B Sc COMPUTER SCIENCE

LOCF SYLLABUS 2023

Department of Computer Science

School of Computing Sciences
St. Joseph's College (Autonomous)
Tiruchirappalli - 620002, Tamil Nadu, India

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

St. Joseph's College (Autonomous), an esteemed institution in the realm of higher education in India, has embarked on a journey to uphold and perpetuate academic excellence. One of the pivotal initiatives in this pursuit is the establishment of five Schools of Excellence commencing from the academic year 2014-15. These schools are strategically designed to confront and surpass the challenges posed by the 21st century.

Each School amalgamates correlated disciplines under a unified umbrella, fostering synergy and coherence. This integrated approach fosters the optimal utilization of both human expertise and infrastructural assets. Moreover, it facilitates academic fluidity and augments employability by nurturing a dynamic environment conducive to learning and innovation. Importantly, while promoting collaboration and interdisciplinary study, the Schools of Excellence also uphold the individual identity, autonomy, and distinctiveness of every department within.

The overarching objectives of these five schools are as follows:

1. Optimal Resource Utilization: Ensuring the efficient use of both human and material resources to foster academic flexibility and attain excellence across disciplines.

2. Horizontal Mobility for Students: Providing students with the freedom to choose courses aligning with their interests and facilitating credit transfers, thereby enhancing their academic mobility and enriching their learning experience.

3. Credit-Transfer Across Disciplines (CTAD): The existing curricular structure, in accordance with regulations from entities such as TANSCHE and other higher educational institutions, facilitates seamless credit transfers across diverse disciplines. This underscores the adaptability and uniqueness of the choice-based credit system.

4. Promotion of Human Excellence: Nurturing excellence in specialized areas through focused attention and resources, thus empowering individuals to excel in their respective fields.

5. Emphasis on Internships and Projects: Encouraging students to engage in internships and projects, serving as stepping stones toward research endeavors, thereby fostering a culture of inquiry and innovation.

6. Addressing Stakeholder Needs: The multi-disciplinary nature of the School System is tailored to meet the requirements of various stakeholders, particularly employers, by equipping students with versatile skills and competencies essential for success in the contemporary professional landscape.

In essence, the Schools of Excellence at St. Joseph's College (Autonomous) epitomize a holistic approach towards education, aiming not only to impart knowledge but also to cultivate critical thinking, creativity, and adaptability – qualities indispensable for thriving in the dynamic global arena of the 21st century.

Credit system

The credit system at St. Joseph's College (Autonomous) assigns weightage to courses based on the hours allocated to each course. Typically, one credit is equivalent to one hour of instruction per week. However, credits are awarded regardless of actual teaching hours to ensure consistency and adherence to guidelines.

The credits and hours allotted to each course within a programme are detailed in the Programme Pattern table. While the table provides a framework, there may be some flexibility due to practical sessions, field visits, tutorials, and the nature of project work.

For undergraduate (UG) courses, students are required to accumulate a minimum of 133 credits, as stipulated in the programme pattern table. The total number of courses offered by the department is outlined in the Programme Structure.

OUTCOME-BASED EDUCATION (OBE)

OBE is an educational approach that revolves around clearly defined goals or outcomes for every aspect of the educational system. The primary aim is for each student to successfully achieve these predetermined outcomes by the culmination of their educational journey. Unlike traditional methods, OBE does not prescribe a singular teaching style or assessment format. Instead, classes, activities, and evaluations are structured to support students in attaining the specified outcomes effectively.

In OBE, the emphasis lies on measurable outcomes, allowing educational institutions to establish their own set of objectives tailored to their unique context and priorities. The overarching objective of OBE is to establish a direct link between education and employability, ensuring that students acquire the necessary skills and competencies sought after by employers.

OBE fosters a student-centric approach to teaching and learning, where the delivery of courses and assessments are meticulously planned to align with the predetermined objectives and outcomes. It places significant emphasis on evaluating student performance at various levels to gauge their progress and proficiency in meeting the desired outcomes.

Here are some key aspects of Outcome-Based Education:

Course: A course refers to a theory, practical, or a combination of both that is done within a semester.

Course Outcomes (COs): These are statements that delineate the significant and essential learning outcomes that learners should have achieved and can reliably demonstrate by the conclusion of a course. Typically, three or more course outcomes are specified for each course, depending on its importance.

Programme: This term pertains to the specialization or discipline of a degree programme.

Programme Outcomes (POs): POs are statements that articulate what students are expected to be capable of by the time they graduate. These outcomes are closely aligned with Graduate Attributes.

Programme Specific Outcomes (PSOs): PSOs outline the specific skills and abilities that students should possess upon graduation within a particular discipline or specialization.

Programme Educational Objectives (PEOs): PEOs encapsulate the expected accomplishments of graduates in their careers, particularly highlighting what they are expected to achieve and perform during the initial years postgraduation.

LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK (LOCF)

The Learning Outcomes-Centric Framework (LOCF) places the learning outcomes at the forefront of curriculum design and execution. It underscores the importance of ensuring that these outcomes are clear, measurable, and relevant. LOCF orchestrates teaching methodologies, evaluations, and activities in direct correlation with these outcomes. Furthermore, LOCF adopts a backward design approach, focusing on defining precise and attainable learning objectives. The goal is to create a cohesive framework where every educational element is in harmony with these outcomes.

Assessment practices within LOCF are intricately linked to the established learning objectives. Evaluations are crafted to gauge students' achievement of these outcomes accurately. Emphasis is often placed on employing authentic assessment methods, allowing students to showcase their learning in real-life scenarios. Additionally, LOCF frameworks emphasize flexibility and adaptability, enabling educators to tailor curriculum and instructional approaches to suit the diverse needs of students while ensuring alignment with the defined learning outcomes.

Some Important Terminologies

Core Course (CC): *Core Courses represent obligatory elements within an academic programme, imparting fundamental knowledge within the primary discipline while ensuring consistency and acknowledgment.*

Allied Course (AC): *Allied Courses complement primary disciplines by furnishing supplementary knowledge, enriching students' understanding and skill repertoire within their academic pursuit.*

Foundation Course (FC): *Foundation Courses serve to bridge the gap in knowledge and skills between secondary education and college-level studies, facilitating a smoother transition for students entering higher education.*

Skill Enhancement Course (SE): *Skill Enhancement Courses aim to nurture students' abilities and competencies through practical training, open to students across disciplines but particularly advantageous for those in programme-related fields.*

Value Education (VE): *Value education encompasses the teaching of moral, ethical, and social values to students, aiming to foster their holistic development. It instills virtues such as empathy, integrity, and responsibility, guiding students towards becoming morally upright and socially responsible members of society.*

Ability Enhancement Compulsory Course (AE): *Ability Enhancement Compulsory Course is designed to enhance students' knowledge and skills; examples include Communicative English and Environmental Science. These courses are obligatory for all disciplines.*

AE-1: Communicative English: This three-credit mandatory course, offered by the Department of English during the first semester of the degree programme, is conducted outside regular class hours.

AE-2: Environmental Science: This one-credit compulsory course, offered during the second semester by the Department of Human Excellence, emphasizes environmental awareness and stewardship.

Allied Optional (AO): *Allied optional course are elective modules that complement the primary disciplines by providing additional knowledge and skills. These courses allow students to explore areas of interest outside their major field of study, broadening their understanding and enhancing their skill set.*

Discipline Specific Elective (ES): *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. Four courses are offered, two courses each in semester V and VI*

Note: To offer one ES, a minimum of two courses of equal importance/weightage is a must. A department with two sections must offer two courses to the students.

Generic Elective (EG): *A course chosen from a different discipline or subject area, typically to gain exposure. Students pursuing specific disciplines must select Generic Elective courses from the options available across departments as per the college's course offerings. The breadth of Generic Elective (GE)*

Courses is directly linked to the diversity of disciplines offered by the college. Two GE Courses are available, one in each semester V and VI, and are open to students from other departments.

Self-paced Learning (SP): *It is a two-credit course designed to foster students' ability for independent and self-directed learning. With a syllabus structured to be completed within 45 hours, this course encourages learners to take control of their own educational journey. Notably, Self-paced Learning is conducted outside of regular class hours, emphasizing autonomy and self-motivation in students.*

Internship (IS): *Following the fourth semester, students are required to undertake an internship during the summer break. Subsequently, they must submit a comprehensive report detailing their internship experience along with requisite documentation. Additionally, students are expected to participate in a viva-voce examination during the fifth semester. Credits for the internship will be reflected in the mark statement for the fifth semester.*

Comprehensive Examination (CE): *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: *To support students in acquiring knowledge and skills through online platforms such as Massive Open Online Courses (MOOCs), additional credits are granted upon verification of course completion. These extra credits can be availed across five semesters (2 - 6). In line with UGC guidelines, students are encouraged to enhance their learning by enrolling in MOOCs offered by portals like SWAYAM, NPTEL, and others. Additionally, certificate courses provided by the college also qualify for these extra credits.*

Outreach Programme (OR): *It is a compulsory course to create a sense of social concern among all the students and to inspire them to dedicated service to the needy.*

Course Coding

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

23	**UXX**	**0**	**0**	**XX**	**00/X**
Year of Revision	UG Department Code	Semester Number	Part Specification	Course Specific Initials	Running Number/with Choice

Course Specific Initials

GL - Languages (Tamil / Hindi / French / Sanskrit)
GE - General English
CC - Core Theory; CP- Core Practical
AC - Allied Course
AP - Allied Practical
FC - Foundation Course
SE - Skill Enhancement Course
VE - Value Education
WS - Workshop
AE - Ability Enhancement Course
AO - Allied Optional
OP - Allied Optional Practical
ES - Discipline Specific Elective
IS - Internship
SP - Self-paced Learning
EG - Generic Elective
ES - Discipline Specific Elective
PW - Project and Viva Voce
CE - Comprehensive Examination
OR - Outreach Programme

EVALUATION PATTERN

Continuous Internal Assessment

Sl No	Component	Marks Alloted
1	Mid Semester Test	30
2	End Semester Test	30
3	*Three Components (15 + 10 + 10)	35
4	Library Referencing (30 hours)	5
	Total	**100**

Passing minimum: 40 marks

* *The first component is a compulsory online test (JosTEL platform) comprising 15 multiple choice questions (10 questions at K1 level and 5 questions at K2 level); The second and the third components are decided by the course in-charge.*

Question Paper Blueprint for Mid and End Semester Tests

Duration: 2 Hours								**Maximum Marks: 60**
Section		**K levels**						**Marks**
		K1	**K2**	**K3**	**K4**	**K5**	**K6**	
A *(compulsory)*		7						7 × 1 = 7
B *(compulsory)*			5					5 × 3 = 15
C *(either…or type)*				3				3 × 6 = 18
D *(2 out of 3)*	*For courses with K5 as the highest cognitive level, one K4 and one K5 question is compulsory. (Note: two questions on K4 and one question on K5)*				1	1*		2 × 10 = 20
	*For courses with K6 as the highest cognitive level: **Mid Sem:** two questions on K4 and one question on K5; **End Sem:** two questions on K5 and one question on K6)*				Mid Sem			
						End Sem		
					1	1	1*	
							Total	**60**

***** *Compulsory*

Question Paper Blueprint for Semester Examination

Duration: 3 Hours					**Maximum Marks: 100**
UNIT	**Section A** *(Compulsory)*	**Section B** *(Compulsory)*	**Section C** *(Either…or type)*	**Section D** *(3 out of 5)*	
	K1	**K2**	**K3**	**K4**	**K5**
UNIT I	2	2	2	3*	2*
UNIT II	2	2	2		
UNIT III	2	2	2		
UNIT IV	2	2	2		
UNIT V	2	2	2		
Marks	**10 × 1 = 10**	**10 × 3 = 30**	**5 × 6 = 30**	**3 × 10 = 30**	

* *For courses with K5 as the highest cognitive level wherein two K4 and one K5 questions are compulsory. (Note: three questions on K4 and two question on K5)*

Evaluation Pattern for Part IV and One/Two-credit Courses

Title of the Course	CIA	Semester Examination	Total Marks
• Skill Enhancement Course (Non Major Elective) • Foundation Course • Skill Enhancement Course (WS)	20 + 10 + 20 = 50	50 *(A member from the Department other than the course instructors)*	100
• Self-paced Learning • Comprehensive Examination	25 + 25 = 50	50 *(CoE)*	100
• Value Education • Environmental Studies	50	50 *(CoE)*	100
• Skill Enhancement Course: Soft Skills	100	-	100
• Generic Elective	100	100 *(CoE)*	100
• Project Work and Viva Voce	100	100	100

Grading System

The marks obtained in the CIA and semester for each course will 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 (SGPA) and Cumulative Grade Point Average (CGPA), respectively. These two are calculated by the following formulae:

$$SGPA\ and\ CGPA = \frac{\sum_{i=1}^{n} C_i Gp_i}{\sum_{i=1}^{n} C_i}$$

$$WAM = \frac{\sum_{i=1}^{n} C_i M_i}{\sum_{i=1}^{n} C_i}$$

Where,

Ci - credit earned for the Course i
Gpi - Grade Point obtained for the Course i
Mi - Marks obtained for the Course i
*n - Number of Courses **passed** in that semester*
WAM - Weighted Average Marks

Classification of Final Results

- For each of the first three parts in the UG Programme, there shall be separate classification on the basis of CGPA, as indicated in Table - 2.
- For the purpose of declaring a candidate to have qualified for the Degree of Bachelor of Arts/Science/Commerce/Management 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 all the five Parts of the programme.
- Grade in Part IV and Part V shall be shown separately and it shall not be taken into account for classification.
- A pass in SHEPHERD will continue to be mandatory although the marks will not be counted for the calculation of the CGPA.
- Absence from an examination shall not be considered as an attempt.

Table - 1: Grading of the Courses

Mark 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: Grading of the Final Performance

CGPA	Grade	Performance
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
5.00 to 5.99	B	Above Average
4.00 to 4.99	C	Average
Below 4.00	RA	Re-appear

**The Candidates who have passed in the first appearance and within the prescribed duration of the UG programme are eligible. If the Candidates Grade is O/A+ with more than one attempt, the performance is considered "Very Good".*

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 (PEOs)

- 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)

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 Objectives (PSOs)

After completing the BSc Computer Science Programme, the graduates will

1. acquire the required knowledge in the Hardware and Software aspects of Computer Science domain and the art of programming.
2. understand the development methodologies of software systems and the ability to analyse, design and develop computer applications for real life problems.
3. knowledge and skills to collaborate and communicate with peers for performance enhancement in IT / ITES industries.
4. ability to understand, adjust and adapt with the dynamic technical environment for the growth of IT industry.
5. capacity to transfer the skills gained, to provide innovative and novel solutions by maintaining ethical norms for the betterment of humane society.

PROGRAMME STRUCTURE					
Part	**Semester**	**Specification**	**No. of Courses**	**Hours**	**Credits**
1	1- 4	Languages (Tamil / Hindi/ French/ Sanskrit)	4	17	12
2	1 - 4	General English	4	20	12
3	1 - 6	Core Course	11	48	38
	1 - 6	Core Practical	7	23	16
	1 - 6	Allied Course	2	11	7
	3, 4	Allied Optional	2	8	6
	3, 4	Allied Optional Practical	1	4	2
	5, 6	Discipline Specific Elective	4	20	12
	5	Internship	1	-	2
	5	Self-paced Learning	1	-	2
	5	Project Work and Viva Voce	1	3	2
	5	Comprehensive Examination	1	-	2
4	1	Foundation Course	1	2	1
	1	Skill Enhancement Course (Non-Major Elective)	1	2	1
	5	Skill Enhancement Course (Soft Skills)	1	2	1
	6	Skill Enhancement Course (WS)	1	2	1
	1 - 4	Value Education	4	8	4
	1, 2	Ability Enhancement Compulsory Course	2	2(6)	4
	5, 6	Generic Elective	2	8	4
5	2 - 6	Outreach Programme (SHEPHERD)	-	-	4
	2 - 6	Extra Credit Courses (MOOC)/Certificate Courses	5	-	(15)
		Total	**56**	**180(6)**	**133(15)**

PROGRAMME PATTERN								
Course Details						Scheme of Exams		
Sem	**Part**	**Course Code**	**Title of the Course**	**Hours**	**Credits**	**CIA**	**SE**	**Final**
1	1	23UTA11GL01A	General Tamil - 1	5	3	100	100	100
		23UFR11GL01	French - 1					
		23UHI11GL01	Hindi - 1					
		23USA11GL01	Sanskrit - 1					
	2	23UEN12GE01	General English - 1	5	3	100	100	100
	3	23UCS13CC01	**Core Course - 1:** Python Programming	4	3	100	100	100
		23UCS13CP01	**Core Practical - 1:** Python Programming	5	4	100	100	100
		23UCS13AC01	**Allied Course - 1:** Numerical Methods	5	3	100	100	100
	4	23UCS14FC01	**Foundation Course**: Problem Solving Techniques	2	1	100	-	100
		-	**Skill Enhancement Course - 1: (Non Major Elective):** Refer ANNEXURE 1	2	1	100	-	100
		23UHE14VE01	**Value Education - 1:** Essentials of Humanity*	2	1	50	50	50
		23UEN14AE01	**Ability Enhancement Compulsory Course - 1:** Communicative English	(6)	3	100	-	100
			Total	**30(6)**	**22**			
2	1	23UTA21GL02	General Tamil - 2	4	3	100	100	100
		23UFR21GL02	French - 2					
		23UHI21GL02	Hindi - 2					
		23USA21GL02	Sanskrit - 2					
	2	23UEN22GE02	General English - 2	5	3	100	100	100
	3	23UCS23CC02	**Core Course - 2:** Object Oriented Programming with C++	4	3	100	100	100
		23UCS23CC03	**Core Course - 3:** Data Structures and Algorithms	4	3	100	100	100
		23UCS23CP02	**Core Practical - 2:** C++ and Data Structures	3	2	100	100	100
		23UCS23AC02	**Allied Course - 2:** Statistical Methods	6	4	100	100	100
	4	23UHE24VE02	**Value Education - 2:** Fundamentals of Human Rights*	2	1	50	50	50
		23UHE24AE01	**Ability Enhancement Compulsory Course - 2:** Environmental studies*	2	1	50	50	50
		-	Extra Credit Courses (MOOC/Certificate Courses)-1	-	(3)			
			Total	**30**	**20(3)**			
3	1	23UTA31GL03	General Tamil - 3	4	3	100	100	100
		23UFR31GL03	French - 3					
		23UHI31GL03	Hindi - 3					
		23USA31GL03	Sanskrit - 3					
	2	23UEN32GE03	General English - 3	5	3	100	100	100
	3	23UCS33CC04	**Core Course - 4:** Discrete Mathematics	5	4	100	100	100
		23UCS33CC05	**Core Course - 5:** Database Systems	5	4	100	100	100
		23UCS33CP03	**Core Practical - 3:** RDBMS	3	2	100	100	100
		23UCS33AO01A	**Allied Optional - 1**: Applied Physics - 1	4	3	100	100	100
		23UCS33AO01B	**Allied Optional - 1**: Principles of Electronics					
		@	**Allied Optional Practical:** Applied Physics	2	-	-	-	-
		@	**Allied Optional Practical:** Electronics					
	4	23UHE34VE03A	**Value Education - 3:** Social Ethics - 1*	2	1	50	50	50
		23UHE34VE03B	**Value Education - 3:** Religious Doctrine - 1*					
		-	Extra Credit Courses (MOOC/Certificate Courses)-2		(3)			
			Total	**30**	**20(3)**			
4	1	23UTA41GL04B	General Tamil - 4: அறிவியல் தமிழ் (Scientific Tamil)	4	3	100	100	100
		23UFR41GL04	French - 4					
		23UHI41GL04	Hindi - 4					
		23USA41GL04	Sanskrit - 4					
	2	23UEN42GE04	General English - 4	5	3	100	100	100
	3	23UCS43CC06	**Core Course - 6:** Java Programming	5	4	100	100	100
		23UCS43CC07	**Core Course - 7:** Digital Computer Fundamentals and Microprocessor	5	4	100	100	100
		23UCS43CP04	**Core Practical - 4:** Java Programming	3	2	100	100	100

		23UCS43AO02A	**Allied Optional - 2:** Applied Physics-2	4	3	100	100	100
		23UCS43AO02B	**Allied Optional - 2:** Communication Electronics					
		23UCS43OP01A	**Allied Optional Practical:** Applied Physics	2	2	100	100	100
		23UCS43OP01B	**Allied Optional Practical:** Electronics					
	4	23UHE44VE04A	**Value Education - 4:** Social Ethics - 2*	2	1	50	50	50
		23UHE44VE04B	**Value Education - 4:** Religious Doctrine - 2*					
		-	Extra Credit Courses (MOOC/Certificate Courses)-3	-	(3)			
			Total	**30**	**22(3)**			
5	3	23UCS53CC08	**Core Course - 8:** Web Application Development	4	3	100	100	100
		23UCS53CC09	**Core Course - 9:** Operations Research	4	3	100	100	100
		23UCS53CP05	**Core Practical - 5:** Web Application Development	3	2	100	100	100
		23UCS53CP06	**Core Practical - 6:** Digital and Microprocessor	3	2	100	100	100
		23UCS53ES01A	**Discipline Specific Elective - 1:** Operating Systems	5	3	100	100	100
		23UCS53ES01B	**Discipline Specific Elective - 1:** Digital Marketing					
		23UCS53ES02A	**Discipline Specific Elective - 2:** Computer Networks	5	3	100	100	100
		23UCS53ES02B	**Discipline Specific Elective - 2:** Security in Computing					
		23UCS53IS01	Internship	-	2	100	-	100
		23UCS53SP01	**Self-paced Learning:** Web Ethics*	-	2	50	50	50
	4	-	**Generic Elective - 1:** Refer ANNEXURE 2	4	2	100	100	100
		23USS54SE01	**Skill Enhancement Course - 2:** Soft Skills	2	1	100	-	100
		-	Extra Credit Courses (MOOC/Certificate Courses)-4	-	(3)			
			Total	**30**	**23(3)**			
6	3	23UCS63CC10	**Core Course - 10:** Software Engineering	4	4	100	100	100
		23UCS63CC11	**Core Course - 11:** Mobile Application Development	4	3	100	100	100
		23UCS63CP07	**Core Practical - 7:** Mobile Application Development	3	2	100	100	100
		23UCS63ES03A	**Discipline Specific Elective - 3:** Big Data Analytics	5	3	100	100	100
		23UCS63ES03B	**Discipline Specific Elective - 3:** Cloud Computing					
		23UCS63ES04A	**Discipline Specific Elective - 4:** Internet of Things	5	3	100	100	100
		23UCS63ES04B	**Discipline Specific Elective - 4:** Artificial Intelligence and Machine Learning					
		23UCS63PW01	Project Work and Viva Voce	3	2	100	100	100
		23UCS63CE01	Comprehensive Examination*	-	2	50	50	50
	4	-	**Generic Elective - 2:** Refer ANNEXURE 3	4	2	100	100	100
		-	**Skill Enhancement Course - 3 (WS):** Refer ANNEXURE 4	2	1	100	-	100
		-	Extra Credit Courses (MOOC/Certificate Courses)-5	-	(3)			
			Total	**30**	**22(3)**			
2 - 6	5	23UCW65OR01	Outreach Programme (SHEPHERD)		4			
1 - 6			**Total (3 years)**	**180**	**133(15)**			

@ - year end practical

*- for grade calculation 50 marks are converted into 100 in the mark statements

Passed by	***Board of Studies held on 18.12.2023***
Approved by	***48th Academic Council Meeting held on 27.03.2024***

ANNEXURE 1

Skill Enhancement Course - 1: (Non-Major Elective)*

Department	Course Code	Title of the Course
Botany	23UBO14SE01	Skill Enhancement Course - 1: (Non-Major Elective): Organic Farming
BCA	23UBC14SE01	Skill Enhancement Course - 1: (Non-Major Elective): Fundamentals of Information Technology
Mathematics	23UMA14SE01	Skill Enhancement Course - 1: (Non-Major Elective): Mathematics for Competitive Examinations
Statistics	23UST14SE01	Skill Enhancement Course - 1: (Non-Major Elective): Basics of Statistics
Vis Com	23UVC14SE01	Skill Enhancement Course - 1: (Non-Major Elective): Digital Storytelling and Scriptwriting
English	23UEN14SE01	Skill Enhancement Course - 1: (Non-Major Elective): English for Communication
History	23UHS14SE01	Skill Enhancement Course - 1: (Non-Major Elective): Introduction to Tourism
Tamil	23UTA14SE01	Skill Enhancement Course - 1: (Non-Major Elective): பேச்சுக்கலைத் திறன் (Oratory Skills)
BBA	23UBU14SE01A	Skill Enhancement Course - 1: (Non-Major Elective): Practical Advertising
	23UBU14SE01B	Skill Enhancement Course - 1: (Non-Major Elective): Digital Marketing
B. Com	23UCO14SE01A	Skill Enhancement Course - 1: (Non-Major Elective): Introduction to Accounting
	23UCO14SE01B	Skill Enhancement Course - 1: (Non-Major Elective): Consumer Protection and Rights
B. Com CA	23UCC14SE01	Skill Enhancement Course - 1: (Non-Major Elective): Entrepreneurship Skills
Economics	23UEC14SE01	Skill Enhancement Course - 1: (Non-Major Elective): Demography
Chemistry	23UCH14SE01	Skill Enhancement Course - 1: (Non-Major Elective): Role of Chemistry in Daily Life
Electronics	23UEL14SE01	Skill Enhancement Course - 1: (Non-Major Elective): Consumer Electronics
Physics	23UPH14SE01A	Skill Enhancement Course - 1: (Non-Major Elective): Physics for Everyday Life
	23UPH14SE01B	Skill Enhancement Course - 1: (Non-Major Elective): Home Electrical Installation

**Offered to students from other Departments*

ANNEXURE 2

Generic Elective - 1*

Department	Course Code	Title of the Course
Botany	23UBO54EG01	Generic Elective - 1: Landscape designing
BCA	23UBC54EG01	Generic Elective - 1: Fundamentals of Data Science
Mathematics	23UMA54EG01	Generic Elective - 1: Numerical Ability
Statistics	23UST54EG01	Generic Elective - 1: Actuarial Statistics
Vis Com	23UVC54EG01	Generic Elective - 1: Media Education
English	23UEN54EG01	Generic Elective - 1: Film Studies
History	23UHS54EG01	Generic Elective-1: Tamil Heritage and Culture
Tamil	23UTA54EG01	Generic Elective - 1: தமிழிலக்கியத்தில் மனித உரிமைகள் (Human rights in Tamil literature)
BBA	23UBU54EG01A	Generic Elective - 1: Global Supply Chain Management
	23UBU54EG01B	Generic Elective - 1: Starts-ups and small Business Management
B.Com.	23UCO54EG01A	Generic Elective - 1: Computerised Accounting
	23UCO54EG01B	Generic Elective - 1: Basics of Excel
	23UCO54EG01C	Generic Elective - 1: Personal Investment Planning
B. Com CA	23UCC54EG01	Generic Elective - 1: E-commerce and E Business Management
Economics	23UEC54EG01	Generic Elective - 1: Principles of Economics
Chemistry	23UCH54EG01	Generic Elective - 1: Health Science
Electronics	23UEL54EG01A	Generic Elective - 1: Everyday Electronics
	23UEL54EG01B	Generic Elective - 1: Wireless Communication
Physics	23UPH54EG01A	Generic Elective-1: Everyday Physics
	23UPH54EG01B	Generic Elective-1: Renewable Energy Physics

**Offered to students from other Departments*

ANNEXURE 3

Generic Elective - 2*

Department	Course Code	Title of the Course
Botany	23UBO64EG02	Generic Elective - 2: Solid Waste Management
BCA	23UBC64EG02	Generic Elective - 2: Industry 4.0
Mathematics	23UMA64EG02	Generic Elective - 2: Quantitative Techniques
Statistics	23UST64EG02	Generic Elective - 2: Applied Statistics
Vis Com	23UVC64EG02	Generic Elective - 2: Digital Media Production
English	23UEN64EG02	Generic Elective - 2: English for the Media
History	23UHS64EG02	Generic Elective - 2: Intellectual Revivalism in Tamil Nadu
Tamil	23UTA64EG02	Generic Elective - 2: தமிழர் மருத்துவம் (Tamil Medicine)
BBA	23UBU64EG02A	Generic Elective - 2: Personality Development
	23UBU64EG02B	Generic Elective - 2: NGO Management
B. Com	23UCO64EG02A	Generic Elective - 2: Rural Marketing
	23UCO64EG02B	Generic Elective - 2: Entrepreneurship Development
	23UCO64EG02C	Generic Elective - 2: Digital Marketing
B. Com CA	23UCC64EG02	Generic Elective - 2: Total Quality Management
Economics	23UEC64EG02	Generic Elective - 2: Economics for Competitive Exams
Chemistry	23UCH64EG02	Generic Elective - 2: Solid Waste Management
Electronics	23UEL64EG02A	Generic Elective - 2: CCTV and Smart Security Systems
	23UEL64EG02B	Generic Elective - 2: Entrepreneurial Electronics
Physics	23UPH64EG02A	Generic Elective - 2: Laser Technology and its applications
	23UPH64EG02B	Generic Elective - 2: Physics of Earth

**Offered to students from other Departments*

ANNEXURE 4

Skill Enhancement Course - 3 (WS)*

School	Course Code	Title of the Course
SCS	23UBC64SE02A	Skill Enhancement Course - 3(WS): Web Design
	23UBC64SE02B	Skill Enhancement Course - 3(WS): 3DAnimation
	23UMA64SE02	Skill Enhancement Course - 3 (WS): MATLAB
	23UST64SE02	Skill Enhancement Course - 3 (WS): Official Statistics
	23UVC64SE02	Skill Enhancement Course - 3 (WS): Event Management

**Offered to students from other Departments within School*

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23UTA11GL01A	General Tamil - 1	5	3

கற்றலின் நோக்கங்கள்
தமிழ்ச் செவ்வியல் இலக்கியங்களையும் காப்பியங்களையும் மாணவர்கள் அறிந்துகொள்ளல்
தமிழர் பேணி வளர்த்த அறம்சார் விழுமியங்களை மாணவர்கள் தம் வாழ்வில் பின்பற்றுதல்
தமிழில் பக்திஇயக்கப் பங்களிப்பையும் பகுத்தறிவுச் சிந்தனை மரபையும் உணர்தல்
மாணவர்கள் தம் எழுத்தாற்றலையும் மொழிப்புலமையையும் வளர்த்தெடுத்தல்
போட்டித்தேர்வுகளை எதிர்கொள்ளும் வகையில் இலக்கணம், இலக்கியம் கற்றல்

அலகு - 1 தமிழ் இலக்கிய, இலக்கண வரலாறு அறிமுகம். **(10 மணி நேரம்)**

1. இலக்கணம் :

அ.தொல்காப்பியம், இறையனார் களவியல் உரை , நம்பியகப் பொருள், புறப்பொருள் வெண்பா மாலை, நன்னூல், தண்டியலங்காரம், யாப்பருங்கலக்காரிகை- நூல்கள்

ஆ.மொழிப் பயிற்சி- ஒற்றுப்பிழை தவிர்த்தல்

- வல்லினம் மிகும் இடங்கள்
- வல்லினம் மிகா இடங்கள்
- ஈரொற்று வரும் இடங்கள்
- ஒரு, ஓர் வரும் இடங்கள்
- அது, அஃது வரும் இடங்கள்
- தான், தாம் வரும் இடங்கள்

பயிற்சி : வல்லினம் மிகும் இடங்கள், மிகா இடங்கள் தவறாக வரும்வகையில் ஒரு பத்தி கொடுத்து ஒற்றுப் பிழை திருத்தி எழுதச் செய்தல்.

2. சங்க இலக்கியம் - எட்டுத்தொகை, பத்துப்பாட்டு
3. அற இலக்கியம்-பதினெண்கீழ்கணக்கு நூல்கள்
4. காப்பிய இலக்கியம் - ஐம்பெருங் காப்பியங்கள், ஐஞ்சிறு காப்பியங்கள், சமயக் காப்பியங்கள்
5. பக்தி இலக்கியமும் (பன்னிரு திருமுறைகள், நாலாயிர திவ்வியப் பிரபந்தம் -- பகுத்தறிவு இலக்கியமும் (சித்தர் இலக்கியங்கள், புலவர் குழந்தையின் இராவண காவியம்)

அலகு - 2 சங்க இலக்கியம் **(15 மணி நேரம்)**

எட்டுத்தொகை :

6. நற்றிணை-முதல் பாடல் -நின்ற சொல்லர்
7. குறுந்தொகை 3 ஆம் பாடல் -நிலத்தினும் பெரிதே
8. ஐங்குறுநூறு –நெல் பல பொலிக! பொன் பெரிது சிறக்க!' (முதல் பாடல்)-வேட்கைப் பத்து
9. கலித்தொகை- 51 - சுடர்த்தொடீஇக் கேளாய் -குறிஞ்சிக் கலி
10. புறநானூறு -189 தெண்கடல் வளாகம் பொதுமையின்றி, நாடா கொன்றோ -187

பத்துப்பாட்டு:

முல்லைப்பாட்டு (முழுவதும்)

அலகு - 3 அற இலக்கியம் **(10 மணி நேரம்)**

12. திருக்குறள் -அறன் வலியுறுத்தல் அதிகாரம்
13. நாலடியார்-பாடல்: 131 (குஞ்சியழகும்)
14. நான்மணிக்கடிகை-நிலத்துக்கு அணியென்ப
15. பழமொழி நானூறு- தம் நடை நோக்கார்
16. இனியவை நாற்பது- 37. இளமையை மூப்பு என்று

அலகு - 4 காப்பிய இலக்கியம் **(20 மணி நேரம்)**

17. சிலப்பதிகாரம் – வழக்குரைகாதை
18. மணிமேகலை- பாத்திரம் பெற்ற காதை

19. *பெரியபுராணம் - பூசலார் நாயனார்புராணம்*
20. *கம்பராமாயணம்- குகப் படலம்*
21. *சீறாப்புராணம் – மானுக்குப் பிணை நின்ற படலம்*
22. *இயேசு காவியம் -ஊதாரிப்பிள்ளை*

அலகு - 5 பக்தி இலக்கியமும், பகுத்தறிவு இலக்கியமும் **(15 மணி நேரம்)**

23. ***பக்தி இலக்கியம்:***

- *திருநாவுக்கரசர் தேவாரம் - நாமார்க்கும் குடியல்லேம் எனத் தொடங்கும் பாடல் மட்டும்*
- *மாணிக்கவாசகர் திருவாசகம் - நமச்சிவாய வாஅழ்க நாதன்தாள் வாழ்க முதல் சிரம்குவிவார் ஓங்குவிக்கும் சீரோன் கழல் வெல்க வரை*
- *பொய்கையாழ்வார்-வையந் தகளியா வார்கடலே*
- *பூதத்தாழ்வார்-அன்பே தகளியா*
- *பேயாழ்வார்-திருக்கண்டேன் பொன்மேனி கண்டேன்*
- *ஆண்டாள் – திருப்பாவை மார்கழித் திங்கள்* (முதல் பாடல்)

24. ***பகுத்தறிவு இலக்கியம் :***

- *திருமூலர் – திருமந்திரம்* (270,271, 274, 275 285)
- *பட்டினத்தார் -திருவிடை மருதூர்* (*காடே திரிந்து – எனத் தொடங்கும் பாடல்*
- *பா.எண்.*279, 280)
- *கடுவெளி சித்தர் - பாபஞ்செய் யாதிரு மனமே* (பாடல் முழுவதும்)
- *இராவண காவியம் –* ***தாய்மொழிப் படலம்*** - 18. (ஏடுகை யில்லா ரில்லை முதல் - 22. செந்தமிழ் வளர்த்தார் வரை)

கற்பித்தல் முறை	***விரிவுரை*** *(Lecture),* ***காணொளிக் காட்சி*** *(Videos),* ***விளக்கக் காட்சி*** *(PPT presentation)*

பாடநூல்

1. ***பொதுத்தமிழ்****-1 (* ***தமிழ் இலக்கிய வரலாறு****-1),* ***தமிழாய்வுத்துறை, தூய வளனார் தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி*** *– 620 002,* ***முதற்பதிப்பு*** *- 2023*
2. ***பார்வை நூல்கள்***
3. *வரதராசன்.மு., தமிழ் இலக்கிய வரலாறு, சாகித்ய அக்காதெமி, புதுடெல்லி. 2021*
4. *விமலானந்தன். மது. ச., தமிழ் இலக்கிய வரலாறு, முல்லை நிலையம், சென்னை, 2019*
5. *தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, பாரி நிலையம், சென்னை, 2022*
6. *சிற்பி பாலசுப்பிரமணியன் & சேதுபதி.சொ., தமிழ் இலக்கிய வரலாறு, கவிதா வெளியீடு, சென்னை, 2015*
7. *சிற்பி பாலசுப்ரமணியம், & பத்மநாபன். நீல., புதிய தமிழ் இலக்கிய வரலாறு (3 தொகுதிகள்), சாகித்ய அக்காதெமி, புதுடெல்லி,2013*
8. *பெருமாள். அ.கா., தமிழ் இலக்கிய வரலாறு, சுதர்சன் புக்ஸ், நாகர்கோவில், 2014*
9. *ஏசுதாசன். ப.ச., தமிழ் இலக்கிய வரலாறு, நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை, 2015*
10. *ஸ்ரீகுமார். எஸ்., தமிழ் இலக்கிய வரலாறு, ஸ்ரீசெண்பகா பதிப்பகம், சென்னை, 2014*
11. *பாக்கியமேரி எஃப்., வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, பூவேந்தன் பதிப்பகம், சென்னை,*2022
12. *சுப்புரெட்டியார்.ந., தமிழ் பயிற்றும் முறை, மணிவாசகர் நூலகம், சிதம்பரம், 1980*

Websites and eLearning Sources

1. https://www.chennailibrary.com/
2. https://www.sirukathaigal.com
3. https://www.tamilvirtualuniversity.org
4. https://www.noolulagam.com
5. https://www.katuraitamilblogspot.com

Course Outcomes		
CO No.	**CO-Statements** ***இப்பாடத்தின் நிறைவில் மாணவர்கள்***	**Cognitive Levels (K - Level)**
CO1	*சங்க இலக்கியங்கள்வழி பண்டைத்தமிழரின் வாழ்வியலையும் பண்பாட்டையும் அறிந்து கொள்வர்*	**K1**
CO2	*அற இலக்கியங்கள், காப்பியங்கள் வெளிப்படுத்தும் அறம்சார் விழுமியங்களைத் தம் வாழ்வில் பின்பற்றுவர்*	**K2**
CO3	*இலக்கணக் கோட்பாடுகளை இக்கால வாழ்வியலோடு பொருத்திப் பார்ப்பர்*	**K3**
CO4	*மொழியறிவோடு பெறுவர் திறன் பகுத்தாராயும் இலக்கியங்களைப்*	**K4**
CO5	*பக்தி இயக்கங்களின் செல்வாக்கையும், தமிழரின் பகுத்தறிவு மரபையும் மதிப்பிடுவர்*	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
1	**23UTA11GL01A**			General Tamil - 1						**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO 1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	1	2	3	2	2	3	3	2	2	2	**2.2**
CO2	2	2	3	2	2	2	3	2	3	2	**2.3**
CO3	1	2	2	3	2	2	2	3	3	3	**2.3**
CO4	2	2	3	2	2	3	2	3	3	2	**2.4**
CO5	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/Week	Credits
1	23UFR11GL01	French - 1	5	3

Course Objectives
Identify the basic French sentence structure
Define and describe the various grammatical tenses and use them to communicate in French
Examine the various documents presented and discuss and reply to the questions asked on it
Analyze and interpret expressions used to convey the cause, the effect, the purpose, and the opposition in French
Evaluate the grammatical nature present in passages

UNIT I **(15 Hours)**

- Salut ! Enchanté

UNIT II **(15 Hours)**

- J'adore

UNIT III **(15 Hours)**

- Tu veux bien ?

UNIT IV **(15 Hours)**

- On se voit quand ?

UNIT V **(15 Hours)**

- Bonne idée

Teaching Methodology	Videos, Audios, PPT presentation, Role-play, Quiz

Book for Study

1. Mérieux, R. & Loiseau, Y. (2017). *Latitudes* -1- (A1 /A2), méthode de français, Didier. (Units 1 - 6 only)

Books for Reference

1. P.Dauda,L.Giachino and C.Baracco, *Generation A1*, Didier, Paris 2020.
2. J.Girardet and J.Pecheur, *Echo A1*, CLE International, 2^{e}edition ,2017
3. Isabelle Fournier, *Talk French*, Goyal Publishers, 2011

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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

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	recall and remember the usage of grammatical tenses in constructing sentences in a dialogue.	**K1**
CO2	apply the learnt grammar rules in practice exercises to improve their understanding	**K2**
CO3	explain the nuances in the usage of various grammatical tenses and their aspects	**K3**
CO4	demonstrate knowledge of various expressions used to express opinions, emotions, cause, effect, purpose, and hypothesis in French	**K4**
CO5	communicate in French and summarize a given text	**K5**

Relationship Matrix											
Semester	**Course Code**	**Title of the Course**							**Hours**		**Credits**
1	**23UFR11GL01**	French - 1							**5**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	1	3	1	3	3	2	3	2	**2.4**
CO2	2	3	3	2	1	3	3	3	3	2	**2.5**
CO3	1	3	2	1	2	2	2	2	3	2	**2.0**
CO4	3	3	3	3	3	3	3	2	3	2	**2.8**
CO5	3	3	3	3	2	3	3	3	3	2	**2.8**
										Mean Overall Score	**2.5 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23UHI11GL01	Hindi - 1	5	3

Course Objectives
To understand the basics of Hindi Language
To make the students to be familiar with the Hindi words
To enable the students to develop their effective communicative skills in Hindi.
To introduce the socially relevant subjects in Modern Hindu Literature
To empower the students with globally employable soft skills

UNIT I: Buniyadi Hindi **(15 Hours)**

- Swar
- Vyanjan
- Barah Khadi
- Shabd aur
- Vakya Rachna

UNIT II: Hindi Shabdavali **(15 Hours)**

- Rishto ke Naam
- Gharelu padartho ke Naam

UNIT III: Vyakaran **(15 Hours)**

- Sadharan Vakya aur Sangya
- Sarvanam
- Visheshan
- Kriya aadi shabdo ka prayog

UNIT IV: Chote Gadyansh ka pattan **(15 Hours)**

- Bacho ki Kahaniya
- Patra-Patrikao mein prakashit Gadyansho ka Pathan

UNIT V: Nibandh **(15 Hours)**

- Sant Tiruvalluvar
- E.V.R Thandai Periyar
- Naari Sashaktikaran
- Paryavaran Sanrakshan
- Vibhinna pratiyogi parikshao ke bare mein jaankari dena
- Pratiyogi priksha par adharit nibandho dwara bhasha ki kshamta badhane vale prashikshan kary.

Teaching Methodology	Videos, PPT, Quiz, Group Discussion, Project Work.

Books for Study

1. Gupth, M.K. (2020). *Hindi Vyakaran*, Anand Prakashan, Kolkatta.
2. Tripaty, V. (2018). *Kuchh Kahaniyan*, Rajkamal Prakashan Pvt. Ltd, New Delhi.
3. Jain, S.K. (2019). *Anuwad: Siddhant Evam Vyavhar*, Kailash Pustak Sadan, Madhya Pradesh.

Books for Reference

1. Abdul Kalam, A. P.J. (2020). *Mere sapnom ka Bharath*, Prabath Prakashan, Noida.
2. Singh, L.P. (2017). *Kavya ke sopan*, Bharathy Bhavan Prakashan.
3. Kumar, A. (2019). *Sampoorna Hindi Vyakaran our Rachana*, Lucent publisher.

4. (2018). *Adhunik Hindi Vyakaran our Rachana,* Bharati Bhavan Publishers & distributors.
5. Shukla, A.R. (2022). *Hindi Sahitya Ka Itihas*, Prabhat Prakashan.

Websites and e-Learning Sources

1. https://learningmole.com/hindi-alphabet-letters-pronunciation-guide/
2. https://www.careerpower.in/hindi-alphabet-varnamala.html
3. https://www.youtube.com/watch?v=b0UvXnIC8qc
4. https://www.importanceoflanguages.com/learn-hindi-language-guide/
5. https://parikshapoint.com/hindi-sahitya/

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, the student will be able to	**Cognitive Levels (K - Level)**
CO1	Introduction to Hindi sounds	**K1**
CO2	Acquisition of Hindi Vocabulary	**K2**
CO3	Sentence formation in Hindi	**K3**
CO4	Reading of stories and other passages	**K4**
CO5	Modules to increase language ability through general essays based on competitive exams	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**				**Hours**		**Credits**	
1	**23UHI11GL01**			Hindi - 1				**5**		**3**	
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	2	1	3	3	3	1	3	2	**2.3**
CO2	2	3	2	3	1	2	3	3	3	2	**2.4**
CO3	3	2	2	2	1	3	2	3	2	3	**2.3**
CO4	3	1	2	3	2	3	2	3	3	2	**2.4**
CO5	2	3	3	2	3	2	3	3	1	3	**2.5**
										Mean Overall Score	**2.38 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23USA11GL01	Sanskrit - 1	5	3

Course Objectives
To help the students learn the alphabets of Sanskrit.
To understand the Sanskrit grammar and sabdas.
To have an idea of the epics.
To closely understand the literary works in Sanskrit with special reference toPancamahakavyas.
To understand the Raghuvasa Mahakava and Kalidasa.

UNIT I **(15 Hours)**

Introduction to Sanskrit (Alphabets, Two letter words and three letter words)

Grammar:

akārāntaḥpuṁliṅgaḥśabda-s - 1. बाल (*Bāla*) and 2. देव (*Deva*) *ākārāntaḥstrīliṅgaḥśabda-s* - 1. बाला (*Bālā*) and 2. लता (*Latā*)*akārāntaḥnapuṁsakaliṅgaḥśabda-s* -

1. फल (*Phala*) and 2. वन (*Vana*)

UNIT II **(15 Hours)**

Introduction to *Rāmāyana,Kālidāsa* and his poetic works

Text: *Raghuvaṁśa* (Canto I) Verses 1-15

UNIT III **(15 Hours)**

Introduction to the works of *Bhāravi* -

Text: *Raghuvaṁśa* (canto I) Verses 16-30

UNIT IV **(15 Hours)**

Introduction to the works of *ŚrīHarṣha* -

Text: *Raghuvaṁśa* (Canto I) Verses 31-45

UNIT V **(15 Hours)**

Grammar:

Conjugations -*Laṭlakāra-s* – (Present tense)

(i) गच्छतत (*Gacchati*) (ii) ततष्ठतत (*Tiṣṭhati*) (iii) पठतत (*Paṭhati*)

(iv) नृत्यतत (*Nṛtyati*) (v) कु प्यतत (*Kupyati*) (vi) कथयतत (*Kathayati*)

(vii) गणयतत (*Gaṇayati*) (viii) अततत (*Asti*)

(ix) करोतत (*Karoti*) (x) शृणोतत (*Śṛṇoti*)

Indeclinables (Avyayaani) - अतप (*api*), कदा (*kadā*), च (*ca*), अद्य (*adya*), तवना (*vinā*),सह (*saha*), तत्र (*tatra*), ककम् (*kim*), यकद (*yadi*) - तर्ह (*tarhi*), यथा (*yathā*) - तथा (*tathā*) Prefixes (*Upasargas*) - आङ् (*āṅ*), तव (*vi*), परर (*pari*), अनु (*anu*),

अति (*adhi*), उत् (*ut*), प्रतत (*prati*), उप (*upa*), प्र (*pra*) तनर् (*nir*)

Teaching Methodology	Videos, PPT, demonstration.

Book for Study

1. Murugan, C., et al. (eds.). (2022). *Kalasala Samskrta Sukha Bodhini I* (for under graduate foundation course) Published by University of Madras.

Book for Reference

1. Vadhyar, R.S. (2017). *Shabdha manjari*, R.S. Vadyar & Sons, Palakkad.

Websites and e-Learning Sources

1. https://www.arlingtoncenter.org/Sanskrit%20Alphabet.pdf
2. https://courses.lumenlearning.com/suny-hccc-worldcivilization/chapter/sanskrit/

3. https://www.newworldencyclopedia.org/entry/Sanskrit_literature
4. https://archive.org/details/AShortHistoryOfsanskritLiterarure
5. https://archive.org/details/raghuvamsha_with_sanjivini_edited_by_mr_kale

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	remember the usage of grammatical tenses inconstructing sentences in dialogue.	**K1**
CO2	apply the rules of usage in practice exercises and identify errors	**K2**
CO3	explain the nuances in the usage of various grammatical tenses and aspects	**K3**
CO4	demonstrate knowledge of various expressions of opinion, emotions, cause, effect, purpose, and hypothesisin French	**K4**
CO5	communicate in French and summarize the given text	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
1	**23USA11GL01**			Sanskrit - 1						**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	1	3	2	3	1	3	2	3	2	2	**2.1**
CO2	2	3	2	3	1	2	2	3	2	3	**2.5**
CO3	3	2	2	2	2	2	3	2	3	2	**2.1**
CO4	3	2	3	2	2	3	3	2	3	2	**2.4**
CO5	3	2	3	3	2	2	3	2	3	3	**2.3**
									Mean Overall Score		**2.34 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23UEN12GE01	General English - 1	5	3

Course Objectives
To enable learners to acquire self awareness and positive thinking required in various life situations
To help them acquire the attribute of empathy
To assist them in acquiring creative and critical thinking abilities
To enable them to learn the basic grammar
To assist them in developing LSRW skills

UNIT I: Self-awareness ELF-A (WHO) & Positive Thinking (UNICEF) (15 Hours)

Life Story

1. Chapter 1 from Malala Yousafzai, I am Malala
2. An Autobiography or The Story of My Experiments with Truth (Chapters 1, 2 & 3) M.K. Gandhi

Poem

3. Where the Mind is Without Fear – Gitanjali 35 – Rabindranath Tagore
4. Love Cycle – Chinua Achebe

UNIT II: Empathy (15 Hours)

Poem

5. Nine Gold Medals – David Roth
6. Alice Fell or poverty – William Wordsworth

Short Story

7. The School for Sympathy – E.V. Lucas
8. Barn Burning – William Faulkner

UNIT III: Parts of Speech (15 Hours)

9. Articles
10. Noun
11. Pronoun
12. Verb
13. Adverb
14. Adjective
15. Preposition

UNIT IV: Critical & Creative Thinking. (15 Hours)

Poem

16. The Things That Haven't Been Done Before – Edgar Guest
17. Stopping by the Woods on a Snowy Evening – Robert Frost

Readers Theatre

18. The Magic Brocade – A Tale of China
19. Stories on Stage – Aaron Shepard (Three Sideway Stories from Wayside School" by Louis Sachar)

Unit V: Paragraph and Essay Writing (15 Hours)

20. Descriptive
21. Expository
22. Persuasive
23. Narrative
24. Reading Comprehension

Teaching Methodology	Interactive methods, and multimedia presentations

Books for Study

1. Yousafzai, M. (2013). *I am Malala, Little.* Brown and Company.
2. Gandhi, M. K. (2011). *An Autobiography or The Story of My Experiments with Truth (Chapter - I).* Rupa Publications.
3. Tagore, R. (1913). *"Gitanjali 35" from Gitanjali (Song Offerings): A Collection of Prose Translations Made by the Author from the Original Bengali.* MacMillan.
4. Shepard, A. (2017). *Stories on Stage.* Shepard Publications.

Books for Reference

1. Krishnasamy. N. (1975). *Modern English: A Book of Grammar, Usage and Composition.* Macmillan.
2. Nesfield, J. C. (2019). *English Grammar Composition and Usage.* Macmillan.

Websites and eLearning Sources

1. https://archive.org/details/i-am-malala
2. https://www.indiastudychannel.com/resources/146521- Book-Review-An- Autobiography-or-The-story-of-my-experiments-with-Truth.aspx
3. https://www.poetryfoundation.org/poems/45668/gitanjali-35
4. https://amzn.eu/d/9rVzlNv
5. https://archive.org/details/in.ernet.dli.2015.44179

Course Outcomes		
CO No.	**CO-Statements**	**Cognitive Levels (K - Level)**
	On successful completion of this course, students will be able to	
CO1	discover self awareness and positive thinking required in various life situations	**K1**
CO2	classify the attributes of empathy	**K2**
CO3	apply creative and critical thinking skills	**K3**
CO4	focus on grammar for functional purposes	**K4**
CO5	integrate the LSRW skills for effective communication	**K5**

Relationship Matrix											
Semester	**Course Code**	**Title of the Course**							**Hours**		**Credits**
1	**23UEN12GE01**	General English - 1							**5**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	3	3	3	3	3	3	**3**
CO2	2	3	3	3	2	3	3	3	3	3	**2.5**
CO3	3	3	3	2	3	3	3	3	3	2	**2.8**
CO4	3	3	3	3	3	3	3	3	3	3	**3**
CO5	3	2	3	3	3	3	3	3	3	3	**2.8**
										Mean Overall Score	**2.82 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23UCS13CC01	**Core Course - 1:** Python Programming	4	3

Course Objectives
To make students understand the concepts of Python programming
To provide solutions using control structures in Python programming
To apply the knowledge functions, strings and modules in Python based solutions
To learn the various element-based data types in Python programming
To work with file-based operations with Python

UNIT I: Fundamentals of Python **(12 Hours)**

Basics of Python Programming: History of Python-Features of Python-Literal-Constants- Variables - Identifiers - Keywords-Built-in Data Types - Output Statements - Input Statements - Comments - Indentation - Operators-Expressions-Type conversions. **Python Arrays:** Defining and Processing Arrays - Array methods.

UNIT II: Control Statements **(12 Hours)**

Control Statements: Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. **Iterative Statements**: While loop, For loop, Else suite in loop and Nested loops. **Jump Statements:** Break, Continue and Pass statements**.**

UNIT III: Functions in Python **(12 Hours)**

Functions: Function Definition - Function Call - Variable Scope and its Lifetime-Return Statement. **Function Arguments**: Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments - Recursion. **Python Strings:** String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. **Modules**: import statement- The Python module - dir() function - Modules and Namespace - Defining our own modules.

UNIT IV: Lists and Dictionaries **(12 Hou rs)**

Lists: Creating a list -Access values in List-Updating values in Lists-Nested lists -Basic list operations-List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple - Nested tuples-Difference between lists and tuples. **Dictionaries:** Creating, Accessing, Updating and Deleting Elements in a Dictionary - Dictionary Functions and Methods - Difference between Lists and Dictionaries.

UNIT V: File Handling **(12 Hours)**

Types of files in Python - Opening and Closing files-Reading and Writing files: write() and writelines() methods- append() method - read() and readlines() methods - with keyword - Splitting words - File methods - File Positions- Renaming and deleting files.

Teaching Methodology	Videos, PPT, Demonstration, Hands on Session and Lecture Methods.

Books for Study

1. Thareja, R. (2017). *Python programming using problem solving approach,* (1st Ed.). Oxford University Press.
2. Rao, N. R. (2017). *Core Python programming,* (1st Ed.). Dream tech Publishers.

Books for Reference

1. Kurama, V. (2018). *Python programming: A modern approach*. Pearson Education.
2. Lambert, K. A. (2017). *Fundamentals of Python - First programs*. CENGAGE
3. Publication.

Websites and eLearning Sources

1. https://www.programiz.com/python-programming
2. https://www.guru99.com/python-tutorials.html
3. https://www.w3schools.com/python/python_intro.asp
4. https://www.geeksforgeeks.org/python-programming-language/
5. https://en.wikipedia.org/wiki/Python_(programming_language)

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, the students will be able to	**Cognitive Levels (K-Level)**
CO1	recall simple Python programs that solve basic problems	**K1**
CO2	explain the basic concepts of Python programming	**K2**
CO3	use Python to interact with the operating system and other external resources.	**K3**
CO4	analyse and apply solutions to problems by using various Python techniques.	**K4**
CO5	develop reusable and maintainable Python software.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**		**Credits**
1	**23UCS13CC01**			**Core Course - 1:** Python Programming					**4**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	1	1	3	3	2	3	2	2	**2.2**
CO2	3	2	3	3	2	1	3	2	2	2	**2.3**
CO3	3	3	2	3	1	3	2	3	2	3	**2.5**
CO4	2	2	3	1	3	2	3	2	3	3	**2.4**
CO5	2	3	2	2	2	2	3	2	2	2	**2.2**
Mean Overall Score											**2.32 (High)**

Semester	Course Code	Title of the Course	Hours/ Week	Credits
1	23UCS13CP01	**Core Practical - 1:** Python Programming	5	5

List of Exercises:

1. Variables, constants, I/O statements
2. Operators
3. Conditional Statements, Loops and Jump Statements
4. Functions and Recursion
5. Arrays
6. Strings
7. Modules
8. Lists and Tuples
9. Dictionaries
10. File Handling

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23UCS13AC01	**Allied Course 1:** Numerical Methods	5	3

Course Objectives
To introduce the various topics in Numerical methods.
To make understand the fundamentals of algebraic equations
To apply interpolation and approximation on examples
To solve problems using numerical differentiation and integration
To solve linear systems, numerical solution of ordinary differential equations

UNIT I: Fundamentals of Algebraic Equation **(15 Hours)**

Solution of algebraic and transcendental equations-Bisection method - Method of successive Approximations or iteration method - Newton Raphson

UNIT II: Simultaneous Linear Algebraic Equations **(15 Hours)**

Simultaneous linear algebraic equations - Gauss elimination method - Gauss Jordan method Iterative methods - Gauss Jacobi method - Gauss Seidel method

UNIT III: Interpolation with Equal And Unequal Interval **(15 Hours)**

Interpolation with equal intervals - Newton's forward and backward difference formulae- Approximation of derivatives using interpolation polynomials- Interpolation with unequal intervals- Newton's divided difference interpolation Lagrange's interpolation.

UNIT IV: Numerical Integration **(15 Hours)**

Numerical integration - Trapezoidal rule - Romberg's Method - Simpson's 1/3

UNIT V: Initial Value Problems For Ordinary Differential Equations **(15 Hours)**

Single step methods - Taylor's series method - Euler's method - Modified Euler's method - RungeKutta method for solving equations

Teaching Methodology	Chalk and Talk, PPT

Book for Study

1. Venkataraman, M. K. (2000). *Numerical methods in science and engineering,* (5th Ed.). National Publishing Company, Madras.
   Unit I: *Chapter 3 (Sec: 2, 3, 5)*
   Unit II: *Chapter 4 (Sec: 2, 6)*
   Unit III: *Chapter 6 (Sec: 3, 4), Chapter 8 (Sec: 4)*
   Unit IV: *Chapter 9 (Sec: 7, 8, 9, 10)*
   Unit V: *Chapter 11 (Sec 6, 10, 12, 13)*

Books for Reference

1. Singaravelu, A. (1992). *Numerical methods*. Meenakshi Publications
2. Kandasamy, P., Thilagavathy, K. & Gunavathi, K. (2008). *Numerical methods*. S. Chand & Company Ltd.
3. Jain, M. K., Iyengar, S. R. K. & Jain, R. K. (2007). *Numerical methods for scientific and engineering computation*. New Age Pvt. Publishers, New Delhi.

Websites and eLearning Source

1. https://onlinecourses.nptel.ac.in/noc23_ma94/preview

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, the students will be able to	**Cognitive Levels (K-Level)**
CO1	acquire the knowledge on various problems on numerical methods	**K1**
CO2	understand to solve numerical related problems	**K2**
CO3	apply appropriate numerical methods to solve the given problems and evaluate their solutions	**K3**
CO4	analyze the best approximated value of the root of the given function using various numerical methods	**K4**
CO5	evaluate various numerical problems using of ordinary differential equations and integration	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
1	**23UCS13AC01**			**Allied Course 1:** Numerical Methods						**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	2	2	3	2	3	2	2	**2.5**
CO2	2	3	3	2	2	2	3	2	2	3	**2.4**
CO3	3	1	3	2	2	3	2	2	1	2	**2.1**
CO4	3	2	2	1	2	3	3	3	2	3	**2.4**
CO5	2	3	3	1	2	3	3	2	2	3	**2.4**
										Mean Overall Score	**2.36 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23UCS14FC01	**Foundation Course:** Problem Solving Techniques	2	1

Course Objectives
To study the basics of computers
To study the data types and arithmetic operations, know about the algorithms and develop program using flow chart and pseudocode
To understand and apply the basic concepts of operators, structures, and loops
To learn about numeric data and character-based data and analyze about arrays
To understand and illustrate DFD based on program modules

UNIT I: An Introduction to Computers and Programming (6 Hours)

Introduction: History, characteristics and limitations of Computer. **Hardware/Anatomy of Computer:** CPU, Memory, Secondary storage devices, Input Devices and Output devices. **Types of Computers:** PC, Workstation, Minicomputer, Main frame and Supercomputer. **Software**: System software and Application software. **Programming Languages:** Machine language, Assembly language, High-level language,4 GL and 5GLFeatures of good programming language. **Translators:** Interpreters and Compilers.

UNIT II: Developing a Program (6 Hours)

Data: Data types, Input, Processing of data, Arithmetic Operators, Hierarchy of operations and Output. Different phases in Program Development Cycle (PDC). **Structured Programming**: **Algorithm**: Features of good algorithm, Benefits and drawbacks of algorithm. **Flowcharts**: Advantages and limitations of flowcharts, when to use flowcharts, flowchart symbols and types of flowcharts. **Pseudocode**: Writing a pseudocode. **Coding, documenting and testing a program**: Comment lines and types of errors. Program design: Modular Programming.

UNIT III: Selection and Repetition Structures (6 Hours)

Selection Structures: Relational and Logical Operators -Selecting from Several Alternatives - Applications of Selection Structures. **Repetition Structures:** Counter Controlled Loops -Nested Loops- Applications of Repetition Structures.

UNIT IV: Data Types and Arrays (6 Hours)

Data: Numeric Data and Character Based Data. **Arrays:** One Dimensional Array - Two Dimensional Arrays - Strings as Arrays of Characters.

UNIT V: Program Modules and Data Files (6 Hours)

Data Flow Diagrams: Definition, DFD symbols and types of DFDs. **Program Modules:** Subprograms- Value and Reference parameters- Scope of a variable - Functions - Recursion. **Files:** File Basics-Creating and reading a sequential file- Modifying Sequential Files.

Teaching Methodology	Videos, PPT, Demonstration, Hands on Session and Lecture Methods.

Book for Study

1. Venit, S. (2010). *Introduction to programming: Concepts and design,* (4th Ed.). Dream Tech Publishers.

Books for Reference

1. Venit, S., & Drake, E. (2013). *Prelude to programming: Concepts and design,* (5th Ed.). Pearson Education.
2. Venit, S., & Drake, E. (2015). *Prelude to programming: Concepts and design,* (6th Ed.). Pearson Education.
3. Leon, A., & Leon, M. (1999). *Fundamentals of information technology.* Vikas.
4. Jaiswal, S. (2009). *Information technology today,* (4th Ed.). Galgotia Publications.

Websites and eLearning Sources

1. https://www.geeksforgeeks.org/computer-fundamentals-tutorial

2. https://www.tutorialspoint.com/computer_programming/computer_programming_basic

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, the students will be able to	**Cognitive Levels (K-Level)**
CO1	recall the basics of computers	**K1**
CO2	demonstrate Structured Programming and its representation through using selection and repetition procedures.	**K2**
CO3	understand and apply modularization on data and represent it through DFD based on program modules.	**K3**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
1	**23UCS14FC01**			**Foundation Course:** Problem Solving Techniques						**2**	**1**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	2	2	2	3	2	2	2	2	**2.2**
CO2	3	2	3	2	2	2	3	2	3	2	**2.4**
CO3	2	3	2	2	2	2	2	3	2	3	**2.3**
										Mean Overall Score	**2.3 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23UHE14VE01	**Value Education - 1:** Essentials of Humanity	2	1

Course Objectives
To identify one's own potentials, strengths and weaknesses
To identify various challenges (physical, emotional, and social) in adolescence
To consciously overcome one's challenges and move towards self-esteem
To maximize one's own potential in enabling a holistic development
To assimilate human values comprehensively

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: Development of Human Personality **(6 Hours)**

Personality: Introduction, Theories, Integration & Factors influencing the development of personality - SEL Series - Discovering self - Defence 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 - Crimens against Women - Women rights - Time-line of Women achievements in India

Book for Study

1. Department of Human Excellence. (2021). *Essentials of Humanity.* St. Joseph's College.

Books for Reference

1. Xavier, A. (2012). *You Shall Overcome,* (6th Ed.). ICRDE Publication.
2. Alex, K. (2009). *Soft Skills.* S. Chand.
3. Kalam, A. A. P. J. (2012). *You Are Unique.* Punya Publishing.

Websites and eLearning Sources

1. http://livingvalues.net. Accessed 05 March 2021.
2. http://www.apa.org/topics/personality#. Accessed 05 March 2021.
3. http://www.peacecorps.gov/educators/resources/global-issues-gender-equaligy-and womens empowerment/. Accessed 05 March 2021.

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, the students will be able to	**Cognitive Levels (K-Level)**
CO1	recall the prescribed values and their dimensions.	**K1**
CO2	examine themselves by learning the developmental changes happening in the course of their lifetime.	**K2**
CO3	apply the trained values in the day-to-day life.	**K3**

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**							**Hours**	**Credits**
1	**23UHE14VE01**		**Value Education - 1:** Essentials of Humanity							**2**	**1**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	2	3	3	2	3	3	**2.8**
CO2	3	2	2	3	3	2	3	3	2	2	**2.5**
CO3	2	3	3	3	2	3	3	3	3	3	**2.8**
Mean Overall Score											**2.7 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23UEN14AE01	**Ability Enhancement Compulsory Course - 1:** Communicative English	6	3

Course Objectives
To recognize and identify the components of a formal letter.
To summarize the main points of a given letter and identify the intended meaning.
To use appropriate grammatical structures in context within their own writing.
To compare and contrast the elements of successful and unsuccessful letters.
To create well-structured letters with clear purpose and effectively evaluate and revise their own writing.

Basic Level

UNIT I **(18 Hours)**

1) A letter to avail college hostel
2) A requisition letter to provide fee concession
3) A requisition letter to provide Bonafide certificate
4) A letter to avail resources in college library
5) An On Duty Permission Letter
6) Nouns
7) Pronouns
8) Adjectives
9) Verbs
10) Adverbs

UNIT II **(18 Hours)**

11) A letter to provide conduct certificate
12) A letter to provide new ID card
13) A Permission letter for Name Correction in Mark sheet
14) A permission letter for Sports Events
15) A letter to avail permission for the Shepherd programme
16) Prepositions
17) Conjunctions
18) Articles
19) Conjugation of present form ‘Be’ verbs
20) Conjugation of past form ‘Be’ verbs

UNIT III **(18 Hours)**

21) A letter to avail the College Hostel
22) A permission letter to join the sport team
23) A request letter to access college Wi-Fi
24) A letter to vice principal requesting to change Elective course
25) A permission letter for project extension
26) Conjugation of future form ‘Be’ verbs
27) Conjugation of present continuous ‘Be’ verbs
28) Conjugation of Past continuous ‘Be’ verbs
29) Conjugation of Future continuous ‘Be’ verbs
30) Conjugation of Present Perfect ‘Be’ verbs

UNIT IV **(18 Hours)**

31) An apology letter to Dean for using mobile phone
32) A request letter to repair fan and tube light
33) A letter to invite Chief guest for Bibliophile Club meeting

34) A requisition Letter to issue the Transfer certificate
35) A permission letter for group exam coaching class
36) Conjugation of Past Perfect ‘Be’ verbs
37) Conjugation of Future Perfect ‘Be’ verbs
38) Conjugation of Present Perfect Continuous ‘Be’ verbs
39) Conjugation of Past Perfect Continuous ‘Be’ verbs
40) Conjugation of Future Perfect Continuous ‘Be’ verbs

UNIT V **(18 Hours)**

41) A letter seeking help to find the missing laptop
42) A letter to the editor regarding frequent power cut
43) A medical leave letter
44) A requesting OD Letter to issue invitation to other colleges
45) A requisition letter to change Shift
46) Conjugation of present form ‘Action’ verbs
47) Conjugation of past form ‘Action’ verbs
48) Conjugation of Present form ‘do verbs
49) Conjugation of Past form ‘do’ verbs
50) Conjugation of Future form ‘have’ verbs

Teaching Methodology	Chalk and Talk, discussion, Training

Book for Study

1. Jayapaul, V.L. (2023). *Begin to Learn English.* St. Joseph’s College (Autonomous), Tiruchirappalli.

Course Outcomes		
CO No.	**CO-Statements**	**Cognitive Levels (K - Level)**
	On successful completion of this course, students will be able to	
CO1	compose various types of letters (request, permission, and apology) demonstrating clarity, coherence, and correctness.	**K1**
CO2	exhibit a sound understanding of nouns, pronouns, adjectives, verbs, and adverbs, utilizing them accurately in written and spoken English.	**K2**
CO3	apply language skills in real-life college scenarios, gaining confidence in communicating effectively with peers, faculty, and administrative staff.	**K3**

Relationship Matrix											
Semester	**Course Code**	**Title of the Course**							**Hours**		**Credits**
1	**23UEN14AE01**	**Ability Enhancement Compulsory Course - 1:** Communicative English							**6**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	2	2	3	2	3	2	3	2	**2.4**
CO2	2	2	3	2	3	3	2	3	2	2	**2.3**
CO3	2	3	2	3	2	2	3	2	3	2	**2.4**
										Mean Overall Score	**2.37 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23UEN14AE01	**Ability Enhancement Compulsory Course - 1:** Communicative English	6	3

Course Objectives
To recognize and identify common punctuation marks and their usage in paragraphs.
To summarize the main topics introduced in a paragraph and demonstrate understanding.
To apply the learned concepts to construct paragraphs that convey ideas effectively.
To analyze paragraphs to identify the role of prefixes, suffixes, and noun types in enhancing meaning.
To synthesize information to create paragraphs, evaluate their own writing, and engage in role-playing scenarios to demonstrate understanding.

Intermediate Level

UNIT I **(18 Hours)**

1) Paragraph Punctuation
2) Introducing a Topic
3) Rhyming Words
4) Word Association
5) Going To
6) What Will Happen

UNIT II **(18 Hours)**

7) Every Drop Counts
8) Prefix
9) Suffix
10) Comprehending Characters
11) Complimenting & Thanking
12) Proper & Common Nouns

UNIT III **(18 Hours)**

13) Noun Substitution Table
14) A, Some
15) Visual Comprehension
16) Singular to Plural
17) Making & Responding
18) Pronoun Classification

UNIT IV **(18 Hours)**

19) Pronoun I, Me, He, Him, She, Her, We.
20) Singular to Plural
21) Responding
22) Pronoun Classification
23) Using Preposition of Movement
24) Preposition: Visual Talk

UNIT V **(18 Hours)**

25) Prepositional Phrases
26) Storytelling
27) Asking For Opinion
28) Using Things Creatively
29) Transition Sequencing
30) Role Play

Book for Study

1. Joy, J. L. (2020). *Learning to Communicate*. St. Joseph's College (Autonomous), Tiruchirappalli.

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	demonstrate proficiency in paragraph construction, rhyming words, and the use of prefixes and suffixes.	**K1**
CO2	apply advanced grammar rules, including proper/common nouns and pronoun usage, in both written and spoken communication.	**K2**
CO3	express opinions, compliments, and gratitude effectively, showcasing an enhanced ability to articulate thoughts and emotions.	**K3**

Relationship Matrix											
Semester	**Course Code**	**Title of the Course**							**Hours**		**Credits**
1	**23UEN14AE01**	**Ability Enhancement Compulsory Course - 1:** Communicative English							**6**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	2	2	3	2	3	2	3	2	**2.4**
CO2	2	2	3	2	3	3	2	3	2	2	**2.3**
CO3	2	3	2	3	2	2	3	2	3	2	**2.4**
										Mean Overall Score	**2.37 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
1	23UEN14AE01	**Ability Enhancement Compulsory Course - 1:** Communicative English	6	3

Course Objectives
To recognize and demonstrate basic self-introduction strategies.
To summarize information from listening and reading exercises, demonstrating understanding.
To apply learned concepts to construct essays, actively contribute to group discussions, and create coherent narratives.
To analyze reviews to understand how different elements contribute to a comprehensive evaluation.
To synthesize information to create compelling presentations, actively participate in debates, interviews, and assess their own communication proficiency.

Advance Level

UNIT I **(18 Hours)**

1) Self Introduction
2) Listening
3) Reading

UNIT II **(18 Hours)**

4) Essay Writing
5) Group Discussion
6) Story Building, Story Writing & Story Narration

UNIT III **(18 Hours)**

7) Book Review
8) Film Review

UNIT IV **(18 Hours)**

9) News Paper Reading and Analysis
10) Public speaking: Drafting and Speaking

UNIT V **(18 Hours)**

11) Debate
12) Interview Skills

Websites and eLearning Resources

1. https://ielts-up.com/listening/ielts-listening-practice.html
2. https://www.bestmytest.com/ielts/speaking
3. https://ielts-up.com/speaking/ielts-speaking-practice.html
4. https://learnenglishteens.britishcouncil.org/skills/writing/a2-writing/film-review

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	exhibit high-level language skills in self-introduction, listening, reading, and diverse writing tasks such as essay writing and storytelling.	**K1**
CO2	critically evaluate and analyze literature through book reviews, film reviews, and newspaper reading, demonstrating an ability to articulate informed opinions.	**K2**
CO3	showcase proficiency in public speaking, group discussions, debates, and interviews, reflecting a comprehensive mastery of advanced communication skills.	**K3**

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**						**Hours**		**Credits**
1	**23UEN14AE01**		**Ability Enhancement Compulsory Course - 1:** Communicative English						**6**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	2	2	3	2	3	2	3	2	**2.4**
CO2	2	2	3	2	3	3	2	3	2	2	**2.3**
CO3	2	3	2	3	2	2	3	2	3	2	**2.4**
Mean Overall Score											**2.37 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
2	23UTA21GL02	General Tamil - 2	4	3

கற்றலின் நோக்கங்கள்
தமிழ் இலக்கிய வரலாற்றை அறிதல்.
எழுத்து, சொல் இலக்கணங்களின் அடிப்படைகளைக் கண்டறிதல்.
அயலகக் கவிதை வடிவங்களை விளங்கிக் கொள்ளுதல்.
மொழிபெயர்ப்புக் கவிதைகளின் வாயிலாக மொழிபெயர்ப்புத் திறனை வளர்த்தெடுத்தல்.
போட்டித் தேர்வுகளை எதிர்கொள்வதற்கான இலக்கண அறிவு பெறுதல்.

அலகு – 1 **(12 மணிநேரம்)**

பாரதியார் கவிதைகள் – குயில்பாட்டு (குயில் தன் பூர்வ ஜென்மக் கதை உரைத்தல்)
பாரதிதாசன் கவிதைகள் – சஞ்சீவி பர்வதத்தின் சாரல்
நற்றமிழ்க்கோவை – முதல் மூன்று கட்டுரைகள்

அலகு - 2 **(12 மணிநேரம்)**

வெ.இராமலிங்கனார் – சொல், தமிழன் இதயம்
முடியரசனார் – உயிர் வெல்லமோ, மனத்தூய்மை
பெருஞ்சித்திரனார் – அஞ்சாதீர், மொழி,இனம்,நாடு
பட்டுக்கோட்டை கலியாண சுந்தரனார் – வருங்காலம் உண்டு, உழைக்காமல் சேர்க்கும் பணம்
இலக்கணம் – எழுத்து
இலக்கிய வரலாறு – புதுக்கவிதை, தமிழில் புதிய கவிதை வடிவங்கள்

அலகு–3 **(12 மணி நேரம்)**

சுரதா - நல்ல தீர்ப்பு
கண்ணதாசன் - ஒரு பானையின் கதை
அப்துல் ரகுமான்- வீடு
மேத்தா - ஒரேகுரல்
இலக்கிய வரலாறு – தமிழ்ச்சிறுகதைகள், இருபதாம் நூற்றாண்டு உரைநடை வளர்ச்சி
சிறுகதை – முதல் மூன்று சிறுகதைகள்

அலகு – 4 **(12 மணிநேரம்)**

அரசியல் கவிதைகள்

ஈரோடு தமிழன்பன்- அகல் விளக்காக இரு
ஆதவன் தீட்சண்யா– இன்னும் இருக்கும் சுவர்களின் பொருட்டு
சுகிர்தராணி– என் கண்மணியே இசைப்பிரியா
சக்தி ஜோதி – யுகாந்திர உறக்கம்
பழநி பாரதி- வெள்ளைக்காகிதம்
லிவிங்ஸ்மைல் வித்யா – நினைவில் பால்யம் அழுத்தம்
இலக்கணம் - சொல்

அலகு – 5 **(12 மணிநேரம்)**

அயலகக் கவிதைகள்

ஓசேரிசால் (தமிழில் நெய்தல்)- விடைகொடு என்தாய் மண்ணே
ஹைபுன் கவிதைகள்
சிறுகதை – நான்கு முதல் ஆறு சிறுகதைகள்
நற்றமிழ்க் கோவை – நான்கு முதல்ஆறு கட்டுரைகள்

கற்பித்தல் முறை (Teaching Methodology)	விரிவுரை (Lecture), காணொளிக் காட்சி (Videos), விளக்கக் காட்சி (PPT presentation)

பாடநூல்கள்

1. தமிழாய்வுத்துறை (2023). பொதுத்தமிழ் -2, தூய வளனார் தன்னாட்சிக் கல்லூரி.
2. தமிழாய்வுத்துறை (2021). நற்றமிழ்க் கோவை, தூய வளனார் தன்னாட்சிக் கல்லூரி.

Websites and eLearning Sources

1. https://www.chennailibrary.com/bharathiyar/kuyilpattu.html
2. www.tamildigitallibrary.in
3. https://eluthu.com/kavithai
4. https://podhutamizh.blogspot.com/2017/09/blog-post_42.html
5. https://thamizhsudar.com
6. https://ta.wikipedia.org/wiki

Course Outcomes		
CO No.	**CO-Statements** ***இப்பாடத்தின் நிறைவில் மாணவர்கள்***	**Cognitive Levels (K - Level)**
CO1	***தமிழ் இலக்கிய நூல்கள் பற்றிய அறிவைப் பெறுவர்.***	**K1**
CO2	***தமிழ் இலக்கண வளர்ச்சியைப் புரிந்து கொள்வர்.***	**K2**
CO3	***பிழையின்றி எழுதும் திறன் பெறுவதோடு கற்றல் திறனையும் வளர்த்துக்கொள்வர்.***	**K3**
CO4	***பிற கவிதை வடிவங்களைக் கையாளும் திறன் பெறுவர்.***	**K4**
CO5	***போட்டித் தேர்வுகளை எதிர்கொள்ளும் திறனைப் பெறுவர்.***	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
2	**23UTA21GL02**			General Tamil - 2						**4**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO 1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	1	2	2	3	3	3	2	3	2	**2.3**
CO2	2	1	2	2	2	3	2	2	2	2	**2.0**
CO3	2	1	2	2	3	3	3	2	3	2	**2.3**
CO4	1	2	1	2	2	3	2	2	3	2	**2.0**
CO5	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/Week	Credits
2	**23UFR21GL02**	French - 2	**4**	**3**

Course Objectives
To construct simple phrases with pronominal verbs
To apply the different types of articles
To understand the usage of pronouns
To analyse the French culture through French culinary art
To evaluate and compare the French fashion in current scenario

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 goûts 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: Où 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: Découvrez et Dégustez
- 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 de paiement
- 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 : connaître 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

Teaching Methodology	Chalk and talk, visual cues like flashcards, one to one conversation

Book for Study

1. Dauda, P., Giachino, L. & Baracco, C. (2016). *Generation A1*. Didier.

Books for Reference

1. Girardet, J. & Pecheur, J. (2017). *Echo A1*. CLE International, (2nd Ed.).
2. Mérieux, R. & Loiseau, Y. (2012). *Latitudes A1*. Didier.
3. Fournier, I. (2011). *Talk French.* Goyal Publishers.

Websites and eLearning Sources

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/

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	relate pronominal verbs in expressing one's day today activity	**K1**
CO2	compare the different types of articles – article partitif and contracte	**K2**
CO3	construct texts using pronouns – passages and dialogues	**K3**
CO4	discover the food habits of the French culture	**K4**
CO5	appraise the French fashion	**K5**

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**						**Hours**		**Credits**
2	**23UFR21GL02**		French - 2						**4**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	1	3	1	2	2	2	**2.2**
CO2	2	1	2	3	2	3	1	2	2	2	**2.0**
CO3	3	2	3	2	2	3	3	1	3	2	**2.4**
CO4	3	2	2	1	3	3	3	1	1	3	**2.2**
CO5	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/Week	Credits
2	23UHI21GL02	Hindi - 2	4	3

Course Objectives
To understand the basics of Hindi Language
To make the students to be familiar with the Hindi words
To enable the students to develop their effective communicative skills in Hindi
To introduce the socially relevant subjects in Modern Hindi Literature
To empower the students with globally employable soft skills

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
- Sandhi
- Letter Writing - Nagarpalika Ko Patra
- Bakthikal - Visheshathayem

Teaching Methodology	Peer Instruction Exercise, Videos, PPT, Quiz, Group Discussion

Books for Study

1. Viswanath Tripaty. (2018). *Kuchh Kahaniyan*, Rajkamal Prakashan Pvt. Ltd.
2. Kamathaprasad Gupth, M. (2020). *Hindi Vyakaran*. Anand Prakashan.
3. Sadananth Bosalae. (2020). *kavya sarang*, Rajkamal Prakashan.

Books for Reference

1. Acharya Ramchandra Shukla. (2021). *Hindi Sahitya Ka Itihas*. Prabhat Prakashan.
2. Krishnakumar, G. (2016). *Anuvad vigyan ki Bhumika*. Rajkamal Prakashan.
3. Aravind Kumar. (2019). *Sampoorna Hindi Vyakaran our Rachana*, Lucent publisher.
4. Lakshman Prasad Singh. (2017). *Kavya ke sopan*. Bharathy Bhavan Prakashan.

Websites and e-Learning Sources

1. https://hindigrammar.in/sandhi.html
2. https://www.successcds.net/class10/hindi/samas-in-hindi
3. https://mycoaching.in/kriya-ke-bhed-verb-in-hindi
4. https://namastesensei.in/adverb-in-hindi-examples/
5. https://viahindi.in/hindi-vyakaran/sandhi-paribhasha-prakar-or-udaharan

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, the student will be able to	**Cognitive Levels (K - Level)**
CO1	Find out the Terms & Expressions related to letter writing.	**K1**
CO2	Explain the works of Hindi writers.	**K2**
CO3	Complete the sentences in Hindi using basic grammar.	**K3**
CO4	Analyze the social & political conditions of Devotional period in Hindi Literature.	**K4**
CO5	Justify the human values stressed on the works of the following authors “Premchand, Nirala, etc.”.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**				**Hours**		**Credits**	
2	**23UHI21GL02**			**HINDI - 2**				**4**		**3**	
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	3	2	2	3	3	3	2	2	**2.5**
CO2	1	3	1	2	2	3	3	3	2	3	**2.3**
CO3	3	2	3	2	2	3	2	3	2	2	**2.4**
CO4	2	3	3	1	3	2	3	2	1	2	**2.2**
CO5	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/Week	Credits
2	23USA21GL02	Sanskrit - 2	4	3

Course Objectives
To bring out the salient aspects of classical Sanskrit poetry
To introduce court epics in Sanskrit
To train students in declensions of pronouns in Sanskrit
To coach the students in the conjugation patterns of verbs in Sanskrit
To offer coaching in morpho-phonemic rules and their applications in Sanskrit

UNIT I **(12 Hours)**

Asmathi usmath tat kim (MFN) sarvanaam asabdaha

UNIT II **(12 Hours)**

Sandhi Niyamaah Abhyaash (Guna , Visarga , Dirgha , Vrddhi)

UNIT III **(12 Hours)**

Lang lakaarah Kriyapadaani Prayoga Vivaranam

UNIT IV **(12 Hours)**

Raguvamsaha Pratama sargaha (1 -15 slokas)

UNIT V **(12 Hours)**

Suvacanani Vakya Prayoga Vivaranam

Teaching Methodology	Videos, PPT, Blackboard, Demonstration, Exercises

Books for Study

1. Saralasamkritham Skisha. (2021).
2. Dhaatu Manjari. (2021).

Books for Reference

1. Paindrapuram Ashram, Srirangam. (2019).
2. Vadhyar, R. S., & Sons, Book - Seller and Publishers. (2021).
3. Kulapthy, K. M. (2018). *Saral Sanskrit Balabodh*. Bharathiys Vidya Bhavan.

Websites and eLearning Sources

1. https://www.meritnation.com
2. https://www.aplustopper.com
3. https://mycoaching.in/lang-lakar
4. https://sanskritdocuments.org/sites/giirvaani/giirvaani/rv/sargas/01_rv.htm
5. https://resanskrit.com/blogs/blog-post/sanskrit-shlok-popular-quotes-meaning-hindi-english

Course Outcomes		
CO No.	CO-Statements On successful completion of this course, students will be able to	Cognitive Levels (K - Level)
CO1	Remembering names of different objects, remembering different verbal forms and sandhi	K1
CO2	Contrast different verbal forms Explain good sayings, Relate good saying to life.	K2
CO3	Apply and build small sentences	K3
CO4	Analyze different forms of Verbs and nouns	K4
CO5	Appreciate subhashitas and Sanskrit poetry	K5

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**							**Hours**	**Credits**
2	**23USA21GL02**		Sanskrit - 2							**4**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	1	3	2	2	2	3	3	2	1	**2.1**
CO2	3	2	3	2	2	3	2	3	3	2	**2.5**
CO3	2	2	3	2	2	2	2	3	3	1	**2.1**
CO4	3	2	3	3	1	2	3	3	3	1	**2.4**
CO5	3	2	2	2	3	2	2	3	3	1	**2.3**
									Mean Overall Score		**2.28 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
2	23UEN22GE02	General English - 2	5	3

Course Objectives
To develop an expanded and specialised vocabulary related to diverse themes such as education, entertainment, career, and society through activities like word grids, reading, and discussions.
To enhance problem-solving abilities through activities like debates, role-playing, and scenario analysis.
To enable students to express ideas with precision and clarity by practising different forms of expressing quality, comparison, and actions in various contexts.
To equip students with language skills relevant to professional settings.
To encourage students to explore language as a tool for creative expression and communication.

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
49. Emailing an Application
50. Mock Interview

UNIT V **(15 Hours)**

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

Teaching Methodology	Lecture Method, Use of ICT Tools and Interactive method

Book for Study

1. Joy, J.L. & Peter, F.M. (2014). *Let's Communicate 2*, Trinity Press.

Books for Reference

1. Ahrens, Sönke. (2017). *How to Take Smart Notes: One Simple Technique to Boost Writing, Learning and Thinking*. Create Space.
2. Aspinall, Tricia. (2002). *Test Your Listening.* Pearson.
3. Bailey, Stephen. (2004). *Academic Writing: A Practical Guide for Students*. Routledge.
4. Fitikides, T.J. (2002). *Common Mistakes in English*, (6th Ed.). Longman
5. Wainwright., Gordon. (2007). *How to Read Faster and Recall More: Learn the Art of Speed Reading with Maximum Recall*, (3rd Ed.). How to Books.

Websites and eLearning Sources

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

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	write paragraphs with apt punctuation marks	**K1**
CO2	discuss basic issues with friends, relatives and members of the family	**K2**
CO3	use polite expressions in appropriate ways	**K3**
CO4	evaluate the language and communication aspects of the topics	**K4**
CO5	create and produce various forms of communication, including professional documents like resumes and cover letters, debates	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
2	**23UEN22GE02**			**General English - 2**						**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	2	2	3	2	3	2	3	2	**2.4**
CO2	2	2	3	2	3	3	2	3	2	2	**2.3**
CO3	2	3	2	3	2	2	3	2	3	2	**2.4**
CO4	2	2	3	2	3	3	2	3	2	3	**2.5**
CO5	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/Week	Credits
2	23UCS23CC02	**Core Course - 2:** Object Oriented Programming with C++	4	3

Course Objectives
To make students understand the basic programming constructs of C++
To make the students know the concepts of class and objects
To solve the given application problems using constructor concepts
To learn and apply various forms of inheritance
To understand the file management, templates and exception handling

UNIT I: Object Oriented Programming **(12 Hours)**

Introduction- Concepts -Benefits -Applications of OOP. Structure-Compiling and linking of C++ program. Functions: Function prototyping -Inline functions - Default arguments - Const Argument - Function Overloading

UNIT II: Classes and Objects **(12 Hours)**

Specifying a class-Member functions- Private Member functions -Arrays within a class - Static Data Members -Static Member Functions -Array of objects -Object as function arguments -Friendly Functions-Returning objects.

UNIT III: Constructors and Destructors **(12 Hours)**

Constructors - Parameterized Constructors - Multiple Constructors in a class - Constructors with default arguments -Dynamic Initialization of Object - Copy Constructor - Dynamic Constructors- Destructors - Operator Overloading: Defining Operator Overloading - Overloading unary and binary Operator - Overloading binary operators using friend functions.

UNIT IV: Inheritance **(12 Hours)**

Introduction - Defining Derived Classes - single Inheritance - Multilevel Inheritance - Multiple Inheritance - Hybrid Inheritance -Virtual base classes - abstract classes

UNIT V: Files and Exception Handling **(12 Hours)**

C++ stream classes - Unformatted I/O Operations -Formatted Console I/O operations - Files: Introduction - Classes for file Streams- Opening and Closing a File - File Modes - File Pointers and their Manipulations - Sequential Input and Output Operations - Command Line Arguments -Templates: Class Templates -Function Templates-Exception Handling

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions

Book for Study

1. Balagurusamy, E. (2016). *Object Oriented Programming with C++* (6th Ed.). Tata McGraw-Hill.

   Unit-I *Chapter 1*: 1.5, 1.6, 1. 8, *Chapter 2:* 2.6, 2.8, *Chapter 4:* 4.3, 4.6, 4.7, 4.8, 4.10
   Unit-II *Chapter 5:* 5.3, 5.4, 5.8, 5.9, 5.11 -5.16
   Unit-III *Chapter 6:* 6.2 -6.8, 6.11, *Chapter 7:* 7.2 -7.5
   Unit-IV *Chapter 8:* 8.1 -8.3, 8.5, 8.6, 8.9, 8.10
   Unit-V *Chapter 10:* 10.3 -10.5, Chapter *11:* 11.1 -11.3, 11.5 -11.7, 11.10, *Chapter 12:* 12.2, 12.4, Chapter *13*.

Books for Reference

1. Lafore, R. (2012). *Object-Oriented Programming in C++*. (4th Ed.). Pearson Education, Ninth Impression.
2. Stroustrup, B. (2012). *The C++ Programming Language.* (3rd Ed.). Pearson Education and Dorling Kindersley, Tenth Impression.
3. Schildt, H. (2009). *The Complete Reference C++*. (4th Ed.). Tata McGraw-Hill, 25th Reprint

Websites and eLearning Sources

1. https://www.programiz.com/cpp-programming
2. https://www.simplilearn.com/tutorials/cpp-tutorial/oops-concepts-in-cpp
3. https://www.w3schools.com/cpp/cpp_oop.asp
4. https://www.geeksforgeeks.org/object-oriented-programming-in-cpp
5. https://www.javatpoint.com/cpp-oops-concepts

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K- Level)**
CO1	define and understand the basic concepts in C++ Programming.	**K1**
CO2	explain and execute C++ programs to explore the concepts of classes and objects.	**K2**
CO3	apply the skills to write the C++ code using constructors and operator overloading.	**K3**
CO4	analyze the concepts of OOPS such as Inheritance, Virtual base class and Abstract class	**K4**
CO5	discover the concept of streams, file management, Template and Exception handling in C++	**K5**

Relationship Matrix											
Semester	**Course Code**	**Title of the Course**								**Hours**	**Credits**
2	**23UCS23CC02**	**Core Course - 2:** Object Oriented Programming with C++								**4**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	2	2	2	3	2	2	3	2	**2.3**
CO2	3	3	2	2	2	3	3	1	1	2	**2.2**
CO3	2	3	2	3	3	2	3	3	2	2	**2.5**
CO4	2	2	2	2	3	2	3	3	2	3	**2.4**
CO5	2	2	3	2	3	3	3	2	3	2	**2.5**
Mean Overall Score											**2.38 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
2	23UCS23CC03	**Core Course - 3:** Data Structures and Algorithms	4	3

Course Objectives
To comprehend the fundamental concepts of data structures, including arrays, linked lists, stacks, and queues
To apply stack operations for the evaluation of arithmetic expressions
To implement binary tree traversal algorithms
To use the various sorting and searching algorithms
To learn the basic steps of algorithm design and various algorithm design methods

UNIT I: Arrays and Linked Lists **(12 Hours)**

Arrays: Definition - Terminology - One dimensional array - multi dimensional arrays. Linked lists: Definition - Circular linked lists - Double linked lists - Circular double linked lists

UNIT II: Stacks and Queues **(12 Hours)**

Stacks: Definition - Representation of a Stack - operations on Stacks - Evaluation of Arithmetic expressions. Queues: Definition -Representation of Queues - Various Queue structures.

UNIT III: Tree Traversals **(12 Hours)**

Trees: Basic terminologies - Definition and concepts - Representation of Binary tree - Binary tree traversals.

UNIT IV: Searching and Sorting **(12 Hours)**

Computer Sorting: Terminologies -Techniques -Bubble sort -Insertion sort -Quick sort -Radix sort - Searching -Terminologies - Linear search with arrays -Binary Search.

UNIT V: Hill Climbing and Backtracking **(12 Hours)**

Algorithms - Basic Steps. Algorithm Design Methods: Sub goals - Hill Climbing - Working Backward - Heuristics - Backtrack Programming -Recursion.

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions

Books for Study

1. Samanta, D. (2009). *Classic Data Structures*. (2nd Ed.). PHI Learning Pvt. Ltd.
2. Goodman, S.E, & Hedetniemi, S.T. (1988). *Introduction to the Design and Analysis of Algorithms*. McGraw-Hill, International edition.

Books for Reference

1. Horowitz, E. & Sahni, S. (1985). *Fundamentals of Data Structures*. Galgotia Publications.
2. Tanenbaum, A.M. & Augustein, M.J. (1985). *Data structures with Pascal*. Prentice Hall of India Ltd.

Websites and eLearning Sources

1. https://www.geeksforgeeks.org/data-structures/
2. https://www.codechef.com/certification/data-structures-and-algorithms/prepare
3. https://www.coursera.org/learn/database-structures-and-management-with-mysql
4. https://www.shiksha.com/online-courses/database-structures-and-management-with-mysql-course-courl5214

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	gain a thorough understanding of and practical experience in using arrays, linked lists, stacks, and queues.	**K1**
CO2	extend the operations of stack and queue.	**K2**
CO3	learn how to build, represent, and conduct traversals on binary trees.	**K3**
CO4	analyze and apply sorting techniques and searching algorithms.	**K4**
CO5	acquire the skills to develop problem-solving plans using data structures and algorithms.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
2	**23UCS23CC03**			**Core Course - 3:** Data Structures and Algorithms						**4**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	1	2	3	3	2	1	2	**2.2**
CO2	3	3	2	2	2	3	3	3	2	2	**2.5**
CO3	2	3	3	2	2	2	3	3	2	2	**2.4**
CO4	3	3	3	1	3	3	3	3	1	2	**2.5**
CO5	2	3	3	2	2	2	3	3	2	1	**2.4**
										Mean Overall Score	**2.4 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
2	**23UCS23CP02**	**Core Practical - 2:** C++ and Data Structures	**3**	**2**

List of Exercises

1. Classes and Objects
2. Constructors
3. Inheritance
4. Function Overriding and Overloading
5. Operations on array
6. Operations on stack
7. Convert Infix to Postfix and evaluate Postfix using Stack class
8. Operations on Queue
9. Operations on Singly linked list
10. Binary Tree Creation and Traversals
11. Analyze Bubble Sort with number of passes, comparisons and data moves
12. Linear and Binary Search

Semester	Course Code	Title of the Course	Hours/Week	Credits
2	23UCS23AC02	**Allied Course - 2:** Statistical Methods	6	4

Course Objectives
To make students understand the concepts of probability, statistical measures and theoretical Distributions.
To apply probability and statistical measures concepts in real life problems.
To impart knowledge on coefficient of skewness and coefficient of correlation.
To interpret the relationship between variables.
To apply the theoretical distributions and discuss the expected results in real life problems.

UNIT I: Measures of Central Tendency (average) **(18 Hours)**

Arithmetic mean: Discrete series, Continuous series - Open end classes - Median: Discrete series, Continuous series - Quartiles - Mode: Discrete series, Continuous series

UNIT II: Dispersion and skewness **(18 Hours)**

Concept of Variation - Methods of Measuring Dispersion: Range, Inter quartile range, Mean deviation, Standard deviation - Mean deviation: Individual series, Discrete series, Continuous series - Standard deviation: Individual series, Discrete series, Continuous series - Coefficient of variation - Skewness - Relative measure of skewness: Karl Pearson's coefficient of skewness

UNIT III: Correlation and regression **(18 Hours)**

Correlation - Properties of coefficient of correlation - Karl Pearson's coefficient of correlation - Rank correlation coefficient - Regression: Regression of Y on X - Deviation taken from arithmetic mean of X on Y - Deviation Taken from assumed mean.

UNIT IV: Probability **(18 Hours)**

Mathematical Preliminaries - Permutation and Combination - Measurement of Probability - Bayes Theorem.

UNIT V: Theoretical distribution **(18 Hours)**

Binominal distribution: Properties of Binominal distribution - Fitting a Binominal distribution - Poisson distribution: Fitting a Poisson distribution - Normal distribution.

Note: No derivations problems only.

Teaching Methodology	Chalk and Talk method, Problem solving

Book for Study

1. Pillai, R. S. N. & Bagavathi. (2009). *Statistics Theory and Practice*. (7th Ed.). S. Chand and Company Ltd.
   - **Unit I:** Chapter *9 (Pages 125-134,136-139,145-154,156-159, 166-172).*
   - **Unit II:** *Chapter 10 (Pages 241-268, 278-290), Chapter 11 (Pages 338-347)*
   - **Unit III:** *Chapter 12 (Pages 396-410,415-420), Chapter 13 (Pages 465-480)*
   - **Unit IV:** *Chapter 18 (Pages 726-759)*
   - **Unit V:** *Chapter 19 (Pages 769-800)*

Books for Reference

1. Gupta, S. C. & Kapoor, V. K. (2002). *Fundamentals of Mathematical Statistics.* (11th Ed.). Sultan Chand & Sons.
2. Gupta, S. P. (2005). *Statistical method.* (33rd Ed.). Sultan Chand & Sons.

3. Vittal, P. R. (2004). *Mathematical Statistics.* Margham Publications.
4. Kapur, J. N. & Saxena, H. C. (2010). *Mathematical Statistics.*, (20th Ed.). S. Chand & Co Ltd.

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	acquire knowledge of probability and statistical methods, theoretical distributions.	**K1**
CO2	understand the fundamental concepts of measures of central tendency, dispersion, correlation and theoretical distributions	**K2**
CO3	construct appropriate mathematical model to solve a variety of practical problems.	**K3**
CO4	accurate and efficient use of different methods such as measures of central tendency, dispersion, correlation and theoretical distributions	**K4**
CO5	demonstrate the competency in solving problems related to probability and statistics.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**		**Credits**
2	**23UCS23AC02**			**Allied Course - 2:** Statistical Methods					**6**		**4**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	2	2	1	3	3	2	2	3	**2.2**
CO2	2	3	2	1	2	3	3	2	2	3	**2.3**
CO3	1	2	3	2	3	2	3	2	3	2	**2.3**
CO4	1	2	2	3	1	2	3	2	2	3	**2.1**
CO5	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/Week	Credits
2	23UHE24VE02	**Value Education - 2:** Fundamentals of Human Rights	2	1

Course Objectives
To sensitize students about various human rights and their importance
To empower them with the right understanding of human rights
To enable them to understand the Fundamental rights and the duties in the constitution of India
To help them comprehend the background, principles and the articles of UDHR
To make them involved in activities to defend human rights

UNIT I: Human Rights - An Introduction **(6 Hours)**

Introduction- Classification of Human Rights- Scope of Human Rights-Characteristics of Human Rights - Challenges for Human Rights in the 21st Century.

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- Preamble to Indian Constitution - 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 - NHRC - SHRC.

Teaching Methodology	Chalk and Talk, Power point, Handouts and Group discussion

Book for Study

1. Department of Human Excellence, (2021). *Techniques of Social Analysis: Fundamentals of Human Rights.*

Books for Reference

1. Venkatachalem. (2005). *The Constitution of India, Giri Law House.*
2. Naik, V. & Shany, M. (2011). *Human rights education and training*, Crescent Publishing Corporation.
3. Neera, B. (2011). *Human Rights Content and Extent.* Swastika Publications.

Websites and eLearning Sources

1. https://www.un.org/en/universal-declaration-human-rights/
2. https://www.ilo.org/global/lang--en/
3. https://www.amnesty.org/en/

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	Identify the importance and the values of human rights	**K1**
CO2	Understand the historical background and the development of Human Rights and the related organizations	**K2**
CO3	Apply the provisions of National and International human rights to themselves and the society	**K3**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**	**Credits**	
2	**23UHE24VE02**			**Value Education - 2:** Fundamentals of Human Rights					**2**	**1**	
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO 2**	**PSO3**	**PSO 4**	**PSO5**	
CO1	3	2	1	2	2	3	2	2	2	2	**2.1**
CO2	3	2	1	2	2	3	2	2	2	2	**2.1**
CO3	3	2	2	2	2	2	3	2	1	2	**2.1**
Mean Overall Score											**2.1 (Medium)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
2	23UHE24AE01	**Ability Enhancement Compulsory Course - 2:** Environmental Studies	2	1

Course Objectives
To enable students connect themselves with nature
To Impart knowledge of the concept of Biodiversity
To create awareness of the causes and consequences of various pollution
To help them recognize the available natural resources and the need to sustain them
To enable them to Identify the environmental problems and offer alternatives by making interventions both individually and collectively

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 - Issues deals with Population growth.

Teaching Methodology	Chalk and Talk, Power point and Field visit

Book for Study

1. Department of Human Excellence, (2021). *Environmental Studies.*

Books for Reference

1. Rathor, V.S. & Rathor B. S. (2013). *Management of Natural Resources for Sustainable Development*. Daya Publishing House.
2. Sharma P.D. (2010). *Ecology and Environment*, (8th Ed.). Rastogi Publications.
3. Agrawal, A & Gibson, C.C. (2001). *Introduction: The Role of Community in Natural Resource Conservation.* Rutgers University Press.

Websites and eLearning Sources

1. https://www.unep.org/
2. http://moef.gov.in/en/
3. https://www.ipcc.ch/reports/

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	Identify the concepts related to global ecology and the environment	**K1**
CO2	Comprehend the natural resources and environmental organizations	**K2**
CO3	Apply the acquired knowledge to sensitize individuals and public about the environmental crisis	**K3**

Relationship Matrix											
Semester	**Course Code**	**Title of the Course**								**Hours**	**Credits**
2	**23UHE24AE01**	**Ability Enhancement Compulsory Course - 2:** Environmental Studies								**2**	**1**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO 4**	**PSO 5**	
CO1	3	2	1	2	2	3	2	2	2	2	**2.1**
CO2	3	2	1	2	2	3	2	2	2	2	**2.1**
CO3	3	2	2	2	2	2	3	2	1	2	**2.1**
Mean Overall Score											**2.1 (Medium)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
3	23UTA31GL03	General Tamil - 3	4	3

கற்றலின் நோக்கங்கள்
தனிப்பாடல்களின் பாடற்பொருளை அறிதல்
சிற்றிலக்கியங்களின் வகைகளையும் வகைமைகளையும் அறிதல்
இடைக்காலப் புலவர்களின் பங்களிப்பை உணர்தல்
சிற்றிலக்கியங்களின் பாடுபொருள், தனித்தன்மை, மரபு ஆகியவற்றை அறிதல்
சிற்றிலக்கியங்கள்வழி தமிழின் வளர்ச்சி நிலையை அறிதல்

அலகு – 1 **(12 மணி நேரம்)**

ஔவையார்
காவிரியே தார்வேந்தன் (16) **கற்றது கைமண்ணளவு** (39) **மதியாதார் முற்றம்** (42)
இனியது கேட்கின் (55) **தாயொடு அறுசுவை** (64)
காளமேகப் புலவர் -
நஞ்சிருக்குத் தோலுரிக்கு நாதர்முடி(4) **ஓடுஞ் சுழிசுத்த முண்டமாகும்** (16)
அடிநந்தி சேர்தலால் ஆகம் (22) **செருப்புக்கு வீரரைச் சென்றுழக்கும்** (52)
துதிவாணி வீரம் (80)
இராமச்சந்திர கவிராயர் – **வஞ்சகர்பா னடந்தலைந்த** - 19
பொற்களந்தைப் படிக்காசுத் தம்பிரான் – **குட்டுதற்கோபிள்ளைப் பாண்டிய** - 21
தமிழ்விடுதூது,- கண்ணிகள் 19 **முதல்** 62 **வரை**
கலிங்கத்துப்பரணி -**தேவியைப் பரவியது, பாடல்** 121 **முதல்** 134 **வரை**

அலகு - 2 **(12 மணி நேரம்)**

முக்கூடற்பள்ளு –நாட்டுப்படலம் பாடல்கள் 19 –முதல் 27 வரை
முத்துகுமாரசாமி பிள்ளைத்தமிழ் – அம்புலிப்பருவம் முதல் 5 பாடல்கள்
அறிஞர் அண்ணா – வேலைக்காரி நாடகம்

அலகு - 3 **(12 மணி நேரம்)**

திருக்குற்றாலக்குறவஞ்சி – மலைவளம் (6 பாடல்கள்)
இலக்கியவரலாறு – சிற்றிலக்கியங்கள்
நற்றமிழ்க்கோவை கட்டுரைகள் 7, 8, 9

அலகு - 4 **(12 மணி நேரம்)**

தாயுமானவர் திருப்பாடல்கள் – பராபரக்கண்ணி 7 முதல் 30 வரை உள்ள கண்ணிகள்
இலக்கணம் – அணிகள்
குணங்குடி மஸ்தான் சாகிபு – குறை இரங்கி உரைத்தல் – 7 பாடல்கள்

அலகு – 5 **(12 மணி நேரம்)**

திருவருட்பா – திருக்கதவம் திறத்தல்
இலக்கிய வரலாறு – இடைக்காலப் புலவர்கள், நாடகத்தமிழ்
நற்றமிழ்க்கோவை -கட்டுரைகள் – 10, 11, 12

கற்பித்தல் முறை	**விரிவுரை** (Lecture), **காணொளிக் காட்சி** (Videos), **விளக்கக் காட்சி** (PPT presentation)

பாட நூல்கள்

1. தமிழாய்வுத்துறை (2023), பொதுத்தமிழ்-3, தூய வளனார் கல்லூரி
2. தமிழாய்வுத்துறை (2021), நற்றமிழ்க்கோவை, தூய வளனார் கல்லூரி

பார்வை நூல்கள்

1. செயராமன் ந.வீ. (1967),சிற்றிலக்கியச் செல்வம், மணிவாசகர் பதிப்பகம்
2. பொன்னுசாமி (2023), சிற்றிலக்கிய வரலாறு, இரண்டு தொகுதிகள்,பாரிநிலையம்
3. சண்முகம் பிள்ளை மு. (2022), சிற்றிலக்கிய வகைகள், மணிவாசகர் பதிப்பகம்

Websites and eLearning Sources

1. https://ta.wikipedia.org/wiki/
2. https://www.britannica.com/science/Siddha-medicine
3. https://nischennai.org/main/siddha-medicine/

4. https://tamil.hindustantimes.com/
5. https://www.tamiluniversity.ac.in/english/library2-/digital-library/
6. https://www.tamilelibrary.org/
7. www.projectmadurai.or
8. http://www.tamilvu.org/ta/library-libcontnt-273141
9. https://www.tamildigitallibrary.in/
10. https://noolaham.org/

Course Outcomes		
CO No.	**CO-Statements** ***இப்பாடத்தின் நிறைவில் மாணவர்கள்***	**Cognitive Levels (K - Level)**
CO1	***இடைக்காலப் புலவர்களின் பாட்டுதிதிறனை அறிந்து கொள்வர்***	**K1**
CO2	***சிற்றிலக்கிய வகைகளையும் வகைமைகளையும் அறிந்து கொள்வர்***	**K2**
CO3	***பள்ளு, பரணி, பிள்ளைத்தமிழ், குறவஞ்சி போன்ற இலக்கியங்கள் வழி வீரம், பக்தி, காதல் உணர்வை அறிந்து கொள்வர்***	**K3**
CO4	***சிற்றிலக்கியங்களின்அமைப்பு பாட்டு வடிவங்களை அறிந்து கொள்வர்***	**K4**
CO5	***இடைக்காலத் தமிழ் வளர்ச்சி நிலையை அறிந்து கொள்வர்***	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**	**Credits**	
3	**23UTA31GL03**			General Tamil - 3					**4**	**3**	
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	2	3	2	3	2	3	3	2	**2.5**
CO2	2	2	2	3	3	2	2	3	3	2	**2.4**
CO3	3	3	2	3	3	2	2	3	3	3	**2.7**
CO4	3	2	2	3	2	3	2	3	2	3	**2.5**
CO5	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/Week	Credits
3	23UFR31GL03	French - 3	4	3

Course Objectives
To analyse the French clothing with respect to its culture
To apply prepositions and understand its usages
To analyse a contemporary text in present tense
To evaluate the French festivals and compare with their own cultural context
To apply the past tense using simple conversation

UNIT I **(12 Hours)**

- TITRE: Vivre la ville
- 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 connaître, 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: Félicitations! / 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

Teaching Methodology	PPT Presentation, Seminar, Video Assignments

Book for Study

1. Dauda, P., Giachino, L., & Baracco, C. (2016). *Generation A1*. Didier.

Books for Reference

1. Girardet, J., & Pecheur, J. (2017). *Echo A1*. (2nd Ed.). CLE International.
2. Mérieux, R., & Loiseau, Y. (2012). *Latitudes A1*. Didier.
3. Fournier, I. (2011). *Talk French.* Goyal Publishers.

Websites and eLearning Sources

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

Course Outcomes		
CO No.	**CO-Statements**	**Cognitive Levels (K - Level)**
	On successful completion of this course, students will be able to	
CO1	Relate colours, materials and shapes to the french clothing.	**K1**
CO2	Select appropriate prepositions in giving directions.	**K2**
CO3	construct a text in present tense using different verbs.	**K3**
CO4	examine the travel manners and celebrations of the French.	**K4**
CO5	justify the usage of past tense in a biography.	**K5**

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**						**Hours**		**Credits**
3	**23UFR31GL03**		French - 3						**4**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	1	2	2	3	2	3	1	2	3	**2.1**
CO2	3	2	3	3	1	2	1	2	2	3	**2.2**
CO3	2	1	3	2	2	3	1	3	2	2	**2.1**
CO4	3	1	3	2	3	3	3	1	2	3	**2.4**
CO5	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/Week	Credits
3	23UHI31GL03	Hindi - 3	4	3

Course Objectives
To appreciate the features of Modern Hindi Prose
To understand the Hindi literature in association with the contemporary requirements
To enable the students to develop their effective communicative skills in Hindi
To strengthen the language competence among the students
To empower the students with globally employable soft skills

UNIT I **(12 Hours)**

- Tera Sneh Na Khooon
- Samband Bodak
- Reethikal - Namakarn
- Tense

UNIT II **(12 Hours)**

- Himadri Thung Sring Se
- Paribakshik Shabdavali
- Smuchaya 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
- Bahoo Ki Vidha (One Act Play)

Teaching Methodology	Videos, PPT, Quiz, Group Discussion, Case Based Problem Solving

Books for Study

1. Jain, S.K. (2019). *Anuwad: Siddhant Evam Vyavhar*. Kailash Pustak Sadan.
2. Gupth, K. M. (2020). *Hindi Vyakaran*, Anand Prakashan.
3. Bosalae, S. (2020). *kavya sarang*. Rajkamal Prakashan.

Books for Reference

1. Ramdev. (2016). *Vyakaran Pradeep*. Hindi Bhavan.
2. Singh, L.P. (2017). *Kavya Ke Sopan*. Bharathy Bhavan Prakashan.

3. Shukla, A.R. (2021). *Hindi Sahitya Ka Itihas*, Prabhat Prakashan.
4. Gosamy, K. (2016). *Anuvad vigyan ki Bhumika*. Rajkamal Prakashan.

Websites and eLearning Sources

1. https://www.hindwi.org/poets/jaishankar-prasad/all
2. https://youtu.be/e9wK-pYfVPc
3. https://www.amarujala.com/kavya/sahitya/sumitranandan-pant-best-hindi-poems
4. https://mycoaching.in/samuchchay-bodhak-kya-hai
5. https://www.subhshiv.in/2021/06/avikari-shabd.html

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, the student will able to	**Cognitive Levels (K - Level)**
CO1	find out the dialects of Hindi language.	**K1**
CO2	compare the poems of Sumithra Nandanpanth, Prasad & Bachan in Context with their experience of life.	**K2**
CO3	illustrate the importance given to family ethics by the youth in the modern period according to “Bahoo Ki vidha” One Act play.	**K3**
CO4	categorize the poetics in some selective poems.	**K4**
CO5	justify the social & political conditions of Devotional period in Hindi Literature.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**				**Hours**			**Credits**
3	**23UHI31GL03**			Hindi - 3				**4**			**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	3	3	2	3	2	1	3	2	**2.4**
CO2	3	2	3	2	2	3	2	3	2	3	**2.5**
CO3	3	2	2	3	1	3	2	3	2	3	**2.4**
CO4	2	3	3	2	3	2	3	3	2	1	**2.4**
CO5	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/Week	Credits
3	23USA31GL03	Sanskrit - 3	4	3

Course Objectives
To introduce simple poetry in Sanskrit
To give an exposure to the Vedas and Vedangas
To acquaint students with epics and puranas
To train students in conjugation of verbs in future tense
To introduce Upasarga-s and their role in verb formations

UNIT I **(12 Hours)**

Ramodantam , Balakandam (1-15 verses)

UNIT II **(12 Hours)**

Ramodantam, Balakandam (15-30 verses)

UNIT III **(12 Hours)**

Vedas - Vedangas vivaranam

UNIT IV **(12 Hours)**

Asta dasha Purana and Dashopanishads

UNIT V **(12 Hours)**

Upasargas and Bhavishyat Kaalah Vakya Prayoga

Teaching Methodology	Videos, PPT, Blackboard, Demonstration, Exercises

Books for Study

1. Vedic literature
2. Ramodantam

Books for Reference

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

Websites and eLearning Sources

1. https://www.scribd.com/doc/210917188/Sri-Ramodantam-Sanskrit-Text-With-English-Translation
2. http://www.sushmajee.com/ms-ppp/text/ved-notes.pdf
3. https://occr.org.in/publication/Vedanga.pdf
4. https://www.forgottenbooks.com/en/download/TheThirteenPrincipalUpanishadsTranslatedFromtheSanskrit_10017247.pdf
5. https://www.learnsanskrit.org/guide/uninflected-words/the-upasarga/

Course Outcomes		
CO No.	CO-Statements On successful completion of this course, students will be able to	Cognitive Levels (K - Level)
CO1	Remember Characters and events of Ramayana	K1
CO2	Understand social ethics and moral duties.	K2
CO3	Apply the values learnt, in day to day life	K3
CO4	Appreciate the Vedic Philosophy	K4
CO5	Evaluate and create new words with upasargas	K5

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**						**Hours**		**Credits**
3	**23USA31GL03**		Sanskrit - 3						**4**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	1	2	2	3	3	3	3	3	2	1	2.3
CO2	3	3	2	3	3	2	2	3	3	3	2.7
CO3	3	3	1	3	3	1	1	3	3	3	2.4
CO4	2	2	1	2	3	2	2	3	2	1	2.0
CO5	3	3	2	3	2	2	3	3	3	2	2.6
										Mean Overall Score	**2.4 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
3	23UEN32GE03	General English - 3	5	3

Course Objectives
To develop strategies to enhance reading skills through teacher-led practices, promoting comprehension, critical analysis, and creative engagement with various genres.
To strengthen informal and formal letter writing skills.
To analyze and appreciate different literary forms, including anecdotes, biographies, poems, and prose, fostering critical thinking and creative expression.
To practice applying grammatical structures, including the simple future and future continuous tenses, in writing tasks.
To engage in critical discussions through reading and writing about societal issues.

UNIT I: Suggestions to Develop Your Reading Habit **(13 Hours)**

1.0 Introduction
1.1 Objectives
1.2 Listening and Reading Skills through Teacher-led Reading Practice
1.3 Glossary
1.3.1 Words
1.3.2 Phrases
1.4 Reading Comprehension
1.5 Critical Analysis
1.6 Creative Task
1.7 General Writing Skill: Letter Writing: Informal
1.8 Grammar: Simple Present Tense

UNIT II: The Secret of Success: An Anecdote **(13 Hours)**

1.9 Introduction
2.0 Objectives
2.1 Listening and Reading Skills through Teacher-led Reading Practice
2.2 Glossary
2.3.1 Words
2.3.2 Phrases
2.4 Reading Comprehension
2.5 Critical Analysis
2.6 Creative Task
2.7 General Writing Skills: Letter Writing: Formal
2.8 Grammar: Present Continuous Tense

UNIT III: The Impact of Liquor Consumption on the Society **(13 Hours)**

2.9 Introduction
3.0 Objectives
3.1 Listening and Reading Skills through Teacher-led Reading Practice
3.2 Glossary
3.3.1 Words
3.3.2 Phrases
3.4 Reading Comprehension
3.5 Critical Analysis
3.6 Creative Task
3.7 General Writing Skills: Letter to Newspaper
3.8 Grammar: Simple Past Tense

UNIT IV: Dr. A.P.J. Abdul Kalam: A Short Biography **(12 Hours)**

3.9 Introduction
4.0 Objectives
4.1 Listening and Reading Skills through Teacher-led Reading Practice
4.2 Glossary
4.3.1 Words
4.3.2 Phrases
4.4 Reading Comprehension
4.5 Critical Analysis
4.6 Creative Task
4.7 General Writing Skill: Write a letter applying for a job
4.8 Grammar: Past Continuous Tense

UNIT V: Golden Rule: A Poem **(12 Hours)**

4.9 Introduction
5.0 Objectives
5.1 Listening and Reading Skills through Teacher-led Reading Practice
5.2 Glossary
5.3.1 Words
5.3.2 Phrases
5.4 Reading Comprehension
5.5 Critical Analysis
5.6 Creative Task
5.7 Grammar: Simple Future Tense
5.8 General Writing Skill: Circular-Writing

UNIT VI: Hygiene **(12 Hours)**

5.9 Introduction
6.0 Objectives
6.1 Listening and Reading Skills through Teacher-led Reading Practice
6.2 Glossary
6.3.1 Words
6.3.2 Phrases
6.4 Reading Comprehension
6.5 Critical Analysis
6.6 Creative Task
6.7 General Writing Skill: Writing an Agenda for a Meeting
6.8 Grammar: Future Continuous Tense

Teaching Methodology	Lecture Method, Use of ICT Tools and Interactive method

Book for Study

1. Jayraj., & Arul, S.J. et al. (2016). *Trend-Setter*: *An Interactive General English Textbook for Undergraduate Students*. Trinity.

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	recall and explain the fundamental components of English language and grammar.	**K1**
CO2	demonstrate their understanding of various texts by summarizing, paraphrasing, and interpreting the contents.	**K2**
CO3	apply their language and comprehension skills to create written communication.	**K3**
CO4	critically analyze the texts presented in the course.	**K4**
CO5	synthesize the language and grammar knowledge to compose creative tasks	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
3	**23UEN32GE03**			General English - 3						**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	2	2	3	2	3	2	3	2	**2.4**
CO2	2	2	3	2	3	3	2	3	2	2	**2.3**
CO3	2	3	2	3	2	2	3	2	3	2	**2.4**
CO4	2	2	3	2	3	3	2	3	2	3	**2.5**
CO5	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/Week	Credits
3	23UCS33CC04	**Core Course - 4:** Discrete Mathematics	5	4

Course Objectives
To gain proficiency in set theory and its operations
To explore algebraic structures such as lattices and Boolean algebra.
To understand logical connectives, duality law and normal forms in logic.
To Understand Fundamental Concepts of Graph Theory.
To impart knowledge on Trees and Graph Theoretic algorithms.

UNIT I: Set Theory **(15 Hours)**

Basic concepts of set theory - notation - inclusion and equality - power set - operations - Venn Diagrams - identifiers - Cartesian products - relations and ordering - functions - composition - inverse- binary and n-ary operations.

UNIT II: Lattices and Boolean Algebra **(15 Hours)**

Lattices as partially ordered sets: Definition - properties - special lattices: complete, complemented, distributive lattices - Boolean Algebra - properties of Boolean algebra.

UNIT III: Mathematical Logic **(15 Hours)**

Statements and notation - connectives - Well-formed formulas - tautologies - equivalence of formulas - duality law - Normal Forms: Disjunctive Normal Forms - Conjunctive Normal Forms- Principal Disjunctive-Principal Conjunctive Normal Forms.

UNIT IV: Graph **(15 Hours)**

Introduction - paths and circuits - isomorphism - sub graphs- connectedness - Euler graph - operations - Hamiltonian paths and circuits - Traveling Salesman Problem.

UNIT V: Trees **(15 Hours)**

Introduction - properties of trees - distance and centers - rooted and binary tree - spanning tree- matrix representations of graph: Incidence matrix - adjacency matrix - graph theoretic algorithms - shortest path between two vertices - shortest path between all pairs.

Teaching Methodology	PPT, Lecture and Deductive Method

Books for Study

1. Tremblay, J. P., & Manohar, R. (2008). *Discrete Mathematical Structure with Applications to Computer Science.* McGraw-Hill International*****. (Unit- I, II, III)
2. Deo, N. (2013). *Graph Theory with Applications to Engineering and Computer Science*. Prentice Hall Publication. (Unit- IV, V)

Books for Reference

1. Lipschutz, S., & Lipson, M. (1999). *Discrete Mathematics,* (2nd Ed.). Schaum's outline series, Tata McGraw-Hill publishing Company Limited
2. Chandrasekaran, N., & Umaparvathi, M. (2015). *Discrete Mathematics*, (2nd Ed.). PHI Learning Pvt. Ltd.

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K-Level)**
CO1	define various basic terms in graph theory and discrete mathematical structure	**K1**
CO2	summarize different theories in graph theory and discrete mathematical structure	**K2**
CO3	solve simple problems in graph theory and discrete mathematical structure	**K3**
CO4	analyze and compare various methods in graph theory and discrete mathematical structure	**K4**
CO5	explain and solve problems related graph theory, mathematical logic, set theory and Boolean Algebra	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**		**Credits**
3	**23UCS33CC04**			**Core Course - 4:** Discrete Mathematics					**5**		**4**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	1	3	3	3	2	1	**2.5**
CO2	3	3	3	3	1	3	3	3	3	1	**2.6**
CO3	3	2	3	3	1	2	2	3	3	1	**2.3**
CO4	3	3	3	2	1	3	3	2	3	1	**2.4**
CO5	3	2	3	3	2	2	2	3	3	2	**2.5**
Mean Overall Score											**2.46 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
3	23UCS33CC05	**Core Course - 5:** Database Systems	5	4

Course Objectives
To understand the concepts of Database systems and its Models.
To improve the database design by applying normalization concepts
To impart knowledge of SQL and T-SQL concepts.
To develop simple PL/SQL programs
To familiarize with concurrency and security features.

UNIT I: Database System and Data Models **(15 Hours)**

Introduction: Flat File - Database System - Database - Actionable for DBA.The Entity-Relationship Model: Introduction - The Entity Relationship Model. Data Models: Introduction - Relational Approach.

UNIT II: Normalization **(15 Hours)**

Introduction - Normalization - Definition of Functional Dependence (FD) - Normal Forms: 1NF, 2NF, 3NF and BCNF.

UNIT III: Structured Query Language **(15 Hours)**

Structured Query Language: Features of SQL - Select SQL Operations - Grouping the Output of the Query - Querying from Multiple Tables - Retrieval Using Set operators - Nested Queries. T-SQL

UNIT IV: PL-SQL **(15 Hours)**

Procedural Language-SQL: PL/SQL Block Structure - PL/SQL Tables. Cursor Management and Advanced PL/SQL: Opening and Closing a Cursor - Processing Explicit Cursor - Implicit Cursor - Exception Handlers - Sub Programs - Functions - Precaution While Using PL/SQL Functions - Stored Procedure - DB Triggers - Object Oriented Technology

UNIT V: Concurrency Control and Security **(15 Hours)**

Concurrency Control and Automatic Recovery: Introduction - Row Level Locks - Automatic Recovery and Backup - Backup Techniques - Advance Backup Techniques. Security Features Built in RDBMS: Introduction - Accessing Database Server - Accessing Database and Defining Roles - Fixed Roles - User Defined Database Role - Granting, Revoking and Denying Permissions - Grant Access on Columns - Creating a User-Defined Role - Adding and Removing Passwords from a Role - Defining and Changing Mutual Exclusivity of Roles - Defining and Changing a Role Hierarchy - Activate or Deactivate a Role - Auditing.

Teaching Methodology	Providing Hands on Sessions, Using OER's to supplement the teaching contents, Demonstrations by connecting the database with a front-end application

Book for Study

1. Narang, N. (2010). *Database Management Systems,* (2nd Ed.). PHI Learning Private Limited.
   UNIT I Chapter 1 to 3 (Pages: 39-41)
   UNIT II Chapter 7(Pages: 92-114)
   UNIT III Chapter 8(Pages: 115-147), Chapter 9(Pages: 148-177)
   UNIT IV Chapter 10(Pages: 178-190), Chapter11 (Pages: 191-222)
   UNIT V Chapter 18 (Pages: 338-345), Chapter 19(Pages: 351-357), Chapter 20(Pages: 367-369)

Books for Reference

1. Martin, J. (1976). *Principles of Database Management*. Prentice Hall.
2. Date, C. J. (2000). *An Introduction to Database Systems*. Addison Wesley.
3. Silberschatz, A., Korth, H.F., & Sudharshan, S. (2019). *Database System Concepts,* (6th Ed.). McGraw Hill International.

Websites and eLearning Sources

1. https://hevodata.com/learn/database-systems/

2. https://ecomputernotes.com/fundamental/what-is-a-database/type-of-database-system
3. https://www.geeksforgeeks.org/dbms/
4. https://www.javatpoint.com/dbms-tutorial

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K-Level)**
CO1	recall the basic and advanced concepts of relational database management system	**K1**
CO2	understand the architecture of various Hierarchical DBMS and its Data models	**K2**
CO3	apply the normalization procedure to design a suitable structure for a given situation	**K3**
CO4	analyze processing logic in the form of PL/SQL routine like functions, procedures, packages and triggers	**K4**
CO5	evaluate and execute SQL queries to interact with the database	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**		**Credits**
3	**23UCS33CC05**			**Core Course - 5:** Database Systems					**5**		**4**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	1	3	3	2	3	2	**2.6**
CO2	3	2	3	3	2	2	3	2	3	2	**2.5**
CO3	3	3	3	3	1	3	3	3	2	1	**2.5**
CO4	3	2	3	3	1	2	2	3	3	1	**2.3**
CO5	3	3	3	2	1	3	3	3	2	1	**2.4**
									Mean Overall Score		**2.46 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
3	23UCS33CP03	**Core Practical - 3:** RDBMS	3	2

List of Exercises:

SQL

1. DDL commands
2. DML commands
3. SQL Functions: Single Row Function & Group Functions
4. Set operations, Join operations
5. Nested Queries
6. Creation and manipulation of Views.

PL/SQL

7. PL/SQL- block
8. Cursors
9. Functions & Procedures
10. Triggers and Packages

OORDBMS

11. Adding a method as a field

Semester	Course Code	Title of the Course	Hours/Week	Credits
3	23UCS33AO01A	**Allied Optional - 1:** Applied Physics - 1	4	3

Course Objectives
To recall the basic concepts of electrostatics, electromagnetic induction, laser and fiber Optic communication.
To understand the importance of coulomb's law and its application in electrostatics.
To explore the concept of electromagnetic induction using Faraday's and Lenz's laws.
To compare the different types of magnetic materials and their properties.
To categorize the different types of LASER and Optical Fibres used for various applications.

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

Electric charge: Its elemental unit, its quantization and conservation - point charges and charges at rest - charge distributions - Coulomb's law - Electric Field - Electric dipole: Dipole moment - Electric field due to a dipole - Lines of force - lines of force of the electric field of a point charge - current - direction of a current - current density - equation of continuity - electromotive force - resistance - Ohm's law - electrical resistivity - combination of resistances - star delta transformation - Definition of electrostatic potential - potential difference - potential due to a point charge - Potentiometer - uses of potentiometer.

UNIT II: Electromagnetic Induction **(12 Hours)**

Biot and Savart law and its application - field on the axis of the coil - magnetic field due to a solenoid - characteristics of the magnetic field of a solenoid - force on a moving charged particle in a magnetic field definition of B - Lorentz force - magnetic field intensity - Hall effect - Electromagnetic induction - faraday's law - Lenz's law - Fleming right hand rule - induced current and charge - self-induction of a long straight solenoid - mutual inductance.

UNIT III: Magnetic Properties and Magnetic Circuits **(12 Hours)**

Magnetization - Magnetic susceptibility and relative permeability - classification of magnetic materials - properties - energy loss due to hysteresis - magnetomotive force - the value of the reluctance - comparison of electric and magnetic circuits - Applications of the concepts of magnetic circuits.

UNIT IV: Lasers and Holography **(12 Hours)**

Properties - Induced absorption, spontaneous emission and stimulated emission - Principle of Laser - pumping - Ruby Laser - He-Ne Laser- Semiconductor Laser - Carbon di oxide Laser - Free electron Laser - Applications of Laser - Holography - Principle - Applications of Holography.

UNIT V: Fibre Optics **(12 Hours)**

Fibre construction - light propagation in fibre - Communication system - advantages - Graded index fibre - single mode fibres - fibre optic sensor - fibre materials - single mode fibres - multimode step index fibres - multimode graded index fibre - comparison - plastic clad fibres - all plastic fibres - Optical fibres as an optical wave guide - propagation modes in single mode fibres - monomode and multimode step index fibres - attenuation on optical fibres - Analog and Digital fibre communication system.

Teaching Methodology	Chalk and talk, Demo Videos, PPT, Handouts, Study materials

Books for Study

1. Sehgal, D.L., Chopra, K.L., & Sehgal N.K. (2004). *Electricity and Magnetism*, (6th Ed.). Sultan Chand & Sons.
2. Murugeshan, R., & Sivaprasath, K., (2016). *Optics and Spectroscopy*, (9th Ed.). S. Chand & Company Ltd.

Books for Reference

1. Tewari, K.K. (2003). *Electricity and magnetism*. S. Chand & Co Ltd.
2. Griffiths, D.J. *Introduction to electrodynamics*, (3rd Ed.). Prentice Hall of India Pvt. Ltd.
3. Halliday, D., Resnick, R., & Walker, J. (2015). *Fundamentals of Physics*, (10th Ed.). Wiley.

Websites and eLearning Sources*

1. https://nptel.ac.in/courses/122/101/122101002/
2. https://nptel.ac.in/courses/108/104/108104087/
3. https://physics.iitd.ac.in/assets/uploads/teaching-labs/Study_of_EMI.pdf
4. https://nptel.ac.in/noc/courses/noc19/SEM1/noc19-cy13/
5. https://nptel.ac.in/courses/108/106/108106167/

(* subject to availability - not to be used for exam purpose)

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	acquire Basic knowledge in the concepts of Electrostatics, Electromagnetic induction, Magnetic properties, LASER and Optical fiber.	**K1**
CO2	understand the problems on Electrostatics and Electromagnetic induction with moderate complexity by adopting the basic concepts	**K2**
CO3	apply the principle of electromagnetic induction in various suitable problems.	**K3**
CO4	analyze and explain the importance of LASER and Optical Fibre in society especially on technological applications.	**K4**
CO5	categorize the concepts and methods of laser, Holography and fibre optic communication.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**		**Credits**
3	**23UCS33AO01A**			**Allied Optional - 1:** Applied Physics - 1					**4**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	2	3	1	3	3	3	2	1	2.3
CO2	3	3	2	2	1	3	3	2	2	1	2.2
CO3	3	3	2	2	1	3	3	3	2	1	2.3
CO4	3	3	2	2	1	3	3	3	2	1	2.3
CO5	3	2	2	2	1	3	3	3	2	1	2.2
										Mean Overall Score	**2.26 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
3	23UCS33AO01B	**Allied Optional - 1**: Principles of Electronics	4	3

Course Objectives

UNIT I: SEMICONDUCTOR DEVICES **(12 Hours)**

Introduction to semiconductor devices-diode-Bipolar Junction Transistor- Field effectTransistor-Applications-Metal oxide Semiconductor - Enhancement mode- Depletion mode-MOSFET -Silicon controlled Rectifier- Laser diode- Photo diode-Optocoupler-Applications.

UNIT II: Electronic Circuits **(12 Hours)**

Introduction to Linear Power supply- Voltage regulators - Relays-types-switching applications using relay-solid state relay - Opto-SCR and Opto-triac based switching for high power applications-Switch mode power supply-Block diagram-Applications- UPS - Capacitive power supply.

UNIT III: Sensors **(12 Hours)**

Sensors and Transducers - Transducers-Resistive transducers-capacitive transducers- Inductive transducers- LVDT principle and applications. Measurement of non electrical quantity: humidity-flow rate-pH pressure-thermal conductivity.

UNIT IV: Integrated Sensors **(12 Hours)**

Basic sensor signal conditioning networks for interfacing with PC- Integrated sensors overview-temperature module based on LM35-Hall effect sensor module-TSOP17 photo module-MOC 3042 opto-isolator module-kmz51 magnetic field module- ICM105A VGA CMOS sensor-MPXV5004G pressure sensor- 3 axis accelerometer module: MPU 6050 IMU sensor-wearable sensors.

UNIT V: PSPICE Simulation for Analog Circuits **(12 Hours)**

Introduction to PSPICE-small circuit simulation-circuit examples for worst case design-DC sweep - plotting output-Sources and polynomially controlled sources- Transfer function analysis (one example).

Teaching Methodology	Chalk and Talk, PPT

Book for Study

1. Malvino, A., Bates, D., & Hoppe, P. (2015). *Electronic Principles,* (9th Ed.).
2. Mathivanan, N. (2007). *PC- Based Instrumentation: Concepts and Practice.*
3. Tuinenga, P.W. (2015). *A guide to circuit simulation and Analysis using PSPICE.*
4. *Material Prepared by the Department*

Unit	Book	Chapter	Sections
I	1	3,5,6,12	3.1,6.1,6.2,6.3,12.1,12.3,12.4,13.2,5.9
II	1,4	22	22.1,22.7
III	2	3	3.1.3,3.2.2,3.3,3.4,3.5
IV	2,4	3,4	3.1.4, Material prepared by the department
V	3,4	1,2,3,5,6	1.1,1.2.2.1-2.4,3.3,5.1,5.6,5.7

Books for Reference

1. Mottershead, A. (1979). *Electronic Devices and Circuits.*
2. Sinclair, I. (2000). *Sensors and Transducers.*
3. Rahid. (2005). *Introduction to PSPICE using ORCAD for Circuits and Electronics.*

Websites and eLearning Source

2. https://onlinecourses.nptel.ac.in/noc23_ma94/preview

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, the students will be able to	**Cognitive Levels (K-Level)**
CO1	classify and interpret the semiconductor devices	**K1**
CO2	demonstrate and analyze the functionalities of various Electronic circuits	**K2**
CO3	distinguish and evaluate various sensors	**K3**
CO4	compare and estimate the operations of integrated sensors	**K4**
CO5	design and develop Electronic circuits for different applications	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
3	**23UCS33AO01B**			**Allied Optional - 1**: Principles of Electronics						**4**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	2	1	2	2	2	3	3	2	2	**2.1**
CO2	3	3	2	3	2	3	3	3	2	2	**2.6**
CO3	2	3	2	2	2	3	2	3	2	3	**2.4**
CO4	3	3	2	3	2	3	3	2	2	3	**2.6**
CO5	3	3	2	3	2	3	3	2	2	3	**2.6**
										Mean Overall Score	**2.5 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
3	23UHE34VE03A	**Value Education - 3:** Social Ethics - 1	2	1

Course Objectives
To gain a comprehensive understanding of the principles advocated in social ethics.
To examine the different types of political systems in a thorough manner.
To comprehend the role and obligations of the educated youth.
To evaluate the conduct of the elected representatives in a detailed manner.
To thoughtfully analyze the various forms of cyber crime.

UNIT I: Introduction to Social Ethics **(6 Hours)**

Social ethics, social ethics and social responsibility, social ethics play an important role on the areas, religion influences social changes and vice versa, 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

Book for Study

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

Books for Reference

1. Arora, R.K. (2014). *Ethics, Integrity and Values*. Public Service Paperback.
2. Cunningham, D. (2004). *There's something happening here: The new left, the Klan, and FBI counterintelligence*. Berkeley: University of California Press.
3. Mali, P. (2017). *Cyber law & Cyber Crimes simplified*. Cyber Info media Paperback.
4. Richardson, M. (2019). *Cyber Crime: Law and Practice Hardcover - Import*.

Websites and eLearning Sources

1. https://cybercrime.gov.in/

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

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	know the responsibility of the educated youth.	**K1**
CO2	understand the values prescribed under social ethics.	**K2**
CO3	apply their minds critically to the various types of cyber crime.	**K3**

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**						**Hours**		**Credits**
3	**23UHE34VE03A**		**Value Education - 3:** Social Ethics - 1						**2**		**1**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	2	3	2	2	3	3	**2.7**
CO2	3	2	2	2	3	2	2	3	2	2	**2.3**
CO3	2	3	3	3	2	3	3	3	3	3	**2.8**
										Mean Overall Score	**2.6 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
3	23UHE34VE03B	**Value Education - 3:** Religious Doctrine - 1	2	1

Course Objectives
To impart knowledge to students about Salvation History
To familiarize students with the life and mission of Jesus Christ
To help Students understand the Holy Spirit
To empower students on Gospel Values
To equip the students about Mother Mary

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: Gospel Values **(6 Hours)**

UNIT V: Mary, the Mother of God **(6 Hours)**

Teaching Methodology	Chalk and Talk, Power point, Assignment and Group discussion

Books for Study

1. Department of Human Excellence. (2022). *Fullness of Life.* St. Joseph's College, Tiruchirappalli.

Books for Reference

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

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	understand the Salvation History	**K1**
CO2	grasp to the life and purpose of Jesus Christ	**K2**
CO3	live out the teachings of the Gospel	**K3**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
3	**23UHE34VE03B**			**Value Education - 3:** Religious Doctrine - 1						**2**	**1**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	2	3	2	2	3	3	**2.7**
CO2	3	2	2	2	3	3	3	3	2	2	**2.5**
CO3	2	2	3	3	2	2	3	3	3	3	**2.6**
										Mean Overall Score	**2.6 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
4	23UTA41GL04B	General Tamil - 4: அறிவியல் தமிழ் (Scientific Tamil)	4	3

கற்றலின் நோக்கங்கள்
அன்றாட வாழ்வில் அறிவியலின் செல்வாக்கை அறிந்துகொள்ளுதல்
பண்டைத்தமிழர் வாழ்வில் இடம்பெற்ற அறிவியல்கூறுகளைக் கண்டறிதல்
அறிவியலின் வளர்நிலைகளையும் வகைப்பாடுகளையும் கண்டுணர்தல்
பண்டைத்தமிழரின் பல்துறைச் சிந்தனைகள்வழி தமிழர் தம் பண்பாட்டு மேன்மையை உணர்தல்
படைப்பாற்றல் திறனைக் கண்டறிந்து வளர்த்தெடுத்தல்

அலகு 1 **(12 மணி நேரம்)**

தொல்காப்பியம்: நிலம் தீ நீர் வளி விசும்போடு (தொல். பொருள் 635)

ஒன்றறிவதுவே (தொல். பொருள் 571)

புறநானூறு

மண் திணித்த நிலனும் (புறம் 2 1- 6) செஞ்ஞா யிற்றுச் செலவும் (புறம் 30 1- 7)

அகநானூறு

அம்ம வாழி, தோழி (அகம் 141: 1-11) செஞ்ஞா யிற்றுச் செலவும் (புறம் 30 1-7)

பதிற்றுப்பத்து

நிலம் நீர் வளி விசும்பு என்ற நான்கின் (பதிற்று 14:1-4)

நெடுவயின் ஒளிறு மின்னுப் பரந்தாங்கு (பதிற்று 24:1-26)

உரைநடைக்கட்டுரை: வியக்க வைக்கும் தமிழரின் அறிவியல்

அலகு 2 **(12 மணி நேரம்)**

சித்தர் பாடல்கள்

பதார்த்த 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 மணி நேரம்)**

திருக்குறள் (2 அதிகாரங்கள்)

வான் சிறப்பு, மருந்து வலைப்பூக்கள் உருவாக்கல், பராமரித்தல் புதிய அறிவியல் கலைச்சொல்லாக்கங்களை உருவாக்குதல்

உரைநடைக்கட்டுரை: தமிழ் இலக்கியங்களில் வெளிப்படும் நீர் மேலாண்மையியல்

அலகு 4 **(12 மணி நேரம்)**

புதினம்: சொர்க்கத்தீவு - சுஜாதா நூல் - திறனாய்வு அறிவியல் புனைவு

ஆவணப்படம், திரைப்படம் - திறனாய்வு

உரைநடைக்கட்டுரை: தமிழில் அறிவியல் புனைவுகள்

அலகு 5 **(12 மணி நேரம்)**

அறிவியல்; கலைச்சொற்கள் அன்றாட வாழ்வில் அறிவியல் பழமொழிகளைத் தொகுத்தல் மூலிகைகள், கீரைகள் ஆகியவற்றின் முக்கியத்துவத்தைக் காட்சிப்படுத்துதல். தமிழர் அறிவியல் கண்காட்சி நடத்துதல்

உரைநடைக்கட்டுரை: அறிவியல் தமிழின் வளர்ச்சி நிலைகள்;

கற்பித்தல் முறை	விரிவுரை (Lecture), காணொளிக் காட்சி (Videos), விளக்கக் காட்சி (PPT presentation)

பாட நூல்கள்

1. தமிழாய்வுத்துறை (2021), அறிவியல் தமிழ் , தூய வளனார் தன்னாட்சிக் கல்லூரி
2. சுஜாதா (2009), சொர்க்கத்தீவு, லிசா பப்ளிகேஷன்ஸ்,

3. மூர்த்தி அ.கி.(2001) , அறிவியல் கலைச்சொல் அகராதி, மணிவாசகர் பதிப்பகம்.

பார்வை நூல்கள்

1. நெடுஞ்செழியன்(2017), இன்னும் மீதமிருக்கிறது நம்பிக்கை, பூவுலகின் நண்பர்கள் வெளியீடு
2. குழந்தைசாமி.வா.செ., (2001), அறிவியல்தமிழ், பாரதி பதிப்பகம்

Websites and eLearning Sources

1. www.tamilvu.org
2. www.tamildigitallibrary.in
3. https://www.tamiluniversity.ac.in/english/library2-/digital-library/
4. https://www.tamilelibrary.org/

Course Outcomes		
CO No.	**CO-Statements** ***இப்பாடத்தின் நிறைவில் மாணவர்கள்***	**Cognitive Levels (K - Level)**
CO1	பண்டைய தமிழர்களின்; அறிவியல் அறிவை அறிந்து கொள்வர்.	**K1**
CO2	பண்டைய தமிழ் இலக்கியங்களுள் காணாலும் அறிவியல் சிந்தனைகளைப் புரிந்துகொள்வர்.	**K2**
CO3	தமிழரின் அறிவியல் மருத்துவத்தையும், நீர் மேலாண்;மை அறிவையும் அறிந்து கொள்வர்.	**K3**
CO4	இக்கால இலக்கியங்களுள் அறிவியல்துறை பெற்றுள்ள இடத்தை அறிந்து கொள்வர்.	**K4**
CO5	அறிவியல் கலைச்சொற்களைத் தமிழில் கற்றுக் கொண்டு அறிவியல்தமிழ் வளரத் துணைபுரிவர்.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**		**Credits**
4	**23UTA41GL04B**			**General Tamil - 4: *அறிவியல் தமிழ்* (Scientific Tamil)**					**4**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	1	2	3	2	2	3	3	2	2	2	**2.2**
CO2	2	2	3	2	2	2	3	2	3	2	**2.3**
CO3	1	2	2	3	2	2	2	3	3	3	**2.3**
CO4	2	2	3	2	2	3	2	3	3	2	**2.4**
CO5	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/Week	Credits
4	23UFR41GL04	French - 4	4	3

Course Objectives
To analyse the French clothing with respect to its culture
To apply prepositions and understand its usages
To analyse a contemporary text in present tense
To evaluate the French festivals and compare with their own cultural context
To apply the past tense using simple conversation

UNIT I **(12 Hours)**

- TITRE: On fait le mélange!
- 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: à 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 événements 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 études a l'étranger/ bon voyage/ la météo
- 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, la météo
- PRODUCTION ORALE : exprimer son opinion sur la météo/parler de l'avenir
- PRODUCTION ECRITE: comparer le système scolaire français et indien

Teaching Methodology	Workshop, group activity, Sharing contemporary french cultural videos

Book for Study

1. Dauda, P., Giachino, L., & Baracco, C. (2016). *Generation A1*. Didier.

Books for Reference

1. Girardet, J., & Pecheur, J. (2017). *Echo A1*. (2nd Ed.). CLE International.
2. Mérieux, R., & Loiseau, Y. (2012). *Latitudes A1*. Didier.
3. Fournier, I. (2011). *Talk French.* Goyal Publishers.

Websites and eLearning Sources

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

Course Outcomes		
CO No.	**CO-Statements**	**Cognitive Levels (K - Level)**
	On successful completion of this course, students will be able to	
CO1	recall the vocabulary pertaining to dwelling place.	**K1**
CO2	outline crisis management in France.	**K2**
CO3	develop a travel diary of your own.	**K3**
CO4	simplify the French education system.	**K4**
CO5	interpret past tenses in a text.	**K5**

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**						**Hours**		**Credits**
4	**23UFR41GL04**		French - 4						**4**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	1	3	2	2	3	2	1	2	2	**2.1**
CO2	3	1	2	3	3	3	2	1	3	1	**2.2**
CO3	3	2	3	2	2	3	2	1	3	2	**2.3**
CO4	3	1	2	2	3	3	3	1	3	3	**2.4**
CO5	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/Week	Credits
4	23UHI41GL04	Hindi - 4	4	3

Course Objectives
To strengthen the language competence among the students
To equip students with cinematic perspective by comparative studies of Hindi literature
To enable the students to develop their effective communicative skills in Hindi
To strengthen the language competence among the students
To incept research-oriented aspirations among students

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

Teaching Methodology	Debate Participation, Videos, PPT, Quiz, Project Work

Books for Study

1. Bosalae, S. (2020). *kavya sarang*. Rajkamal Prakashan.
2. Gupth, M. K. (2020). *Hindi Vyakaran*. Anand Prakashan.
3. Jain, S.K. (2019). *Anuwad: Siddhant Evam Vyavhar*. Kailash Pustak Sadan.

Books for Reference

1. Chaturvedi, R.P. (2015). *Hindi vyakarana*. Upakar Prakashan.
2. Ramdev. (2016). *Vyakaran Pradeep*. Hindi Bhavan.
3. Gosamy, K. (2016). *Anuvad vigyan ki Bhumika*. Rajkamal Prakashan.

4. Shukla, A. R (2021). *Hindi Sahitya Ka Itihas*, Prabhat Prakashan.

Websites and eLearning Sources

1. https://youtu.be/xmr-DaQ3LhA
2. https://mycoaching.in/adhunik-kaal
3. https://m.sahityakunj.net/entries/view/bhartiya-sahitya-mein-anuvad-kee-bhoomika
4. https://mycoaching.in/upsarg-in-hindi
5. https://kalingaliteraryfestival.com/speakers/mamta-kalia/

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, the student will able to	**Cognitive Levels (K - Level)**
CO1	list out the social conditions prevailed in Modern Period which are depicted in Hindi Literature.	**K1**
CO2	discuss the dialects of Hindi language.	**K2**
CO3	illustrate the works of some eminent Hindi Writers related to society.	**K3**
CO4	analyze the human values expressed in life and literature of Hindi Novelist “Mamatha Kaliyah”.	**K4**
CO5	evaluate the film & Literary works in Hindi.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**				**Hours**		**Credits**	
4	**23UHI41GL04**			Hindi - 4				**4**		**3**	
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	2	3	3	2	3	2	3	1	2.4
CO2	3	2	3	3	2	3	2	3	1	2	2.4
CO3	3	2	2	3	2	2	1	3	2	3	2.3
CO4	3	2	3	1	3	3	2	3	3	2	2.5
CO5	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/Week	Credits
4	23USA41GL04	Sanskrit - 4	4	3

Course Objectives
To give an exposure to Sanskrit drama in general
To showcase the structure of pre-kalidasan plays in Sanskrit
To coach students in Sanskrit morphology
To acquaint students with the structures of Sanskrit syntax
To impart communicative skills in Sanskrit by training in the functional aspects of the language

UNIT I **(12 Hours)**

Samskrita Vyavahara sahasri vakiya Prayogaha

UNIT II **(12 Hours)**

Lot Lakaarah, Prayaogh Kartari Vaakyaani

UNIT III **(12 Hours)**

Naatakasya Itihaasah Vivaranam, Thuva and Tum Suffixs

UNIT IV **(12 Hours)**

Karnabhaaram , Naatakasya Visistyam

UNIT V **(12 Hours)**

Samskrita Racanani Vubhavoga

Teaching Methodology	Videos, PPt, Blackboard, Demonstration, Exercises

Books for Study

1. *Karnabhavam & Literature Language*
2. *Dhaatu Manjari*
3. Samskrita Vyavahara Sahasri (*A Collection of One Thousand Sentances*), Samskrita Bharati, Delhi.

Books for Reference

1. Vadhyar, R.S. & Sons. (2019). *History of Sanskrit Literature.* Book - sellers and publishers , Kalpathu ,Palghat, Kerala, south India,
2. Kulapathy, Saral, K.M. (2018). *Sanskrit Balabodh , Bharathita vidya bhavan* , Munshimarg.
3. Bharathi. (2019). *Vadatu sanskritam - Samaskara Binduhu.* S. Aksharam 8th cross, 2nd phase Giri nagar Bangalore.

Websites and eLearning Sources

1. https://sanskritdocuments.org/doc_z_misc_major_works/daily.pdf
2. https://www.learnsanskrit.org/guide/verbs-1/karmani-and-bhave-prayoga/
3. https://ia902903.us.archive.org/7/items/in.ernet.dli.2015.102820/2015.102820.The-Sanskrit-Drama-In-Its-Origin-Development-Theory-And-Practice.pdf
4. https://archive.org/details/oafI_karna-bharam-karnas-burden-of-bhasa-with-dr.-sudhakar-malaviya-gokuldas-sanskrit
5. https://sanskritwisdom.com/composition/essays/sanskrit-language/

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	understand human behaviors by studying dramas	**K1**
CO2	remember and identifying Mahabharata characters and events	**K2**
CO3	apply the morals learnt in day to day life	**K3**
CO4	appreciate ancient Sanskrit dramas	**K4**
CO5	create new conversational sentences and to Improve self-character (Personality Development)	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**		**Credits**
4	**23USA41GL04**			Sanskrit - 4					**4**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	2	2	2	3	3	3	3	3	2	**2.4**
CO2	2	2	3	3	2	3	2	3	3	2	**2.5**
CO3	3	3	2	3	2	1	1	3	3	3	**2.4**
CO4	2	2	3	2	3	3	3	3	2	3	**2.6**
CO5	2	3	3	3	2	1	3	3	3	2	**2.5**
										Mean Overall Score	**2.48 (High)**

Semester	Course Code	Title of the Course	Hours/week	Credits
4	23UEN42GE04	General English - 4	5	3

Course Objectives
To develop and enhance language proficiency in listening, reading, and writing skills through teacher-led reading practice, and comprehension exercises.
To encourage creative thinking through creative tasks and essay writing.
To foster effective communication skills by engaging in tasks that require note-taking, note-making, précis writing, paragraph writing, and the synthesis of information from different sources.
To strengthen grammatical skills by focusing on the application of different tenses and to emphasise grammatical accuracy in various writing tasks.
To encourage students to critically engage with media content and evaluate information.

UNIT I: Women Through the Eyes of Media **(13 Hours)**

1.0 Introduction
1.1 Objectives
1.2 Listening and Reading Skills through Teacher-led Reading Practice
1.3 Glossary
1.3.1 Words
1.3.2 Phrases
1.4 Reading Comprehension
1.5 Critical Analysis
1.6 Creative Task
1.7 General Writing Skill: Writing Minutes of a Meeting
1.8 Grammar: Present Perfect Tense

UNIT II: Effects of Tobacco Smoking **(13 Hours)**

1.9 Introduction
2.0 Objectives
2.1 Listening and Reading Skills through Teacher-led Reading Practice
2.2 Glossary
2.3.1 Words
2.3.2 Phrases
2.4 Reading Comprehension
2.5 Critical Analysis
2.6 Creative Task
2.7 General Writing Skill: Note-Taking
2.8 Grammar: Present Perfect Continuous Tense

UNIT III: Short Message Service (SMS) **(13 Hours)**

2.9 Introduction
3.0 Objectives
3.1 Listening and Reading Skills through Teacher-led Reading Practice
3.2 Glossary
3.3.1 Words
3.3.2 Phrases
3.4 Reading Comprehension
3.5 Critical Analysis
3.6 Creative Task
3.7 General Writing Skill: Note-Making
3.8 Grammar: Past Perfect Tense

UNIT IV: An Engineer Kills Self as Crow Sat on his Head: A Newspaper Report **(12 Hours)**

3.9 Introduction
4.0 Objectives
4.1 Listening and Reading Skills through Teacher-led Reading Practice
4.2 Glossary
4.3.1 Words
4.3.2 Phrases
4.4 Reading Comprehension
4.5. Critical Analysis
4.6. Creative Task
4.7 General Writing Skill: Précis Writing
4.8 Grammar: Past Perfect Continuous Tense

UNIT V: Traffic Rules **(12 Hours)**

4.9 Introduction
5.0 Objectives
5.1 Listening and Reading Skills through Teacher-led Reading Practice
5.2 Glossary
5.3.1 Words
5.3.2 Phrases
5.4 Reading Comprehension
5.5 Critical Analysis
5.6 Creative Task
5.7 General Writing Skill: Paragraph Writing
5.8 Grammar: Future Perfect Tense

UNIT VI: A Handful of Answers: A Zen Tale **(12 Hours)**

5.9 Introduction
6.0 Objectives
6.1 Listening and Reading Skills through Teacher-led Reading Practice
6.2 Glossary
6.3.1 Words
6.3.2 Phrases
6.4 Reading Comprehension
6.5 Critical Analysis
6.6 Creative Task
6.7 General Writing Skill: Writing Short Essays on Current Issues/General Topics
6.8 Grammar: Future Perfect Continuous Tense

Teaching Methodology	Lecture Method, Use of ICT Tools and Interactive method

Book for Study

1. Jayraj., & Arul, S.J. et al. (2016). *Trend-Setter: An Interactive General English Textbook for Under Graduate Students*. Trinity.

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	identify and explain key concepts and topics discussed in the course.	**K1**
CO2	understand the content by summarising, paraphrasing, and interpreting the materials presented.	**K2**
CO3	apply their knowledge to create various forms of written communication, such as meeting minutes, notes, précis, paragraphs, and essays.	**K3**
CO4	analyse the application of different tenses in various texts.	**K4**
CO5	synthesise their knowledge by creating creative tasks, including short essays on current issues and general topics	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**		**Credits**
4	**23UEN42GE04**			**General English - 4**					**5**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	2	2	3	2	3	2	3	2	**2.4**
CO2	2	2	3	2	3	3	2	3	2	2	**2.3**
CO3	2	3	2	3	2	2	3	2	3	2	**2.4**
CO4	2	2	3	2	3	3	2	3	2	3	**2.5**
CO5	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/Week	Credits
4	23UCS43CC06	**Core Course - 6:** Java Programming	5	4

Course Objectives
To understand the basic concepts in Java Programming.
To make familiar in Classes and Inheritance concept.
To impart knowledge on Interfaces, Packages and Exceptions.
To study the features of Multithreading and Stream Classes
To induce fundamental knowledge towards GUI based Programming and Servlet

UNIT I: The Java Language Overview **(15 Hours)**

The Java Language: How Java Impacted the Internet. Java Buzz Words. An Overview of Java: The Three OOP Principles-A first Simple Program-The Java Keywords-The Java Class Libraries. -Operators-Control Statements.

UNIT II: Classes and Inheritance **(15 Hours)**

Introducing Classes: Class Fundamentals-Declaring Objects-Introducing Methods-Constructors-The 'this' Keyword. Overloading Methods-Overloading Constructors-Using Nested and Inner Class-Recursion-Arrays Revisited-Using Command Line Arguments. Inheritance: Inheritance Basics- Using Super- Creating a Multilevel Hierarchy- Method Overriding- Using Abstract Class- Using final with Inheritance.

UNIT III: Packages, Interfaces and Handling Exceptions **(15 Hours)**

Packages and Interfaces: Packages-Defining a Package-Packages and member Access-Importing Packages-Interface: Defining an Interface-Implementing Interfaces-Nested Interfaces- Exception Handling- Exception Handling Fundamentals-Exception Types-Using Try and Catch-Uncaught Exceptions-Multiple catch Statements-throw-finally-Using Exceptions.

UNIT IV: Multithreading **(15 Hours)**

Multithreading: The Java Thread Model-The Mail Thread-Creating a Thread-Creating Multiple Threads-Using isAlive() and Join()-Thread Priorities-Synchronization-Thread Priorities-Suspending, Resuming and Stopping Threads using Multithreading. Input/Output: File-The Stream Classes-The Byte Streams-The Character Streams.

UNIT-V: Swing and Servlets **(15 Hours)**

Swing: JApplet -Icons -JLabel -JTextField -JButton -JCheckBox -JRadioButton -Menus - JSlider -JcomboBox Servlets: Servlets and dynamic web pages -Lifecycle -Simple servlet.

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions

Books for Study

1. Schildt, H. (2017). *Java: The Complete Reference,* (10th Ed.). McGraw-Hill Education.
2. Muthu, C. (2011). *Programming with JAVA,* (2nd Ed.). Vijay Nicole Imprints Private Limited, Chennai.

Book for Reference

1. Balagurusamy, E. (2019). *Programming with JAVA.* Tata McGraw Hill.

Websites and eLearning Sources

1. https://www.geeksforgeeks.org/introduction-to-java/
2. https://docs.oracle.com/javase/tutorial/java/package/packages.html
3. https://www.javatpoint.com/package
4. https://www.w3schools.com/java/java_interface.asp
5. https://www.javatpoint.com/java-awt

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	recall and describe fundamental Java programming and object-oriented principles.	**K1**
CO2	understand the concepts of classes and Objects	**K2**
CO3	apply java programming concepts and principles to develop Java programs	**K3**
CO4	analyze Java code, identify errors, and debug the programs	**K4**
CO5	create simple Java applications	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
4	**23UCS43CC06**			**Core Course - 6:** Java Programming						**5**	**4**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	2	2	1	3	3	2	3	3	**2.4**
CO2	3	3	3	2	2	3	3	3	3	3	**2.8**
CO3	3	3	3	3	3	3	3	2	3	1	**2.7**
CO4	3	2	2	3	2	2	3	3	2	2	**2.4**
CO5	2	3	3	3	1	2	3	3	2	3	**2.5**
										Mean Overall Score	**2.56 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
4	23UCS43CC07	**Core Course - 7:** Digital Computer Fundamentals and Microprocessor	5	4

Course Objectives
To learn about different number systems, character codes, binary arithmetic, and logic gates.
To focus on Boolean algebra, De Morgan's theorems, Karnaugh maps, and the design of simple arithmetic circuits.
To gain a comprehensive understanding of data processing and sequential logic.
To understand the architecture of the Intel 8085 microprocessor, its instruction cycle, addressing modes, and commonly used instructions.
To acquire assembly language programming skills for the Intel 8085 microprocessor.

UNIT I: Number System and Logic Gates **(15 Hours)**

Number Systems: Number systems - Decimal, Binary, Octal, Hexadecimal - conversion from one to another. Characters and codes: ASCII code, Excess3 code, gray code - binary addition, subtraction, multiplication and division - unsigned binary numbers - signed magnitude numbers - complements in number systems. Logic Gates: AND, OR, NOT, NOR & NAND gates, EX-OR gates.

UNIT II: Boolean Algebra and Arithmetic Circuits **(15 Hours)**

Boolean Algebra and Boolean laws and theorems: De Morgan's theorems - Duality theorem - simplification of sum of product and product of sum expressions - Karnaugh map and simplifications - Simple Arithmetic Circuits: Half and Full adders - Binary adder/subtractor - BCD adder.

UNIT III: Data Processing Circuits **(15 Hours)**

Data processing circuits: Multiplexers - Demultiplexers - Encoders and Decoders - Sequential Logic Design: Flip-flops - RS, JK, D & T Flip flops - Master / Slave Flip flop - Shift Registers - Counters - Asynchronous and Synchronous Counters.

UNIT IV: Microprocessor Architecture **(15 Hours)**

Microprocessor Architecture: Intel 8085 - Instruction Cycle - Timing diagram-Instruction Format - Addressing modes - Intel 8085 Instructions.

UNIT V: Programming using 8085 **(15 Hours)**

Programming using 8085: Simple examples - 8-bit addition and subtraction - 16-bit addition - 8-bit decimal subtraction - complements of 8-bit and 16- bit number - shifting bits - finding largest of two numbers - finding largest and smallest in an array - sum of series of numbers - 8-bit multiplication and division.

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions.

Books for Study

1. Leach, D.P., Malvino, A.P., & Saha, G. (2010). *Digital Principles and Application,* (7th Ed.). Tata McGraw-Hill Publishing Company Ltd.
   Unit I: Chapter 5 and 6 **Unit II**: Chapter 2 and 3
   Unit III: Chapter 4
2. Ram, B. (1998). *Fundamentals of Microprocessors and Microcomputers*. Dhanpat Rai Publications Pvt. Ltd.
   Unit IV: Chapter 3 and 4
   Unit V: Chapter 6

Books for Reference

1. Kumar, V. (2006). *Digital Technology Principles and Practice*. New Age International.
2. Chakravorty, J. (2012). *Digital Electronics and Logic Design*. Universities Press.
3. Gaonkar, R. S. (1989). *Microprocessor Architecture, Programming and Applications with the 8085/8080A*. Wiley Eastern Ltd.

Website and eLearning Source

1. https://www.javatpoint.com/digital-computers

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K-Level)**
CO1	recall the fundamentals of number system, digital circuits, 8085 microprocessor architecture and its programming	**K1**
CO2	demonstrate the logics of number system, logic circuits, 8085 microprocessor architecture and ALP	**K2**
CO3	apply the digital logics to simply the Boolean expressions and solve the problems using 8085 microprocessor.	**K3**
CO4	analyze the technical factors involved in digital circuits, 8085 microprocessor architecture and ALP	**K4**
CO5	evaluate the applications of digital circuits, 8085 microprocessor and ALP	**K5**

Relationship Matrix											
Semester	**Course Code**	**Title of the Course**								**Hours**	**Credits**
4	**23UCS43CC07**	**Core Course - 7:** Digital Computer Fundamentals and Microprocessor								**5**	**4**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	1	2	1	2	1	2	2	2	2	2	**1.9**
CO2	2	3	2	2	2	3	2	2	2	2	**2.3**
CO3	2	3	3	2	2	3	3	3	2	2	**2.5**
CO4	2	2	2	2	2	3	3	3	2	2	**2.3**
CO5	2	3	2	2	2	3	3	3	2	2	**2.4**
										Mean Overall Score	**2.28 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
4	23UCS43CP04	**Core Practical - 4:** Java Programming	3	2

List of Exercises:

1. Classes and Objects
2. Constructors
3. Inheritance
4. Method Overloading and Method Overriding
5. Interfaces
6. Packages
7. Exception Handling
8. Multithreading
9. Input / Output streams
10. Swings and Servlets

Semester	Course Code	Title of the Course	Hours/Week	Credits
4	23UCS43AO02A	**Allied Optional - 2:** Applied Physics - 2	4	3

Course Objectives
To know the basic concepts of diodes, transistors, amplifiers, oscillators and Microprocessors.
To understand the functioning of operational amplifiers and modulation and demodulation.
To explore the transistors actions, types of oscillatory circuit, properties of amplifiers.
To compare and contrast between various types of operational amplifiers and learn different instructions set used in Intel 8085.
To construct and experiment the transistor connections, Hartley and Colpitts oscillators.

UNIT-I: DIODE AND TRANSISTOR **(12 Hours)**

PN junction - properties - VI characteristics - Zener diode - Equivalent circuit of Zener diode -Voltage stabilizer - Transistor - transistor action - symbols - transistor connections (CB, CE) -Comparison of transistor connections.

UNIT II: AMPLIFIERS AND OSCILLATORS **(12 Hours)**

Transistor as an amplifier in CE arrangement - transistor load line analysis - operating point - performance of transistor amplifier - cut off and saturation points - Sinusoidal oscillator - types - oscillatory circuit - Barkhausen criterion - Hartley and Colpitt's oscillator - transistor crystal oscillator.

UNIT III: OPERATIONAL AMPLIFIER **(12 Hours)**

Operational amplifier - basic circuit of differential amplifier - operation - CMRR - Properties of operational amplifier - Inverting amplifier - non-inverting amplifier - voltage follower - summing amplifiers - integrator - differentiator.

UNIT-IV: MODULATION AND DEMODULATION **(12 Hours)**

Radio Broadcasting, Transmission and Reception - Modulation - types - Amplitude modulation - modulation factor - analysis of Amplitude modulated wave - transistor AM Modulator - power and limitations in AM - Frequency modulation - theory - comparison - Demodulation - essentials - AM Diode detector - AM Radio receivers - types - FM receiver.

UNIT-V: MICROPROCESSOR INTEL 8085 **(12 Hours)**

Microprocessor Architecture: Intel 8085 - Block Diagram - ALU - Registers - Buses - Pin Configuration - Instruction Word Size - Instruction cycle - Timing Diagram - Addressing Modes - Stack & Subroutines - Interrupts of 8085 - Assembly Language Programs (ALP): Addition & subtraction of 8-bit data, multiplication and division program.

Books for Study

1. Mehta, M.R.V.K. (2021). *Principles of Electronics*, (12th Ed.). S. Chand & company.
2. Ram, B. (2010). *Fundamentals of Microprocessor and Microcomputers*, (7th Ed.). Dhanapat Rai Publications.

UNIT	BOOK	CHAPTER	SECTION
1	1	3,4& 6	3.19, 3.20, 3.23, 4.27, 4.28, 4.29, 4.30, 6.1, 6.4, 6.6, 6.8, 6.9, 6.10, 6.11, 6.15
2	1	6, 12	6.17, 6.18, 6.19, 6.22, 6.23, 12.1, 12.2, 12.3, 12.7, 12.11, 12.12, 12.21
3	1	23	23.1, 23.3, 23.4, 23.8, 23.15, 23.24, 23.26, 23.27, 23.32, 23.35, 23.37

4	1	16	16.1-16.22
5	2	3,4,5,6 & 7	3.1, 3.1.1-3.1.4, 3.1.8, 3.2-3.3.5, 4.3, 4.3.1-4.3.5, 5.5-5.6, 7.5, 6.3, 6.4, 6.29, 6.30.

Books for Reference

1. Bhargava, N.N., Kulshreshtha, D.C., & Gupta, S.C. (2013). *Basic electronics and linear circuits*, (2nd Ed.). Tata McGraw Hill Publishing Company Limited.
2. Gaonkar, R. S. (2002), *Microprocessor Architecture, Programming, and Applications with the 8085*, (5th Ed.). Prentice Hall.
3. Routt, W.A. (2006), *Microprocessor Architecture, Programming, and Systems featuring the 8085*, (1st Ed.). Thomson Delmar Learning.

Web Resources*

1. https://nptel.ac.in/courses/117/103/117103063/
2. https://nptel.ac.in/courses/115/102/115102014/
3. https://ict.iitk.ac.in/courses/working-with-op-amps/
4. https://nptel.ac.in/content/storage2/courses/106105080/pdf/M2L5.pdf
5. https://nptel.ac.in/courses/108/107/108107029/

(* subject to availability - not to be used for exam purpose)

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, student will be able to	**Cognitive Levels (K - Level)**
CO1	acquire knowledge and conceptual understanding of fundamental electronics.	**K1**
CO2	apply the knowledge of microprocessor to write assembly language program for simple applications.	**K2**
CO3	implement the knowledge of s/w, h/w structures of microprocessor and principles of electronics to develop technologies with IT tools to benefit the real world.	**K3**
CO4	describe and understand the basics of modulation and applications of electronic devices in radio communication.	**K4**
CO5	take part in mini projects based on electronic devices.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours/Week**		**Credits**
4	**23UCS43AO02A**			**Allied Optional - 2:** Applied Physics - 2					**4**		**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	3	2	3	2	2	2	1	**2.3**
CO2	3	3	2	2	1	3	2	3	2	1	**2.2**
CO3	3	2	3	2	1	3	3	1	2	1	**2.2**
CO4	3	2	3	2	1	3	2	2		2	**2.3**
CO5	3	2	2	2	2	2	3	3	2	1	**2.2**
										Mean Overall Score	**2.24 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
4	23UCS43AO02B	**Allied Optional - 2**: Communication Electronics	4	3

Course Objectives

UNIT I: Serial and Parallel Port Communication **(12 Hours)**

Basics of digital communication- Parallel port interfacing for simple I/O operations - Serial communication-UART-USART-Data transfer using serial port- USB port specifications-HID device USB for data transfer applications-Communication protocols-SPI-IIC-Applications.

UNIT II: Optical Communication **(12 Hours)**

Basics of optical communication-Block diagram of Optical fibre communication-advantages, disadvantages, and applications of optical fiber communication, optical fiber waveguides, Ray theory, single mode fiber, cutoff wave length, fiber alignment and joint loss, single mode fiber joints, fiber splices, fiber connectors and fiber couplers.

UNIT III: Optical Communication Sources and Detectors **(12 Hours)**

Introduction, LEDs, Phototransistor characteristics- Photo detector noise, Response time, double hetero junction structure, comparison of photo detectors -LM393 light sensor module TCS3200 color sensor module.

UNIT IV: Wireless Communication **(12 Hours)**

Types of Wireless communication System, Comparison of Common wireless system, Trend in Cellular radio and personal communication-Third generation Cellular Networks- Fourth Generation, fifth generation wireless networks- Wireless Local Loop (WLL)-Wireless Local Area network(WLAN)-Bluetooth and Personal Area Networks.

UNIT V Basic Networking with ESP8266 **(12 Hours)**

Introduction to ESP8266 Wi-Fi Module- Wi-Fi library-Web server- installation - configuration - Posting sensor(s) data to web server-ThingSpeak API and MQTT.

Teaching Methodology	Chalk and Talk, PPT

Book for Study

5. Mathivanan, N. (2007). *PC- Based Instrumentation: Concepts and Practice.*
6. Senior, J.M. (2002). *Optical Fiber Communications,* (2nd Ed.). PHI.
7. Thakur, M.R. *Node MCU ESP8266 Communication Methods and Protocols Programming with Arduino IDE.*
8. *Material Prepared by the Department*

Unit	Book	Chapter	Sections
I	1	6	6.1,6.2,9.2,9.3,9.4,9.5
II	2	1,2,3,5	1.2,1.3,2.1,2.2,3.6,5.3
III	2	7,8	7.2,8.1.8.3,8.5,8.6,8.8
IV	4		Material prepared by the department.
V	3	4,5,21	4.1,4.2,4.3,5.2,21.1-21.3

Books for Reference

1. Axelson, J. (2012). *USB Complete: The Developer's Guide, (4th Ed.).*
2. Gehlot, A., Singh, R., Malik, P.K., Gupta, L.R., Singh, B. (2020). *Internet of things with 8051 and EPS8266.*

Websites and eLearning Source

3. https://onlinecourses.nptel.ac.in/noc23_ma94/preview

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, the students will be able to	**Cognitive Levels (K-Level)**
CO1	understand serial and parallel Communication	**K1**
CO2	infer and Elaborate Optical Communication	**K2**
CO3	experiment and Perceive various optical sources and detectors	**K3**
CO4	appraise various Wireless Networks	**K4**
CO5	apply and Analyze wireless networking using ESP 8266	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**	**Credits**	
4	**23UCS43AO02B**			**Allied Optional - 2:** Communication Electronics					**4**	**3**	
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	2	3	2	1	2	3	3	2	2	**2.2**
CO2	3	3	2	2	2	3	3	2	2	3	**2.5**
CO3	3	3	2	3	2	2	3	3	2	2	**2.5**
CO4	3	3	3	3	2	2	3	3	3	2	**2.7**
CO5	3	3	3	3	2	3	3	3	3	3	**2.9**
										Mean Overall Score	**2.6 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
4	23UCS43OP01A	**Allied Optional Practical:** Applied Physics	4	2

Any 16 Experiments

1. Junction diode - V I characteristics
2. Zener diode - V I characteristics
3. Transistor characteristics - CE mode
4. FET characteristics
5. Single stage R-C coupled amplifier - Frequency response
6. Operational amplifier - Basic circuits
7. Basic Logic Gates - Using IC's
8. Logic Gates Using IC's -The study of universal gates & De Morgan's Theorem
9. Encoders using Diodes
10. Encoders using OR gates.
11. Shift register using IC7495.
12. R-S, J-K, D, T Flip-flops using Logic gates IC's
13. Potentiometer - Calibration of Ammeter
14. Potentiometer - Calibration of low range Voltmeter
15. Field along the axis of a coil
16. Resistance of a Thermistor- Multimeter
17. EMF of a Thermocouple - Multimeter
18. Bridge Rectifier - pi filter circuit
19. Hartley / Colpitts's Oscillator
20. Hysteresis
21. Microprocessor I (Data Transfer)
22. Microprocessor II (8bit-addition, subtraction, multiplication & division)

Semester	Course Code	Title of the Course	Hours/Week	Credits
4	23UCS43OP01B	**Allied Optional Practical:** Electronics	4	2

Any 16 Experiments

1. Study of Opto-coupler characteristics and application.
2. Study of Photodiode and phototransistor characteristics
3. Study of Transducers for temperature measurements.
4. Study of MOSFET characteristics.
5. Study on Integrated sensors
6. Construction and study of Linear power supply
7. Construction of voltage regulators.
8. Pspice simulation of basic circuits with resistors and node voltage and branch current calculation.
9. Study on magnetic and solid state relay.
10. Study of SCR characteristics
11. DC to DC switching circuits using MOSFET
12. Pspice simulation of active devices.
13. Configuring ESP8266 based Web-server for data acquisition applications.
14. Digitizing temperature sensor data and uploading in thingspeak API.
15. Study of USB communication (HID device).
16. Study of software serial communication in ESP8266.
17. Study of fibre optic communication.
18. Hall effect sensor for current measurement
19. ESP 8266 I/O operations
20. Interfacing RFID module using Arduino.
21. Interfacing IIC memory module using Arduino.
22. Interfacing HC-05 bluetooth module with arduino
23. Study of Parallel port for I/O operations
24. Study of Serial port data transfer to hyper-terminal.
25. Study of Colour sensing using TCS3200.

Semester	Course Code	Title of the Course	Hours/Week	Credits
4	23UHE44VE04A	**Value Education - 4:** Social Ethics - 2	2	1

Course Objectives
To understand the significance of natural resources and strive to coexist harmoniously with nature.
To implement strategies for disaster management within the community.
To evaluate the significance and distinctions between science and religion.
To recognize the importance of maintaining a healthy lifestyle.
To utilize counseling techniques to address and resolve individuals' issues.

UNIT I: Harmony with Nature **(6 Hours)**

What is environment, Why should we think of harmony, Longing for human well-being, Principles to conserve environmental resources, Causes of disharmony, The fruits of harmony with nature, Forest resources, Water resources, Mineral resources, Food 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, Technology and 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 - The Indian Scenario, 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, Health and Drug Addiction, Drug abuse.

UNIT IV: Disaster Management **(6 Hours)**

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

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.

Books for Study

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

Books for Reference

1. Albert, D., & Steinberg, L. *Judgment and decision making in adolescence*: Journal of Research on Adolescence, page no: 211-224 (2011).
2. Larry, R. C. (2000). *Disaster Management and Preparedness,* Lewis Publications.
3. Hurlock, E.B. (2001). *Developmental Psychology: A: Life-Span Approach*. (5th Ed.). Tata McGraw-Hill.
4. Sangha., & Kamaljit. (2015). *Ways to Live in Harmony with Nature: Living Sustainably and*

Working with Passion. Australia, Woodslane Pty Limited.

Websites and eLearning Sources

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

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	know the value of natural recourses and to live in a harmony with nature.	**K1**
CO2	apply the plans of disaster management in the society.	**K2**
CO3	analyse the importance and differences of science and religion.	**K3**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**		**Credits**
4	**23UHE44VE04A**			**Value Education - 4:** Social Ethics - 2					**2**		**1**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	2	3	3	2	3	3	**2.8**
CO2	3	2	2	3	3	2	3	3	2	2	**2.5**
CO3	2	3	3	3	2	3	3	3	3	3	**2.8**
										Mean Overall Score	**2.7 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
4	23UHE44VE04B	**Value Education - 4:** Religious Doctrine - 2	2	1

Course Objectives
To explore the rich historical background of the Catholic Church
To explore and comprehend the Sacraments practiced by the Catholic Church
To incorporate Christian Prayer into daily routines
To reflect on personal growth through the lens of Sacraments and Christian Prayer
To promote unity by embracing universal values from various religions

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 The Christian Prayer **(6 Hours)**

UNIT V Harmony of Religions **(6 Hours)**

Teaching Methodology	Chalk and Talk, Power point, assignment and Group discussion

Book for Study

1. Department of Human Excellence (2022). Fullness of Life, St Joseph's College (Autonomous), Tiruchirappalli.

Book for Reference

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

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	understand the history of the Catholic Church	**K1**
CO2	examine and grasp the Sacraments of the Catholic Church	**K2**
CO3	apply the Christian Prayer to their everyday life	**K3**

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**						**Hours**	**Credits**
4	**23UHE44VE04B**		**Value Education - 4:** Religious Doctrine - 2						**2**	**1**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	2	3	2	2	3	3	**2.7**
CO2	3	2	2	2	3	3	3	3	2	2	**2.5**
CO3	2	2	3	3	2	2	3	3	3	3	**2.6**
									Mean Overall Score		**2.6 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
5	23UCS53CC08	**Core Course - 8:** Web Application Development	4	3

Course Objectives
To create dynamic Web pages by using ASP.NET
To learn about basic features of ASP.NET and its controls
To create an ASP.NET application using standard .NET Controls
To design applications using Rich Web Controls, Validation and Custom Controls
To learn about connecting data sources using ADO.NET and managing them.

UNIT I: Client Server Computing and .NET Framework (12 Hours)

Client server computing: clients - server - networks - Distributed Systems: Distributed applications - Distributed Processing -web technology - Understanding the .NET Framework: Benefits of the .NET Framework- Elements of the .NET Framework- ASP.NET.

UNIT II: Introduction to ASP.NET (12 Hours)

Getting Started with ASP.NET: Introducing the .NET Framework - Introducing ASP.NET-Setting up the Development Environment- Creating an ASP.NET Application- Deploying an ASP.NET Web Application.

UNIT III: Building web forms with Controls and Events (12 Hours)

Building Forms with Web Controls: Introducing ASP.NET Web Forms- Creating Web Forms Application Projects - Using Web Controls- Working with Events.

UNIT IV: Using Rich Web Controls, Validation and Custom Controls (12 Hours)

Using Rich Web Controls: Using the Ad Rotator Control- Using the Calendar Control- Using the Tree View Control- Validating User Input - Understanding Validation Controls - Introduction to Custom Controls- Basic Structure of Web Forms Controls- Creating Custom Controls- Creating a user control

UNIT V: ADO.NET Programming (12 Hours)

ASP.NET Database Programming: Introducing ADO.NET- ADO.NET Basics- ADO.NET Object Model- Managed Providers- DataSet class.

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions

Books for Study

1. Rajesh., & Kumar, E. (2002). *Computer Networks, Fundamentals and Applications*. Vikas Publishing House Pvt. Ltd.
   Unit-I Chapter 10 (Sec:10.1, 10.2, 10.3), Chapter 11 (Sec:11.1, 11.2,)
2. Parihar, M. (2002). *ASP.NET Bible*. Hungry Minds Inc. 909 Third Avenue.
   Unit- I Chapter 1 **Unit-II** Chapter 2 **Unit-III** Chapter 3
   Unit -IV Chapter 4, Chapter 5 **Unit -V** Chapter 8

Books for Reference

1. Evjen, B. (2006). *Professional ASP.NET 2.0.* Wiley.
2. Walther, S. (2006). *ASP.NET 2.0 Unleashed*, (2nd Ed.). Sams Publications.
3. Macdonald, M., & Szpuszta, M. (2007). *ProASP.NET 3.5 in C# 2008*, (2nd Ed.). Apress.

Websites and eLearning Sources

1. https://www.tutorialspoint.com/asp.net/index.htm
2. https://www.javatpoint.com/asp-net-tutorial
3. https://www.w3schools.com/asp/default.ASP
4. https://dotnet.microsoft.com/en-us/learn/aspnet
5. https://learn.microsoft.com/en-us/aspnet/tutorials

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K-Level)**
CO1	define the elements of distributed systems	**K1**
CO2	understand the ASP.NET development environment	**K2**
CO3	apply various server and client-side controls to create web applications	**K3**
CO4	examine and use the different components in ASP.NET applications	**K4**
CO5	analyze and evaluate the development of web applications with disconnected data access technologies	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
5	**23UCS53CC08**			**Core Course - 8:** Web Application Development						**4**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	3	3	1	3	3	2	2	2	**2.4**
CO2	3	2	2	3	2	2	2	3	3	2	**2.4**
CO3	2	3	2	3	2	3	3	3	2	2	**2.5**
CO4	3	2	2	2	1	3	2	2	3	1	**2.1**
CO5	3	2	3	2	1	3	2	3	2	1	**2.2**
										Mean Overall Score	**2.32 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
5	23UCS53CC09	**Core Course - 9:** Operations Research	4	3

Course Objectives
To understand the methodology of OR problem solving and formulate linear programming problem
To apply duality method for solving LPP and explain the primal-dual relationship
To develop formulation skills in transportation models and finding solutions
To know how project management techniques help in planning and scheduling a project
To familiarize students with the concept of inventory management, and its functional role in different organizations

UNIT I: Linear Programming **(12 Hours)**

Linear Programming - General formulation of the LP Model and its Graphical solution. The Simplex Method - Computational Procedure. Artificial Variable Techniques - the Two Phase Technique - Special cases in Simplex Method.

UNIT II: Duality **(12 Hours)**

Duality in Linear Programming - The Dual Problems - Primal Dual Relationships, Primal - Dual Computations - Dual Simplex Method.

UNIT III: Transportation Problems **(12 Hours)**

Transportation Problems - Transportation Model - Determining the starting solution of Transportation Model, North - West Corner Rule, Least - Cost Method and Vogel's Approximation Method. Determining the optimum solution of Transportation Problems - Assignment Problems and its solution by Hungarian method.

UNIT IV: Scheduling **(12 Hours)**

Project Scheduling by PERT-CPM - Network diagram representations - Critical path calculations - Probability considerations in Project Scheduling.

UNIT V: Inventory Management **(12 Hours)**

Inventory Management: Inventory Control - ABC analysis - Economic Lot size Problems - EOQ with uniform Demand and shortages - Limitations of inventories - Buffer stock - Determination of Buffer stocks.

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions

Book for Study

1. Swarup, K., Guptha, P. K., & Manmohan. (2015). Operations Research. Sultan Chand & Sons.
   Unit-I: Chapter 1 (Sec: 1.1,1:2, 1:10), Chapter 2, Chapter 3(Sec:3:1-3:5), Chapter 4(Sec: 4:1,4:3,4:4(only Two-Phase Method),4:5)
   Unit-II: Chapter 10 (Sec: 10:1,10:5-10:6,10:8-10:10,10:12-10:13,10:15), Chapter 11 (Sec 11:1-11:2,11:3(Pages:298-307)
   Unit-III: Chapter12(Sec 12:1-12:6)
   Unit-IV: Chapter 17 (Sec: 17:1-17:7)
   Unit-V: Chapter 25 (Sec 25:1-25:8)

Books for Reference

1. Sen, R. P. (2010). *Operations Research Algorithms and Applications*. PHI.
2. Selvam, R. P. (2010). *Operations Research*, (2nd Ed.). PHI.
3. Kalavathy, S. (2013). *Operations Research*. Vikas Publishing House.

Websites and eLearning Sources

1. http://www.universalteacherpublications.com/univ/ebooks/or/Ch3/simplexintro.htm
2. https://www.sjctni.edu/Department/cs/eLecture/CMR_Graphical%20Method%20-Special%20cases.pdf
3. https://www.geeksforgeeks.org/transportation-problem-set-1-introduction/
4. http://ecoursesonline.iasri.res.in/mod/resource/view.php?id=90044

5. http://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/mathematics/14._operations_research/02._linear_programming_problem__simplex_method_for_solving_lpp_and_bigm_method/et/9219_et_et.pdf

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	choose the concepts of LPP, TP, AP, Sequencing, Gaming and project Scheduling	**K1**
CO2	compare the concepts of LPP, TP, AP, Sequencing, Gaming and project Scheduling	**K2**
CO3	solve the concepts of LPP, TP, AP, Sequencing, Gaming and project Scheduling	**K3**
CO4	examine the concepts of LPP, TP, AP, Sequencing, Gaming and project Scheduling	**K4**
CO5	prioritize the concepts of LPP, TP, AP, Sequencing, Gaming and project Scheduling	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
5	**23UCS53CC09**			**Core Course - 9:** Operations Research						**4**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	3	2	3	3	2	2	3	**2.6**
CO2	3	3	3	2	2	3	3	2	2	2	**2.5**
CO3	3	3	2	3	2	3	3	3	3	2	**2.7**
CO4	3	3	2	2	3	3	2	3	2	3	**2.7**
CO5	3	2	2	3	2	3	2	3	2	3	**2.5**
										Mean Overall Score	**2.6 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
5	23UCS53CP05	**Core Practical - 5:** Web Application Development	3	2

List of Exercises:

1. Simple Webpage creation using HTML.
2. HTML form validation using VB Script / Java Script
3. Design a Simple Calculator
4. Request and Response Objects
5. Server-side controls.
6. Working with Toolbox Controls.
7. Validation Controls
8. AdRotator Control
9. Calendar Control
10. Database Access - ADO.NET

Semester	Course Code	Title of the Course	Hours/Week	Credits
5	23UCS53CP06	**Core Practical - 6:** Digital and Microprocessor	3	2

List of Experiments:

1. Design of Basic Logic Gates using Universal Gates (NAND, NOR)
2. Design of Half Adders, Full Adders and Subtractors
3. Design of Multiplexers, De-Multiplexers
4. Design of Encoders and Decoders
5. Design of Flip-Flops
6. Counters
7. Computer Hardware Assembling
8. 8085 Microprogramming - 1
9. 8085 Microprogramming - 2
10. IoT Programming using Sensors

Semester	Course Code	Title of the Course	Hours/Week	Credits
5	23UCS53ES01A	**Discipline Specific Elective - 1:** Operating Systems	5	3

Course Objectives
To understand the basic principles and importance of the operating system as the resource manager.
To illustrate functions of process management and deadlock mechanisms.
To explore the main and virtual memory management techniques.
To impart the knowledge on file concepts and file protection mechanisms.
To comprehend the security algorithms and protection methods.

UNIT I: Introduction to Operating systems **(15 Hours)**

Operating Systems: Computer-System Organization - Computer-System Architecture- Operating System Structure - Operating-System Operations - Process Management - Memory Management - Storage Management - Protection and Security.

UNIT II: Process Management and Deadlocks **(15 Hours)**

Process Concept: Process Scheduling-Operations on Processes -Inter process Communication - CPU Scheduling - Basic Concepts - Scheduling Criteria - Scheduling Algorithms. Deadlocks: System Model - Deadlock Characterization - Methods for Handling Deadlocks.

UNIT III: Main Memory and Virtual Memory **(15 Hours)**

Main Memory: Swapping - Contiguous Memory Allocation - Segmentation - Paging - Structure of the Page Table. Virtual Memory: Demand Paging.

UNIT IV: File Concept **(15 Hours)**

File Concept - Access Methods - Directory and Disk Structure - File-System Mounting File Sharing - Protection.

UNIT V: Protection and Security **(15 Hours)**

Protection: Goals of Protection - Principles of Protection - Domain of Protection - Access Matrix. Implementation of the Access Matrix - Access Control. Security: The Security Problem - Cryptography as a Security Tool - User Authentication

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions

Book for Study

1. Silberschatz, S., Galvin, P. B., & Gagne, G. (2013). *Operating Systems Concepts*, (9th Ed.). Wiley Publications.

Books for Reference

1. Stallings, W. (2001). *Operating Systems*, (2nd Ed.). PHI.
2. Stallings, W. (2014). *Operating Systems -Internals and Design Principles*, (8th Ed.). Pearson Publications.
3. Tanenbaum, A. S. (2014). *Modern Operating Systems*, (4th Ed.). Pearson Publications.

Websites and eLearning Sources

1. https://www.greeksforgreeks/web operating system
2. https://www.tutorialpoints.com/web operating system
3. https://www.w3schools.com/web operating system
4. https://www.github.com/operating system
5. https://en.wikipedia.org/wiki/operating system

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K-Level)**
CO1	remember the basic concepts of operating system and security mechanisms	**K1**
CO2	understand the working processes of management techniques, scheduling algorithms and security mechanisms	**K2**
CO3	apply the management techniques and operating system algorithms to solve the various problems	**K3**
CO4	analyze the operating system techniques, methods, algorithms and security procedures	**K4**
CO5	examine the techniques and solutions in operating system and security models	**K5**

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**							**Hours**	**Credits**
5	**23UCS53ES01A**		**Discipline Specific Elective - 1:** Operating Systems							**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	2	2	2	3	2	2	2	3	3	**2.3**
CO2	2	2	2	3	3	2	2	2	3	3	**2.4**
CO3	2	2	3	3	3	2	2	3	3	3	**2.6**
CO4	2	2	2	3	3	2	2	2	3	3	**2.4**
CO5	2	3	3	3	3	3	1	2	2	2	**2.4**
Mean Overall Score											**2.42 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
5	23UCS53ES01B	**Discipline Specific Elective - 1:** Digital Marketing	5	3

Course Objectives
To understand the need and basics of digital marketing
To classify the technology and frameworks used in digital marketing
To choose the elements for the underlying frameworks of digital marketing
To learn the digital marketing strategies for real-time business applications
To develop a site/portal to promote digital marketing

UNIT I: Introduction to Digital Marketing and Internet Marketing (15 Hours)

Introduction to Digital Marketing: Evolution of Digital Marketing - From Traditional to Modern Marketing - Digital, The next wave of marketing - Digital Marketing: Emergence of Digital Marketing as a Tool - Digital Marketing Applications and Benefits - Internet Marketing: Underlying Technology and Frameworks - Digital Marketing Framework - Critical Success Factors for Digital Marketing.

UNIT II: Digital Marketing Models, Consumer Behaviour Model Creation (15 Hours)

Digital Marketing Models Creation: Factors Impacting Digital Marketplace - From Marketspaces to Marketplaces - Value Chain Digitization - Digital Marketing Business Models - Application of Digital Marketing Models. Consumer for Digital Marketing: Consumer Behaviour on the Internet - Evolution of Consumer Behaviour Models - Attributes of Online Buying Behaviour - Brand Building on the Web - Web Tracking Audits and Forecasting - Integrated Marketing Communications (IMC)- Basics of Integrated Marketing Communications - Four Pillars of IMC Construct.

UNIT III: Digital Marketing Assessment Phase and Objectives Planning (15 Hours)

Digital Marketing Assessment Phase: Elements of the Assessment Phase - Marketing Strategy and its Digital Shifts - The Assessment Phase Elements - Macro-Micro Environment Analysis - Marketing Situation Analysis - Digital Marketing Objectives Planning - Digital Presence Analysis - Digital Presence Analysis Matrix - Digital Marketing Objectives Development.

UNIT IV: Digital Marketing Strategy Groundwork and Roadmap (15 Hours)

Digital Marketing Strategy: Groundwork - Understanding Digital Business Strategy - Defining the Digital Marketing Mix - Offering Mix for Digital - Digital Pricing Models - Digital Marketing Strategy Roadmap - PLC Concept.

UNIT V: Basics of Web Development, Management and Usability (15 Hours)

Basics of Web Development and Management - PrePlanning for Web Development - Website Development Stages - User Experience, Usability and Service Quality Elements - Understanding Elements of User Experience - Implementation of Interaction Design - Understanding Web Usability and Evaluation.

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions.

Book for Study

1. Bhatia, P. (2019). *Fundamentals of Digital Marketing*, (2nd Ed.). Pearson India Publications.
   Unit I - Chapter 1
   Unit II - Chapter 2 and 3
   Unit III - Chapter 4
   Unit IV - Chapter 5
   Unit V - Chapter 7

Books for Reference

1. Ahuja, V. (2015). *Digital Marketing*. Oxford University Press.
2. Visser, M., Sikkenga, B. & Berry, M. (2018). *Digital Marketing Fundamentals: From Strategy to ROI*. Noordhoff Groningen / Utrecht.
3. Kagan, J. & Singh, S. S. (2020). *Digital Marketing: Strategy & Tactics*. Wiley

Publications.

Websites and eLearning Sources

1. https://www.investopedia.com/terms/d/digital-marketing.asp
2. https://en.wikipedia.org/wiki/Digital_marketing
3. https: //www.techtarget.com/searchcustomerexperience/definition/digital-marketing
4. https://www.tutorialspoint.com/pinterest_marketing/digital_marketing_introduction.htm

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K-Level)**
CO1	recall the basic elements and factors of digital marketing	**K1**
CO2	classify the technology and frameworks in which digital marketing operates	**K2**
CO3	choose the key internal analysis elements for the relevant applications of underlying Frameworks of digital marketing	**K3**
CO4	analyze different digital marketing strategies for the real time business applications	**K4**
CO5	determine technical specifications and to develop site/portal to promote digital marketing	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**	**Credits**	
5	**23UCS53ES01B**			**Discipline Specific Elective - 1:** Digital Marketing					**5**	**3**	
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	2	3	3	3	2	2	**2.7**
CO2	2	3	3	3	2	2	3	3	3	2	**2.6**
CO3	3	3	2	3	2	3	3	3	2	2	**2.6**
CO4	2	3	3	2	2	2	3	3	2	2	**2.4**
CO5	3	3	3	2	1	3	3	3	3	2	**2.6**
										Mean Overall Score	**2.58 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
5	23UCS53ES02A	**Discipline Specific Elective - 2:** Computer Networks	5	3

Course Objectives
To learn the basic concepts of data communication, networking, and the OSI model.
To understand the analog and digital signals.
To classify the error detection and correction techniques, data link control, and protocols
To examine the technologies used in wired and wireless LAN
To analyze the transport layer and application layer functions

UNIT I: Data Communication **(15 Hours)**

Data Communication - Networks - The Internet - Protocols and Standards - OSI Model- Layers in OSI Model - TCP/IP Protocol Suite - Addressing.

UNIT II: Analog and Digital Signals **(15 Hours)**

Analog and Digital - Digital Signals - Transmission Impairment - Performance - Multiplexing - Guided Media - Unguided Media. Switching: Circuit Switched Networks - Datagram Networks - Virtual Circuit Networks.

UNIT III: Data Link Layer **(15 Hours)**

Error Detection and Correction -Introduction - Block Coding: Error detection, Error correction - Data Link Control: Framing - Flow and Error Control - Protocols - Noiseless Channels - Noisy channels - HDLC - Point to Point Protocol.

UNIT IV: Wired and Wireless LAN **(15 Hours)**

IEEE Standards - Standard Ethernet. Wireless LAN: IEEE 802.11 - Bluetooth. Connecting LANs: Connecting Devices - Virtual LANs. Wireless WAN: Cellular Telephony - Satellite Networks. Network Layer-Logical Addressing: IPv4 Addresses - IPv6 Addresses.

UNIT V: Transport Layer and Application Layer **(15 Hours)**

Process to Process Delivery - User Datagram Protocol - TCP. Application Layer: Domain Name Space - DNS in the Internet - Electronic Mail - File Transfer. WWW: Architecture - HTTP.

Teaching Methodology	Lecture-based instruction, Demonstration, Group Discussion, Peer Learning, Problems solving, and Project-based learning.

Book for Study

1. Forouzan, B. A. (2007). *Data Communications and Networking*, (4th Ed.). McGraw-Hill Companies.
   UNIT I - Chapters 1,2
   UNIT II - Chapters 3,6,7,8
   UNIT III - Chapters 10,11
   UNIT IV - Chapters 13,14
   UNIT V - Chapters 23,25,27

Books for Reference

1. Stallings, W. (2004). *Data and computer communications*, (7th Ed.). Prentice Hall of India.
2. Tanenbaum, A. S. (2013). *Computer Networks*. Prentice Hall of India.
3. Gill, N. S. (2014). *Essential of Computer and Network Technology*. Khanna Book Publishing Company (P) Limited.

Website and eLearning Source

1. https://www.comptia.org/certifications/network

Course Outcomes		
CO No.	**CO-Statements** On completion of this course, students will	**Cognitive Levels (K - Level)**
CO1	Recall the basic concepts of data communication, networking, model, protocol, networking technologies and OSI layers	**K1**
CO2	Summarize the functions and technical specifications of networking, protocol and networking technologies	**K2**
CO3	Investigate the appropriate applications of data communication, networking, protocol, networking technologies and OSI layers	**K3**
CO4	Analyze the technical factors involved in networking, model, protocol and networking technologies	**K4**
CO5	Evaluate the use of data communication, networking, model, protocol, networking technologies and OSI layers	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
5	**23UCS53ES02A**			**Discipline Specific Elective - 2:** Computer Networks						**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	2	2	2	1	3	2	3	2	2	**2.2**
CO2	2	3	3	2	1	3	3	2	2	2	**2.3**
CO3	2	3	2	2	1	3	3	2	2	2	**2.2**
CO4	3	2	3	2	2	3	3	3	2	2	**2.5**
CO5	3	2	3	3	2	3	3	3	3	2	**2.7**
										Mean Overall Score	**2.38 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
5	23UCS53ES02B	**Discipline Specific Elective - 2:** Security in Computing	5	3

Course Objectives
To make students understand the computer security
To classify the existing attacks and threats and apply the security measures
To identify the techniques used to overcome threats using counter measures
To learn the recent threats, and vulnerabilities and be aware of the privacy impacts
To create solutions by security planning and risk analysis

UNIT I: Introduction to Computer Security and attacks **(15 Hours)**

Introduction: Computer Security - Threats -Harm - Vulnerabilities - Controls - Authentication - Access Control - Cryptography. Web User Side - Browser Attacks - Web Attacks Targeting Users - Obtaining User or Website Data - Email Attacks.

UNIT II: Security in Operating Systems and Network **(15 Hours)**

Security: Security in Operating Systems - Security in the Design of Operating Systems -Rootkit- Network security attack- Threats to Network Communications - Wireless Network Security - Denial of Service - Distributed Denial-of-Service.

UNIT III: Security Countermeasures in Network and Databases **(15 Hours)**

Security Countermeasures: Cryptography in Network Security - Firewalls - Intrusion Detection and Prevention Systems - Network Management - Databases - Security Requirements of Databases - Reliability and Integrity - Database Disclosure.

UNIT IV: Privacy Principles and Policies **(15 Hours)**

Privacy: Privacy Concepts - Privacy Principles and Policies - Authentication and Privacy - Governing Data Mining - Privacy Preserving - Privacy on the Web - Email Security - Privacy Impacts of Emerging Technologies.

UNIT V: Management of Incidents using laws **(15 Hours)**

Management and Incidents: Security Planning - Handling Incidents - Risk Analysis - Protecting Programs and Data - Information and law - Rights of Employees and Employers - Ethical Issues - Cryptography - Cyber Warfare.

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions

Book for Study

1. Pfleeger, C. P., Pfleeger, S. L., & Margulie, J. (2015). *Security in Computing,* (5th Ed.). Pearson Education.

   Unit I: Chapter 1, 2, 3
   Unit II: Chapter 5, 6 [6.2, 6.4, 6.5]
   Unit III: Chapter 6 [6.6, 6.7, 6.8, 6.9], 7
   Unit IV: Chapter 9
   Unit V: Chapter 10, 11, 13

Books for Reference

1. Kostopoulous, G. K. (2013). *Cyber Space and Cyber Security.* CRC Press.
2. Lehto, M., & Neittaanmaki, P. (2015). *Cyber Security: Analytics, Technology and Automation*. Springer International Publishing.
3. Nelson, P., & Steuart, E. (2009). *Computer Forensics and Investigations.* Cengage Learning.

Websites and eLearning Sources

1. https://www.brainkart.com/subject/Security-in-Computing_156/
2. https://www.academia.edu/31872697/Security_in_computing

3. https://studentnotes88322212.wordpress.com/2018/05/08/security-in-computing-lecture-notes-study-materials-and-important-questions-answers/
4. https://www.geeksforgeeks.org/computer-security-overview/
5. https://www.tutorialspoint.com/computer_security/index.htm

Course Outcomes		
CO No.	**CO-Statements** On completion of this course, students will	**Cognitive Levels (K-Level)**
CO1	define and relate the concepts and terms of security	**K1**
CO2	classify and outline existing attacks and security measures.	**K2**
CO3	identify the techniques used to materialize threats into attacks.	**K3**
CO4	analyse the recent threats, vulnerabilities and attacks and discover their effects.	**K4**
CO5	design security systems and applications for the benefits of society	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**					**Hours**	**Credits**	
5	**23UCS53ES02B**			**Discipline Specific Elective - 2:** Security in Computing					**5**	**3**	
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	1	2	3	3	2	1	2	**2.2**
CO2	3	3	2	2	2	3	3	3	2	2	**2.5**
CO3	2	3	3	2	2	2	3	3	2	2	**2.4**
CO4	3	3	3	1	3	3	3	3	1	2	**2.5**
CO5	2	3	3	2	2	2	3	3	2	1	**2.4**
										Mean Overall Score	**2.4 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
5	23UCS53SP01	**Self-paced Learning:** Web Ethics	-	2

Course Objectives
To understand the basic concepts of Cyber Ethics, Virtues and Values
To Illustrate the knowledge of Cyber laws, regulations in information Society
To analyse the International Convention for Cyber Space and International Treaties
To identify and explore the different types of Cyber Crimes and offences
To learn the aware of Cyber Bullying and digital literacy for protecting children from bullying

UNIT I: Introduction to Cyber Ethics

Ethics in Cyber Society: Core Values and Virtues: Definitions, Specificities of Cyberspace, Dimensions of Cyber Ethics in Cyber Society, Core Values and Virtues, Cyber Ethics by norms, Laws and Relations, Artificial Intelligence Ethics: "AI for Good". Cyber Ethics as Business Ethics.

UNIT II: Cyber Law and Cyber Ethics

Importance of Cyber Law, The Significance of Cyber Ethics, and Cyber Crime is Unethical and Illegal, The need for Cyber Regulation. The Nine P's of Ethics in Information Society.

UNIT III: International Convention for Cyber Space

The Significance of International Cyber Ethics, Bilateral Agreements, From Bilateral to International Convention, Fast Growing Cybercrime, International Cyber Legal Treaty. Republican Net Neutrality: Introduction, The Relevance of the Net and its Neutrality, Two sets of values underlying "Neutrality", Republican Net Neutrality.

UNIT IV: Cyber Crime

Cybercrime offences, Computer Related Offences, Content Related offences, Government Efforts in Cybersecurity, Cybersecurity in the Academic world. Critical Thinking of Citizens: Ethics in Digital Age, Acting Responsibly in the Digital World, Three Dilemmas: Ethical Intelligence in Practice.

UNIT V: Cyber Bullying

Introduction: Cyber Bullying, Peoples in Cyber Bullying, Signs of Cyber Bullying, Suicidal Tendencies, Role of Children and Duty of parents, Limiting Access of Technology, Child Bullying. Child Protection Online: Prevention through Education for Digital Literacy and Safety, Recommendations of Priority Inventions, Cyber Ethics Research Centers and Networks.

Teaching Methodology	Lecture Based Instruction, Peer Learning, Group Discussion, Videos, PPT, Demonstration, and Hands on sessions

Book for Study

1. Stuckelberger, C., & Duggal, P. (2018). *Cyber Ethics 4.0, Serving Humanity with Values.* Prentice Globethics.net Global series no 17.

Books for Reference

1. Diane, B. (2008). *Cyber Citizenship and Cyber Safety: Cyber Ethics*. The Rosen Publishing group.
2. Kizza, J. M. (2015). *Ethical and Social Issues in the Information Age*, (5th Ed.). Springer.
3. Bynum, T. W., & Rogerson, S. (2004). *Computer Ethics & Professional Responsibility*. Introductory Text & Readings, Blackwell.

Websites and eLearning Sources

1. https://www.geeksforgeeks.org/what-is-cyberethics
2. https://en.wikipedia.org/wiki/Cyberethics
3. https://theknowledgereview.com/cyber-ethics

Semester	Course Code	Title of the Course	Hours/Week	Credits
5	23USS54SE01	**Skill Enhancement Course - 2:** Soft Skills	2	1

Course Objectives
To help students understand, practice, and improve their communication skills
To enable students with effective presentation skills
To help students attend interviews confidently and participate effectively in group discussions
To make students realise their potential and excel on personal as well as professional grounds
To develop the thinking skills of students for better performance in competitive exams, interviews and group discussions

UNIT I: Communication Skills

Basics of Communication: Importance of Good Communication Skills, Types of Communication Skills, Verbal Communication, Non-verbal Communication, Tips for Improving Nonverbal Communication, Communication Styles, Barriers to Communication, Ways To Improve Communication Skills, Practicum

Professional Grooming: How to Create the Impact for that First Impression, Presentation Skills, Developing Handouts, Developing Notes, Adding Visual and Audio Effects, Practicum

UNIT II: Resume Writing & Interview Skills

*Resume Writing***:** The Purpose of a Resume, Finding a Job & Making a Career, Length of Resume, Order of Resume, Tailoring the Resume, What your Resume should include, Some Tips for Listing a Bachelor's degree on Your Resume, What NOT to put on your Resume, Formatting Resume, Difference between Resume, Biodata and Curriculum Vitae, Preparation of a Resume

*Interview Skills***:** Meaning of Interview, Types of Interviews, How to get ready for the big day?, Appropriate Attire, Etiquette, Mastering the Art of Meet and Greet, Resume – Points to Remember, Practicum

Group Discussion: Why is GD Essential?, Factors that influence GD, Outcome of GD, Tips for participation in a GD, Useful phrases for GD, Success Tips in GD, Practicum

UNIT III: Personal Effectiveness

Self-Discovery: Characteristics of Personality, Kinds of Self, Who am I?, Personality Inventory Table

Goal Setting: Why do Goal Setting?, Goal Setting Process, Smart Goals

UNIT IV: Numerical Ability

Average, Simple Interest, Compound Interest, Profit and Loss, Area, Volume and Surface Area

UNIT V: **Test of Reasoning**

*Verbal Reasoning***:** Series Completion, Analogy. *Non-Verbal Reasoning*

Book for Study

1. Balaiah, J., & Joy, J. L. (2024). *Straight from the Traits: Securing Soft Skills*, (Revised 3rd Ed.). St. Joseph's College, Tiruchirappalli.

Books for Reference

1. Aggarwal, R.S. (2010). *A Modern Approach to Verbal and Non-Verbal Reasoning*, S. Chand.
2. Balaiah, J. & Joy, J. L. (2018). *Winners in the Making: A primer on soft skills*. St. Joseph's College, Tiruchirappalli.
3. Covey S. R. (2004). *The 7 Habits of Highly Effective People: Restoring the Character Ethic* (Rev. ed.). Free Press.

4. Egan, G. (1994). *The Skilled Helper* (5th Ed.). Pacific Grove, Brooks/Cole.
5. Khera, S. (2014). *You Can Win*. Macmillan Books.
6. Martin, Y. (2005). *Hiring the Best: A Manager's Guide to Effective Interviewing and Recruiting*, (5th Ed.). Adams Media.
7. Sankaran, K., & Kumar, M. (2010). *Group Discussion and Public Speaking*, (5th Ed.). M.I. Publishers.
8. Trishna. (2012). *How to do well in GDs & Interviews*, (3rd Ed.). Pearson Education.

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	analyse problems directed at testing their cognitive abilities	**K3**
CO2	present the best of themselves as job seekers and communicate effectively in all contexts	**K4**
CO3	assess themselves, set goals, and manage conflicts that are expected of a good leader	**K5**

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**						**Hours**		**Credits**
5	**23USS54SE01**		**Skill Enhancement Course - 2:** Soft Skills						**2**		**1**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Scores of COs**
	PO1	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	
CO1	3	3	3	2	2	2	2	3	2	3	**2.5**
CO2	2	3	3	2	3	3	2	3	2	2	**2.5**
CO3	2	2	3	3	2	3	3	3	2	2	**2.5**
										Mean Overall Score	**2.5 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
6	23UCS63CC10	**Core Course - 10:** Software Engineering	4	4

Course Objectives
To gain a comprehensive understanding of the various phases of the software development life cycle and process models
To learn the process of requirements gathering and the phases in it
To acquire the knowledge on system modelling concepts and phases
To explore the software testing techniques including unit testing, integration testing and system testing
To impart skills on development of reliable and secure software projects and manage them

UNIT I: Introduction to Software Engineering **(12 Hours)**

Introduction-Professional Software Development - Software Processes - Software Process Models - Process Activities - Agile Software Development - Agile methods - Agile development techniques - Agile project management.

UNIT II: Requirements Engineering **(12 Hours)**

Requirements Engineering - Functional and non-functional Requirements - Requirements Engineering processes - Requirements elicitation -Requirements Specification - Requirements validation - Requirements Change.

UNIT III: System Modeling **(12 Hours)**

System Modeling: Context Models - Interaction models - Structural Models - Behavioral - Model Driven Architecture - Architectural Design - Design and implementation.

UNIT IV: Software Testing **(12 Hours)**

Software Testing: Developmental Testing - Test Driven Development - Release Testing - User Testing - Software Evolution: Legacy systems - Software Maintenance.

UNIT V: System Dependability and Security **(12 Hours)**

System Dependability and Security**:** Dependable systems- Reliability Engineering - Safety Engineering - Security Engineering. Software Management - Project Management - Project planning - Quality Management.

Teaching Methodology	Lecture-based instruction, Demonstration, Group Discussion, and Project-based learning

Book for Study

1. Sommerville, I. (2017). *Software Engineering,* (10th Ed.). Pearson.
   Unit-I *Chapter 1 (Sec: 1.1, 1.2), Chapter 2 (Sec 2.1, 2.2), Chapter 3 (Sec 3.1, 3.2,3.3)*
   Unit-II *Chapter 4*
   Unit-III *Chapter5, Chapter 6, Chapter 7*
   Unit-IV *Chapter 8, Chapter 9(Sec 9.2, 9.3)*
   Unit -V *Chapter 10, Chapter 11, Chapter 12, Chapter 13, Chapter 22, Chapter 24*

Books for Reference

1. Pressman, R. S. (2019). *Software Engineering-A Practitioner's Approach,* (8th Ed.). McGraw Hill International.
2. Fairley, R. (2014). *Software Engineering Concepts,* (3rd Ed.). McGraw Hill International.
3. Mall, R. (2014). *Fundamentals of Software Engineering,* (4th Ed.). PHI.

Website and eLearning Sources

1. https://www.geeksforgeeks.org/software-engineering/

Course Outcomes		
CO No.	**CO-Statements** On successful completion of this course, students will be able to	**Cognitive Levels (K-Level)**
CO1	define the basic concepts in software engineering	**K1**
CO2	explain the necessities for quality software development	**K2**
CO3	apply appropriate methods and techniques in software development	**K3**
CO4	analyze various software development models, methods and techniques	**K4**
CO5	evaluate the software development practices	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
6	**23UCS63CC10**			**Core Course - 10:** Software Engineering						**4**	**4**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	2	2	1	2	3	2	2	1	**2.0**
CO2	2	3	3	3	1	2	3	1	3	2	**2.3**
CO3	3	3	3	3	1	3	3	3	2	2	**2.6**
CO4	3	3	3	2	2	2	3	3	3	2	**2.6**
CO5	3	3	3	3	1	2	3	3	3	2	**2.6**
Mean Overall Score											**2.42 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
6	23UCS63CC11	**Core Course - 11:** Mobile Application Development	4	3

Course Objectives
To learn the basic concepts of mobile app using Android Platform
To learn the detail framework of Android Platform
To learn the design aspects in Creating intuitive, reliable mobile apps using the android services and components
To understand the various additional features of mobile app development
To learn Graphical features to design attractive web apps

UNIT I: Introduction to Android Platform **(12 Hours)**

Introducing the Android Software Development Platform: Understanding Java SE and the Dalvik Virtual Machine-The Directory Structure of an Android Project-Common Default Resources Folders-The Values Folder- Leveraging Android XML- Screen Sizes-Desktop Clocks- Using Android Application Resources-Launching Application: The Android Manifest.xml File - Creating Your First Android Application-Running the App-Adding an Application Icon-Adding Transparency.

UNIT II: Overview of Android Framework **(12 Hours)**

Android Framework Overview: The Foundation of OOP: The Object-The Blue print for an Object: The Class-Providing Structure for Classes: Inheritance-Defining an Interface Bundling Classes-An overview of XML- The APK File-Android Application Components Android Activities- Android Services - Broad cast Receivers - Content Providers - Android Manifest XML.

UNIT III: Working with Screen Layouts **(12 Hours)**

Screen Layout Design- Android View Hierarchies - Nesting Views-Defining Screen Layouts - Editing the main.xml File-Using Relative Layouts- Sliding Drawers-Using Padding and Margins with Views and Layouts.

UNIT IV: Working with Buttons, Menus, and Dialogs **(12 Hours)**

UI Design: Buttons, Menus, and Dialogs: Using Common UI Elements- Adding an Image Button to Your Layout-Defining Multistate Image Button - Graphics in XML -Editing the main.xml File-Replacing the Default Background- Adding a Text to Your Layout- Adding an Image-Using Menus in Android-Creating the Menu Structure with XML- Running the Application in the Android Emulator-Making the Menu Work-Adding Dialogs.

UNIT V: Introduction to Graphics in Android **(12 Hours)**

An Introduction to Graphics Resources in Android: Introducing the Drawables-Implementing Images - Creating Animation in Android- Tween Animation in Android-Using Transitions - Creating 9-Patch Custom Scalable Images-Playing Video in Android Apps- SQLite based simple applications

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions

Book for Study

1. Jackson, W. (2011). *Android Apps for Absolute Beginners*, (1st Ed.). Apress.
   Unit-I Chapter 4 (Pages 41 to 65)
   Unit-II Chapter 5 (Pages 67 to 87)
   Unit-III Chapter 6 (Pages 67 to 112)
   Unit -IV Chapter 7 (Pages 115 to 145)
   Unit - V Chapter 8 (Pages 147 to 181)

Books for Reference

1. Smith, D., & Friesen, J. (2011). *Android Recipes: A Problem -Solution Approach,* (1st Ed.). Rakmo Press.
2. DiMarzio, J. F. (2010). *Android: A Programmer's Guide,* (1st Ed.). Tata Mcgraw Hill.
3. Murphy, M. L. (2010). *The Busy Coder's Guide to Android Development,* (1st ed.). Commons Ware.

Website and eLearning Source

1. Android Developer's Guide - available at: http://developer.android.com/

Course Outcomes		
CO No.	**CO-Statements** On completion of this course, students will	**Cognitive Levels (K-Level)**
CO1	recall the elements of software development platform to build android programming.	**K1**
CO2	understand the UI-component layouts, event handling, and screen orientations to develop mobile applications.	**K2**
CO3	Apply the Screen Layout and UI Design in Android Framework to implement the android apps.	**K3**
CO4	organize the various resources and examine the parameter passing mechanism among them.	**K4**
CO5	design and evaluate the user interfaces to support mobile application development.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
6	**23UCS63CC11**			**Core Course - 11:** Mobile Application Development						**4**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	1	3	2	2	3	1	**2.4**
CO2	3	2	3	3	2	3	2	3	3	2	**2.6**
CO3	3	3	1	3	2	2	3	3	1	2	**2.3**
CO4	3	2	3	3	3	3	3	1	2	2	**2.5**
CO5	2	3	2	2	1	2	2	3	2	2	**2.1**
										Mean Overall Score	**2.38 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
6	23UCS63CP07	**Core Practical - 7:** Mobile Application Development	3	2

List of Exercises:

1. Different Layout design including nested layout
2. Arithmetic Operations
3. Business Calculator
4. Animation: Bouncing of a ball
5. Intent
6. Prepare Student Bio-data using Database SQLite
7. Fragments-Tablet Programming
8. Media Player

Semester	Course Code	Title of the Course	Hours/Week	Credits
6	23UCS63ES03A	**Discipline Specific Elective - 3:** Big Data Analytics	5	3

Course Objectives
To understand the basic concepts of Big Data
To identify the issues of data acquisition and validation
To impart knowledge on Online transaction and analytical processing
To analyze distributed data processing concepts
To evaluate storage and statistical analysis techniques

UNIT I: Introduction to Big Data **(15 Hours)**

Introduction: Concepts and Terminology - Big Data Characteristics - Different Types of Data -case study Background - Business goals and Obstacles - Business Motivations and Drivers for Big Data Adoption- Marketplace Dynamic - Business Architecture- Business process Management.

UNIT II: Big data Adoption and Planning Considerations **(15 Hours)**

Organization Prerequisites - Data Procurement - Privacy - Security - Provenance - Limited Realtime Support - Distinct Performance Challenges - Distinct Governance Requirements - Distinct Methodology - Big Data Analytics - Data Identification - Data Acquisition and Filtering - Data Extraction - Data validation and cleansing - Data Aggregation and Representation.

UNIT III: Enterprise Technologies and Big Data Business Intelligence **(15 Hours)**

Online Transaction and Processing (OLTP) - Online Analytical Processing (OLAP) - Extract Transform Load (ETL) - Data Warehouses - Data Marts.

UNIT IV: Big Data Processing Concepts **(15 Hours)**

Introduction - Parallel Data Processing - Distributed Data Processing - Hadoop - Processing Workloads - Cluster - Processing in Batch Mode - Map - Combine - Partition - Shuffle and Sort.

UNIT V: Big Data Storage Technology **(15 Hours)**

On-Disk Storage Devices - NoSQL Database - In-Memory Storage Device - Big Data Analytics Techniques - Quantitative Analysis - Qualitative Analysis - Data Mining - Statistical Analysis - A/B Testing - Correlation-Regression - Machine Learning.

Teaching Methodology	Lecture Based Instruction, Peer Learning, Group Discussion, Videos, PPT, Demonstration, and Hands on sessions

Book for Study

1. Buhler, P., Khattak, W., & Erl, T. (2016). *Big Data Fundamentals: Concepts, Drivers & Techniques*, (1st Ed.). Prentice Hall Publications.
   Unit I: Chapter 1 and 2
   Unit II: Chapter 3
   Unit III: Chapter 4 and 5
   Unit IV: Chapter 6
   Unit V: Chapter 7 and 8

Books for Reference

1. DT Editorial Services. (2016). *Big Data-Black Book (Hadoop 2, MapReduce, Hive, YARN, Pig, R and Data Visualization)*, (1st Ed.). Dreamtech Press.
2. Mohanty, S., Jagadeesh, M., & Srivatsa, H. (2013). *Big Data Imperatives: Enterprise Big Data Warehouse, BI Implementations and Analytics*. Apress Media.
3. White, T. (2012). *Hadoop: The Definitive Guide*, (3rd Ed.). O'Reilly Media.

Websites and eLearning Sources

1. https://www.coursera.org/in/articles/big-data-analytics
2. https://www.tableau.com/learn/articles/big-data-analytics
3. https://www.tibco.com/reference-center/what-is-big-data-analytics

4. https://www.investopedia.com/terms/b/big-data.asp

Course Outcomes		
CO No.	**CO-Statements** On completion of this course, students will	**Cognitive Levels (K-Level)**
CO1	recall the basics of Big Data and its applications	**K1**
CO2	understand big data planning, processing, Storage Techniques and Technologies	**K2**
CO3	apply the cutting-edge tools and technologies to analyze Big Data	**K3**
CO4	analyze the functions of various big data technologies and tools	**K4**
CO5	evaluate the techniques and mechanisms available for Big Data	**K5**

Relationship Matrix											
Semester	**Course Code**		**Title of the Course**							**Hours**	**Credits**
6	**23UCS63ES03A**		**Discipline Specific Elective - 3:** Big Data Analytics							**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	1	1	3	3	2	1	1	**2.0**
CO2	3	3	3	2	1	3	3	3	1	1	**2.2**
CO3	2	2	3	2	2	2	3	2	2	1	**2.1**
CO4	3	3	3	1	2	3	2	3	1	1	**2.2**
CO5	2	3	3	3	3	2	3	3	3	1	**2.6**
										Mean Overall Score	**2.22 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
6	23UCS63ES03B	**Discipline Specific Elective - 3:** Cloud Computing	5	3

Course Objectives
To understand the concepts of cloud computing technology
To know the advantages and applications of enterprise cloud computing
To analyze and summarize the virtual machine services and infrastructures
To know and apply cloud architecture and applications
To elaborate data security and infrastructure security

UNIT I: Cloud Computing **(15 Hours)**

Introduction-Cloud Computing -Roots of Cloud Computing-Layers-Types of Clouds-Features of a Cloud-Cloud Infrastructure Management - Platform as a Service Providers-Challenges and Risks-Migrating into a Cloud-Broad Approaches to Migrating into the Cloud- Seven-Step Model of Migration into a Cloud.

UNIT II: The Enterprise Cloud Computing Paradigm **(15 Hours)**

Challenges of SaaS Paradigm-Approaching the SaaS Integration- New Integration Scenarios-Integration Methodologies- SaaS Integration Methodologies- SaaS Integration Products and Platforms-SaaS Integration Services-Business to Business Integration(B2Bi) Services-A Framework of Sensor-Cloud Integration-SaaS Integration Appliances-The Enterprise Cloud Computing Paradigm-Issues for Enterprise Applications on Cloud-Transition Challenges-Cloud Supply Chain.

UNIT III: Virtual Machines Provisioning and Migration Services **(15 Hours)**

Introduction and Inspiration-Virtual Machines Provisioning and Manageability-Virtual Machine Migration Services- VM Provisioning and Migration in Action- Provisioning in the cloud Context-Future Research Directions-Virtual machines for cloud infrastructure-Anatomy of cloud Infrastructure-Distributed management of Virtual Infrastructure- Enhancing cloud computing environments using cloud as a service-RVWS Design-Cluster as service.

UNIT IV: SLA Management and Service Provider's Perspective **(15 Hours)**

The Best Principles of Cloud Computing-A Model for Federated Cloud Computing-Security Considerations-Traditional Approaches to SLO Management- Types of SLA-Life Cycle of SLA-SLA Management in Cloud-Automated Policy-based Management-Best Practices in Architecture Cloud Applications in the AWS Cloud-Cloud Concepts-Cloud Best Practices-Grep TheWeb.

UNIT V: Data Security **(15 Hours)**

Data Security Considerations - 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-Legal issues in Cloud Computing-Data Privacy and Security Issues-Cloud Contracting Models-Virtualization and Data Location-Cloud User's Point.

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions.

Book for Study

1. Buyya, R., Broberg, J., & Goscinski, A. (2011). *Cloud Computing Principles and Paradigms,* (1st Ed.). Wiley Publication.
   Unit I: Chapter 1 and Chapter 2.
   Unit II: Chapter 3 and Chapter 4.
   Unit III: Chapter 5,6 and 7.
   Unit IV: Chapter 15 and Chapter 16.
   Unit V: Chapter 23 and Chapter 24.

Books for Reference

1. Buyya, V., & Selvi. (2013). *Mastering Cloud Computing: Foundations and Applications Programming*. Tata McGraw Hill.
2. Ingeno, J. (2018). *Software Architect's Handbook*. Packt Publishing.
3. Goessling, S., & Jackson, K. L. (2018). *Architecting Cloud Computing Solutions*. Packt Publishing.

Websites and eLearning Sources

1. https://www.ibm.com/topics/cloud-computing
2. https://www.techtarget.com/searchitchannel/cloud-service-provider-cloud-provide
3. https://www.c-sharpcorner.com/article/top-10-cloud-service-providers/
4. https://www.guru99.com/cloud-computing-service-provider.html

Course Outcomes		
CO No.	**CO-Statements** On completion of this course, students will be able to	**Cognitive Levels (K - Level)**
CO1	recall the fundamental concepts of cloud computing technology	**K1**
CO2	understand the various cloud services	**K2**
CO3	analyze and summarize the virtual machine services and infrastructures	**K3**
CO4	understand and apply cloud architecture and applications	**K4**
CO5	use the cloud security considerations and models	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
6	**23UCS63ES03B**			**Discipline Specific Elective - 3:** Cloud Computing						**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	1	2	3	3	2	1	2	**2.2**
CO2	3	3	3	2	1	3	3	3	2	2	**2.5**
CO3	2	3	3	2	2	2	3	3	2	2	**2.4**
CO4	3	3	3	1	2	3	3	3	1	2	**2.4**
CO5	2	3	3	1	2	2	3	3	2	1	**2.3**
										Mean Overall Score	**2.36 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
6	23UCS63ES04A	**Discipline Specific Elective - 4:** Internet of Things	5	3

Course Objectives
To understand the characteristics and enabling technologies of IoT
To explore the connectivity of sensors and related hardware for IoT application scenario
To enable and to analyze various techniques such as messaging and transport protocols, Addressing and Identification in IoT Domain
To facilitate and to choose the appropriate cloud services and cloud service providers based on the IoT application
To impart the skills to design and develop new IoT-based applications

UNIT I: Introduction to Internet of Things **(15 Hours)**

Definition of Internet of Things - Application Areas of IoT - Characteristics of IoT - Things in IoT - IoT Stack - Enabling Technologies - IoT Challenges.

UNIT II: Sensors, Microcontrollers and their interfacing **(15 Hours)**

Introduction to sensor interfacing - Types of Sensors - Controlling sensors through Webpage - Microcontrollers: a quick walkthrough.

UNIT III: Protocols for IoT **(15 Hours)**

Introduction- Messaging Protocols - XMPP and DDS Protocols - Transport Protocols - Addressing and Identification: Internet Protocol Version 4 - Internet Protocol Version 4 - IPv6 vs IPv4 - Legacy of IPv4 devices - Switching over to IPv6.

UNIT IV: Cloud for IoT **(15 Hours)**

Introduction - IoT with Cloud - challenges - Selection of cloud service provider - Introduction to Fog computing - Cloud computing: Security aspects. Data Analytics: Introduction - Data Analysis.

UNIT V: Application Building with IoT **(15 Hours)**

Introduction - Smart Perishable tracking with IoT and Sensors - Smart Healthcare - IoT based Application to Monitor Water Quality - Smart Warehouse Monitoring - Smart Retail - IoT based Smart Driver Assistance System - System to measure Collision impact in an accident with IoT - Integrated Vehicle Health Management.

Teaching Methodology	PPTs, Videos, Online Portals, Hands on Demonstration

Book for Study

1. Shriram, K. V., Abhishek, S. N. & Sundaran, R. M. D. (2020). *Internet of Things,* (2nd Ed.). Wiley Publication.
   Unit I - Chapters 1
   Unit II - Chapters 2
   Unit III - Chapters 3, 4
   Unit IV - Chapters 5, 6
   Unit V - Chapters 7

Books for Reference

1. Arshdeep, B., & Vijay, M. (2015). *Internet of Things- A Hands-on Approach.* Universities Press Private Limited.
2. Hanes, David, Gonzalo, S., Patrick, G., Robert, B., & Jerome, H. (2017). *IoT fundamentals: Networking technologies, protocols, and use cases for the Internet of Things.* Cisco Press.
3. Qusay, F. H. (2018). *Internet of Things A to Z: Technologies and Applications*. Wiley Publication, IEEE Press

Websites and eLearning Sources

1. https://www.shiksha.com/online-courses/industrial-internet-of-things-iiot-course-courl405

2. https://www.tinkercad.com/
3. https://www.techtarget.com/iotagenda/definition/Internet-of-Things-IoT
4. https://www.oracle.com/in/internet-of-things/what-is-iot/
5. https://www.ibm.com/topics/internet-of-things

Course Outcomes		
CO No.	**CO-Statements** On completion of this course, students will	**Cognitive Levels (K - Level)**
CO1	recall the characteristics and enabling technologies of IoT	**K1**
CO2	understand the connectivity of sensors and other necessary hardware for deploying IoT applications	**K2**
CO3	apply the appropriate transport protocols, addressing and identification techniques suitable for IoT Domain	**K3**
CO4	analyze the apt cloud services and cloud service providers for IoT based Smart services after proper evaluation	**K4**
CO5	design and develop new IoT based applications for different domain	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
6	**23UCS63ES04A**			**Discipline Specific Elective - 4:** Internet of Things						**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	3	2	1	3	2	3	2	2	**2.3**
CO2	3	3	3	3	2	3	3	3	2	2	**2.7**
CO3	2	3	2	2	1	3	3	2	2	1	**2.1**
CO4	3	3	3	2	2	3	3	3	3	2	**2.7**
CO5	3	3	3	3	2	3	3	3	3	2	**2.8**
										Mean Overall Score	**2.52 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
6	23UCS63ES04B	**Discipline Specific Elective - 4:** Artificial Intelligence and Machine Learning	5	3

Course Objectives
To make the students understand the fundamentals of artificial intelligence and Machine Learning
To analyze and apply heuristic search techniques to real-world problem-solving scenarios.
To become familiar with the concept of knowledge representation and its significance in artificial intelligence
To apply various reasoning techniques for AI and ML applications
To apply appropriate machine learning techniques for specific tasks, build machine learning models, and evaluate their performance

UNIT I: Introduction to Artificial Intelligence **(15 Hours)**

Introduction: Definitions of Artificial Intelligence - Artificial Intelligence Problems - Topics of Artificial Intelligence - Timelines of Artificial Intelligence - Production Systems - State Space Representation - Branches of Artificial Intelligence - Applications of Artificial Intelligence.

UNIT II: Heuristic Search Techniques and Game Playing **(15 Hours)**

Heuristic Search Techniques: General and Test - Hill Climbing - Search Techniques - Problem Reduction - Constraints Satisfaction - Means-ends Analysis - Game Playing.

UNIT III: Knowledge Representation **(15 Hours)**

Knowledge Representation: Knowledge Management - Types of Knowledge - Knowledge representation - Approaches to Knowledge Representation - Issues in Knowledge Representation - Knowledge base - First order Logic - Frames - Conceptual Dependency -Scripts - Semantic Network.

UNIT IV: Reasoning **(15 Hours)**

Reasoning: Types of Reasoning - Non-monotonic Inference Methods - Non-monotonic Reasoning - Truth Maintenance Systems - Reasoning with Fuzzy Logic - Rule based Reasoning - Diagnosis Reasoning.

UNIT V: Learning **(15 Hours)**

Learning: Types of Learning - Machine Learning: History of Machine Learning - Types in Machine Learning - Aspects of Inputs to Training - Learning Systems - Machine Learning Applications- Quantification of Classification - Intelligent Agents.

Teaching Methodology	Videos, PPT, Demonstration, and Hands on sessions

Book for Study

1. Chandra, V. S. S. & Hareendran, A.S. (2014). *Artificial Intelligence and Machine Learning*. PHI Learning Pvt Ltd.
   Unit I - Chapter 1
   Unit II - Chapter 2, 3
   Unit III - Chapter 4, 5
   Unit IV - Chapter 7
   Unit V - Chapter 8

Books for Reference

1. Russell, S. J. & Norvig, P. (2016). *Artificial Intelligence A Modern Approach*, (3rd Ed.). Pearson Education Limited.
2. Mitchell, T. M. (2017). *Machine Learning*. McGraw-Hill Education.
3. Mehrotra, D. (2019). *Basics of Artificial Intelligence & Machine Learning*. Notion Press.

Websites and eLearning Sources

1. https://intellipaat.com/blog/tutorial/artificial-intelligence-tutorial/

2. https://www.guru99.com/artificial-intelligence-tutorial.html
3. https://www.geeksforgeeks.org/artificial-intelligence-an-introduction/
4. https://www.geeksforgeeks.org/machine-learning/
5. https://www.javatpoint.com/machine-learning

Course Outcomes		
CO No.	**CO-Statements** On completion of this course, students will	**Cognitive Levels (K-Level)**
CO1	recall the fundamentals of artificial intelligence and Machine Learning	**K1**
CO2	understand the techniques used for AI and ML applications	**K2**
CO3	apply the various AI and ML techniques to real time applications	**K3**
CO4	analyze the skills to use the appropriate techniques in AI and ML applications	**K4**
CO5	evaluate the design of new artificial intelligence and machine learning applications.	**K5**

Relationship Matrix											
Semester	**Course Code**			**Title of the Course**						**Hours**	**Credits**
6	**23UCS63ES04B**			**Discipline Specific Elective - 4:** Artificial Intelligence and Machine Learning						**5**	**3**
Course Outcomes	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	3	2	1	2	2	2	2	1	**2.0**
CO2	2	3	3	3	1	2	3	3	2	1	**2.3**
CO3	2	3	3	3	1	2	3	3	3	1	**2.4**
CO4	2	3	3	3	1	2	3	3	3	1	**2.4**
CO5	2	3	3	3	1	2	3	3	3	1	**2.4**
Mean Overall Score											**2.3 (High)**

Semester	Course Code	Title of the Course	Hours/Week	Credits
6	**23UCS63PW01**	Project Work and Viva Voce	**3**	**2**

Project

All the B.Sc. (CS) students should take up a project work in their sixth semester which needs to apply the knowledge they have gathered in the first five semesters. This could be an application development or system oriented development.

A project guide will approve the project work after going through the synopsis submitted by the student. The project guide will be allotted by the Class-in-charge or the Head of the Department. The synopsis should contain the following.

1. System Analysis
2. System requirements in terms of software and hardware
3. Feasibility Analysis

After the approval from the guide, the students are expected to carry out the project work in the Computer Labs of our college. They should get approval from the guide before they start doing each module of the project work in the lab by getting the signature of the guide at least a day before the project work lab.

After the completion of the project work, the students are expected to compile a project work report which will be approved by the guide and it should contain the following.

1. System Analysis.
2. System requirements in terms of software and hardware.
3. Feasibility Analysis.
4. DFD, E-R diagrams, Object-oriented model diagrams, Circuit diagrams, whatever applicable to their project.
5. Tables of Data, Data Dictionary, if applicable.
6. Output models
7. Implementation details.
8. Future enhancements, if any.
9. References / Bibliography, Web references, whatever applicable to their project.

Each volume should be appended with

A. Source Code.

B. Screen shots of model outputs.

Finally, the students should submit the project work in the form of bound volumes of books of A4 size, the number of volumes will be normally two and it may be three depending on the requirements of the Department from time to time, bearing the certificate of bonafide of the work by the guide and of the Head of the Department.

The evaluation of the project work will be done for 100 marks, of which 75 marks for the Internal examiner. The remaining 25 marks for the viva-voce will be jointly evaluated by project guide and an external examiner. The viva-voce will be conducted tentatively during the last week of the semester.

Semester	Course Code	Title of the Course	Hours/Week	Credits
6	23UCS63CE01	Comprehensive Examination	-	2

C++ and Object-Oriented Programming concepts

1. Data Types
2. Control Structures
3. Arrays
4. Functions
5. Templates
6. Class and Objects
7. Constructors
8. Inheritance
9. Abstract Class
10. Interface

Data Structures and Algorithms

1. Arrays
2. Stack & Queue
3. Linked List
4. Tree, Binary Tree
5. Sorting & Searching Algorithms
6. Backtracking
7. Recursion

Operations Research

1. Linear Programming Problem (LPP)
2. Transportation & Assignment Problem
3. Project Scheduling

Database Systems

1. Data Models - Relational and ER Model
2. Database Design - Normalization
3. SQL

Operating Systems

1. Operating System Structure
2. Process Management Concepts: Life Cycle - Scheduling
3. Memory Management Concepts: Paging-Segmentation- Virtual Memory

Computer Networks

1. Data Communication
2. OSI Layers - Application, Network, Transport
3. TCP/IP Model
4. Security