
4. Tulsian, P. C., Financial Accounting, 1st edition Published byTata McGraw Hills, New Dellhi.

Relationship matrix for Course outcomes, Programme outcomes / Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credit
1	21UBC33AO03B	ALLIED ACCOUNTS -1	6	4

Course Outcomes ↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO-1	PO-2	PO-3	PO-4	PO-5	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	
CO-1	3	2	2	3	2	3	3	2	2	3	2.5
CO-2	2	3	2	1	2	3	3	2	2	3	2.3
CO-3	2	2	3	2	3	2	3	2	3	2	2.4
CO-4	1	2	2	3	1	2	3	2	2	3	2.1
CO-5	2	2	2	2	3	1	3	2	2	3	2.2
Mean Overall Score											2.3
Result											# High

Semester	Course Code	Title of the Course	Hours	Credit
III	**21UBC34SE01**	**SEC -1 (WD): NUMERICAL APTITUDE**	**2**	**1**

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	Recall the problem solving skills	**K1**
CO-2	Extend the theoretical mathematical skills in the competitive examinations	**K2**
CO-3	Apply verbal reasoning skills in aptitude tests.	**K3**
CO-4	Demonstrate the verbal and non-verbal communication ability in real life situations	**K4**
CO-5	Take part in the competitive exams	**K4**

Unit – I **(6-Hours)**

Quantitative Aptitude: Percentages - Averages – Ratio and Proportion - Profit or Loss.

Unit - II **(6-Hours)**

Time and Work, Work and Wages - Pipes and Cisterns- Time and Distance – Alligation or Mixture.

Unit - III **(6-Hours)**

Simple Interest – Compound Interest – Set Theory – Permutations and Combinations.

Unit - IV **(6-Hours)**

Reasoning: Series Completion - Analogy– Coding and Decoding– Blood Relations.

Unit - V **(6-Hours)**

Direction Sense Test- Logical Venn Diagrams- Logical Sequence of Words – Arithmetical Reasoning.

Books for Study

1. Dinesh Khattar, *Quantitative Aptitude for Competitive Examinations*, 2nd Edition, Pearson Education, India, New Delhi, 2016.
   Unit -I – *Section (5,6,7,9)*
   Unit -II – *Section (10,11,12,15)*
   Unit -III – *Section (17,18,30,31)*
2. Dr R S Aggarwal, *A Modern Approach to Verbal & Non-Verbal Reasoning*, 2nd Edition, S. Chand Publishing, India, New Delhi, 2017.
   Unit -IV – *Section (1, 2, 4, 5)*
   Unit - V – *Section (8, 9, 14, 15)*

Books for Reference

1. Dr R S Aggarwal, *Quantitative Aptitude for Competitive Examinations*, Latest Edition, S. Chand Publishing, New Delhi,2017.
2. JaiKishan, PremKishan, *How to Crack Test of Reasoning*, 9th Edition, Arihant Publications, Jaipur, 2018.

3. Disha Experts, *Shortcuts in Quantitative Aptitude for Competitive Exams*, 2nd edition, Disha Publication, New Delhi, 2018.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course				Hours		Credits
III	21UBC34SE01			SEC -1 (WD): NUMERICAL APTITUDE				2		1
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	2	3	3	2	2	2	3	2	2.5
CO-2	2	3	3	3	2	2	3	2	3	3	2.6
CO-3	2	3	2	1	3	3	3	3	2	1	2.3
CO-4	2	3	3	3	2	3	3	2	3	3	2.7
CO-5	3	2	2	3	2	2	3	3	3	3	2.6
									Mean Overall Score		2.5 (High)

Semester	Course Code	Title of the Course	Hours	Credits
III	21UHE24VE03A	PROFESSIONAL ETHICS–I: SOCIAL ETHICS - I	2	1

CO No.	Co- Statements	Cognitive Levels (K- Levels)
	On completion of this course the graduates will be able to	
CO-1	know the responsibility of the educated youth.	K1
CO-2	understand the values prescribed under social ethics.	K2
CO-3	apply their minds critically to the various types of cyber crime.	K3
CO-4	analyse the various kinds of political systems.	K4
CO-5	analyse the behaviour of the elected representatives.	K4

Unit-I Introduction to Social Ethics (6-Hours)

Introduction to social ethics and social responsibility, important role of Social ethics on the various areas, religion influences social changes - secularism. Social ethics and corporate dynamics, forms of social ethics.

Unit-II The Economic and Political System of Today (6-Hours)

Planned economy and communism – market economy and capitalism- socialism - mixed economy -the emerging market economy - political system- totalitarian system- oligarchic system.

Unit-III Integrity in Public Life National Integration (6-Hours)

What is Integrity, Public Life, Integrity and Public Life, Integrity in a Democratic State, India as Democratic State, Behavior of a elected representative of India , Noticeable degradation acts of elected Representatives, Suggestions to stem this rot, Types of integrity, Transparency can be a guarantee for integrity.

Unit-IV Cyber Crime (6-Hours)

Business Ethics, Business ethics permeates the whole organization, Measuring business ethics , The Vital factors highlighting the importance of business ethics , Cyber crime, Strategies in committing Cyber Crimes, Factors aiding Cyber Crime, computer Hacking, Cyber Bullying, Telecommunications piracy, Counter Measures to Cyber Crime, Ethical Hacking.

Unit-V Social Integration (6-Hours)

Global challenges, The future is with the Educational Youth, Cost of the Sacrifice, Crusaders against corruption, Responsibility of the Educated Youth, Positive Global Scenario, Right to Education, Eradicating gender inequality, Sustainable Human Development , Social Integration, Elimination Crime, Integration with Global Market

Books for Study

1. Department of Human Excellence, *Formation of Youth*, St Joseph's College(Autonomous), Tiruchirappali -02, 2021

Books for Reference

1. Ramesh K. Arora, *Ethics, Integrity and Values* by Public Service Paperback ,– 1 January 2014
2. Cunningham, D. *There's something happening here: The new left, the Klan, and FBI counterintelligence*. Berkeley: University of California Press, 2004.
3. Adv. Prashant Mali, *Cyber law & Cyber Crimes simplified* by Cyber Info media Paperback – 1 January 2017.
4. Matthew Richardson, *Cyber Crime: Law and Practice Hardcover – Import*, Wildy publications, 29 November 2019

Web Sources

https://cybercrime.gov.in/
https://open.lib.umn.edu/sociology/chapter/14-2-types-of-political-systems/
https://www.esv.org/resources/esv-global-study-bible/social-ethics/
https://en.wikipedia.org/wiki/Political_system

Semester	Course Code	Title of the Course	Hours	Credits
III	**21UHE34VE03B**	**PROFESSIONAL ETHICS I: RELIGIOUS DOCTRINE- I**	**2**	**1**

CO.No.	CO – Statements	Cognitive Levels (K- Levels)
	On completion of this course, the graduates will be able to	
CO-1	understand the history of the Catholic Church	**K1**
CO-2	examine and grasp the Sacraments of the Catholic Church	**K2**
CO-3	apply the Christian Prayer to their everyday life	**K3**
CO-4	analyze themselves in the light of Sacraments & Christian Prayer	**K4**
CO-5	create a harmonious society learning values from all religions	**K5 & K6**

Unit-I	**God of salvation**	**(6 Hours)**
Unit-II	**Life & Mission of Jesus Christ**	**(6 Hours)**
Unit-III	**The Holy Spirit**	**(6 Hours)**
Unit-IV	**Biblical Values**	**(6 Hours)**
Unit-V	**Mother Mary**	**(6 Hours)**

Books for Study

Department of Human Excellence, *Life in the Lord: Religious Doctrine.* St. Joseph's College, Trichirappalli-02, 2021.

Books for Reference

1. *Compendium: Catechism of the Catholic Church.* Bengaluru: Theological Publications in India, 1994.
2. Holy Bible (NRSV).

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UTA41GL04B	Scientific Tamil (SBS, SPS,SCS)	4	3

CO No.	CO- Statement	Cognitive Level (K- level)
இப்பாடத்தின் நிறைவில் மாணவர்கள்		
CO-1	பண்டைத் தமிழர்களின் அறிவியலறிவை அறிந்துகொள்வர்.	K 1
CO-2	பண்டைத் தமிழிலக்கியங்களுள் காணலாகும் அறிவியல் சிந்தனைகளைப் புரிந்துகொள்வர்.	K 2
CO-3	தமிழரின் அறிவியல் மருத்துவத்தையும், நீர் மேலாண்மை அறிவையும் அறிந்துகொள்வர்.	K 3
CO-4	இக்கால இலக்கியங்களுள் அறிவியல்துறை பெற்றுள்ள செல்வாக்கை அறிந்துகொள்வர்.	K 4
CO-5	அறிவியல் கலைச்சொற்களைத் தமிழில் கற்றுக் கொண்டு அறிவியல் தமிழ் வளரத் துணைபுரிவர்.	K 5

அலகு – 1 **(12 மணிநேரம்)**

தொல்காப்பியம் :

நிலம் தீ நீர் வளி விசும்போடு (தொல்.பொருள் 635)

ஒன்றறிவதுவே (தொல்.பொருள் 571)

புறநானூறு

மண் திணிந்த நிலனும் (புறம்.2)

செஞ்ஞா யிற்றுச் செலவும் (புறம். 30)

அகநானூறு

அம்ம வாழி, தோழி (அகம்.141)

பதிற்றுப்பத்து

நிலம் நீர் வளி விசும்பு என்ற நான்கின் (பதிற்று.14)

நெடுவயின் ஒளிறு மின்னுப் பரந்தாங்கு (பதிற்று.24)

உரைநடைக்கட்டுரை : வியக்க வைக்கும் தமிழரின் அறிவியல்

அலகு- 2 **(12 மணிநேரம்)**

சித்தர் பாடல்கள்

பதார்த்த குண சிந்தாமணி

குளத்து சலந்தானே கொடிதான (27)

ஏரிசலம் வாதமிகு மதுவே (31)

அருவிநீர் மேக மகற்றுங் *(39)*

மேவிய சீவன் வடிவது சொல்லிடில் *(திருமூலர்)*

அணுவில் அணுவினை ஆதிபிரானை *(திருமூலர்)*
நட்டகல்லைத் தெய்வமென்று *(சிவவாக்கியர்)*
உரைநடைக்கட்டுரை: தமிழர்களின் மருத்துவ அறிவியல்

அலகு - 3 **(12 மணிநேரம்)**

திருக்குறள் *(2 அதிகாரங்கள்)*

வான் சிறப்பு, மருந்து

வலைப்பூக்கள் உருவாக்கல், பராமரித்தல்

புதிய அறிவியல் கலைச்சொல்லாக்கங்களை உருவாக்குதல்

உரைநடைக்கட்டுரை: தமிழ் இலக்கியங்களில் நீர் மேலாண்மையியல்

அலகு- 4 **(12 மணிநேரம்)**

புதினம்: சொர்க்கத்தீவு – சுஜாதா

நூல் - திறனாய்வு

அறிவியல் புனைவு ஆவணப்படம், திரைப்படம் - திறனாய்வு

உரைநடைக்கட்டுரை: தமிழில் அறிவியல் புனைவுகள்

அலகு - 5 **(12 மணிநேரம்)**

அறிவியல் கலைச்சொற்கள்

அன்றாட வாழ்வில் அறிவியல் பழமொழிகளைத் தொகுத்தல்

மூலிகைகள், கீரைகள் ஆகியவற்றின் முக்கியத்துவத்தைக் காட்சிப்படுத்துதல்.

தமிழர் அறிவியல் கண்காட்சி நடத்துதல்

உரைநடைக்கட்டுரை: அறிவியல் தமிழின் வளர்ச்சி நிலைகள்

பாட நூல்கள்

1. **அறிவியல் தமிழ்**, தமிழாய்வுத்துறை, தூய வளனார் தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி, முதற்பதிப்பு, *2022*
2. சுஜாதா, **சொர்க்கத்தீவு,** விசா பப்ளிகேஷன்ஸ், சென்னை-*17*, ஒன்பதாம் பதிப்பு, *2009*
3. மூர்த்தி அ.கி., **அறிவியல் அகராதி,** மணிவாசகர் பதிப்பகம், சென்னை, *2001*

பார்வை நூல்கள்

1. குழந்தைசாமி.வா.செ., **அறிவியல்தமிழ்,** பாரதி பதிப்பகம், சென்னை-*17*, 6ஆம்பதிப்பு, *2001*
2. நெடுஞ்செழியன், **இன்னும் மீதமிருக்கிறது நம்பிக்கை,** பூவுலகின் நண்பர்கள் வெளியீடு, சென்னை, முதற்பதிப்பு, *2017*

3. பரிமேலழகர்(உரை.), **திருக்குறள்,** பாரதி பதிப்பகம், சென்னை-17, ஏழாவது பதிப்பு, *2000.*
4. வையாபுரிப்பிள்ளை, **பாட்டும் தொகையும்,** பாரி நிலையம், சென்னை, இரண்டாம் பதிப்பு, *1967.*

Semester	Course Code			Title of the Course			Hours	Credit			
IV	21UTA41GL04B			Scientific Tamil (SBS, SPS,SCS)			4	3			
Course Outcomes (COs)	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO-1	PO-2	PO-3	PO-4	PO-5	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	
CO-1	1	2	3	2	2	3	3	2	2	2	2.2
CO-2	2	2	3	2	2	2	3	2	3	2	2.3
CO-3	1	2	2	3	2	2	2	3	3	3	2.3
CO-4	2	2	3	2	2	3	2	3	3	2	2.4
CO-5	3	1	2	2	2	2	3	2	3	3	2.3
Mean Overall Score											2.3 (High)

Semester	Course Code	Title of the Course	Hours	Credits
IV	**21UFR41GL04**	**FRENCH – IV**	**4**	**3**

CO No.	CO–Statements	Cognitive Levels (K –Levels)
	On successful completion of this course, students will be able to	
CO–1	recall the vocabulary pertaining to dwelling place.	**K1**
CO–2	outline crisis management in France.	**K2**
CO–3	develop a travel diary of your own.	**K3**
CO–4	simplify the French education system.	**K4**
CO–5	interpret past tenses in a text.	**K5**

Unit- I: **(12 hours)**

TITRE:ON FAIT LE MELANGE!

GRAMMAIRE : le présent progressif, les pronoms possessifs, la phrase négative

LEXIQUE : décrire les étapes d'une action, la maison, les taches ménagères

PRODUCTION ORALE : comprendre le récit d'un voyage

PRODUCTION ECRITE : raconter ses actions quotidiennes

Unit - II: **(12 hours)**

TITRE:A PROPOS DE LOGEMENT

GRAMMAIRE : quelques adjectifs et pronoms indéfinis, les verbes lire, rompre et se plaindre

LEXIQUE : la localisation et le logement, les pièces, meubles et équipement

PRODUCTION ORALE : jeu de rôle –votre ami et vous s'installe dans un nouveau meuble

PRODUCTION ECRITE : décrire votre maison/appartement

Unit- III: **(12 hours)**

TITRE:TOUS EN FORME!

GRAMMAIRE : le passé composé et l'imparfait, le passé récent, l'expression de la durée

LEXIQUE : un souvenir et les évènements du passées, le corps humain : extérieur, le corps humain : intérieur

PRODUCTION ORALE : échanger sur ses projets de vacances

PRODUCTION ECRITE : raconter un souvenir

Unit - IV: **(12 hours)**

TITRE:ACCIDENTS ET CATASTROPHES

GRAMMAIRE : les adjectifs et les pronoms indéfinis : rien/ personne/aucun, les verbes dire, courir et mourir

LEXIQUE : savoir les mots et les expressions des catastrophes naturelles, les maladies et les remédies, les accidents, les catastrophes naturelles

PRODUCTION ORALE : comprendre des personnes qui expriment leur accord ou leur désaccord selon un thème donné

PRODUCTION ECRITE : écrivez sur une catastrophe naturelle en articulant la cause et la conséquence

Unit -V: **(12 hours)**

TITRE:FAIRE SES ETUDES A L'ETRANGER/ BON VOYAGE/ LA METEO

GRAMMAIRE : les pronoms démonstratifs neutres, le futur simple, situer dans le temps, moi

aussi/non-plus – moi non/si, les verbes impersonnels, les verbes croire, suivre et pleuvoir
LEXIQUE : savoir vivre en France, le système scolaire, les formalités pour partir à l'étranger.
PRODUCTION ORALE : exprimer son opinion sur la météo/parler del'avenir
PRODUCTION ECRITE: comparer le système scolaire français et indien

Book for Study

P.Dauda,L.Giachino and C.Baracco, *Generation A2*, Didier, Paris 2016.

Books for Reference

1. J.Girardet and J.Pecheur, *Echo A2*, CLE International, 2^{e}edition,2013
2. Régine Mérieux and Yves Loiseau, *Latitudes A2*, Didier, 2012.
3. Isabelle Fournier, *Talk French*, Goyal Publishers,2011

Web Resources

1. https://www.frenchcourses-paris.com/french-travel-journal/
2. http://www.saberfrances.com.ar/vocabulary/house.html
3. https://www.thoughtco.com/different-past-tenses-in-french-1368902
4. https://www.youtube.com/watch?v=JZdwJM7sEY8
5. https://www.scholaro.com/pro/Countries/France/Education-System

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course code**			**Title of the Course**				**Hours**		**Credits**
IV	**21UFR41GL04**			**FRENCH – IV**				**4**		**3**
Course Outcomes (COs)	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of Cos**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO–1	**3**	**1**	**3**	**2**	**2**	**3**	**2**	**1**	**2**	**2**	2.1
CO–2	**3**	**1**	**2**	**3**	**3**	**3**	**2**	**1**	**3**	**1**	2.2
CO–3	**3**	**2**	**3**	**2**	**2**	**3**	**2**	**1**	**3**	**2**	2.3
CO–4	**3**	**1**	**2**	**2**	**3**	**3**	**3**	**1**	**3**	**3**	2.4
CO–5	**2**	**2**	**3**	**3**	**1**	**3**	**1**	**2**	**3**	**2**	2.2
Mean overall Score											**2.24 (High)**

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UHI41GL04	HINDI - IV	4	3

CO No.	CO–Statements On successful completion of the course, students will be able to	Cognitive Levels (K –Levels)
CO-1	list out the social conditions prevailed in Modern Period which are depicted in Hindi Literature.	K1
CO-2	discuss the dialects of Hindi language.	K2
CO-3	illustrate the works of some eminent Hindi Writers related to society.	K3
CO-4	analyze the human values expressed in life and literature of Hindi Novelist “Mamatha Kaliyah”.	K4
CO-5	evaluate the film & Literary works in Hindi.	K5

Unit - I **(12 Hours)**

Computer ka yug
Prathyay
Adhunik Kal - Namakarn
Namakaran

Unit - II **(12 Hours)**

Vigyan hani/labh
Paryayvachy Shabdh
Adhunik Kal - Samajik Paristhithiyam
Samanarthy Shabdh

Unit - III **(12 Hours)**

Nari shiksha
Upasarg
Adhunik Kal – Sahithyik Paristhithiyam
Adhunik kal – Salient Features

Unit - IV **(12 Hours)**

Review- Book/Film
Paryavaran Pradookshan
Adhunik Kal - Main Divisions
Adhunik Kal - Visheshathayem

Unit - V **(12 Hours)**

Sapnom Kee Home Delivery (Novel)
Anuvad - 4

Books for Study

1. Dr. Sadananth Bosalae, *kavya sarang*, Rajkamal Prakashan, New Delhi, 2020.
   Unit-I *Chapters 4*
2. M. Kamathaprasad Gupth, *Hindi Vyakaran*, Anand Prakashan, Kolkatta, 2020.
   Unit-II, III and IV *Chapter 2*
3. Dr. Sanjeev Kumar Jain, *Anuwad: Siddhant Evam Vyavhar*, Kailash Pustak Sadan, MadhyaPradesh,2019 **Unit-V** *Chapter 2*

Books for Reference

1. Hindi Niband Sangrah,V&S Publishers, 2015.
2. Rajeswar Prasad Chaturvedi, Hindi vyakarana, Upakar prakashan,2015.
3. Ramdev,Vyakaran Pradeep, Hindi Bhavan, 2016.
4. Krishnakumar Gosamy, Anuvad vigyan ki Bhumika, Rajkamal Prakashan, 2016.
5. Acharya ramchandra shukla, Hindi Sahitya Ka Itihas, Prabhat Prakashan, 2021.

Web Resources

1. https://youtu.be/xmr-DaQ3LhA
2. https://youtu.be/xIm-VEmgEg0
3. https://youtu.be/ZHuqxWbMtas
4. https://youtu.be/HGS63OJuHto
5. https://youtu.be/r-i3autqPug

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course					Hours	Credits
IV	21UHI41GL04			HINDI - IV					4	3
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	2	3	3	2	3	2	3	1	2.4
CO-2	3	2	3	3	2	3	2	3	1	2	2.4
CO-3	3	2	2	3	2	2	1	3	2	3	2.3
CO-4	3	2	3	1	3	3	2	3	3	2	2.5
CO-5	3	2	2	3	3	2	3	2	3	3	2.6
Mean Overall Score											2.44 (High)

Semester	Course Code	Title of the Course	Hours	Credits
IV	21USA41GL04	SANSKRIT - IV	4	3

CO No.	CO–Statements	Cognitive Levels (K –Levels)
	On successful completion of the course, the student will be able to	
CO-1	remember and identifying Mahabharatha characters and events.	K1
CO-2	understand human behaviors by studying dramas.	K2
CO-3	apply the morals learnt in day to day life.	K3
CO-4	create new conversational sentences and to Improve self-character (Personality Development).	K4
CO-5	appreciate ancient Sanskrit dramas.	K5

Unit - I **(12 Hours)**

Samskrita Vyavahara sahasri vakiya Prayogaha

Unit - II **(12 Hours)**

Lot Lakaarah , Prqayaogh Kartari Vaakyaani

Unit - III **(12 Hours)**

Naatakasya Itihaasah Vivaranam, Thuva and Tum Prathiyaha

Unit - IV **(12 Hours)**

Karnabhaaram , Naatakasya Visistyam

Unit - V **(12 Hours)**

Samskrita Rachanani priyogaha

Book for Study

Karnabhavam & Literature Language, 2019 , K.M Saral Sanskrit Balabodh , Bharathita vidya bhavan , Munshimarg Mumbai – 400 007

Books for Reference

1. R.S.Vadhyar & Sons , Book – sellers and publishers , Kalpathu ,Palghat – 678003 , Kerala , south India , History of Sanskrit Literature 2019

2. Kulapathy , K.M Saral Sanskrit Balabodh , Bharathita vidya bhavan , Munshimarg Mumbai – 400 007 2018
3. Samskrita Bharathi , Aksharam 8 th cross , 2nd phase Giri nagar Bangalore Vadatu sanskritam – Samaskara Binduhu 2019

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course				Hours		Credit
IV	21USA41GL04			SANSKRIT-IV				4		3
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	2	2	3	2	3	2	3	3	2	2.5
CO-2	2	2	3	2	3	3	3	3	3	2	2.4
CO-3	3	3	2	3	2	1	1	3	3	3	2.4
CO-4	2	3	3	3	2	1	3	3	3	2	2.5
CO-5	2	2	3	2	3	3	3	3	2	3	2.6
Mean Overall Score											2.48
Result											# High

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UEN42GE04	GENERAL ENGLISH - IV	5	3

CO No.	CO-Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	identify different local and global issues in given passages	K1
CO-2	understand explicit and implicit information given in written texts	K2
CO-3	use appropriate words and punctuations in writing	K3
CO-4	analyse written texts and modify them for better clarity	K4
CO-5	assess the coherence and cohesion of written texts and rewrite them	K5 & K6

Unit-I **(15 Hours)**

1. Women through the Eyes of Media
2. General Writing Skill: Writing Minutes of a Meeting
3. Grammar: Present Perfect Tense

Unit-II **(15 Hours)**

4. Effects of Tobacco Smoking
5. General Writing Skill: Note-Taking
6. Grammar: Present Perfect Continuous Tense

Unit-III **(15 Hours)**

7. Short Message Service (SMS)
8. General Writing Skill: Note-Making
9. Grammar: Past Perfect Tense

Unit-IV **(15 Hours)**

10. An Engineer Kills Self as Crow Sat on his Head: A Newspaper Report
11. General Writing Skill: Précis Writing
12. Grammar: Past Perfect Continuous Tense

Unit-V **(15 Hours)**

13. Traffic Rules
14. General Writing Skill: Paragraph Writing
15. Grammar: Future Perfect Tense and Future Perfect Continuous Tense

Book for Study

Jayraj, S. Joseph Arul et al. *Trend-Setter: An Interactive General English Textbook for Under Graduate Students*. Trinity, 2016.

Books for Reference

1. Clark Peter, Roy. *Writing Tools: 50 Essential Strategies for Every writer*. USA: Little, Brown Spark Publishers, 2008.

2. Carnegie, Dale. *The Quick and Easy Way to Effective Speaking*. India: Fingerprint Publishers, 2018.
3. Vaughn, Steck. *Reading Comprehension*. USA: Steck-Vaughn Co, 2014.
4. Birkett, Julian. *Word Power: A Guide to Creative writing*. India: Bloomsburry Acdemic, 2016.
5. Knight, Dudley. *Speaking with Skill: An Introduction to Knight-Thompson Speechwork*. USA: Methuen Drama, 2016.

Web Resources

1. https://blog.lingoda.com/en/10-news-sites-to-practice-your-english-reading-skills/
2. https://www.espressoenglish.net/how-to-learn-english-for-free-50-websites-for-free-english-lessons/
3. https://www.ef.com/wwen/english-resources/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Course Code			Title of the Course						Hours	Credits
IV	21UEN42GE04			GENERAL ENGLISH - IV						5	3
Course Outcome (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	2	2	3	2	3	2	3	2	2.4
CO-2	2	2	3	2	3	3	2	3	2	2	2.3
CO-3	2	3	2	3	2	2	3	2	3	2	2.4
CO-4	2	2	3	2	3	3	2	3	2	3	2.5
CO-5	2	2	2	3	2	2	2	3	2	2	2.2
Mean Overall Score											2.36 (High)

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UBC43CC07	CORE – 7: SOFTWARE ENGINEERING	4	2

CO No.	CO- Statements	Cognitive Levels (K- levels)
	On successful completion of this course, students will be able to	
CO-1	recall the basic concepts of Software Engineering and Software Development Life Cycle Models.	K1
CO-2	comprehend the concepts of Requirement Analysis.	K2
CO-3	understand the Software Design Concepts.	K2
CO-4	apply User Interface Design, quality factors to evaluate the software solutions.	K3
CO-5	distinguish Software Testing Strategies.	K4

Unit-I: Software Engineering (12 Hours)

Software Engineering: Defining the Discipline – The Software process – Software Engineering Practice – Software Development Myths. Software Process Structure: A Generic Process Model – Defining a Framework Activity – Identifying a Task Set – Process Patterns – Process Assessment and Improvement. Process Models: Prescriptive Process Models – Specialized Process Models. Agile Development: Agility and the Cost of Change – Extreme Programming and other Agile Process Models – A Tool Set for the Agile Process.

Unit-II: Requirements Understanding (12 Hours)

Understanding Requirements: Requirement Engineering – Establishing the Groundwork – Eliciting Requirements – Developing Use cases – Building the Analysis Model – Negotiating Requirements – Requirements Monitoring – Validating Requirements – Avoiding Common Mistakes. Requirements Modeling - Behavior, Patterns and Web/Mobile Apps: Creating a Behavioral Model – Identifying Events with the Use Case – State Representations – Patterns for Requirements Modeling – Requirements Modeling for Web and Mobile Apps.

Unit-III: Design Concepts (12 Hours)

Design Concepts: Design within the context of Software Engineering – The Design Process – Design Concepts – The Design Model. Architectural Design: Software Architecture – Architectural Genres – Architectural Styles – Architectural considerations.

Unit-IV: User Interface Design (12 Hours)

User Interface Design: The Golden Rules – User Interface Analysis and Design – Interface Analysis – Interface Design Steps – WebApp and Mobile Interface Design – Design Evaluation. Quality Concepts: Software Quality – The Software Quality Dilemma – Achieving Software Quality.

Unit-V: Software Testing **(12 Hours)**

Software Testing Strategies: A Strategic Approach to Software Testing – Strategic Issues – Test Strategies for conventional Software – Test Strategies for Object-Oriented Software – Test Strategies for WebApps – Test Strategies for MobileApps – Validation Testing – System Testing – The Art of Debugging. Maintenance and Reengineering: Software Maintenance – Software supportability – Reengineering – Business Process Reengineering – Software Reengineering – Reverse reengineering – Restructuring – Forward Engineering – The Economics of Reengineering.

Books for Study

1. Roger S. Pressman, *Software Engineering - A Practitioner's Approach,* 8th Edition, McGraw-Hill, New York, 2019.
   - **Unit-I** *Chapter 2, Chapter 3, Chapter 4(Sec. 4.1, 4.2), Chapter 5*
   - **Unit-II** *Chapter 8, Chapter 11*
   - **Unit-III** *Chapter 12, Chapter 13(Sec. 13.1, 13.2, 13.3 13.4)*
   - **Unit – IV** *Chapter 15, Chapter 19*
   - **Unit – V** Chapter *22, Chapter 36*

Books for Reference

1. Rajib Mall, *Fundamentals of Software Engineering*, 5th Edition, Prentice Hall of India Private Limited, Delhi, 2018.
2. Tom Halt, *Software Engineering: Principles and Applications*, 10th Edition, NY Research Press, USA, 2016.
3. Ian Sommerville, Software Engineering, 10th Edition, Pearson, UK, 2017.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course					Hours				Credits
IV	21UBC43CC07	CORE – 7: SOFTWARE ENGINEERING					4				2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	1	1	2	1	3	2	2	1	1	1.7
CO-2	1	3	2	1	1	2	2	2	3	2	1.9
CO-3	3	3	3	3	2	3	3	3	3	3	2.9
CO-4	3	2	2	3	2	2	3	3	3	3	2.6
CO-5	2	3	2	2	1	2	2	3	2	2	2.1
										Mean Overall Score	2.24 (High)

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UBC43CC08	CORE – 8: JAVA PROGRAMMING	4	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	define the principles and practice of object-oriented concepts.	K1
CO-2	demonstrate Inheritance and Packages for reusability of modules.	K2
CO-3	apply the functionality of AWT and Exception Handling in Java	K3
CO-4	build knowledge of Threads and I/O Streams techniques in Java	K3
CO-5	simplify and demonstrate the ability to use Networking and JDBC for web-based applications	K4

Unit-I: Introduction to Java (12 Hours)

Introduction to Java: Primaries – Control Statements. Classes and Objects: General form of a class – Creation of Objects – Usage of Constructors – 'this' keyword - Constructor Overloading - Copy constructors - Static Data Members – Static Methods - 'finalize ()' Method.

Unit-II: Inheritance and Polymorphism (12 Hours)

Inheriting Variables in a Class – Inheriting Methods in a Class – Inheritance and Constructors – Abstract Classes – Final Classes. Interfaces and Packages: Interfaces - Structure of an Interface – Implementation of an Interface – Interface Inheritance. Packages – Placing the Classes in a Package – Package Hierarchy – Access Control Modifiers.

Unit-III: Abstract Windowing Toolkit (12 Hours)

Events – Listeners – Event Handling Methods – Inheritance Hierarchy of Control Classes – Windows and Frames – Menus – Dialogs – Mouse Events and their Listeners. Exception Handling: Default Exception Handling – Exception and Error Classes – Catch Block Searching Pattern – 'Throw' Statement – 'Throws' Clause – Custom Exceptions.

Unit-IV: Threads (12 Hours)

Life Cycle of a Thread – Creating and Running Threads – Methods in the Thread Class – Setting the priority of a thread – Synchronization – Dead Lock – Inter Thread Communication – Applets Involving Threads. I/O STREAMS: Input Stream and Output Stream classes – Reader and Writer classes – Data Output Stream and Data Input Stream Classes.

Unit-V : Networking (12 Hours)

TCP Server Socket Class – TCP Socket Class – UDP Datagram Socket and Datagram Packet Classes. DATABASE CONNECTIVITY: JDBC – ODBC Connection.

Books for Study

1. C. Muthu, *Programming with JAVA*, 2nd ed., Vijay Nicole Imprints Private Limited, Chennai, 2011.

Unit-I *Chapter 1(Pages 1-6), Chapter 2(Pages 9-20), Chapter 3(Pages 22-29), Chapter 5(Pages 47-59)*
Unit-II *Chapter 6(Pages 62-72), Chapter 7(Pages 77-91)*
Unit-III *Chapter 9(Pages 118-122), Chapter 10(Pages 150-162), Chapter 12(Pages 189-202)*
Unit-IV *Chapter 13(Pages 203-222), Chapter 14(Pages 223-232)*
Unit-V *Chapter 15(Pages 248-266), Chapter 18(Pages 318-345)*

Books for Reference

1. Herbert Scheldt, *The Complete Reference Java 2.0*, 9th Edition., Tata McGraw Hill, New Delhi, 2017.
2. E. Balagurusamy, *Programming with Java, 6th Edition*, McGraw-Hill, New Delhi, 2019
3. Yashavant P. Kanetkar, *LET US JAVA: Strong Foundation for JAVA Programming*, 7th Edition., BPB Publications, New Delhi, 2019.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**					**Hours**	**Credits**
IV	**21UBC43CC08**			**CORE – 8: JAVA PROGRAMMING**					**4**	**2**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	2	2	2	3	2	3	3	2	2	3	2.4
CO-2	2	3	2	2	2	2	3	3	2	2	2.3
CO-3	2	2	3	2	3	2	2	2	3	2	2.3
CO-4	3	2	2	3	2	2	3	2	3	2	2.4
CO-5	3	3	2	3	2	2	3	2	2	3	2.5
									Mean Overall Score		2.38 (High)

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UBC43CP04	SOFTWARE LAB-4: JAVA PROGRAMMING	3	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	demonstrate applications using object-oriented concepts	K1
CO-2	show well-structured Java applications	K2
CO-3	construct the applications using the concepts of Multithreading, Exception handling and I/O Streams.	K3
CO-4	test for database connections using JDBC for Web-Based applications	K4
CO-5	build the behavior of JSP and Cookies	K5

List of Exercises:

1. Simple Programs
2. Classes & Objects
3. Constructors
4. Inheritance
5. Packages
6. Interfaces
7. Exception Handling
8. Threads
9. AWT controls
10. Streams and Files
11. Networking
12. JDBC Connection

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course					Hours	Credits
IV	21UBC43CP04	SOFTWARE LAB-4: JAVA PROGRAMMING					3	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	2	2	2	3	3	3	2	2	3	2.4
CO-2	2	3	2	2	2	3	2	2	3	3	2.4
CO-3	3	2	3	2	2	2	3	3	3	2	2.5
CO-4	3	2	3	3	2	2	2	3	2	2	2.4
CO-5	2	2	3	2	3	2	3	2	2	2	2.3
Mean Overall Score											2.4 (High)

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UBC43AO04A	ALLIED 2: FINANCIAL ACCOUNTING PACKAGE – TALLY PRIME ADVANCED	3	2

CO..NO.	CO- Statements	Cognitive Level (K- level)
	On successful completion of this course, students will be able to	
CO1	To provide knowledge on the importance of maintaining various book	K4
CO2	To help the student to know the application of them in different situations.	K4
CO3	To gain comprehensive understanding of all aspects relating to financial statements.	K4
CO4	Understand knowledge on cash budget admission of Partnership	K4
CO5	Differentiate single entry from double entry system.	K4

UNIT- I **(09-Hours)**

Budget – Definition – Characteristics – Cash Budget – Advantages –Preparation of Cash Budget – Receipts and Payments Method.

UNIT-II: **(09-Hours)**

Cost centre – Cost category – Voucher entries using cost centre –Payroll preparation – Budget and Control – Scenario Management

UNIT-III: **(09-Hours)**

Introduction – Adjustments – Revaluation of Assets and Liabilities – Undistributed Profit or Loss – Accumulated Reserve – Treatment of Goodwill– Revaluation Account, Capital Accounts and Balance sheet after Admissionof Partner.

UNIT-IV: **(09-Hours)**

Inventory info – Stock Groups, Stock Categories - God owns /Locations – Units of Measure Stock Items – Inventory Vouchers – VouchersEntry in Tally ERP.9 – TDS – VAT – CST –GST - PoS.

UNIT – V **(09-Hours)**

Backup and Restore – Backup of Data – Restoring Data from a Backup File – Export and Import of Data – Exporting and Importing of Data from one Company to Another in XML Format – Exporting of data in other available formats – E-mailing in Tally ERP9 – Printing Reports - Managing of Data during Financial Year End Process.

Books for Study

1. Lal, Jawahar and Seema Srivastava, Financial Accounting, Himalaya Publishing House.2019
2. Monga, J.R., Financial Accounting: Concepts and Applications, Mayoor Paper Backs, New Delhi.2018
3. Shukla, M.C., T.S. Grewal and S.C.Gupta. Advanced Accounts. Vol.-I. S. Chand & Co., New Delhi.2020

Books for Reference

1. S. N. Maheshwari, Financial Accounting, Vikas Publication, New Delhi. T.S, Grewal, Introduction to Accounting, S. Chand and Co., New Delhi 2020
2. Compendium of Statements and Standards of Accounting. The Institute of Chartered Accountants of India, New Delhi

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credit
IV	21UBC43AO04A	ALLIED 2: FINANCIAL ACCOUNTING PACKAGE – TALLY PRIME ADVANCED	3	2

Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	2	2	1	3	3	2	2	3	2.2
CO-2	2	3	2	1	2	3	3	2	2	3	2.3
CO-3	1	2	3	2	3	2	3	2	3	2	2.3
CO-4	1	2	2	3	1	2	3	2	2	3	2.1
CO-5	1	2	2	2	3	1	3	2	2	3	2.1
										Mean Overall Score	2.2
										Result	# High

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UBC43AP02A	SOFTWARE LAB: FINANCIAL ACCOUNTING PACKAGE – TALLY PRIME ADVANCED	3	2

CO No.	CO- Statements	Cognitive Level (K- level)
	On successful completion of this course, students will be able to	
CO-1	Extract profit and loss account and balance sheet through ledger account balances and adjustment entries.	K4
CO-2	Pass entries for transactions in accounting vouchers with or without stock items.	K4
CO-3	Pass entries for transactions requiring special features such as TDS, VAT, CST, GST Cost centers and Payrolls.	K4
CO-4	Carry out order processing and maintain accounting records along with inventory records and generate reports.	K4
CO-5	Work as an accountant or a storekeeper in the computerized environment of business organizations.	K4

Exercises

1. Creation, alteration and deletion of primary and secondary accounting groups.
2. Final A/Cs with adjustments (Creation and deletion of ledgers)
3. Voucher entry problems in double entry mode
4. Voucher entry problem in single entry mode.
5. Voucher entries using cost centre, Cost Category
6. Budget preparation and reporting variance
7. Payroll preparation
8. Accounting vouchers using stock items
9. Order processing and inventory vouchers
10. Generation of accounting books and reports
11. Generation of inventory books and reports.
12. TDS, VAT, CST, and ExciseGST

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credit
IV	21UBC43AP02A	SOFTWARE LAB: FINANCIAL ACCOUNTING PACKAGE – TALLY PRIME ADVANCED	3	2

Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	2	2	1	3	3	2	2	3	2.2
CO-2	2	3	2	1	2	3	3	2	2	3	2.3
CO-3	1	2	2	3	1	2	3	2	2	3	2.1
CO-4	2	3	2	1	2	3	3	2	2	3	2.3
CO-5	1	2	2	2	3	1	3	2	2	3	2.1
Mean Overall Score											2.2
Result											# High

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UBC43AO03B	ALLIED ACCOUNTS -II	6	4

CO No.	CO- Statements	Cognitive Level (K- level)
	On successful completion of this course, students will be able to	
CO-1	Know the concepts of financial accounting	K1
CO-2	Understand the consignment and joint venture accounts	K2
CO-3	Explain the concepts of branch accounting and departmental accounting	K2
CO-4	Apply the hire purchase accounts and fire insurance claims methods in business	K3
CO-5	Analyze and prepare the financial statements of partnership firm	K4

UNIT – 1 FINAL ACCOUNTS – ADJUSTMENTS

Adjustments – closing stock – outstanding expenses – prepaid Expenses – Accrued Incomes – Incomes received in Advance – Interest on Capital – Interest on Drawings – Interest on Loan – Interest on Investments – Depreciation – Bad Debts – Provision for Bad And Doubtful Debts – Provision for Discount on Debtors – Provision for Discount on Creditors – preparation of Final Accounts

UNIT – 2 CASH BUDGET

Budget – Definition – Characteristics – Cash Budget – Advantages – Preparation of Cash Budget – Receipts and Payments Method.

UNIT – 3 PARTNERSHIP – ADMISSION

Introduction – Adjustments – Revaluation of Assets and Liabilities – Undistributed Profit or Loss – Accumulated Reserve – Treatment of Goodwill – Revaluation Account, Capital Accounts and Balance sheet after Admission of Partner.

UNIT – 4 PARTNERSHIP – RETIREMENT OF A PARTNER.

Introduction – Adjustments - Revaluation of Assets and Liabilities – Undistributed Profit or Loss – Accumulated Reserve – Treatment of Goodwill – Revaluation Account, Capital Accounts Bank Account and Balance sheet of the Reconstituted Partnership Firm.

UNIT – 5 COST SHEET

Preparation of cost sheet – tender quotation.

Book for Stduy

1. Shukla &Grewel, 2015 - Advanced Accounts, Vol. I, 1st edition, published by Sultan & Chand PublishingCo., New Delhi.

Book for Reference

1. Reddy and A. Moorthy.T.S, (2016) - Financial Accounting, 1st edition Published by Marghampublishers , Chennai.
2. Jain & Narang, (2015), Advanced accounting, 1st edition, published by Kalyani Publishers, New Delhi.
3. Nagarajan, Vinaykarn&Mani , (2012)– Principles of Accountancy – 1st edition

Published by Eurasia Publishing House, New Delhi,
4. Tulsian, P. C., Financial Accounting, 1st edition Published byTata McGraw Hills, New Delhi.

Semester	Course Code	Title of the Paper	Hours	Credit
IV	21UBC430403B	ALLIED ACCOUNTS -II	6	4

Course Outcomes ↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO-1	PO-2	PO-3	PO-4	PO-5	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	
CO-1	3	2	2	3	2	3	3	2	2	3	2.5
CO-2	2	3	2	1	2	3	3	2	2	3	2.3
CO-3	2	2	3	2	3	2	3	2	3	2	2.4
CO-4	1	2	2	3	1	2	3	2	2	3	2.1
CO-5	2	2	2	2	3	1	3	2	2	3	2.2
Mean Overall Score											2.3
Result											# High

Semester	Course Code	Title of the Course	Hours	Credit
IV	21UBC44SE02	SEC - 2(BS): DIGITAL ARTWORK	2	1

CO No.	CO- Statements	Cognitive Levels (K- levels)
	On successful completion of this course, students will be able to	
CO-1	recall the basic concepts of traditional and digital Images	K1
CO-2	demonstrate the implementation of various drawing tools and techniques	K2
CO-3	construct digital artwork using vector and raster techniques	K3,K4
CO-4	make use of advance animation and design techniques using digital images to design digital landscapes	K5
CO-5	adapt the fundamentals of Video Editing to create motivational videos and social-relevant documentaries	K6

Unit-I: Introduction (6 Hours)

Adobe Photoshop: Getting to know the Work Area – Starting to work with Photoshop – Using the Tools – Sampling a Color – Working with tools and tool properties – Undoing actions in Photoshop – Panels. Basic Photo Corrections: Strategy for retouching – Resolution and Image Size – Cropping – Color and Tone – Spot Healing Brush – Content Aware – Sharpening.

Unit-II: Selectors (6 Hours)

Working With Selections: Selection tools – Cloud documents – Magic Wand tool – Quick Selection – Manipulation Selections – Lasso Tools. Layer Basics: Layers Panel – Rearranging – Gradients – Adjustment Layer – Flattening. Quick Fixes: Improving a Snapshot – Adjusting facial features – Panorama – Depth of Field – Image Distortion – Content Aware Fill.

Unit-III : Masks and Channels (6 Hours)

Masks and Channels: Getting Started – Selecting Masks – Creating Masks – Quick Masks – Puppet Warp – Alpha Channels. Typographic Design: Type – Clipping Mask – Type on A Path – Warping point type – Paragraphs – Rounded Rectangle – Vertical Text.

Unit-IV Drawing Techniques (6 Hours)

Vector Drawing Techniques: Bitmap Vs Vector Graphics – Paths and Pen Tool – Drawing Shapes – Drawing Paths from Photos – Converting paths to Selection and Layer Mask – Creating Logo – ID Card – Book Front Page – Custom Shapes – Digital Landscapes.

Unit-V: Composting (6 Hours)

Advanced Compositing: Arranging Layers – Smart Filters – Add New Filters and Plugins – Creating and Running Actions – Painting a Layer – Upscaling a low-resolution Image. EDITING VIDEO: Creating a New Video Project – Animating Text with Key frames – Creating Effects – Adding Transitions – Adding Audio – Rendering Video.

Book for Study

1. Andrew Faulkner and Conrad Chavez, *Adobe Photoshop Classroom in a Book (2020 release),* Adobe Press, San Francisco, USA, 2019.

Unit-I *Chapter 1 and Chapter 2*
Unit-II *Chapter 3, Chapter 4 and Chapter 5*
Unit-III *Chapter 6 and Chapter 7*
Unit-IV *Chapter 8*
Unit-V *Chapter 9 and Chapter 11*

Books for Reference

1. Scot Kelby, *The Photoshop Elements 2020 Book for Digital Photographers*, New Riders; 1st edition, 2020.
2. DT Editorial Services, *Photoshop CC in Simples Steps*, Wiley, DreamTech Press, 1st edition 2019.
3. Martin Evening, *Adobe Photoshop CC for Photographers: A professional image editor's guide to the creative use of Photoshop for the Macintosh and PC*, Routledge, USA, 2nd Edition, 2018.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**					**Hours**	**Credit**
IV	**21UBC44SE02**			**SEC - 2(BS): DIGITAL ARTWORK**					**2**	**1**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	2	3	3	3	2	3	1	3	3	2	2.5
CO-2	3	2	2	2	2	2	2	2	3	2	2.2
CO-3	3	2	2	2	2	3	2	2	3	3	2.4
CO-4	2	2	3	3	2	2	3	1	2	2	2.2
CO-5	3	2	2	3	3	3	2	2	2	2	2.4
									Mean Overall Score		2.34 (High)

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UHE44VE04A	PROFESSIONAL ETHICS–II: SOCIAL ETHICS - II	2	1

Co. No.	CO- Statements	Cognitive Levels (K- levels)
	On completion of this course the graduates will be able to	
CO-1	know the value of natural recourses and to live in a harmony with nature.	K1
CO-2	comprehend the importance of a healthy life.	K2
CO-3	apply the plans of disaster management in the society.	K3
CO-4	analyse the importance and differences of science and religion.	K3
CO-5	apply counseling skills and solve their problems.	K4

Unit-I Harmony with Nature (6-Hours)

What is environment, Why should we think of harmony, Principles to conserve environmental resources, Causes of disharmony, The fruits of harmony with nature, Natural Resources, Fruits of disharmony, Economic values and growth, Environmental Ethics, Guidelines to live in harmony with nature, Towards life-centered system for better quality of life. Harmony with animal kingdom.

Unit-II Issues Dealing with Science and Religion (6-Hours)

What is Science, Science and Religion, Social Relevance of Science and Technology, Science and technology for social justice, Difference caused by Science and Technology, Need for indigenous technology, Science and Technology Innovation Policy of India.

Unit-III Public Health (6-Hours)

Health related issues, Health Care in India vs Developed Countries, Health and Heredity, Public Health - Objectives of public health in India, Public Health System in India, Failure on the public health front, Role of the central government, Hospitals Services in India, Health and Abortion, Drug Addiction and Drug abuse

Unit-IV Disaster Management (6-Hours)

Disaster Management, Types of disaster, Plans of disaster management, Technology to manage natural disasters and catastrophes, Rehabilitation and Reconstruction, Human-induced disaster, First Aid, The importance of First-aid.

Unit-V Counselling for Adolescents (6-Hours)

High Risk Behaviours, Developmental Changes in Adolescents, Key Issues of the Adolescents, Need for Counselling, Nature of Counselling, Counselling Goals, Does helping help? The Good and the Bad news.Importance of Career Guidance Counselling.

Book for Study

Department of Human Excellence, *Formation of Youth*, St Joseph's College (Autonomous), Tiruchirappali 02, 2021.

Books for Reference:

1. Albert, D. and Steinberg, L, *Judgment and decision making in adolescence*: Journal of Research on Adolescence, page no: 211-224. 2011
2. Larry R. Collins, *Disaster Management and Preparedness*, Lewis Publications, 22 November 2000.
3. Elizabeth B. Hurlock, *Developmental Psychology: A: Life-Span Approach*, New Delhi: Tata McGraw-Hill, 1981, 5th Edition, August 18, 2001.
4. Sangha, Kamaljit. *Ways to Live in Harmony with Nature: Living Sustainably and Working with Passion.* Australia, Woodslane Pty Limited, 2015.

Web Sources:

https://en.wikipedia.org/wiki/Disaster_management_in_India
https://ndma.gov.in/
https://talkitover.in/services/child-adolescent-counselling/
https://www.nipccd.nic.in/schemes/adolescent-guidance-centre-19#gsc.tab=0

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UHE44VE04B	PROFESSIONAL ETHICS II: RELIGIOUS DOCTRINE - II	2	1

CO.No.	CO-Statements	Cognitive Levels (K- levels)
	On completion of this course, the graduates will be able to	
CO-1	Understand the history of the Catholic Church	K1
CO-2	Examine and grasp the Sacraments of the Catholic Church	K2
CO-3	Apply the Christian Prayer to their everyday life	K3
CO-4	Analyze themselves in the light of Sacraments & Christian Prayer	K4
CO-5	Create a harmonious society learning values from all religions	K5 & K6

Unit-I	**The Catholic Church**	**(6 Hours)**
Unit-II	**Sacraments of Initiation**	**(6 Hours)**
Unit-III	**Sacraments of Healing & at the Service of Community**	**(6 Hours)**
Unit-IV	**Christian Prayer**	**(6 Hours)**
Unit-V	**Harmony of Religions**	**(6 Hours)**

Books for Study

Department of Human Excellence, *Life in the Lord: Religious Doctrine.* St. Joseph's College, Trichirappalli 02, 2021.

Books for Reference

1. *Compendium: Catechism of the Catholic Church.* Bengaluru: Theological Publications in India, 1994.
2. Holy Bible (NRSV).

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53CC09	CORE- 9: PROGRAMMING WITH ASP.Net	4	3

CO No.	CO- Statements On successful completion of this course, students will be able to	Cognitive Levels (K- Levels)
CO-1	recall the fundamental concepts of .NET framework.	K1
CO-2	demonstrate databases using entity framework.	K2
CO-3	develop C# programs using object-oriented programming.	K3
CO-4	develop webpages using RAZOR PAGES, MVC.	K3
CO-5	examine intelligent applications using Machine Learning and Construct windows desktop applications.	K4

Unit –I: Introduction (12 Hours)

Introduction: Understanding .NET – Building console apps using Visual Studio Code. Speaking C#: Introducing C# – Understanding C# basics – Working with variables – Working with null values – Exploring console applications further. Controlling Flow and Converting Types: Operating on variables – Understanding selection statements – Understanding iteration statements – Casting and converting between types.

Unit –II: Testing (12 Hours)

Writing, Debugging, and Testing Functions: Writing functions – Debugging during development – Logging during development and runtime – Unit testing functions. Building Your Own Types With Object-Oriented Programming: Talking about object-oriented programming – Building class libraries – Building class libraries – Storing data within fields – Writing and calling methods – Controlling access with properties and indexers.

Unit –III: Interfaces (12 Hours)

Implementing Interfaces and Inheriting Classes: Setting up a class library and console application – Simplifying methods – Raising and handling events – Implementing interfaces – Inheriting from classes – Casting within inheritance hierarchies – Inheriting and extending .NET types. Working With Databases Using Entity Framework Core: Understanding modern databases – Setting up EF Core – Defining EF Core models – Querying EF Core models – Loading patterns with EF Core – Manipulating data with EF Core.

Unit –IV: Website Building (12 Hours)

Building Websites Using Asp.Net Core Razor Pages: Understanding web development – Understanding ASP.NET Core – Exploring Razor Pages – Using Entity Framework Core with ASP.NET Core – Using Razor class libraries. Building Websites Using The Model – View - Controller Pattern: Setting up an ASP.NET Core MVC website – Exploring an ASP.NET Core MVC website – Customizing an ASP.NET Core MVC website.

Unit – V: ASP.Net Core (12 Hours)

Customizing An Asp.Net Core MVC Website: Understanding the benefits of a CMS – Understanding Piranha CMS – Defining components, content types, and templates – Testing the

North wind CMS website. Building Intelligent Apps Using Machine Learning: Understanding machine learning – Understanding ML.NET – Making product recommendations.

Books for Study

1. Mark J. Price, *C# 8.0 and .NET Core 3.0 – Modern Cross-Platform Development,* Packt Publishing Ltd., 4th Edition, UK, 2019.

Unit-I *Chapter 1, Chapter 2, Chapter 3*
Unit-II *Chapter 4, Chapter 5*
Unit-III *Chapter 6, Chapter 11*
Unit-IV *Chapter 15, Chapter 16 (Page no. 509 – 526)*
Unit-V *Chapter 16 (Page no. 527- 546), Chapter 19*

Books for Reference

1. Troelsen, Andrew, Japikse, Philip, *Pro C# 8 with .NET Core 3 Foundational Principles and Practices in Programming,* 9th Edition, Apress., USA, 2020.
2. Freeman Adam, *Pro ASP.NET Core 3,* Apress, 8th Edition, USA, 2020.
3. E Balagurusamy, *Programming in C#,* McGraw Hill Education Private Limited, 4th Edition, New Delhi, 2015

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53CC09	CORE- 9: PROGRAMMING WITH ASP.Net	4	3

Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	1	2	2	3	2	3	3	2	3	3	2.4
CO-2	2	2	2	2	3	2	2	3	2	3	2.3
CO-3	1	3	3	3	2	3	2	2	2	3	2.4
CO-4	2	2	2	3	3	2	2	3	2	3	2.4
CO-5	2	2	3	2	2	2	3	2	3	3	2.4
									Mean Overall Score		2.38 (High)

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53CC10	CORE – 10: WEB TECHNOLOGIES	4	3

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	list the HTML form controls	K1
CO-2	demonstrate the basic concepts and functions in PHP	K2
CO-3	apply Cascading Style Sheets to develop dynamic web pages.	K3
CO-4	create PHP objects for server side Programming	K4
CO-5	build simple database using MySQL for Software Solutions.	K5

Unit –I: Introduction to HTML (12 Hours)

HTML: Introduction - LISTS: Creating Ordered and Unordered Lists - Styling Nested Lists - Creating Description Lists. FORMS: Creating Forms - Processing Forms - Organizing the Form Elements - Creating Text Boxes - Creating Password Boxes - Creating Radio Buttons - Creating Select Boxes - Creating Checkboxes - Creating a Submit Button - Using an Image to Submit a Form. VIDEO, AUDIO, AND MULTIMEDIA: Video File Formats - Adding a Single Video to Your Web Page - Adding Audio File Formats- Adding a Single Audio File to Your Web Page - Getting Multimedia Files. TABLES: Structuring Tables - Spanning Columns and Rows.

Unit –II: CSS (12 Hours)

Introduction To CSS: Importing a Stylesheet – Using IDs – Using Classes – Using Semicolons – CSSRules – Style Types– CSSSelectors – The CSSCascade – The Difference Between div and span Elements – Measurements – Fonts and Typography– Managing Text Styles – CSS Colors – Positioning Elements – Pseudo classes – Shorth and Rules – The Box Model and Layout. Advanced CSS With CSS3 : Attribute Selectors – The box-sizing Property – CSS3 Backgrounds – CSS3 Borders – Box Shadows – Element Overflow – Multicolumn Layout – Colors and Opacity – Text Effects – Web Fonts – Transformations – Transitions.

Unit –III: PHP (12 Hours)

Introduction to PHP: Incorporating PHP within HTML – The Structure of PHP. Expressions and Control Flow in PHP: Expressions – Operators – Conditionals – Looping – Implicit and Explicit Casting – PHP Dynamic Linking – Dynamic Linking in Action. PHP FUNCTIONS: PHP Functions – Including and Requiring Files – PHP Version Compatibility.

Unit –IV: PHP OBJECTS (12 Hours)

PHP Objects - PHP ARRAYS: Basic Access – The for each...as Loop – Multi dimensional Arrays – Using Array Functions. PRACTICAL PHP: Using printf – Date and Time Functions – File Handling – System Calls – XHTML or HTML5.

Unit – V: MySQL (12 Hours)

Introduction to MySQL: My SQL Basics – Accessing MySQL via the Command Line – Indexes – My SQL Functions – Accessing MySQL via PHP MyAdmin. Mastering MYSQL: Database Design – Normalization – Relationships – Transactions – Using EXPLAIN – Backing Up and

Restoring. Accessing MySQL Using PHP: Querying a MySQL Database with PHP – A Practical Example – Practical MySQL – Preventing Hacking Attempts – Using MySQLi Procedurally.

Books for Study

1. Elizabeth Castro, Bruce Hyslop, *HTML5 & CSS3,* Peachpit Press, 7th Edition, UK, 2012.
   Unit-I – *Chapter 15, Chapter 16, Chapter 17, Chapter 18*
2. Robin Nixon, *Learning PHP, MySQL & JavaScript with jQuery, CSS & HTML5,* O'Reilly Media, Inc., 5th Edition, New York, 2018.
   Unit -II – *Chapter 18, Chapter 19*
   Unit -III – *Chapter 3, Chapter 4, Chapter 5 (Page no. 95 – 105)*
   Unit -IV – *Chapter 5 (Page no. 106 – 120), Chapter 6, Chapter 7*
   Unit - V – *Chapter 8, Chapter 9, Chapter 10*

Books for Reference

1. Paul Gibbs, *PHP Tutorials: Programming with PHP and MySQL: Learn PHP 7 / 8 with MySQL,* 5th Edition, 2020.
2. Steve Prettyman, *Learn PHP 8: Using MySQL, JavaScript, CSS3, and HTML5,* A Press, 2020.
3. DT, Editorial Services, *Web Technologies,* Dreamtech Press, New Delhi, 2018.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**				**Hours**		**Credits**
V	**21UBC53CC10**			**CORE – 10:WEB TECHNOLOGIES**				**4**		**3**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	1	2	3	2	2	3	2	2	3	3	2.3
CO-2	2	2	3	2	3	2	2	2	2	3	2.3
CO-3	1	2	2	2	2	2	3	3	3	3	2.3
CO-4	2	2	2	2	3	2	3	3	2	3	2.4
CO-5	2	3	2	2	2	2	3	3	2	3	2.4
									Mean Overall Score		2.34 (High)

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53CP05	SOFTWARE LAB-5:PROGRAMMING WITH ASP.NET	3	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	Show console applications for simple problems	K1
CO-2	Demonstrate the concepts of Model View Controller	K2
CO-3	Contrast webpages using RAZOR and CMS to improve dynamic websites	K2
CO-4	Apply Machine Learning concepts to solve business analytics problems.	K3
CO-5	Construct a database using Entity Framework for back end operations	K4

List of Exercises:

1. Build a console application
2. Demonstrate the conditional statements and looping
3. Write a program using functions
4. Inheritance
5. Interface
6. Create a database using entity framework
7. Query and manipulate data with entity framework
8. Build website using RAZOR pages
9. Build website using MVC model
10. Build website using Piranha CMS
11. Testing North wind CMS website
12. Build a program with ML.NET

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credit
V	21UBC53CP05	SOFTWARE LAB -5 : PROGRAMMING WITH ASP.NET	3	2

Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	2	1	3	2	2	3	3	2	3	2.3
CO-2	1	2	3	2	3	2	3	2	3	3	2.4
CO-3	1	2	3	2	3	2	3	2	2	3	2.3
CO-4	2	3	3	2	2	2	3	2	3	2	2.4
CO-5	2	2	2	3	3	2	3	2	3	3	2.5
										Mean Overall Score	2.38 (High)

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53CP06	SOFTWARE LAB-6 : WEB TECHNOLOGIES	3	2

CO No.	CO- Statements	Cognitive Level (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	show attractive webpages using Cascading Style Sheets.	K1,K2
CO-2	demonstrate dynamic web forms using HTML and PHP	K2
CO-3	apply PHP functions and objects for modular programming	K3
CO-4	construct PHP programs using arrays and files for text manipulation	K3
CO-5	design database using MySQL for real-time problems	K4

List of Exercises:

HTML & CSS

1. Lists and Tables
2. Design a form in HTML
3. Audio and video to web pages in HTML
4. Selectors and Colors in CSS
5. Text effects, BOX shadows, colors and opacity in CSS

PHP with MySQL

6. Conditional statements and looping
7. PHP Functions
8. PHP Objects
9. Arrays in PHP
10. File handling in PHP
11. Accessing MySQL database with queries
12. Student Mark list using MySQL

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course					Hours	Credits			
V	21UBC53CP06	SOFTWARE LAB-6: WEB TECHNOLOGIES					3	2			
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	1	3	2	3	2	3	2	2	3	3	2.4
CO-2	2	2	3	2	3	2	2	2	2	3	2.3
CO-3	1	2	3	2	2	3	2	3	3	3	2.4
CO-4	1	3	2	2	3	2	3	3	2	3	2.4
CO-5	2	2	3	2	2	2	3	3	2	3	2.4
									Mean Overall Score		2.38 (High)

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53ES01A	DSE- 1 : OPERATING SYSTEMS	5	3

CO No.	CO- Statements	Cognitive Level (K- level)
	On successful completion of this course, students will be able to	
CO-1	recall the fundamental concept of Computer System and Operating System.	K1
CO-2	explain the ideas of process and processor management with deadlocks and CPU scheduling to solve real times scenario	K2
CO-3	make use of the memory management and apply the virtual memory concepts in a real time situation.	K3
CO-4	choose the correct mass storage devices according to the customer requirements for life long needs.	K3
CO-5	analyze the security issues in Operating System and Distributed systems in by providing proper Protection Mechanisms in order to provide solutions to the technological challenges.	K4

Unit-I: Introduction (**15 Hours)**

Introduction: Operating Systems – Computer System Organization – Computer System Architecture – Operating System Structure – Operating System Operations - Process Management Memory Management - Storage Management- Protection and Security - Kernel Data Structures - Computing Environments – Open-Source Operating Systems. Operating System Structures: Operating System Services - System Calls - Types of System Calls.

Unit-II: Process Management **(15 Hours)**

Process Management: Processes - Process Concept - Operation on Processes - Inter-Process Communication. Process Synchronization: Background - Critical-Selection Problem – Semaphores. CPU Scheduling: Basic Concepts - Scheduling Algorithms - Real Time Scheduling. Deadlocks: System Model - Methods for Handling Deadlocks - Deadlock Avoidance - Recovery from Deadlock.

Unit-III: Memory Management **(15 Hours)**

Memory Management: Background - Swapping - Segmentation - Paging. Virtual Memory: Demand Paging – Page Replacement - Allocation of Frames – Thrashing.

Unit-IV: File Management **(15 Hours)**

File - System Interface: File Concept - Access Methods – Directory and Disk Structures File-System Implementation: File-system Structure – Allocation Methods - Efficiency and Performance - Recovery. Mass Storage Structure: Disk Structure - Disk Scheduling - Swap-Space Management - Stable-Storage Implementation.

Unit-V: Protection **(15 Hours)**

Protection: Goals of Protection - Access Matrix - Capability Based Systems - Language-based Protection. SECURITY: The Security Problem - Cryptography as a Security Tool- User

Authentication. Distributed Systems: Advantages of Distributed Systems - Types of Network based Operating Systems - Communication Structure.

Books for Study

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, *Operating System Concepts*, 9th Edition., John Wiley & Sons Inc., New Delhi, 2013.
   Unit-I *Chapter 1 (Sec: 1.1, 1.12), Chapter 2(Sec: 2.1, 2.3, 2.4)*
   Unit-II *Chapter3(Sec:3.1,3.3,3.4), Chapter5(Sec:5.1,5.2,5.6), Chapter6(Sec:6.1,6.3,6.6), Chapter 7(Sec: 7.1,7.3,7.5,7.7)*
   Unit-III *Chapter 8 (Sec: 8.1, 8.2, 8.4, 8.5), Chapter 9(Sec: 9.2, 9.4, 9.5, 9.6)*
   Unit – IV *Chapter 11(Sec: 11.1, 11.2, 11.3), Chapter 12(Sec: 12.1, 12.4, 12.6), Chapter 10 (Sec: 10.2, 10.4, 10.6, 10.8)*
   Unit – V *Chapter 14 (Sec: 14.1, 14.4, 14.8, 14.9), Chapter 15 (Sec: 15.1, 15.4, 15.5), Chapter 17(Sec: 17.1, 17.2, 17.4)*

Books for Reference

1. Homas Anderson, Michael Dahlin, *Operating Systems: Principles and Practice*, Kindle Edition, Kindle Direct Publishing, USA, 2015.
2. Lucus Darnell, *Create Your Own Operating System*, Kindle Edition, Kindle Direct Publishing, USA, 2016.
3. Sam Marshall, *Guide to Make Your Own Operating System*, Kindle Edition, Kindle Direct Publishing, USA, 2020.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53ES01A	DSE-1: OPERATING SYSTEMS	5	3

Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	3	3	3	2	1	2	3	2	2.4
CO-2	3	2	3	3	3	2	1	3	2	3	2.5
CO-3	2	3	2	2	1	1	2	2	3	2	2.0
CO-4	2	2	3	1	2	3	1	3	3	3	2.3
CO-5	3	3	1	2	3	2	3	2	2	2	2.3
									Mean Overall Score		2.3 (High)

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53ES01B	DSE-1 :LINUX PROGRAMMING	5	3

CO No.	CO- Statements	Cognitive Levels (K- level)
	On successful completion of this course, students will be able to	
CO-1	define the principles of Linux.	K1
CO-2	demonstrate to implement music CDs.	K2
CO-3	apply the Commands and Log Files.	K3
CO-4	build knowledge of User Accounts.	K3
CO-5	simplify and Demonstrate the Encryption Techniques.	K4

Unit-I: Linux Introduction and Installation (15 Hours)

Linux - Advantages – RedHatLinux - New Features – Installation Procedures and Methods - Using Desktop - GNOME - KDE. Accessing And Running Applications: Installing Red Hat Linux Applications – Running Window Application - Running Window - DOS and Macintosh Applications.

Unit-II: Multimedia in Red Hat Linux (15 Hours)

Audio - Webcams and TV cards - Digital camera - Creating music CDs. Tools for Using Internet and Web: Internet Tools - Browsing the Web - Communicating with E-mail - Using Remote Login - Copy and Execution.

Unit-III: System Administration (15 Hours)

Root Login - Super User - GUI Tools - Commands and Log Files – Configuring Hardware - File Systems and Disk Space Management - Monitoring System Performances.

Unit-IV: Setting Up and Supporting Users (15 Hours)

Creating User Accounts - Setting User Defaults - Creating Portable Desktops- Providing Support to Users - Modifying Accounts - Deleting User Accounts- Checking Disk Quotas - Sending Mail to All Users.

Unit-V: Security Issues (15 Hours)

Hacker versus Cracker -Password Protection – Protection from Break-ins - Filtering Network Access - Firewalls - Detecting Intrusions from Log Files - Detect Tampered Files - Denial-of-Service Attacks - Encryption Techniques - Log and Port Sentry.

Book for Study

1. Christopher Negus, *Red Hat Linux 9 Bible*, Wiley Publishing Pvt. Ltd, New Delhi, 2013.
   - **Unit-I** *Chapters 1, 2, 3, 5*
   - **Unit-II** *Chapter 8, 9*
   - **Unit-III** *Chapter 10*
   - **Unit-IV** *Chapter 11*
   - **Unit-V** *Chapter 14*

Books for References

1. Christopher Negus, *Linux Bible*, 9th Edition, John Wiley & Sons, Inc., Indiana, 2015.
2. Herbert Scheldt, *The Complete Reference Linux*, 6th Edition, Tata McGraw Hill, New Delhi, 2017.
3. William Shotts, *The Linux Command Line: A Complete Introduction*, 2nd Edition, No Starch press, San Francisco, 2019.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**		**Title of the Course**							**Hours**	**Credit**
V	**21UBC53ES01B**		**DSE-1:LINUX PROGRAMMING**							**5**	**3**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	2	2	2	3	2	3	3	2	2	3	2.4
CO-2	2	3	2	2	2	2	3	3	2	2	2.3
CO-3	2	2	3	2	3	2	2	2	3	2	2.3
CO-4	3	2	2	3	2	2	3	2	3	2	2.4
CO-5	3	3	2	3	2	2	3	2	2	3	2.5
										Mean Overall Score	2.38
										Result	# High

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53ES02A	DSE-2: COMMUNICATION NETWORKS	5	3

CO No.	CO- Statements On successful completion of this course, students will be able to	Cognitive Levels (K- Levels)
CO-1	recall the different aspects of networks, protocols and network design models.	K1
CO-2	understand the modes of transmission and switching techniques for data communication	K2
CO-3	identify the important aspects and functions of network layer, mobile networks and wireless LAN's in internetworking.	K3
CO-4	classify different routing algorithms and network addressing scheme	K4
CO-5	analyze different security mechanisms for secured network communication.	K4

Unit – I: Introduction (15 Hours)

Data Communication: Introduction – Network Models. Physical Layer and Media: The OSI Model - Layers in the OSI Model - TCP / IP Protocol Suite - Addressing. Analog Transmission: Analog and Digital - Transmission Impairment Performance - Guided Media – Unguided Media.

Unit – II: Bandwidth (15 Hours)

Bandwidth Utilization: Multiplexing and Spreading – Multiplexing – Spread Spectrum. Switching: Circuit Switched Networks – Datagram Networks – Virtual Circuit Networks.

Unit – III: Network layer (15 Hours)

Network Layer IPv4 Addresses - IPv6 Addresses - Address Mapping - ICMP – IGMP. Transport Layer: Process-to-Process Delivery – User Datagram Protocol – TCP.

Unit – IV: Wireless Networks (15 Hours)

Wireless and Mobile Networks: Introduction - Wireless Links and Network Characteristics - Wi-Fi: 802.11 Wireless LANs - Cellular Internet Access -Mobility Management: Principles - Managing Mobility in Cellular Networks - Wireless and Mobility: Impact on Higher-Layer Protocols.

Unit – V: Security (15 Hours)

Security in Computer Networks: Introduction - Principles of Cryptography - Message Integrity and Digital Signatures - End-Point Authentication - Securing E-Mail - Network-Layer Security: IPsec and Virtual Private Networks - Operational Security: Firewalls and Intrusion Detection Systems.

Books for Study

Behrouz A. Forouzan, *Data Communications and Networking*, Tata McGraw Hill Publications, 5thEdition. New Delhi, 2012.

Unit -I: *Chapter 1,2,3,7 (Sec 1.1, 2.2, 2.3, 2.4, 3.1, 3.4, 7.1, 7.2)*
Unit-II: *Chapter 6, 8(Sec 6.1, 6.2, 8.1, 8.2, 8.3)*
Unit-III: *Chapter 19, 21, 22 (Sec 19.1, 19.2, 21.1, 21.2, 21.3, 22.1) and Chapter 23 (sec 23.1, 23.2, 23.3)*

2. James F. Kurose, Keith Ross, *Computer Networking- a Top down Approach*, Hoboken, New Jersey: Pearson, 7th Edition, 2017.
Unit- IV: *Chapter 7(Sec 7.1, 7.2, 7.3, 7.4, 7.5, 7.7, 7.8)*
Unit -V: *Chapter 8 (Sec 8.1, 8.2, 8.3, 8.4, 8.5, 8.7, 8.8, 8.9)*

Books for Reference

1. Doug Lowe, *Networking- All in one For Dummies*, Hoboken, New Jersey, John Wiley & Sons, 7th Edition, 2018.
2. Behrouz A. Forouzan, *Data Communication and Networking* 4th Edition, MC Graw Hill Publication, India, 2017.
3. Pinaki Mitra, *Recent Trends in Communication Networks*, First Edition, Intech Open Publication, United Kingdom, 2020.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53ES02A	DSE-2: COMMUNICATION NETWORKS	5	3

Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	3	3	3	3	3	3	2	2	2.8
CO-2	3	3	3	2	2	3	3	2	3	3	2.7
CO-3	3	3	3	2	2	2	2	3	3	3	2.6
CO-4	3	3	3	3	2	3	2	3	3	2	2.7
CO-5	3	3	3	3	3	3	3	2	2	3	2.8
Mean Overall Score											2.72 (High)

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53ES02B	DSE -2 : SOFTWARE TESTING	5	3

CO No.	CO- Statements On successful completion of this course, students will be able to	Cognitive Levels (K- Levels)
CO-1	adapt the fundamentals of software testing and quality assurance concepts.	K1
CO-2	demonstrate the testing and activities using modern software tools.	K2
CO-3	construct test cases from software requirement specifications.	K3, K5
CO-4	list the different levels of Testing and its functions.	K1
CO-5	examine the ways of judging test case adequacy and how to manage tests.	K4

Unit –I: Introduction (15 Hours)

Introduction to Testing as an Engineering Activity: The Role of Process in Software Quality - Testing as a Process - Overview of the Testing Maturity Model. Testing Fundamentals: Introduction - Basic Definitions - Software Testing Principles - The Tester's Role in a Software Development Organization. Defects, Hypotheses, and Tests: Origins of Defects - Defect Classes, the Defect Repository, and Test Design.

Unit –II: Software Development Life Cycle Models (15 Hours)

Phases of Software Project - Quality, Quality Assurance, and Quality Control- Testing, Verification, and Validation - Process Model to Represent Different Phases - Life Cycle Models – White box testing- black box testing.

Unit –III: Strategies and Methods for Test case Design (15 Hours)

Introduction to Testing Design Strategies - The Smart Tester - Test Case Design Strategies - Random Testing - Equivalence Class Partitioning - Boundary Value Analysis - Other Black Box Test Design Approaches- Test Adequacy Criteria - Coverage and Control Flow Graphs - Covering Code Logic - Paths: Their Role in White Box–Based Test Design - Additional White Box Test Design Approaches.

Unit –IV: Levels of Testing (15 Hours)

The Need for Levels of Testing - Unit Test: Functions, Procedures, Classes, and Methods as Units - Unit Test: The Need for Preparation- Unit Test Planning - Designing the Unit Tests - The Class as a Testable Unit: Special Considerations - The Test Harness - Running the Unit Tests and Recording Results - Integration Test: Goals - Integration Strategies for Procedures and Functions - Integration Strategies for Classes - Designing Integration Tests - Integration Test Planning - System Test: The Different Types - Regression Testing.

Unit –V: Test Management and Automation (15 Hours)

Introduction - Test Planning – Test Management - Test Process – Test Reporting. Software Test Automation: Introduction - Terms Used in Automation - What to Automate, Scope of Automation - Design and Architecture for Automation - Selecting a Test Tool.

Books for Study

1. Ilene Burnstein, *Practical Software Testing,* Springer International Edition, USA, 2003.
   Unit -I – *Chapter 1, Chapter 2, Chapter 3.*
   Unit -III–*Chapter 4, Chapter 5.*
   Unit -IV–*Chapter 6.*

2. Srinivasan Desikan, Gopalaswamy Ramesh, *Software Testing - Principles and Practices,* Pearson Education, India, 2007.
   Unit -II – *Chapter 2, Chapter 3, Chapter 4.*
   Unit -V–*Chapter 15, Chapter 16.*

Books for References

1. Naresh Chauhan, *Software Testing - Principles and Practices*, Oxford University Press, Second edition, India, 2016.
2. Mukesh Sharma, *Software Testing 2020 – Preparing for New Roles*, Auerbach Publications, USA, 2016.
3. William E. Lewis, David Dobbs, Gunasekaran Veerapillai, *Software Testing A Continuous Quality Improvement* , Third Edition, Auerbach Publications, USA, 2017.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course					Hours	Credits
V	21UBC53ES02B			DSE-2 : SOFTWARE TESTING					5	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	3	3	3	1	2	2	3	3	2.6
CO-2	3	2	3	3	3	2	3	1	2	3	2.5
CO-3	3	3	3	1	2	3	3	3	3	3	2.7
CO-4	3	1	3	3	3	3	3	3	2	2	2.6
CO-5	3	2	2	2	3	2	2	3	3	3	2.5
Mean Overall Score											2.58 (High)

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53IS01	INTERNSHIP	-	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	tell new technical skills with respect to industry standards.	K1
CO-2	interpret information collected through internship	K2
CO-3	develop problem-solving and critical thinking skills.	K3
CO-4	develop appropriate workplace attitudes, behaving ethically and professionally.	K3
CO-5	compare the Effective utilization of new software tools to complete tasks	K4

Internship

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course						Hours	Credits
V	21UBC53IS01			INTERNSHIP						-	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	3	2	3	2	3	2	2	2	2.4
CO-2	3	2	2	3	3	2	2	2	2	2	2.3
CO-3	3	3	2	3	2	2	2	2	2	2	2.3
CO-4	3	2	3	2	2	2	3	3	2	3	2.5
CO-5	3	2	3	2	3	3	2	3	2	2	2.5
										Mean Overall Score	2.2 (High)

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53SP01	SELF-PACED LEARNING : CLOUD COMPUTING	-	2

CO No.	CO- Statements On successful completion of this course, students will be able to	Cognitive Levels (K- Levels)
CO-1	list the importance of protocols and standards in cloud services.	K1,K2
CO-2	interpret the models of distributed and cloud computing.	K2
CO-3	identify the comparative advantages and disadvantages of Virtualization technology.	K3
CO-4	analyze authentication, confidentiality and privacy issues in cloud computing.	K4
CO-5	discover the knowledge of big data analytics in Enterprises.	K4

Unit –I: Introduction

Cloud Computing at a Glance - Historical Developments – Building Cloud Computing Environments – Computing Platforms and Technologies. Virtualization: Introduction – Characteristics of Virtualized Environments – Taxonomy of Virtualization Techniques – Virtualization and Cloud Computing – Pros and Cons of Virtualization – Technology Examples.

Unit –II: Cloud Computing Architecture

Cloud Reference Model – Types of Clouds – Economics of the Cloud. Cloud Platforms in Industry: Amazon Web Services: Compute Services – Storage Services – Communication Services – Additional Services. Google AppEngine: Architecture and Core Concepts – Application Life Cycle – Cost Model. Microsoft Azure: Azure core Concepts – SQL Azure.

Unit –III: Data Intensive Computing

Map-Reduce Programming – Characterizing Data-Intensive Computations – Challenges ahead – Historical Perspective – Technologies for Data-Intensive Computing – Programming Platform. Cloud Applications: Scientific Applications – Healthcare – Biology – Geoscience – Business and Consumer Applications: CRM and ERP – Productivity – Social Networking – Media Applications.

Unit –IV: Advanced Topics in Cloud Computing

Energy Efficiency in Clouds - Market Based Management of Cloud: Market-Oriented Cloud Computing – A Reference Model for MOCC – Technologies and Initiatives supporting MOCC. Federated Clouds / Inter Cloud: Characterization and Definition – Cloud Federation Stack – Aspects of Interest – Technologies for Cloud Federations.

Unit – V: Secure Distributed Data Storage in Cloud Computing

Introduction - Cloud Storage: from LANs TO WANs - Technologies for Data Security in Cloud Computing. Data Security in the Cloud: An Introduction to the Idea of Data Security - The Current State of Data Security in the Cloud - Homo Sapiens and Digital Information - Cloud Computing and Data Security Risk Cloud Computing and Identity - The Cloud, Digital Identity, and Data Security - Content Level Security - Pros and Cons.

Books for Study

1. Rajkumar Buyya, ChristianVecchiola, S. Thamarai Selvi, *Mastering Cloud Computing*, McGraw Hill Education (India) Private Limited Publications, 1st Reprint, New Delhi, 2013.

Unit-I: *Chapter 1(Sec 1.1, 1.2, 1.3, 1.4), Chapter 3 (Sec 3.1, 3.2, 3.3, 3.4, 3.5, 3.6)*
Unit-II: *Chapter 4 (Sec 4.1, 4.2, 4.3) Chapter 9 (Sec 9.1,9 .2, 9.3)*
Unit-III: *Chapter 8(Sec 8.1, 8.2), Chapter 10 (Sec 10.1, 10.2)*
Unit-IV: *Chapter 11(Sec 11.1, 11.2, 11.3)*

2. Rajkumar Buyya, James Broberg, Andrzej Goscinski, *Cloud Computing–Principles and Paradigms*, John Wiley & Sons, Inc. Publications, New Jersey, 2011.

Unit-V: *Chapter 8(Sec 8.1, 8.2, 8.3) Chapter 23 (23.1, 23.2, 23.3, 23.4, 23.5, 23.6, 23.7)*

Books for Reference

1. Anand Nayyar, *Handbook of Cloud Computing*, First Edition, BPB Publication, India, 2019.
2. Surbhi Rastogi, *Cloud Computing Simplified: Explore Application of Cloud, Cloud Deployment Models, Service Models and Mobile Cloud Computing*, First Edition, BPB Publications, India, 2021
3. John R.Vacca, *Cloud Computing Security Foundations and Challenges*, Second Edition, CRC Press, New York, 2020

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course					Hours				Credits
V	21UBC53SP01	SELF-PACED LEARNING: CLOUD COMPUTING					-				2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	3	2	2	3	3	3	2	2	2.6
CO-2	3	3	3	2	2	3	3	3	2	3	2.7
CO-3	3	3	3	2	3	3	2	3	3	2	2.7
CO-4	3	3	2	3	3	3	2	3	3	3	2.8
CO-5	3	3	3	2	3	3	3	2	3	3	2.8
										Mean Overall Score	2.72 (High)

Semester	Course Code	Title of the Course	Hours	Credits
V	21USS54SE03	SEC-3: SOFT SKILLS	2	1

Cos (CourseOutcomes)
Uponcompletionof thecourse, Students will:

- bekeen on developing and sustaining Soft Skillsrequired ofan educated youth
- be trainedtopresentthebestofthemselvesasjobseekerstodealwithanyproblemand conflict situations
- beabletotransfertheskillslearntforconcreteoutcomesandincreasedproductivityof companies
- beabletodeveloppeopleskills,lifeskills thatarerequiredtobeagoodhumaninthe long run and set a living standard
- be embedded with Employability skills such as “communication", "teamwork" , "initiative,“enterprise",theattributesof"reliability","balance betweenwork-life“, "commitment” and continuous learning

Module1**: EffectiveCommunication**
Definitionofcommunication,BarriersofCommunication, VerbalandNon-verbal Communication;Self introduction matrix,Conversation Techniques, Good manners and Etiquettes, Introduction to Professional Communication, Professional Grooming and Presentation Skills and exercises

ModuleII:**ResumeWriting &Interviewskills**
ResumeWriting: Basic ResumeFormats.Typesof Resume-Chronological,Functionaland MixedResume**,**StepsinpreparationofResume,Sample objectives,ModelResumes.**Interview Skills:**Preparationfor interview,Commoninterview questions,Attitude, BodyLanguage,Mock interviews and Practicum, Figuring out common interview questions and answers

ModuleIII: **Group Discussion:** DefinitionofGD.Thesalient featuresofGD,Factorsthat influenceGD,OutcomeofGD,Tipsfor successinGD,ParametersofGD,EssentialPointsfor GDpreparation, GDTopics, Model GD and Practicum.

Module IV:**PersonalEffectiveness:**SelfDiscovery: Personality,Traitsof Personality; Personality Tests; Intelligenceand Skill Assessment Form.**GoalSetting**:Goal setting Process, Questioneers &Presentations

ModuleV:**NumericalAbility:**Average, Percentage; Profitand Loss**,**Area, Volume and Surface Area. (SimpleInterest, CompoundInterest; TimeandWork,PipesandCisterns;Time and Distance**,** Problems on Trains**,** Illustrations, Boatsand Streams;Illustrations-Optional)

ModuleVI:**TestofReasoning-VerbalReasoning:**SeriesCompletion,Analogy.**Non-VerbalReasoning**

Text Book

MelchiasG,BalaiahJohn,JohnLoveJoy(Eds),2018.StraightfromtheTraits:SecuringSoftSkills, SJC, Trichy.

References

Aggarwal,R.S. 2010.*A ModernApproach toVerbaland Non VerbalReasoning*. S.Chand, New Delhi.Covey,Stephen.2004.*7HabitsofHighlyeffectivepeople,*FreePress.Egan,Gerard.(1994). *TheSkilled Helper*(5th Ed). PacificGrove, Brooks/Cole.

Khera,Shiv 2003.*You Can Win.*Macmillan Books , Revised Edition.

MelchiasG, BalaiahJohn,JohnLove Joy(Eds),2018.Winnersinthe Making:A primer on soft skills. SJC, Trichy.

Otherbooks

Murphy,Raymond.1998.*EssentialEnglishGrammar*.2nd ed.,Cambridge UniversityPress.

Sankaran,K., &Kumar,M.*Group DiscussionandPublicSpeaking*.M.I.Pub,Agra,5th ed., Adams, Media.

Trishna's 2006. *How to do wellin GDs & Interviews*, Trishna Knowledge Systems.

Yate,Martin.2005.H*iringtheBest: AManager'sGuidetoEffectiveInterviewingand Recruiting**

Semester	Course Code	Title of the Course	Hours	Credits
V	21UBC53EG01	GENERIC ELECTIVE -1: FUNDAMENTALS OF DATA SCIENCE	4	2

CO No.	CO- Statements	Cognitive Levels (K- levels)
	On successful completion of this course, students will be able to	
CO-1	recall the concepts of mining techniques for data science	K1
CO-2	understand the basic concepts of Classification and Clustering	K2
CO-3	apply various data pre-processing techniques to improve the quality of the data	K3
CO-4	compare the types of Big Data for effective data analysis	K4
CO-5	demonstrate the Data Analytics techniques in Hadoop.	K2,K3,k4

Unit –I: Introduction (12 Hours)

Data mining – Kinds of Data Mined – Kind of Patterns Can be Mined – Technologies of Data mining– kind of Targeted Applications– Major Issues in Data Mining.

Unit –II: Data Pre-Processing (12 Hours)

Overview –Data Cleaning - Data Integration– Data Reduction: Overview of Data Reduction Strategies - Histograms – Clustering – Sampling- Data Cube Aggregation **–** Data Transformation and Data Discretization: Data Transformation Strategies overview - CLASSIFICATION: Basic Concepts Clustering: Cluster Analysis-K-Means: A Centroid- Based Techniques.

Unit –III: Digital Data (12 Hours)

Types of Digital Data**:** Introduction to Big Data - Big Data Analytics- Big Data Technologies Landscape: NoSQL.

Unit- IV: Hadoop (12 Hours)

Hadoop: Features of Hadoop – Key Advantages of Hadoop – Versions of Hadoop – Overview of Hadoop Ecosystems – Hadoop Distribution – Hadoop versus SQL – Integrated Hadoop Systems offered by Leading Market Vendors- Cloud based Hadoop Solution. Introducing Hadoop: Why Hadoop –Why not RDBMS – RDBMS versus Hadoop – Distributed Computing Challenges – History of Hadoop – Hadoop Overview – Use Case of Hadoop- Hadoop Distributors – HDFS.

Unit – V: MapReduce 12-Hours)

Introduction to MapReduce Programming: Introduction to HIVE **-** Hive- Hive Architecture – Hive Data Types- Hive File Format – Hive Query Language. Introduction to Pig**:** Pig – Anatomy of Pig – Pig on Hadoop –Pig Philosophy – ETL Processing – Pig Latin Overview

Books for Study

1. Jiawei Han and MicelineKamber, *Data Mining Concepts and Techniques,* Morgan Kaufmann Publishers, California, USA, 2016.
Unit –I*Chapter 1*
Unit –II*Chapter 3, Chapter 10.1, 10.2*
2. Seema Acharya and Subhashini Chellappan, *Big Data Analytics*, Wiley India Pvt Ltd, 2018.
Unit-III *Chapter 1, Chapter 2, Chapter 3, Chapter 4.1*

Unit-IV *Chapter 4.2, Chapter (5.1-5.10***)**
Unit-V *Chapter 8***,** *Chapter (9.1-9.5), Chapter (10.1-10.6)*

Books for Reference

1. Mohammed J. Zaki, Wagner Meira, Jr, *Data Mining and Machine Learning: Fundamental Concepts and Algorithms*, Cambridge University Press, United Kingdom, 2020.
2. John D. Kelleher and Brendan Tierney, *Data Science*, The MIT Press Essential Knowledge Series, 2018.
3. Benjamin Bengfort, Jenny Kim, *Data Analytics with Hadoop*, O'Reilly Media, California USA, 2016.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**				**Hours**		**Credits**
V	**21UBC53EG01**			**GENERIC ELECTIVE -1: FUNDAMENTALS OF DATA SCIENCE**				**4**		**2**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	3	3	2	3	3	2	2	3	3	2	2.6
CO-2	2	2	3	3	2	1	3	2	3	3	2.4
CO-3	2	3	2	1	3	3	3	2	2	1	2.2
CO-4	1	3	3	1	2	3	3	2	3	3	2.4
CO-5	3	3	2	3	2	3	2	3	3	3	2.7
									Mean Overall Score		2.43 (High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63CC11	CORE – 11: PYTHON PROGRAMMING	4	3

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	recall the basics of Python programming and control statements.	K1
CO-2	classify the skills of designing Graphical User Interfaces in Python.	K2
CO-3	infer the numerical data using Numpy to perform effective data analytics.	K3
CO-4	analyze the modular programming and differentiate mutability of various datatypes.	K4
CO-5	discover the business applications to solve the real time problems.	K4

Unit-I:Preliminaries (12 Hours)

Python for Data Analysis - Essential Python Libraries – Installation and setup python. Python language basics: The python Interpreter- IPython Basics- Data Structure and Sequences: Tuple – list – Built-in Sequence Functions - Dict - Set Numpy basics: The Numpy ndarray – Universal Functions -Linear Algebra.

Unit-II: Pandas (12 Hours)

Getting Started With Pandas: Introduction to Panda's data structure – Essential Functionality - Summarizing and Computing Descriptive Statistics Data Loading: Reading and Writing data in text format -Binary Data Format – Interacting with web APIs – Interaction with databases -Data Cleaning and preparation: Handling Missing data – Removing duplicates – Replacing values - String manipulation.

Unit-III: Operators (12 Hours)

Operators in Python: Arithmetic, Assignment, Unary Relational and Bitwise Operator – Membership Operators – Identity Operators – Mathematical Functions Input and Output: Output statement – input statement – command line arguments – Control Statements Array in Python: Array – Types of Array – Attributes of an Array – Multi dimensional Array

Unit-IV: Functions (12 Hours)

Functions: Defining a function – Formal and actual arguments – Positional Arguments – Keyword Arguments – Default Arguments Lists and Tuples : List – creating lists using range() function – Nested Lists – Tuples – Creating Tuples- Basic Operations on Tuples – Nested Tuples -Insert, Modify and Deleting Elements from tuples.

Unit-V: Plotting and Visualization (12 Hours)

A Brief Matplotlib API Primer - Plotting with Pandas and Seaborn Time Series: Date and Time data types – Time series Basics – Time Zone Handling Dictionaries: Operations on Dictionaries – Dictionary methods Files in Python: Files – Types of files in python – Opening a file -Closing a file – The seek() and tell() method – Random Accessing of Binary Files.

Books for Study

1. Wes McKinney, *Python for Data Analysis*, Published by O'Reilly Media, USA, 2018.
   Unit-I *Chapter 1 (Sec: 1.2, 1.3, 1.4), Chapter 2 (Sec 2.1, 2.2), Chapter 3 (Sec 3.1) Chapter 4 (Sec 4.1, 4.2, 4.5)*
   Unit-II *Chapter 5 (Sec: 5.1, 5.2, 5.3), Chapter 6 (Sec 6.1, 6.2) Chapter 7 (Sec: 7.1, 7.2)*
   Unit-V *Chapter 9 (Sec: 9.1, 9.2), Chapter 11(Sec: 11.1, 11.2, 11.4)*
2. Dr.R.Nageswara Rao, *Core Python Programming*, Dreamtech Press, New Delhi, 2017.
   Unit-III *Chapter 4(Pages 71-88), Chapter 5 (Pages 96-118), Chapter 7(Pages 151,159,186, 189)*
   Unit-IV *Chapter 9 (Pages 237,253-256), Chapter 10 (Pages 283 -285, 301 -317)*
   Unit-V *Chapter 11 (Pages 321-324), Chapter 17 (Pages 441-444)*

Books for Reference

1. Allen B. Downey, *Think Python: How to Think Like a Computer Scientist*, 2nd Edition, Updated for Python 3, Shroff/O'Reilly Publishers, USA, 2016
2. Guido van Rossum and Fred L. Drake Jr, *An Introduction to Python - Revised and Updated for Python 3.2*, Network Theory Ltd., 2018
3. Jake VanderPlas, *Python Data Science Handbook: Essential Tools for Working with Data*, 1st Edition, O'Reilly Media, USA, 2016.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**					**Hours**		**Credits**
VI	**21UBC63CC11**			**CORE – 11: PYTHON PROGRAMMING**					**4**		**3**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	3	2	2	3	2	2	3	3	2	2	2.4
CO-2	3	2	3	2	2	3	2	2	3	3	2.5
CO-3	2	2	2	2	3	2	3	3	2	2	2.3
CO-4	3	2	2	3	2	3	2	3	2	3	2.5
CO-5	2	3	3	2	3	2	3	2	2	3	2.5
										Mean Overall Score	2.44 (High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63CC12	CORE – 12: MOBILE APPLICATION DEVELOPMENT USING ANDROID	4	3

CO No.	CO- Statements	Cognitive Levels (K- level)
	On successful completion of this course, students will be able to	
CO-1	understand the various dimensions of mobile computing and N- Tier Client Server Framework in the domain of mobile application	K1
CO-2	demonstrate the android development environment and understand the user interface to be user-friendly	K2
CO-3	apply the Java programming languages and to build android mobile apps for users.	K3
CO-4	design and develop the Android applications using layouts, buttons and widgets to solve the user requirements.	K4
CO-5	compare the android 2D and 3D digital graphics and animation to enrich themselves to be skillful for the society.	K4

Unit-I: Introduction to Mobile Computing (12 Hours)

Introduction - Added Dimensions of Mobile Computing - Condition of the Mobile User – Architecture of Mobile Software Applications. Introduction to Mobile Development Frameworks and Tools: Fully Centralized Frameworks and Tools - N-Tier Client–Server Frameworks and Tools – Java.

Unit-II: Android (12 Hours)

Getting To Know Android: Android - The Open Handset Alliance -The Android Execution Environment- Components of an Android Application - Android Activity Lifecycle -Android Service Lifecycle. Setting Android Development Environment: Creating an Android Development Environment. Android Development Environment For Real Application: Android and Social Networking - The Project Root Folder - The Source Folder - The Resource Folder - Building and Running the micro jobs Application.

Unit-III: Layouts (12 Hours)

Layouts: Frame Layout – Linear Layout – Table Layout –Absolute Layout –Relative Layout. Building A View: Android GUI Architecture. Widget Bestiary: Android Views -Text view and Edit text -Button and Image button Adapters and Adapter views - Checkboxes, Radio buttons, and Spinners - View groups - Gallery And Grid view-List view And List activity–Scroll view.

Unit-IV Graphics (12 Hours)

Drawing 2D and 3D Graphics: Rolling Your Own Widgets -Layout - Canvas Drawing - Drawables - Bitmaps Bling - Shadows, Gradients, and Filters- Animation -OpenGL Graphics. Inter Process Communication: Inter-Process Communication: Intents: Simple, Low Overhead IPC - Getting A Result via Inter-Process Communication

Unit-V: Location and Mapping **(12 Hours)**

Location-Based Services - Mapping - The Google Maps Activity -The Map view and Map activity.

Books for Study

1. Reza B'far , *Mobile Computing Principles Designing And Developing Mobile Applications With UML and XML,*United States of America by Cambridge University Press, New York, 2005
   Unit-I *Chapter 1 (Sec: 1.1, 1.2, 1.3, 1.4), Chapter 2 (Sec 2.1, 2.2, 2.3)*
2. Rick Rogers, John Lombardo, ZigurdMednieks, and Blake Meike, *Android Application Development*O'Reilly, Shroft Publishers & Distributors Pvt Ltd, New Delhi, 2010.
   Unit-II (*Chapter 1, Chapter 2, Chapter 3)*
   Unit-III (*Chapter 10, Chapter 11)*
   Unit – IV (*Chapter 12, Chapter 13)*
   Unit – V (*Chapter 9)*

Books for Reference

1. Michael Burton, *Android App Development for Dummies*, 3ed, Wiley Publication, New Jersey, 2015.
2. Rick Boyer, *Android 9 Development Cookbook,* 3rd Edition, Packt Publishing, India, 2018.
3. Sujit Kumar Mishra, *Fundamentals of Android App Development*, English Edition, BPB Publication, New Delhi, 2020.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**	**Title of the Course**	**Hours**	**Credits**
VI	**21UBC63CC12**	**CORE – 12: MOBILE APPLICATION DEVELOPMENT USING ANDROID**	**4**	**3**

Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	2	1	3	3	3	2	1	2	3	2	2.2
CO-2	1	2	3	3	3	2	2	3	2	2	2.3
CO-3	2	3	2	2	1	1	2	2	3	2	2.0
CO-4	1	2	3	2	2	3	1	3	3	2	2.2
CO-5	2	3	1	3	3	2	3	3	2	2	2.4
									Mean Overall Score		**2.22 (High)**

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63CP07	SOFTWARE LAB-7 : PYTHON PROGRAMMING	3	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	match the programming skills to write a wide variety of problems in mathematics, science, and games.	K1
CO-2	illustrate the rich controls and conditional statement in Python	K2
CO-3	construct the applications using the Python Programming Language.	K3
CO-4	test for read and write data from & to files in Python and develop application using Pygame	K4
CO-5	analysis coding tasks related to the fundamental notions and techniques used in object-oriented programming	K4

List of Exercises:

1. Variables and data types
2. Strings and Functions
3. Loops, Arrays and sorting
4. Dictionaries, Lists and Tuples
5. Write Python applications using matrices
6. Create Calculator Program
7. Array Function using Numpy
8. Aggregation function using Numpy
9. Pandas Basics
10. Twitter API Integration for tweet Analysis

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63CP07	SOFTWARE LAB-7 : PYTHON PROGRAMMING	3	2

Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	2	3	3	2	2	3	2	2	2.5
CO-2	2	2	3	3	2	3	2	3	3	3	2.6
CO-3	3	2	3	3	3	3	3	3	2	3	2.8
CO-4	2	3	3	2	2	2	2	3	2	2	2.3
CO-5	3	3	2	3	2	2	3	2	2	3	2.5
Mean Overall Score											2.54 (High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63CP08	SOFTWARE LAB-8: ANDROID	3	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
CO-1	understand and select correct layouts to useful for different mobile applications in the real life situations.	K1
CO-2	classify the various user interface controls to be useful for mobile application development to solve many problems.	K2
CO-3	install and configure Android application development tools and develop mobile apps for industry.	K3
CO-4	design and develop user Interfaces with colours and styles for the Android users and its user friendly.	K4
CO-5	apply the various image manipulations and Analyse Java programming concepts to build various mobile app development solution to the society.	K4

List of Exercises:

1. Layout and its types
2. Simple programs using Button Controls
3. Check box
4. Radio Button
5. Student Mark sheet using controls
6. Working with Colors
7. Working With Text Using Styles
8. Image Manipulation
9. Implicit Intents
10. Explicit Intents

Semester	Course Code	Title of the Course					Hours				Credits
VI	21UBC63CP08	SOFTWARE LAB-8:ANDROID					3				2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	2	3	3	3	2	1	3	3	2	2.4
CO-2	2	1	3	3	3	2	3	3	2	2	2.4
CO-3	2	3	2	2	1	1	2	2	3	2	2.0
CO-4	3	1	3	2	3	3	1	3	3	3	2.5
CO-5	3	3	2	3	3	2	3	3	2	2	2.6
Mean Overall Score											2.38 (High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63ES03A	DSE-3: INFORMATION SECURITY	5	3

CO No.	CO- Statements On successful completion of this course, students will be able to	Cognitive Levels (K- Levels)
CO-1	relate the need for security in different aspects	K1
CO-2	explain legal, ethical and professional aspects of Information Security	K2
CO-3	identify a network security threat and familiarize in intrusion detection and Prevention	K3
CO-4	apply security policy in system design and analyze network security protocols	K3
CO-5	distinguish the concept of Cryptography and recognize its Tools	K4

Unit-I: Introduction to Information Security (15 Hours)

Security – Components of Information System – The System Development Life Cycle – Security Development life cycle- Security Professionals and the Organizations – Communities of Interest – Information Security.

Unit-II: Security (15 Hours)

The Need for Security: Business needs first – Threats – Attacks – Secure Software Development.

Unit-III: Law and Ethics in Information Security (15 Hours)

Legal, Ethical, and Professional Issues In Information Security**:** Law and Ethics in Information Security - Relevant U.S. Laws -Ethics and Information Security - Codes of Ethics and Professional Organizations. Planning for Security: Information Security Planning and Governance - Information Security Policy, Standards, and Practices - Security Education, Training, and Awareness Program.

Unit-IV: Security Technology (15 Hours)

Security Technology**:** Intrusion Detection and Prevention Systems, and Other Security Tools: Intrusion Detection and Prevention Systems - Scanning and Analysis Tools.

Unit-V : Cryptography (15 Hours)

Foundations of Cryptology - Cipher Methods - Cryptographic Algorithms - Cryptographic Tools - Attacks on Cryptosystems.

Books for Study

1. Michael E. Whitman, Herbert J. Mattord, *Principles of Information Security*, 4th Edition, Course Technology, Cengage Learning, USA, 2012.
   Unit-I *Chapter 1*
   Unit-II *Chapter2*
   Unit-III *Chapter 3, 5*
   Unit – IV *Chapter7*
   Unit – V *Chapter 8*

Books for Reference

1. William Stallings, *Cryptography and Network Security Principles and Practice*, 7th Edition, Pearson Education Inc., First Impression, USA, 2017.
2. Behrouz A. Ferouzan, *Cryptography and Network Security*, 3rd Edition Tata McGraw Hill, New Delhi, 2015.
3. Mark Stamp, *Information Security: Principles and Practice*, Wiley–Blackwell Publications, Canada, 2022.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
VI	**21UBC63ES03A**			**DSE- 3: INFORMATION SECURITY**						**5**	**3**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	3	2	3	3	2	3	2	3	2	2	2.5
CO-2	2	3	1	3	2	3	2	1	2	3	2.2
CO-3	3	3	2	2	2	2	2	2	2	3	2.3
CO-4	2	3	2	2	2	3	2	2	3	2	2.3
CO-5	3	3	2	3	2	3	3	3	2	3	2.7
Mean Overall Score											2.4 **(High)**

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63ES03B	DSE- 3: BUSINESS INTELLIGENCE	5	3

CO.No	CO- Statements On successful completion of this course, students will be able to	Cognitive Levels (K- level)
CO-1	recall the fundamental concepts of Business Intelligence	K1
CO-2	demonstrate various data warehouse schema	K2
CO-3	make use of association rule mining in data mining	K3
CO-4	examine decision tree classifier	K4
CO-5	function of NoSQL in big data	K4

Unit –I: Introduction to Business Intelligence (15 Hours)

Business Intelligence - Mobile Business Intelligence - Real-time Business Intelligence. DATA WAREHOUSE: The Need for an Operational Data Store (ODS) – Operational Data Store - Data Warehousing - Data Marts - Comparative Study of Data Warehouse with OLTP and ODS.

Unit –II: Data Warehouse Schema (15 Hours)

Introduction to Data Warehouse Schema - Star Schema - Snowflake Schema - Fact Constellation Schema - Comparison among Star, Snowflake and Fact Constellation Schema. Online Analytical Processing: Introduction to Online Analytical Processing– Representation of Multi-dimensional Data– Improving efficiency of OLAP by pre-computing the queries - Types of OLAP Servers - OLAP Operations.

Unit –III: Introduction to Data Mining (15 Hours)

Need of Data Mining - Data Mining Applications - Data Mining Process - Data Mining Techniques - Difference between Data Mining and Machine Learning. Data Preprocessing: Need for Data Preprocessing - Data Preprocessing Methods. Association Mining: Introduction to Association Rule Mining - Defining Association Rule Mining - Representations of Items for Association Mining - The Metrics to Evaluate the Strength of Association Rules - The Apriori Algorithm.

Unit –IV: Classification (15 Hours)

Types of Classification - Input and Output Attributes - Working of Classification - Guidelines for Size and Quality of the Training Dataset - Introduction to the Decision Tree Classifier - Naïve Bayes Method - Understanding Metrics to Assess the Quality of Classifiers.

Unit – V: Cluster Analysis (15 Hours)

Introduction to Cluster Analysis - Applications of Cluster Analysis - Desired Features of Clustering - Distance Metrics - Major Clustering Methods/Algorithms - Partitioning Clustering - Hierarchical Clustering Algorithms. BIG DATA AND NOSQL: The Rise of Relational Databases - Major Issues with Relational Databases - Challenges from the Internet Boom - Emergence of Big Data due to the Internet Boom - Possible Solutions to Handle Huge Amount of Data - The

Emergence of Technologies for Cluster Environment - Birth of NoSQL - Defining NoSQL from the Characteristics it Shares - Some Misconceptions about NoSQL - Data Models of NoSQL.

Books for Study

1. Drew Bentley, *Business Intelligence and Analytics*, Library Press, USA, 2017.
   Unit-I *Chapter 1*
2. Parteek Bhatia, *Data Mining and Data Warehousing Principles and Practical Techniques*, Cambridge University Press, USA, 2019.
   Unit-I *Chapter 12*
   Unit-II*Chapter 13, Chapter 14*
   Unit-III*Chapter 2, Chapter 9*
   Unit-IV*Chapter 5*
   Unit-V*Chapter 7, Chapter 15*

Books for References

1. Pedro Novo Melo, Carolina Machado, *Business Intelligence and Analytics in Small and Medium Enterprises*, CRC Press, USA, 2020.
2. Steve Williams, *Business Intelligence Strategy and Big Data Analytics*, Morgan Kaufmann, USA, 2016.
3. G Sreedhar, *Web Data Mining and the Development of Knowledge-Based Decision Support Systems*, IGI Global, USA, 2017.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**					**Hours**	**Credit**
VI	**21UBC63ES00**			**DSE- 3: BUSINESS INTELLIGENCE**					**5**	**3**
Course Outcomes(COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	2	2	3	2	2	3	2	3	2.4
CO-2	2	2	2	3	3	2	2	2	3	3	2.4
CO-3	2	2	3	3	3	3	2	3	2	3	2.6
CO-4	2	3	2	3	3	2	2	3	3	2	2.5
CO-5	2	2	3	3	2	2	3	2	3	3	2.5
									Mean Overall Score		2.48
									Result		High

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63ES04A	DSE 4 – FUNDAMENTALS OF IoT	5	3

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	find the rudiments of the Internet and its applications.	K1
CO-2	classify the different applications of the Internet of Things.	K2
CO-3	build IoT prototype solutions for prospective commercial and social requirements.	K3
CO-4	distinguish various embedded devices and peripherals.	K4
CO-5	compare various scenarios where IoT can be applied by reviewing various Use Cases.	K4

Unit-I: Overview of IoT **(15 Hours)**

The Flavour of the Internet of Things – The "Internet" of "Things" – The Technology of the Internet of Things – Enchanted Objects – Making the Internet of Things. Internet Principles – Internet Communication – IP Addresses – MAC Address – TCP and UDP Ports – Application Layer Protocols.

Unit-II: Prototyping **(15 Hours)**

Thinking About Prototyping: Sketching – Familiarity – Costs vs Ease of Prototyping – Open Source vs Closed Source – Tapping into the Community. Prototyping Embedded Devices: Electronics – Embedded Computing Basics.

Unit-III: Embedded Devices **(15 Hours)**

Prototyping Embedded Devices: Arduino – Raspberry PI – Beagle bone Black – Other Notable Platforms

Unit-IV: IoT Platforms **(15 Hours)**

IoT Enablement Platforms: IoT Building Blocks – IoT Enablement Platforms – IoT Architectural Building Blocks – Azure IoT HUB – Amazon Web Service IoT Platform – IoT Data Virtualization Platforms – IoT Data Visualization Platforms – IoT Edge Data Analytics

Unit-V: IoT Smart Use Cases **(15 Hours)**

Introduction - Governance Use Cases – Ubiquitous Connectivity – Omnipresent Devices – Collaboration Platforms – Cloud Computing - Open Standards and Service Oriented Architecture – Smart Cities – Smart Industrial Use Cases of IoT – Smart Transport Systems – Connected Cars – Consumer Use Cases of IoT – Smart Homes/Buildings – Smart Education Systems using Wearable Devices.

Books for Study

1. Adrian McEwen and Hakim Cassimally, *Designing the Internet of Things*, John Wiley and Sons, United Kingdom, 2014.
   Unit-I *Chapter 1, Chapter 3*
   Unit-II *Chapter 4, Chapter 5(Pages: 87-96)*
   Unit-III *Chapter 5(96-144)*
2. Pethuru Raj and Anupama C. Raman, *The Internet of Things Enabling Technologies, Platforms, and Use Cases*, CRC Press, USA, 2017
   Unit – IV *Chapter 5*
   Unit – V *Chapter 11*

Books for Reference

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton and Jerome Henry, *IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things*, Cisco Press, USA, 2017.
2. MaciejKranz,, *Building the Internet of Things: Implement New Business Models, Disrupt Competitors, Transform Your Industry*, Wiley, United Kingdom, 2016.
3. CunoPfister, *Getting Started with the Internet of Things: Connecting Sensors and Microcontrollers to the Cloud*, Maker Media, USA, 2011.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**				**Hours**		**Credits**
VI	**21UBC63ES04A**			**DSE-4 : FUNDAMENTALS OF IoT**				**5**		**3**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	3	2	3	3	2	2	2	3	2	2	2.4
CO-2	2	3	3	2	2	3	2	1	2	2	2.2
CO-3	2	3	3	2	2	2	2	3	3	2	2.4
CO-4	3	2	3	2	2	2	3	2	2	1	2.2
CO-5	3	2	2	2	3	3	2	2	2	3	2.4
									Mean Overall Score		2.32 (High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63ES04B	DSE- 4: CROSS-PLATFORM APP DEVELOPMENT	5	3

CO.No.	CO- Statements	Cognitive Levels (K- level)
	On successful completion of this course, students will be able to	
CO-1	understand basic concepts of Virtual Machines	K1, K2
CO-2	understand the fundamentals of the Flutter framework	K2, K3
CO-3	design apps with Material Design, themes and assets	K1, K2, K4
CO-4	implement interactivity in the app with text input and gestures	K3, K4
CO-5	learn to retrieve local and real-time data from the web to create various apps	K1, K2, K3, K4

Unit-I: Virtual Machines (15 Hours)

Host Requirements – Virtual Machine Features and Specifications. Installation: Installing on a Windows Host – Using the Workstation Player Window – Transferring Files and Text – Removing a Virtual Machine. Creating Virtual Machines – Understanding Virtual Machines – Guest Operating System – Importing Virtual Machines

Unit-II: Flutter (15 Hours)

Introduction to Flutter – Other options – Native Solutions. Developing In Flutter: The Flutter Tool Chain – SDK – IDE – Dev Tools – Development Process. Foundational Flutter: Widgets – UI as Code – Value Widgets – Layout Widgets – Navigation Widgets – Other Widgets – Create custom stateless widgets – Stateless and Stateful Widgets.

Unit-III: Dart Language Basics (15 Hours)

Variables Store References – Built-in Types – Strings – Introduction to Collections – Operators – Equality and Relational – Type Test – Assignment – Implementing Dart concepts to Flutter. Dart For Flutter Logic: Control Flow – If and Else – Conditional Expression – Looping – While and Do While – Loop Labels – Switch and Case – Constructors – Classes – Functions or Methods – Lexical Scope – Getter and Setter – Changing the UI.

Unit-IV: Widgets (15 Hours)

Text Widget – Icon Widget – Image Widget – Input Widgets. Responding To Gestures: Button Family – Custom Gestures – Long Press – Gesture Detector – Swiping. Navigation and Routing: Stack Navigation – Drawer Navigation – Tab Navigation – Dialog Widget.

Unit-V: Firebase with Flutter (15 Hours)

Introducing Firebase – Cloud Fire Store – Cloud Functions – Authentication – Setting up Firebase – Creating a Firebase project – Creating the Database – Creating an IOS app – Creating an Android App – Using Fire Store – Get a Collection – Query – UPSERT – DELETE.

Books for study

1. VMware, *Using VMware Workstation Player for Windows*, VMware, Inc. California, USA, 2020.

Unit-I Chapter *1, Chapter 2, Chapter 4*

2. Rap Payne, *Beginning App Development with Flutter Create Cross-Platform Mobile Apps*, Apress Media, Texas, USA, 2019.

Unit-II *Chapter 1, Chapter 2 and Chapter 3*

Unit-IV *Chapter 4, Chapter 5 and Chapter 7*

Unit-V *Chapter 12*

3. Sanjib Sinha, *Beginning Flutter with Dart*, LeanPub, British Columbia, Canada, 2021.

Unit-III *Chapter 3 and Chapter 4*

Books for References

1. Alessandro Biessek, *Flutter for Beginners*, Packt, USA. 2019.
2. Alberto Miola, *Flutter Complete Reference: Create beautiful, fast and native apps for any Device*, Pub.Dev, USA, 2020.
3. Ed Freitas, *Flutter Succinctly*, Syncfusion, USA, 2019.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course					Hours	Credits
VI	21UBC63ES04B	DSE-4: CROSS-PLATFORM APP DEVELOPMENT					5	3
Course Outcomes (COs) ↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	3	3	2	3	1	3	3	2	2.5
CO-2	3	2	2	2	2	2	2	2	3	2	2.2
CO-3	3	2	2	2	2	3	2	2	3	3	2.4
CO-4	2	2	3	3	2	2	3	1	2	2	2.2
CO-5	3	2	2	3	3	3	2	2	2	2	2.4
									Mean Overall Score		2.34
									Result		# High

Semester	Course Code	Title of the Course	Hours	Credit
VI	21UBC63PW01	PROJECT WORK	-	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	tell various components of a software project.	K1
CO-2	explain the Feasibility Criteria for a software project.	K2
CO-3	knowing how and when to Use Technology and Choosing the Most Appropriate Tool for the Task.	K3
CO-3	develop Communication Skills, Both for Interpersonal And Presentation Need.	K4
CO-5	visualize the problems and provide solution by Decision Making.	K4

Semester	Course Code	Title of the Course				Hours	Credit				
VI	21UBC63PW01	PROJECT WORK				-	2				
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	1	2	2	3	3	2	2	3	3	2	2.3
CO-2	3	1	3	2	2	3	2	2	3	3	2.4
CO-3	2	2	2	1	2	2	3	2	3	2	2.1
CO-4	3	2	2	3	2	3	2	3	2	3	2.5
CO-5	3	2	3	2	3	2	2	3	2	2	2.4
Mean Overall Score											2.4 (high)

Semester	Course Code	Title of the Course	Hours	Credit
VI	21UBC63CE01	COMPREHENSIVE EXAMINATION	-	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	recall the basic concept of Computer System and Operating System Structure with simple examples.	K1
CO-2	summarize Java and its advance concepts in application programs.	K2
CO-3	apply the fundamental principles of digital electronics and memories to problems.	K3
CO-4	analyze the concepts of PHP with MySQL in simple problems	K4
CO-5	examine the basic concepts of OOP and Apply it in problem solving	K4

Unit – I
C Programming, Relational Database Management Systems
Unit –II
C#. Net, Digital Computer Fundamentals
Unit – III
Java, Networks
Unit – IV
ASP.Net, Web Technologies
Unit – V
Python, Android

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code	Title of the Course	Hours	Credit
VI	21UBC63CE01	COMPREHENSIVE EXAMINATION	-	2

Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	1	2	2	3	3	2	2	3	3	2	2.3
CO-2	3	1	3	2	2	3	2	2	3	3	2.4
CO-3	2	2	2	1	2	2	3	2	3	2	2.1
CO-4	3	2	2	3	2	3	2	3	2	3	2.5
CO-5	3	2	3	2	3	2	2	3	2	2	2.4
Mean Overall Score											2.4 (High)

Semester	Course Code	Title of the Course	Hours	Credit
VI	21UBC64SE04A	SEC- 4 (WS): WEB DESIGN	2	1

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	find the basic elements for building Web Pages to provide practical solutions.	K1
CO-2	understand the basic methods of HTML to enhance the web pages.	K2
CO-3	apply HTML and CSS techniques to design real time application.	K3
CO-4	design Web Pages Using API's for effective outlook.	K4
CO-5	apply the various techniques of CSS to make attractive Web pages.	K4

Unit-I: Web Page Building Blocks (06 Hours)

Basic HTML Pages – Semantic HTML – Markup – Elements – Attributes – Values.

Unit-II: Text Content (06 Hours)

Links – Images – URLs. BASIC HTML STRUCTURE: Creating Header- Marking Navigation- Creating an Article- Defining a section-Specifying an aside- Creating Footer.

Unit-III: Forms (06 Hours)

Input Type – Value – Attribute – Post – Get – Buttons. TABLES: Rows – Columns – Row span – Colspan – Spacing – Editing Tables.

Unit-IV: CSS (06 Hours)

Introduction TO CSS: Cascade Rule - Style Sheets – Integration – Applying Various Styles – Importance of Location.

Unit-V: Advanced CSS (06 Hours)

Advanced CSS: Selectors – Name – Class – ID – Group – Pseudo Selectors – Formatting Fonts – Setting Color – Background – Shadow – Basic Transition.

Book for Study

1. Elizabeth Castro and Bruce Hyslop, *HTML5 and CSS3, Visual Quick Start Guide,* Peach pit Press, 7th Edition, Berkeley, 2012.
   Unit-I *Chapter1 (pages: 1-15)*
   Unit-II *Chapter1 (pages: 17-23) Chapter3 (61-83)*
   Unit-III *Chapter16, Chapter 18.*
   Unit -IV *Chapter 7, Chapter 8.*
   Unit -V *Chapter 9.*

Books for Reference

1. Brian P. Hogan, *HTML5 & CSS3 Develop with Tomorrow's Standards Today,* Pragmatic Programmers, LLC, USA, 2010.
2. Anne Boehm, Zak Ruvalcaba, *Murach's HTML5 and CSS3,* 4th Edition, Mike Murach & Associates Inc, UK, 2018.

3. David Sawyer Mcfarland, *CSS: The Missing Manual*, O'Reilly, USA, 2015.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**						**Hours**	**Credit**
VI	**21UBC64SE04A**			**SEC- 4 - (WS): WEB DESIGN**						**2**	**1**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of Cos**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	1	2	2	3	3	2	2	3	3	2	2.3
CO-2	3	1	3	2	2	3	2	2	3	3	2.4
CO-3	1	2	2	1	2	2	3	2	3	2	2
CO-4	3	2	2	3	2	3	2	3	2	3	2.5
CO-5	2	2	3	2	3	2	2	3	2	2	2.3
Mean Overall Score											2.3 (High)

Semester	Course Code	Title of the Course	Hours	Credit
VI	21UBC64SE04B	SEC- 4 (WS): 3D ANIMATION	2	1

CO No.	CO- Statements On successful completion of this course, students will be able to	Cognitive Levels (K- Levels)
CO-1	find the various 3D environment features to design animated objects.	K1
CO-2	understand the characteristics of lighting for rendering 3D objects.	K2
CO-3	apply the fundamentals of 3D design for real time application.	K3
CO-4	experiment with multiple designs using severaltools and techniques.	K3
CO-5	develop the advanced 3D models for real time modelling.	K4

Unit-I: Blender Interface (06 Hours)

Blender Screen – User PBOOKS FOR REFERENCE– 3D Window – Window Modes – Moving in 3D Space – Blender Controls.

Unit-II: Creating Objects (06 Hours)

Meshes – Placing objects – Moving objects – Creating Vertices – Extruding Shapes – Modifiers – Knife Tool – Sculpt Mode. LIGHTING: Lighting – Cameras.

Unit-III: Materials (06 Hours)

MATERIALS: Settings – Buttons – New Materials – Preview – Diffuse. Texture: Mapping – Displacement – Texture painting.

Unit-IV: Animation` (06 Hours)

Animation: Introduction - Moving – Rotating - Scaling – Keying – Editing Curves.

Unit-V: 3D TEXT (06 Hours)

Creating 3D Text in Blender- the Object data Button "F"- Fonts – Creating text on a Curve – Converting Text to a Mesh Object – Converting Text to a Curve – Entering External Font.

Book for Study

1. John M. Blain, *The Complete Guide to Blender Graphics: Computer Modeling And Animation*, CRC Press, Florida, 2012.
   Unit-I *Chapter 1*
   Unit-II *Chapter 3*
   Unit-III *Chapter 6*
   Unit-IV Chapter *11*
   Unit – V *Chapter 12*

Books for Reference

1. Peter Lord, Nick Park Brian Sibley, *Cracking Animation: The Aardman Book of 3-D Animation,* Thames and Hudson; Revised and expanded edition, 2015.
2. Andy Beane, *3D Animation Essentials*, John Wiley & Sons, Inc., New Jersey, 2015.
3. Isaac V. Kerlow, *The Art of 3D Computer Animation and Effects*, Wiley, New Jersey, 2009.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	Course Code			Title of the Course					Hours	Credit
VI	21UBC64SE04B			SEC - 4 (WS): 3D ANIMATION					2	1
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	2	2	3	3	2	2	3	3	2	2.4
CO-2	3	3	3	2	2	3	2	2	3	3	2.6
CO-3	3	2	2	2	2	2	3	2	3	2	2.3
CO-4	3	2	2	3	2	3	2	2	2	3	2.4
CO-5	2	2	3	2	3	2	2	3	3	2	2.4
									Mean Overall Score		2.42 (High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC64EG02	GENERIC ELECTIVE-2: INDUSTRY 4.0	4	2

CONo.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	select the drivers and enablers of IoT.	K1
CO-2	outline the various systems used in a manufacturing plant and their role in an Industry 4.0 world.	K2
CO-3	identify the smartness in Smart Factories, Smart cities, Smart products and Smart services.	K3
CO-4	choose opportunities, challenges brought about by Artificial Intelligence.	K3
CO-5	analyze the power of Block chain in a networked economy.	K4

Unit-I: Introduction to Internet of Things (12 Hours)

Physical design of IoT – Logical design of IoT – IoT Enabling Technologies – IoT levels & Deployment technologies. DEMYSTIFYING THE IoT PARADIGM: The Emerging IoT flavors - The Industrial Internet of Things – Consumer Internet of Things - Social Internet of things - Semantics for The Interoperable IoT- Cognitive IoT.

Unit-II: Introducing Industry 4.0 (12 Hours)

Defining Industry 4.0 - Four Main Characteristics of Industry 4.0 - The Value Chain - Industry 4.0 Design Principles - Building Blocks of Industry 4.0 - Smart Manufacturing.

Unit-III: Smart Factories (12 Hours)

Introducing the Smart Factory - Smart Factories in Action - Smart Manufacturing is Important - Real-World Smart Factories - INDUSTRY 4.0: The Way Forward.

Unit-IV: Artificial Intelligence (12 Hours)

The History of AI - AI and Society - Agents - Knowledge-Based Systems. MACHINE LEARNING AND DATA MINING: Introduction - Data Analysis - Clustering.

Unit-V: Block chain (12 Hours)

Money - Digital Money - Cryptography - Crypto currencies - Block chain Technology.

Books for Study

1. Pethuru Raj and Anupama C. Raman, *The Internet of Things Enabling Technologies, Platforms, and Use Cases,* Taylor & Francis, CRC Press, 1st Edition, United Kingdom, 2017.
   Unit-I *Chapter 1(Pages 1-38)*
2. Alasdair Gilchrist, *Industry 4.0- The Industrial Internet of Things,* Apress, New York, 2016.
   Unit-II *Chapter 13(Pages 195-216)*
   Unit-III *Chapter 14(Pages 217-230)*
3. Wolfgang Ertel, *Introduction to Artificial Intelligence,* Undergraduate Topics in Computer Science, Springer, 2017.
   Unit-IV *Chapter 1(Sec: 1.1-1.5), Chapter 8(Sec: 8.1, 8.9)*
4. Antony Lews, *The Basics of Bit coins and Block chains,* Mango Publishing Group, USA, 2018.

Unit-V *Chapters 1-4, 6*

Books for Reference

1. B.K.Tripathy and J.Anuradha, *Internet of Things (IoT): Technologies, Applications, Challenges and Solutions*, CRC Press, Florida, 2018.
2. Alp Ustundag and EmreCevikcan *Industry 4.0: Managing the digital transformation*, Springer, 2018.
3. Max Tegmark, Alfred A. Knopf, *Life 3.0 - Being Human in the Age of Artificial Intelligence*, Penguin Random House LLC, New York, 2017.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
VI	**21UBC64EG02**			**GENERIC ELECTIVE-2: INDUSTRY 4.0**						**4**	**2**
Course Outcomes (COs)↓	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	3	2	3	2	3	3	3	2	2	2	2.5
CO-2	2	3	2	2	2	3	2	3	2	3	2.4
CO-3	2	2	3	2	3	2	2	2	3	2	2.3
CO-4	3	3	2	3	2	2	3	3	2	2	2.5
CO-5	2	3	2	2	3	3	2	2	2	3	2.4
									Mean Overall Score		2.42 (High)