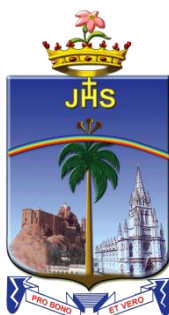


M.Sc. COMPUTER SCIENCE

LOCF SYLLABUS – 2021

SCHOOLS OF EXCELLENCE

WITH CHOICE BASED CREDIT SYSTEM (CBCS)



**DEPARTMENT OF INFORMATION TECHNOLOGY
SCHOOL OF COMPUTING SCIENCES
ST. JOSEPH'S COLLEGE (AUTONOMOUS)**

Special Heritage Status Awarded by UGC
Accredited at A⁺⁺ Grade (IV Cycle) by NAAC
College with Potential for Excellence by UGC
DBT-STAR & DST-FIST Sponsored College
Tiruchirappalli - 620 002, Tamil Nadu, India

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

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

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

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

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

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

Human excellence in specialized areas

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

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

Credit system:

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

For PG courses, a student must earn a minimum of 110 credits as mentioned in the programme pattern table. The total number of minimum courses offered by the Department is given in the Programme Structure.

OUTCOME-BASED EDUCATION (OBE)

LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK (LOCF)

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

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

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

Some important aspects of the Outcome Based Education

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

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

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

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

Programme Specific Outcomes (PSOs):

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

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

Some important terminologies repeatedly used in LOCF.

Core Courses (CC)

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

Discipline Specific Elective Courses (DSE)

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

DSE: Four courses are offered, one course in each semester.

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

One DSE Course in semester two is offered as interdisciplinary/common course among the departments in a School (Common Core Course) at the PG level.

Generic Elective Courses

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

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

Two GE Courses are offered, one each in semesters II and III. The GE course offered in semester II is within the school level and the GE in semester III is Between Schools level

The Ability Enhancement Courses (AEC)

One Main discipline related Ability Enhancement Course for 3 credits is offered for a PG programme by the Department.

Skill Enhancement Courses (SECs)

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

One SEC is offered in semester II as a compulsory course on Soft Skills, offered by the Department of Human Excellence, common to all the students of PG programme.

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

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

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

Course Coding:

The following code system (10 alphanumeric characters) is adopted for Post Graduate courses:

21	PXX	N	XX	NN/NNX
Year of Revision	PG Department Code	Semester number.	Part Category	running number/with choice

N:- Numerals X :- Alphabet

Part Category

CC - Core Theory

CP- Core Practical

IS- Internship

SP- Self Paced Learning

CE- Comprehensive Examination

PW- Project Work & viva-voce

Electives Courses

ES – Department Specific Electives

EG- Generic Electives

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

Ability Enhancement Courses

AE – Ability Enhancement Course

SE – Skill Enhancement Course – Soft skills

CW - SHEPHERD & Gender Studies (Outreach)

CIA AND SEMESTER EXAMINATION

Continuous Internal Assessment (CIA):

Distribution of CIA Marks	
Passing Minimum: 50 Marks	
Library Referencing	5
3 Components	35
Mid-Semester Test	30
End-Semester Test	30
CIA	100

MID-SEM & END-SEM TEST

Centralised – Conducted by the office of COE

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

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

Knowledge levels for assessment of Outcomes based on Blooms Taxonomy

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

WEIGHTAGE of K – LEVELS IN QUESTION PAPER

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

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

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

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

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

Assessment pattern for two credit courses.

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

EVALUATION

GRADING SYSTEM

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

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

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

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

CLASSIFICATION OF FINAL RESULTS:

- i) The classification of final results shall be based on the CGPA, as indicated in Table-2.
- ii) For the purpose of Classification of Final Results, the candidates who earn the CGPA 9.00 and above shall be declared to have qualified for the Degree as 'Outstanding'. Similarly the candidates who earn the CGPA between 8.00 and 8.99, 7.00 and 7.99, 6.00 and 6.99 and 5.00 and 5.99 shall be declared to have qualified for their Degree in the respective programmes as 'Excellent', 'Very Good', 'Good', and 'Above Average' respectively.
- iii) A Pass in SHEPHERD will continue to be mandatory although the marks will not count for the calculation of the CGPA.
- iv) Absence from an examination shall not be taken an attempt.

Table-1: Grading of the Courses

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

Table-2: Final Result

CGPA	Corresponding Grade	Classification of Final Result
9.00 and above	O	Outstanding
8.00 to 8.99	A+	Excellent
7.00 to 7.99	A	Very Good
6.00 to 6.99	B+	Good
5.00 to 5.99	B	Above Average
Below 5.00	RA	Re-appearance

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

Declaration of Result

Mr./ MS. _____ has successfully completed the Post Graduate in _____ programme. The candidate's Cumulative Grade Point Average (CGPA) is _____ and the class secured is _____ by completing the minimum of 110 credits.

The candidate has also acquired _____ (if any) extra by attending MOOC courses.

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

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

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

Mapping	<40%	$\geq 40\%$ and < 70%	$\geq 70\%$
Relation	Low Level	Medium Level	High Level
Scale	1	2	3

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

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

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

VISION

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

MISSION

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

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

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

POs - PG

1. Graduates will be able to apply assimilated knowledge to evolve tangible solutions to emerging problems.
2. Graduates will be able to analyze and interpret data to create and design new knowledge.
3. Graduates will be able to engage in innovative and socially relevant research and effectively communicate the findings.
4. Graduates will become ethically committed professionals and entrepreneurs upholding human values.
5. Graduates groomed with ethical values and social concern will be able to understand and appreciate cultural diversity, promote social harmony and ensure sustainable environment.

Programme Specific Outcomes (PSOs)	
PSO1	Acquire fundamental knowledge in problem solving, general computing and comprehensive knowledge in Computer Science.
PSO2	Competence to identify, analyze, design, optimize and implement system solutions using contemporary computing techniques which propels towards employability.
PSO3	Gain fundamental knowledge in computational methods and tools for solving real-time problems and implanting the quest for continual learning of novel and in-demand skills.
PSO4	Demonstrate the ability to act as a leader, or as a part of a team to create multi-functional Software Solutions.
PSO5	Ability to showcase discrete practical experiences by implementing various strategies that utilizes a variety of software techniques that are ethical and would be beneficial to the society.

M.Sc. COMPUTER SCIENCE					
PROGRAMME STRUCTURE					
Sem.	Specification	No. of Courses	No. of Hours	Credits	Total Credits
I-IV	Core Courses: Theory	7	6x5=30 1x6=6	5	35
I-IV	Core Courses: Practicals	6	6x3=18	2	12
II	Self-paced learning	1	-	2	2
IV	Comprehensive Examination	1	-	2	2
III	Mini Project work & Viva Voce	1	-	7	7
IV	Major Project work & Viva Voce	1	1x30=30	20	20
I- IV	Discipline Specific Elective	4	4x5=20	4	16
I	Ability Enhancement Course	1	1x4=4	3	3
II	Skill Enhancement Course (Soft Skills)	1	1x4=4	3	3
II	Generic Elective IDC (WS)	1	1x4=4	3	3
III	Generic Elective IDC (BS)	1	1x4=4	3	3
I - III	Online Courses (MOOC)	3	-	(2)	(6)
I-IV	Outreach Programme	-	-	-	4
	Total		120		110(6)

M.Sc. COMPUTER SCIENCE							
PROGRAMME PATTERN							
Course Details					Scheme of Exams		
Sem	Code	Course Title	Hrs	Cr	CIA	SE	Final
I	21PCS1CC01	Programming in Java	5	5	100	100	100
	21PCS1CC02	NoSQL with MongoDB	5	5	100	100	100
	21PCS1CC03	Mathematical Foundations	5	5	100	100	100
	21PCS1CP01	Practical I – Java	3	2	100	100	100
	21PCS1CP02	Practical II – MongoDB	3	2	100	100	100
	21PCS1ES01A	DSE-1: Data Structures and Algorithm Design Methods	5	4	100	100	100
	21PCS1ES01B	DSE-1: High Performance Computing					
	21PCS1AE01	AEC: Big Data Analytics	4	3	50	50	50
		Extra Credit courses (MOOC)-1	-	(2)			
		Total	30	26 (2)			
II	21PCS2CC04	Programming with C# using ASP.NET	6	5	100	100	100
	21PCS2CC05	Data Science Using Python	5	5	100	100	100
	21PCS2CP03	Practical III – ASP.NET	3	2	100	100	100
	21PCS2CP04	Practical IV - Python	3	2	100	100	100
	21PCS2SP01	Self-Paced Learning: Computer Networks	-	2	50	50	50
	21PCS2ES02A	DSE-2: Internet of Things	5	4	100	100	100
	21PCS2ES02B	DSE-2: Compiler Design					
	21PSS2SE01	SEC: Soft skills	4	3	100	-	100
	21PCS2EG01	GE-1(WS): Mobile Adhoc Networks (MANET)	4	3	100	100	100
	21PMA2EG01	GE-1(WS): Mathematical Foundations (Offered by Math's)					
		Extra Credit courses (MOOC)-1	-	(2)			
		Total	30	26 (2)			
III	21PCS3CC06	Web Design using PHP	5	5	100	100	100
	21PCS3CC07	Smart Device Programming using Android	5	5	100	100	100
	21PCS3CP05	Practical V - PHP	3	2	100	100	100
	21PCS3CP06	Practical VI - Android	3	2	100	100	100
	21PCS3ES03A	DSE-3: Artificial Intelligence	5	4	100	100	100
	21PCS3ES03B	DSE-3: Computational Intelligence					
	21PCS3ES04A	DSE-4: Digital Marketing	5	4	100	100	100
	21PCS3ES04B	DSE-4: Ethical Hacking					
	21PCS3EG02	GE-2 (BS): Advances in Computer Science	4	3	100	100	100
	21PCS3CE01	Comprehensive Examination	-	2	50	50	50
	21PCS3PW01	Mini Project Work	-	7	100	100	100
		Extra Credit courses (MOOC)-2		(2)			
		Total	30	34 (2)			
IV	21PCS4PW02	Major Project work & Viva Voce	30	20	100	100	100
		Total	30	20			
I-IV	21PCW4OR01	Outreach program (SHEPHERD)		4			
Total (Four Semesters)			120	110(6)			

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

GENERIC ELECTIVE -1: 2nd Semester Within school (WS)- Offered to students belong to other Departments in the School							
Course Details					Scheme of Exams		
School	Course Code	Course Title	Hrs	Cr	CIA	SE	Final
SBS	21PBI2EG01	Herbal Technology	4	3	100	100	100
	21PBT2EG01	Medical Biotechnology	4	3	100	100	100
	21PBO2EG01	Medicinal Botany	4	3	100	100	100
SCS	21PCA2EG01	Applied Statistics using R	4	3	100	100	100
	21PMA2EG01	Mathematical Foundations	4	3	100	100	100
	21PCS2EG01	Mobile Adhoc Networks (MANET)	4	3	100	100	100
SLAC	21PEN2EG01A	Indian Literature in Translation	4	3	100	100	100
	21PEN2EG01B	English Literature For Competitive Examinations					
SMS	21PCO2EG01	Supply Chain Management	4	3	100	100	100
	21PEC2EG01	Labour Economics	4	3	100	100	100
	21PHR2EG01	Organizational Behaviour	4	3	100	100	100
	21PCC2EG01	Stress Management	4	3	100	100	100
SPS	21PCH2EG01	Industrial Products	4	3	100	100	100
	21PPH2EG01A	Solar Energy and Utilization	4	3	100	100	100
	21PPH2EG01B	Renewable Energy Resources	4	3	100	100	100

GENERIC ELECTIVE -2: 3rd Semester Between schools (BS)- Offered to students in the Departments belong to other Schools (Except the school offering the course)							
Course Details					Scheme of Exams		
School	Course Code	Course Title	Hrs	Cr	CIA	SE	Final
SBS	21PBI3EG02	First Aid Management	4	3	100	100	100
	21PBT3EG02	Food Technology	4	3	100	100	100
	21PBO3EG02	Horticulture and Landscaping	4	3	100	100	100
SCS	21PCA3EG02	Web Design	4	3	100	100	100
	21PMA3EG02	Operations Research	4	3	100	100	100
	21PCS3EG02	Advances in Computer Science	4	3	100	100	100
	21PDS3EG02	Deep Learning	4	3	100	100	100
SLAC	21PEN3EG02	English for Effective Communication	4	3	100	100	100
SMS	21PCO3EG02	Basics of Taxation	4	3	100	100	100
	21PEC3EG02	Managerial Economics	4	3	100	100	100
	21PHR3EG02	Counselling and Guidance	4	3	100	100	100
	21PCC3EG02	Dynamics of Human Behaviour in Business	4	3	100	100	100
SPS	21PCH3EG02	Health Science	4	3	100	100	100
	21PPH3EG02A	Physics for Competitive Exam	4	3	100	100	100
	21PPH3EG02B	Nano Science	4	3	100	100	100

Semester	Course Code	Title of the Course	Hours	Credits
I	21PCS1CC01	CORE-1: PROGRAMMING IN JAVA	5	5

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	find solutions for a range of problems using object-oriented programming.	K1
CO-2	explain the Java Event-Handling model GUI Components.	K2
CO-3	solve problems using the fundamental syntax and semantics of the Java Programming Language.	K3
CO-4	examine JDBC programming techniques in Java.	K4
CO-5	evaluate Remote real-time applications using RMI and Servlet.	K5, K6

Unit-I: Classes and Objects

(15-Hours)

General Form of a Class - Creation of Objects -Usage of Constructors - 'this' Keyword- Constructor Overloading-Copy Constructors-Static Data Members - Static Methods- Finalize Method. Inheritance and Polymorphism: Inheriting Variables in a Class - Inheriting Methods in a Class - Inheritance and Constructors Abstract Classes - Final Classes.

Unit-II: Interfaces and Packages

(15-Hours)

Interfaces-Structure of an Interface - Implementation of an Interface Inheritance. Packages - Placing the Classes in a Package - Package Hierarchy Access Control Modifiers. Applets: The Life Cycle of an Applet -The Applet Class Development and Execution of a Simple Applet - Syntax of Applet Tag- Methods in the Graphic Class.

Unit-III: Swings

(15-Hours)

Applet class - Icons - JLabel Control - JOptionPane Class - JTextField Control JButton Control - JCheckBox Control - JRadioButton Control Menus. Exception Handling: Default Exception Handling - Exception and Error Classes - Catch Block Searching Pattern - Custom Exceptions. I/O Streams: Text and Binary Formats of Data Input Stream and Output Stream Classes - Reader and Writer Classes - Data Output Stream and Data Input Stream Classes.

Unit-IV: Threads

(15-Hours)

Life Cycle of a Thread - Creating and Running Threads - Method in the Thread Class - Setting the Priority of a Thread - Synchronization. Networking: TCP Server Socket Class - TCP Socket Class. Java Database Connectivity: Establishing A Connection - Creation of Data Tables Entering Data into The Tables - Table Updating.

Unit-V: Remote Method Invocation

(15-Hours)

Remote Interface-Java.Rmi.Server Package The Naming Class - Creating RMI Client And Server Classes. Servlet: Servlet and Dynamic Webpages Life Cycle of a Servlet a Simple Servlet Javax.Servlet Package Retrieving the Values of Parameters. Cookies: Creating a Cookie and Sending it to the Client – Retrieving the Stored Cookies.

Book for Study

1. C. MUTHU, *Programming with JAVA*, Second Edition, Vijay Nicole Imprints Private Limited, Chennai, 2011.

Unit I - Chapter 5, Chapter 6

Unit II - Chapter 7, Chapter 8

Unit III - Chapter 11, Chapter 14

Unit IV - Chapter 13, Chapter 15, Chapter 18

Unit V - Chapter 19, Chapter 20

Books for Reference

1. Herbert Schildt, *Java 2: Complete Reference*, 11th Edition, Tata McGraw Hill, New Delhi, 2018.
2. E Balagurusamy, *Programming with JAVA*, 6th Edition, Tata McGraw Hill, New Delhi, 2019.
3. Mark Lassooff, *Java Programming for Beginners*, 1st Edition, Packt Publishing, UK, 2017.

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

Semester	Course Code	Title of the Course									Hours	Credits
I	21PCS1CC01	CORE-1: PROGRAMMING IN JAVA									5	5
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	2	3	2	3	3	3	2	3	3	2.6	
CO-2	2	3	2	2	3	3	3	2	2	3	2.5	
CO-3	1	2	3	2	3	3	2	3	2	2	2.3	
CO-4	2	2	3	2	2	3	3	2	3	3	2.5	
CO-5	2	2	3	3	2	2	3	2	3	3	2.5	
Mean Overall Score											2.48 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
I	21PCS1CC02	CORE-2: NOSQL WITH MONGODB	5	5

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	show the fundamental concepts of NoSQL and key value to engage the database.	K1
CO-2	comprehend the structure of NoSQL to implement MongoDB .	K2
CO-3	apply the basic queries on MongoDB to solve real time problem.	K3
CO-4	analyze the different concept of aggregation to implement and retrieve the data using mathematical methods.	K4
CO-5	estimate the various strategies Replication and Sharding for implementing various software solutions.	K5, K6

Unit-I: NoSQL Database

(15-Hours)

RDBMS Vs NOSQL - Data Management with Distributed Databases- ACID and BASE- Four types of NOSQL Databases. Key Value Databases: Introduction to key value databases- Essential Features of Key-value Databases- Key-Value Database Data Modelling Terms- Key-Value Architecture Terms- Key-Value Implementation Terms.

Unit-II: Document Database

(15-Hours)

Introduction to Document Database: Document managing Multiple Document in Collection- Basic Operations on document Database- Types of Partitions- Data modelling and Query Processing Normalization, De-normalization, and the Search for proper Balance.

Unit-III: Introduction to MongoDB

(15-Hours)

Documents- Collections- Databases- Starting MongoDB- Data Types- Inserting and Saving Documents- Removing Documents- Updating Documents- Introduction to find- Query Criteria- Type-Specific Queries- \$where Queries- Introduction to Indexing- Using explain () and hint () - Types of Indexes.

Unit-IV: Aggregation

(15-Hours)

The Aggregation Framework- Pipeline Operations- MapReduce- Aggregation Commands- Normalization versus Denormalization- Optimizations for Data Manipulation- When Not to Use MongoDB.

Unit-V: Replication

(15-Hours)

Introduction to Replication- Configuring a Replica Set- Changing Your Replica Set Configuration- How to Design a Set- Member Configuration Options- Components of a Replica Set. Sharding: Introduction to Sharding- Understanding the Components of a Cluster- Starting the Servers- How MongoDB Tracks Cluster Data.

Books for Study

1. Dan Sullivan, *NoSQL for Mere Mortals*, Addison-Wesley, USA, 2015.

Unit-I Chapter 2, Chapter3

Unit-II Chapter 6

2. Kristina Chodorow, *MongoDB: The Definitive Guide*, O'Reilly, USA, 2013.

Unit - III Chapter 2, Chapter3, Chapter 4, Chapter 5

Unit – IV Chapter 7

Unit – V Chapter 9, Chapter10

Books for Reference

1. Kyle Banker, Piter Bakkum, Shaun Verch, *MongoDB in Action*, Dream tech Press, New Delhi, 2016.
2. David Hows, Eelco Plugge, Peter Membray, Tim Hawkins, *The Definitive Guide to MongoDB*, Apress, UK, 2013.
3. Pramod J. Sadalage and Martin Fowler, *NoSQL Distilled. A Brief Guide to the Emerging World of Polyglot Persistence*, Pearson, Chennai, 2012.

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

Semester	Course Code	Title of the Course									Hours	Credits
I	21PCS1CC02	CORE-2: NOSQL WITH MONGODB									5	5
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	2	2	3	3	3	2	3	2	2	2.4	
CO-2	2	2	3	3	2	3	3	3	2	3	2.6	
CO-3	2	2	2	2	2	2	3	3	2	3	2.3	
CO-4	3	2	2	3	2	2	3	2	2	3	2.4	
CO-5	2	2	3	2	3	2	3	3	2	3	2.5	
Mean Overall Score											2.44 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
I	21PCS1CC03	CORE-3: MATHEMATICAL FOUNDATIONS	5	5

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	understand the rudimentary knowledge in Mathematical Logics.	K1
CO-2	demonstrate the use of Operations Research approaches to solve real-time problems in Industry.	K2
CO-3	gain Fundamental knowledge in recurrence relations, statistical methods to improve decision making and develop critical thinking and objective analysis of decision problems.	K3
CO-4	examine Transportation and Assignment problems using appropriate method.	K4
CO-5	evaluate various cryptographic techniques through mathematical knowledge that utilizes a variety of software techniques that would aid the society.	K5, K6

Unit-I: Mathematical Logic

(15-Hours)

Propositions - Precedence Rules for Operators – Truth tables –Tautologies-Contradiction - Laws of Equivalence -Substitution Rules – Evaluation of Constant Proposition theorem - Well Defined Formula – Duality Law.

Unit-II: Recursion and Statistical Analysis

(15-Hours)

The Many Faces of Recursion- Sequences – Recurrence Relation- Some Common Recurrence Relation. Statistical analysis: F-distributions - chi-square Test- T test.

Unit-III: Operation Research

(15-Hours)

Introduction - Basics of OR - OR & Decision Making - Linear Programming- Mathematical Formulation- Graphical Solution - Canonical & Standard Forms of LPP.

Unit-IV: Simplex Method

(15-Hours)

Simplex Method – Big M method – Assignment model Transportation Problem: North West Corner method – Least cost method – VAM method.

Unit-V: Coding Theory

(15-Hours)

Introduction– Cryptography- Caesar Cypher Coding- Matrix Encoding- Scrambled Codes- Hamming Metric - Hamming Distance - Error Detecting -Capability of an Encoding.

Books for Study

1. David Gries, *The Science of Programming*, Narosa Pub. House, New Delhi, 1993.

Unit-I: Chapters (Sec. 1, 2 ,3.1 to 3.3)

2. Alan Doerr, Kenneth Levasseur, *Applied Discrete Structure for Computer Science*,

GalgotiaPub., New Delhi, 1995.

Unit-II: Chapter 8(Sec 8.1-8.4)

3. S.C.Gupta & V.K.Kapoor, *Fundamentals of Mathematical Statistics*, 11th Edition, Sultan Chand and Sons, New Delhi, 2007.

Unit- II:Chapter 13,14 (Sec 14.5.1, 14.2, 13.3)

4. KantiSwarup, Gupta, ManMohan, *Operations Research*, 7th Edition, Sultan Chand & Sons, New Delhi, 1994.

Unit:III:Chapter 1(Sec 1.1,1.9) Chapter 2(Sec 2.1,2.2, 2.3,2.4)

Chapter 3 (Sec 3.1,3.2,3.5)

Unit-IV: Chapter 4(Sec 4.1,4.4) Chapter 10(Sec 10.1,10.2,10.3)

Chapter 11(11.1,11.2,11.3,11.7)

5. James L. Fisher, *Application Oriented Algebra*, Dun Donnelly Pub., New York, 1977.

Unit-V: Chapter 9(Sec 9.1 - 9.5)

Books for Reference

1. Hamdy A. Taha, *Operation Research An Introduction*, 10th Edition, University of Arkansas, Pearson Education, New Jersey U.S, 2017.
2. Kenneth Rosen , *Discrete Mathematics and Its Applications*, 8th Edition, MC Graw Hill Education, India, 2019.
3. Oscar Levin, *Discrete Mathematics an open Introduction*, First Edition, University of Northern Colorado, Create Space Publication, U.S, 2018.

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

Semester	Course Code		Title of the Course								Hours	Credits
I	21PCS1CC03		CORE-3: MATHEMATICAL FOUNDATIONS								5	5
Course Outcomes(COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	3	2	3	3	3	3	2	3	2.7	
CO-2	2	2	3	3	2	3	3	3	2	3	2.6	
CO-3	3	3	3	2	3	3	3	3	2	3	2.8	
CO-4	3	3	2	2	2	3	3	3	2	2	2.5	
CO-5	3	3	2	3	3	3	3	3	2	3	2.8	
Mean Overall Score											2.68	(High)

Semester	Course Code	Title of the Course	Hours	Credits
I	21PCS1CP02	PRACTICAL –I: JAVA	3	2

CO No.	CO- Statement	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	show the behavior of Exception handling and Multithreading.	K1
CO-2	demonstrate the basic concepts of OOPS.	K2
CO-3	apply the JDBC methods to establish connection with database.	K3
CO-4	examine the GUI techniques such as Event handling, Applet and Swing.	K4, K5
CO-5	develop programming aspect with files and networking.	K6

List of Exercises:

1. Classes & Objects
2. Packages & Interfaces
3. Inheritance
4. Exception Handling
5. Multithreading
6. Applet
7. Swing
8. Event Handling Mechanisms
9. Streams and Files
10. Networking
11. JDBC
12. JavaBean
13. Servlets

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

Semester	Course Code	Title of the Course								Hours	Credits
I	21PCS1CP01	PRACTICAL - I: JAVA								3	2
Course Outcomes↓ (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	1	1	2	3	2	2	2	3	2	3	2.1
CO-2	1	3	3	3	2	2	3	3	2	3	2.5
CO-3	2	2	2	3	2	3	3	2	3	3	2.5
CO-4	3	2	3	3	3	2	2	3	3	2	2.6
CO-5	2	3	3	3	2	3	3	2	2	3	2.6
Mean Overall Score											2.46 (High)

Semester	Course Code	Title of the Course	Hours	Credits
I	21PCS1CP02	PRACTICAL-II: MONGODB	3	2

CO No.	CO- Statements	Cognitive Level (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	understand the fundamental design concepts of database using MongoDB.	K1
CO-2	comprehend the regular expression and indexing for solving real time problem.	K2
CO-3	apply distributed techniques for querying documents and modification.	K3
CO-4	analyze clustering and projecting techniques to interpret the data set.	K4
CO-5	estimate the various strategies to Manipulate data.	K5, K6

List of Exercises:

1. Basic Queries Using MongoDB
2. Indexes
3. Comparison operations
4. Project
5. Group
6. Match
7. Sort
8. Search Text
9. Logical Operations
10. Set Operations
11. Replication
12. Sharding

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

Semester	Course Code		Title of the Course								Hours	Credits
I	21PCS1CP02		PRACTICAL-II: MONGODB								3	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	2	2	2	3	3	2	3	2	2	2.3	
CO-2	3	2	3	3	2	3	3	3	2	3	2.7	
CO-3	2	2	2	2	3	2	3	2	2	2	2.2	
CO-4	3	2	2	3	2	3	2	3	2	3	2.5	
CO-5	2	3	3	2	3	3	3	3	2	2	2.6	
Mean Overall Score											2.46 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
I	21PCS1ES01A	DSE-1: DATA STRUCTURES AND ALGORITHM DESIGN METHODS	5	4

CO No.	CO- Statements	Cognitive Level (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	recall the fundamentals of data structure with their implementation and its applications.	K1
CO-2	infer the complexity of algorithms.	K2
CO-3	apply the Greedy methods to solve real time problems.	K3
CO-4	compare different sorting and searching techniques.	K4,K5
CO-5	design new algorithms with Dynamic Programming Techniques for Analytical Problems.	K6

Unit-I: Introduction to Data Structure

(15-Hours)

Arrays - Memory Allocation - Stacks - Operations On Stacks – Evaluation of Arithmetic Expressions – Queues – Representation - Circular Queue - Round Robin Algorithm.

Unit-II: Advance Data Structures

(15-Hours)

Single Linked List - Circular Linked List - Double Linked List. Trees - Binary Trees – Traversals – Expression Tree - Binary Search Tree.

Unit-III: Algorithm Specification

(15-Hours)

Recursive Algorithms. Divide and Conquer: General Method - Binary Search - Finding The Maximum and Minimum - Merge Sort- Quick Sort- Insertion Sort - Selection Sort.

Unit-IV: Algorithm Design Methods

(12-Hours)

The Greedy Method: General Method - Knapsack problem - Job Sequencing with Deadlines - Minimum Cost Spanning Trees - Optimal Merge Patterns. Algorithm Design Methods: Sub goals - Hill Climbing and Working Backward - Heuristics - Backtrack Programming.

Unit-V: Dynamic Programming

(15-Hours)

Dynamic Programming: General Method - Multistage Graphs – General Weights - All Pair Shortest Paths - Optimal Binary Search Trees - Traveling Salesperson Problem.

Books for Study

1. Debasis Samanta, *Classic Data Structures*, 2nd Edition, PHI Learning Pvt. Ltd., New Delhi. 2017.

Unit-I Chapter 2 (Sec: 2.3.1), Chapter 4 (Sec 4.4, 4.5.1), Chapter 5 (Sec 5.3, 5.4.1, 5.5.3)

Unit-II Chapter 3 (Sec: 3.2, 3.3, 3.4), Chapter 7 (Sec 7.4.3, 7.5.1, 7.5.2)

2. Ellis Horowitz, Sartaj Sahni, *Fundamentals of Computer Algorithms*, Galgotia Publications, New Delhi. 2007.

Unit-III Chapter 1 (Sec: 1.2), Chapter 3 (Sec 3.1, 3.2, 3.3, 3.4, 3.5 and 3.6)

Unit-IV Chapter 4 (Sec: 4.1, 4.2, 4.4, 4.5 and 4.7)

Unit-V Chapter 5 (Sec: 5.1, 5.2, 5.3, 5.5, and 5.9)

3. S.E. Goodman and S.T. Hedetniemi, *Introduction to the Design and Analysis of Algorithms*, Tata McGraw Hill, International Edition. New Delhi, 1987.

Unit-IV Chapter 3 (Sec: 3.1, 3.2, and 3.3)

Books for Reference

1. Jean-Paul Tremblay and Paul G.Sorenson, *An introduction to data structures with applications*, 2nd Edition, Tata McGraw Hill Publishing Company Limited, New Delhi. 2017.
2. Ellis Horowitz, SartajSahni and Sanguthevar Rajasekaran, *Fundamentals of Computer algorithms*, 2nd Edition, Universities Press, Hyderabad, 2008.
3. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft, *Data Structures and Algorithms*, Addison Wesley, United States. 1987.

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

Semester	Course Code	Title of the Course									Hours	Credits
I	21PCS1ES01A	DSE-1: Data Structures and Algorithm Design Methods									5	4
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	3	2	1	3	2	2	1	2	2.1	
CO-2	3	2	2	3	2	1	3	3	2	1	2.2	
CO-3	3	2	3	3	3	3	2	1	3	1	2.4	
CO-4	1	2	1	1	3	2	3	3	1	3	2.0	
CO-5	3	1	2	1	3	2	3	3	3	2	2.3	
Mean Overall Score											2.2 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
I	21PCS1ES01B	DSE-1: HIGH PERFORMANCE COMPUTING	5	4

CO No.	CO- Statements	Cognitive Level (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	define the principles of Parallel Algorithm Design.	K1
CO-2	understand the fundamental concepts, techniques in Parallel Computation Structuring and Design.	K2
CO-3	solve the algorithms using Parallel Programming Principle	K3
CO-4	distinguish various architectures of high-performance computing systems.	K4
CO-5	interpret modern design structures of pipelined and multiprocessors systems.	K5, K6

Unit-I: Modern Processors

(15-Hours)

Stored-program computer architecture – General-purpose cache-based microprocessor architecture – Memory hierarchies – Multi core processors - Multithread processors - Vector processors - Basic optimization techniques for serial code - Common sense optimizations - Simple measures - large impact - Role of compilers.

Unit-II: Parallel Computers

(15-Hours)

Data access optimization - Balance analysis and light speed estimates - Storage order - Taxonomy of parallel computing paradigms - Shared memory computers - Distributed memory computers - Hierarchical systems – Networks - Basics of parallelization- Parallelism – Parallel scalability.

Unit-III: Principles of Parallel Algorithm Design

(15-Hours)

Preliminaries - Decomposition techniques - Characteristics of tasks and interactions - Mapping techniques for load balancing - Methods for containing interaction overheads - Parallel algorithm models – Basic communication operations

Unit-IV: Sorting and Graph Algorithms

(15-Hours)

Dense matrix Algorithm: Matrix-vector multiplication - Matrix- matrix multiplication- **Sorting:** Issues in sorting on parallel computing - Sorting networks - Bubble sorts and its variants - Quick sort - Graph algorithms - Definition and representation - Prims algorithm - Dijkstra's algorithm - All pairs shortest path - Transitive closure – Connected components

Unit-V: Shared-Memory Parallel Programming with Openmp

(15-Hours)

Short introduction to OpenMP, Advanced OpenMP: Wavefront parallelization, Profiling OpenMP programs Performance pitfalls, Case study: OpenMP - parallel Jacobi algorithm & Parallel sparse matrix-vector multiply.

Books for Study

1. Georg Hager and Gerhard Wellein, *Introduction to High Performance Computing for Scientists and Engineers*, Chapman & Hall, CRC Press, New York, 2010.

Unit-I Chapter 1, Chapter 2(section 2.2,2.3,2.4)

Unit-II Chapter 4, Chapter 5

Unit –V Chapter 6, Chapter 7

2. AnanthGrama and George Karypis, *Introduction to parallel computing*, Addison-Wesley, USA, 2009.

Unit-III Chapter 3, Chapter 4

Unit – IV Chapter 8, Chapter 9, Chapter 10

Books for Reference

1. John Levesque and Gene Wagenbreth, *High Performance Computing: Programming and Applications*, Chapman & Hall, CRC Press, New York, 2010.
2. Wen-Mei W Hwu, David B Kirk, *Programming Massively Parallel Processors A Hands-on Approach*, Third Edition, Morgann Kaufmann, USA, 2016.
3. Rezaur Rahman, *Intel Xeon Phi Coprocessor Architecture and Tools*, Apress Open, UK, 2013.

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

Semester	Course Code	Title of the Course									Hours	Credits
I	21PCS1ES01B	DSE-1: HIGH PERFORMANCE COMPUTING									5	4
Course Outcomes(COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	3	2	2	3	2	3	3	3	2.6	
CO-2	3	2	3	2	1	3	3	2	3	2	2.4	
CO-3	3	2	1	3	3	2	3	3	2	3	2.5	
CO-4	2	3	3	2	3	2	2	2	2	3	2.4	
CO-5	3	2	3	1	3	3	3	3	3	2	2.6	
Mean Overall Score											2.5	(High)

Semester	Course Code	Title of the Course	Hours	Credits
I	21PCS1AE01	AEC: BIG DATA ANALYTICS	4	3

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	comprehend the overview of an exciting growing field of big data analytics.	K1, K2
CO-2	perform the fundamentals of various big data analytics techniques.	K3
CO-3	analyze the HADOOP and Map Reduce technologies associated with Distributed File System	K4
CO-4	evaluate the Job Execution in Hadoop Environment.	K5
CO-5	discuss the programming tools in Hadoop Echo System.	K6

Unit-I: Overview of Big Data

(12-Hours)

What is big data – Structuring Big data – Elements of Big data – Big data analytics- Careers in Big data. EXPLORING THE USE OF BIG DATA IN BUSINESS: Use of big data in social networking - Preventing Fraudulent Activities – Detecting Fraudulent Activities in Insurance Sector – Retail Industry.

Unit- II: Technologies for Handling Big Data

(12-Hours)

Distributed and parallel computing for Big data – Hadoop – Cloud computing and big data – In-Memory computing technology for big data. Understanding Hadoop Ecosystem: Hadoop Ecosystem – Hadoop Distributed File System – MapReduce – Hadoop YARN.

Unit- III: HBase

(12-Hours)

HBase Architecture – Storing big data with HBase – Interacting with the Hadoop Ecosystem – Combining HBase and HDFS – Hive – Pig and Pig Latin – Sqoop – Zookeeper – Flume – Oozie. Mapreduce and Hbase: MapReduce framework – Techniques to optimize MapReduce Jobs -Uses of MapReduce – Role of HBase in big data processing.

Unit-IV: Big Data Technology

(12-Hours)

Exploring the big data stack – virtualization and big data. Storing Data in Database and Data Warehouse: RDBMS and Big data – Non- Relational Database – Polyglot Persistence – Interacting big data with Traditional data warehouse.

Unit- V: Hadoop Yarn Architecture

(12-Hours)

YARN Architecture – Working of YARN – YARN Schedulers. Exploring Hive: Hive services – Data Types in Hive – Hive DDL- Data manipulation in Hive- Data Retrieval Queries.

Book for Study

1. DT Editorial Services, *BIG DATA BLACK BOOK*, Dreamtech Press, New Delhi, 2017.

Unit-I Chapter 1 (Pages 1-20), Chapter 2 (Pages 29-44)

Unit-II Chapter 3 (Pages 53-74), Chapter 4 (Pages 83-104)

Unit-III Chapter 4 (Pages 103-115), Chapter 5 (Pages 121-142)

Unit-IV Chapter 6 (Pages 150-162), Chapter 7 (Pages 177-187),

Unit-V Chapter 10 (Pages 277-293), Chapter 12 (Pages 311-335)

Books for Reference

1. Michael Minelli, Michael Chambers, Ambiga Dhiraj, *Big Data, Big Analytics*, Wiley, UK, 2014.
2. Dr. Arvind Sathi, *Big Data Analytics: Disruptive Technologies for changing the game*, published by Elsevier, New York, 2013.
3. Soumendra Mohanty, Madhu Jagadeesh, and Harsha Srivatsa, *Big Data Imperatives: Enterprise Big Data Warehouse, BI Implementations and Analytics*, Published by Apress Media, UK, 2013.

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

Semester	Course Code	Title of the Course									Hours	Credits
I	21PCS1AE01	AEC: BIG DATA ANALYTICS									4	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	2	2	2	2	2	3	3	3	2.4	
CO-2	3	2	2	3	2	2	2	2	3	2	2.3	
CO-3	2	2	3	2	3	3	2	2	3	3	2.5	
CO-4	2	2	2	3	2	2	2	3	2	2	2.2	
CO-5	2	2	3	2	2	2	3	2	2	3	2.3	
Mean Overall Score											2.34 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
II	21PCS2CC04	CORE-4: PROGRAMMING WITH C# USING ASP.NET	6	5

CO No.	CO- Statements	Cognitive Levels (K-Levels)
	On successful completion of this course, students will be able to	
CO-1	recall the fundamental concepts of .NET Framework.	K1
CO-2	explain the use of database in Entity Framework.	K2, K5
CO-3	develop C# programs using Object-Oriented Programming Concepts.	K3
CO-4	examine Intelligent Applications using Machine Learning and Windows Desktop Applications using Resources and Templates.	K4
CO-5	interpret the webpages using RAZOR PAGES and MVC.	K6

Unit-I: Understanding .NET

(18-Hours)

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

Unit-II: Writing, Debugging, and Testing Functions

(18-Hours)

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

Unit-III: Implementing Interfaces and Inheriting Classes

(18-Hours)

Setting up a class library and console application – Simplifying methods – Raising and handling events – Implementing interfaces – Inheriting from classes – Casting within inheritance hierarchies – Inheriting and extending .NET types. WORKING WITH DATABASES USING ENTITY FRAMEWORK CORE: Understanding modern databases – Setting up EF Core – Defining EF Core models – Querying EF Core models – Loading patterns with EF Core – Manipulating data with EF Core.

Unit-IV: Building Websites Using Asp.Net Core Razor Pages

(18 Hours)

Understanding web development – Understanding ASP.NET Core – Exploring Razor Pages – Using Entity Framework Core with ASP.NET Core – Using Razor class libraries. Building Websites Using the Model-View-Controller Pattern: Setting up an ASP.NET Core MVC website – Exploring an ASP.NET Core MVC website – Customizing an ASP.NET Core MVC website. Customizing an Asp.Net Core MVC Website: Understanding the benefits of a CMS – Understanding Piranha CMS – Defining components, content types, and templates – Testing the Northwind CMS website.

Unit-V: Building Intelligent Apps Using Machine Learning (18-Hours)

Understanding machine learning – Understanding ML.NET – Making product recommendations. Building Windows Desktop Apps: Understanding legacy Windows application platforms – Understanding the modern Windows platform – Creating a modern Windows app – Using resources and templates – Using data binding.

Book for Study

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

Unit-I – Chapter 1, Chapter 2, Chapter 3

Unit-II – Chapter 4, Chapter 5

Unit-III – Chapter 6, Chapter 11

Unit-IV – Chapter 15, Chapter 16

Unit-V – Chapter 19, Chapter 20

Books for Reference

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

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

Semester	Course Code	Title of the Course									Hours	Credits
II	21PCS2CC04	CORE-4: PROGRAMMING WITH C# USING ASP.NET									6	5
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	1	2	3	3	2	3	3	2	3	3	2.5	
CO-2	2	2	2	2	3	2	2	3	2	3	2.3	
CO-3	1	3	3	3	2	3	2	2	2	3	2.4	
CO-4	2	2	2	3	3	2	2	3	2	3	2.4	
CO-5	2	2	3	2	2	2	3	2	3	3	2.4	
Mean Overall Score											2.4 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
II	21PCS2CC05	CORE-5: DATA SCIENCE USING PYTHON	5	5

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	gain the outline knowledge in Data Science through Big Data Analytics.	K1
CO-2	explain the various programming paradigms in Python.	K2
CO-3	discover the relationship among the numerical data using Numpy for doing statistical analysis.	K3,K4
CO-4	interpret the data through Matplotlib for visualization to give possible solutions.	K5
CO-5	build Data Frames using pandas for Business Solutions that require Data Analytics.	K6

Unit – I: The Way of the Program

(15-Hours)

Program – Running Python - The First Program – Arithmetic Operators – Values and Types – Formal and Natural language - Debugging. Variables - Expressions and Statements: Assignments Statements – Variable Names – Expressions and Statements – Script mode – Order of Operations- String Operations – Comments. Functions –Function Call – Math Functions – Composition – Adding New Functions – Definitions and Uses – Flow of Execution – Parameters and Arguments – Variable and Parameters – Stack Diagrams

Unit – II: Conditionals and Recursion

(15-Hours)

Floor Division and Modulus – Boolean Expression – Logical Operators- Conditional Execution – Alternative Execution – Chained Conditionals – Nested Conditionals – Recursion – infinite Recursion – Keyboard Input. Fruitful Functions: Return values - Incremental Development= Composition- Boolean Functions – More Recursion – Leap of faith. Iteration: reassignment – Updating variables – while – Break – algorithms.

Unit – III: Strings

(15-Hours)

Len – Traversal – String Slices – Strings are immutable – searching – Looping and Counting – String methods – The in operator – string Operation. Lists: A List is a sequence – lists are mutable – traversing a List – List Operations – List slices – List methods- Map, filter and Reduce – Deleting Elements – Lists and strings – Objects and values – Aliasing – List arguments. Dictionaries: A Dictionary is a Mapping – Dictionary as a collection of counters – Looping and Dictionaries – Reverse Lookup – Dictionaries and Lists- Memos- Global Variables. Tuples: Tuples Are Immutable - Tuple Assignment - Tuples as Return Values - Tuples as Return Values - Variable-Length Argument Tuples - Lists and Tuples - Dictionaries and Tuples.

Unit – IV: The Numpy Library

(15-Hours)

Numpy a Little History – nd array - The Heart of the library – Basic Operations – Indexing, Slicing and Iterating – Conditional and Boolean Arrays – Shape Manipulation – Array Manipulation – General Concepts – Structured Arrays – Reading and Writing Array Data on Files. PANDAS LIBRARY – An Introduction: Introduction to Pandas Data Structures - Functionalities on Indexes - Operation between Data Structures – Function Application and

mapping – Sorting and Ranking – Correlation and Covariance – Not a Number – Hierarchical indexing and Levelling.

Unit – V: Data Visualization with Matplotlib (15-Hours)

Matplotlib Library – Architecture – pyplot – The Plotting Window – kwargs – Adding Elements to The Chart – Saving Charts – Handling Date Values – Chart Typology – Line Charts – Histograms – Bar Charts – Pie Charts – Advanced Charts – 3D Toolkit – Multi-Panel Plots

Books for Study

1. Allen B. Downey, *Think Python*, 2nd Edition, Published by O'Reilly Media Inc., USA, 2015.

Unit – I Chapter 1,2,3

Unit – II Chapter 5,6,7

Unit – III Chapter 8,10,11,12

2. Fabio Nelli, *Python Data Analytics with Pandas, NumPy, and Matplotlib*, 2nd Second Edition, Apress, UK, 2018.

Unit – IV Chapter 3,4,5

Unit – V Chapter 7

Books for Reference

1. Michael Minelli, Michele chambers, Ambiga Dhiraj, *Big Data Analytics-Emerging Business Intelligence and Analytic Trends for Today's Business*, Wiley CIO Series, New Jersey, USA, 2014.
2. Chun, J Wesley, *Core Python Programming*, 3rd Edition, Pearson, UK, 2012.
3. Jake VanderPlas, *Python Data Science Handbook*, O'Reilly Media Publishers, USA, 2016.

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

Semester	Course Code	Title of the Course									Hours	Credits
II	21PCS2CC05	CORE 5: DATA SCIENCE USING PYTHON									5	5
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	3	2	2	3	3	3	3	3	2.8	
CO-2	3	3	3	2	2	3	3	3	3	2	2.7	
CO-3	3	3	3	3	2	3	3	2	2	3	2.7	
CO-4	3	3	3	3	2	3	3	2	2	3	2.7	
CO-5	3	3	3	2	2	3	3	2	2	3	2.6	
Mean Overall Score											2.7	(High)

Semester	Course Code	Title of the Course	Hours	Credits
II	21PCS2CP03	PRACTICAL-III: ASP.NET	3	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	show console applications.	K1
CO-2	demonstrate conditional statements and looping.	K2
CO-3	apply OOPS concepts to programming.	K3
CO-4	contrast webpages with RAZOR, MVC and CMS.	K4
CO-5	build a database using EF core.	K5, K6

List of Exercises:

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

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

Semester	Course Code	Title of the Course									Hours	Credits
II	21PCS2CP03	Practical-III: ASP.NET									3	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	2	1	2	3	2	3	3	2	3	2.3	
CO-2	1	2	3	2	3	3	3	2	3	3	2.5	
CO-3	1	2	3	2	3	2	3	2	2	3	2.3	
CO-4	2	3	3	2	2	3	3	2	3	2	2.5	
CO-5	3	2	2	3	3	2	3	2	3	3	2.6	
Mean Overall Score											2.44	(High)

Semester	Course Code	Title of the Course	Hours	Credits
II	21PCS2CP04	PRACTICAL-IV: PYTHON	3	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	demonstrate forms using various Python functions.	K1, K2
CO-2	apply rich controls and conditional statement logic in Python.	K3
CO-3	analyze the data using various statistical and mathematical functions for Decision Making.	K4
CO-4	interpret the data through Matplotlib for visualization to give possible solutions.	K5
CO-5	build applications using Pandas.	K6

List of Exercises:

1. Variables, Data Types
2. Strings and Functions.
3. Loops, Arrays, Sorting
4. Dictionaries, Lists and Tuples.
5. Multidimensional Data.
6. Files
7. Array Function using Numpy
8. Aggregation function using Numpy
10. Pandas – Series
11. Pandas – Data Frame
12. Data Visualization –Matplotlib

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

Semester	Course Code		Title of the Course							Hours	Credits
II	21PCS2CP04		PRACTICAL-IV: PYTHON							3	2
Course Outcomes(COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	2	3	2	2	3	3	3	2	3	2.5
CO-2	2	3	2	2	2	3	3	3	3	3	2.6
CO-3	3	3	3	2	2	3	3	2	3	3	2.7
CO-4	3	3	3	2	2	3	3	3	1	3	2.6
CO-5	3	3	3	2	2	3	3	3	1	3	2.6
Mean Overall Score											2.74 (High)

Semester	Course Code	Title of the Course	Hours	Credits
II	21PCS2SP01	SELF-PACED LEARNING: COMPUTER NETWORKS	-	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	define the services, functions, and inter-relationship of different layers in network models	K1, K2
CO-2	apply various protocols used in communication.	K3
CO-3	discover the inter-operability of modules in different layers and their enactment.	K4
CO-4	understand the various networks and switching concept	K5
CO-5	estimate the functionality of various Networking Technologies using protocols.	K6

Unit-I: Introduction

Data Communications - Networks - The Internet – Protocols and Standards - Network Models - Layered Tasks - The OSI Model – Layers in the OSI Model - TCP/IP Protocol Suite – Addressing.

Unit-II: Physical Layer and Media

Analog and Digital - Analog to Digital Conversion - Transmission Modes - Digital to Analog Conversion - Multiplexing - Transmission Media - Guided Media - Unguided Media - Switching – Circuit Switched Networks – Datagram Networks - Virtual Circuit Networks

Unit-III: Data Link Layer

Error Detection and Correction – Block Coding - Cyclic codes - Checksum - Data Link Control- Framing - Flow and error control - Protocols – Noiseless Channels - Noisy Channels -Point to Point Protocol - Channelization - IEEE 802.11 - Bluetooth - Cellular Telephony - Satellite Networks.

Unit-IV: Network Layer

IPv4 Addresses - IPv6 Addresses - Internetworking - IPv4 - IPv6 - Transition from IPv4 to IPv6 - Address mapping - ICMP – IGMP - Delivery - Forwarding - Unicast Routing Protocols - Multicast Routing Protocols.

Unit-V: Transport Layer and Application Layer

Process to Process Delivery - UDP - TCP - SCTP - Data Traffic - Congestion - Congestion Control - Quality of Service. Application Layer: NameSpace - Domain Name Space – Remote Logging - Email & File Transfer.

Book for Study

1. Behrouz A. Forouzan, *Data Communications and Networking*, 4th Edition, Tata McGraw Hill Publishing Company Limited, New York, 2009.

Unit-I Chapter 1, Chapter 2

Unit-II Chapter 3, Chapter 4, Chapter 6, Chapter 7

Unit-III Chapter 10, Chapter 11, Chapter 16

Unit-IV Chapter 20, Chapter 21

Unit-V Chapter 24, Chapter 25 Chapter 26**Books for Reference**

1. William Stallings, *Data and Computer Communication*, 9th Edition, Dorling Kindersley Pvt. Ltd., India, 2018.
2. Andrew S. Tanenbaum, Nickolas Feamster, *Computer Networks*, 5th Edition, Pearson Education India, United Kingdom, 2019.
3. James F. Kurose and Keith W. Ross, *Computer Networks*, 7th Edition, Pearson Education, Inc., New York, 2017

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

Semester	Course Code	Title of the Course									Hours	Credits
II	21PCS2SP01	SELF-PACED LEARNING: COMPUTER NETWORKS									-	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	2	2	2	2	3	2	2	1	2.1	
CO-2	2	3	2	2	3	3	3	2	2	2	2.4	
CO-3	1	2	3	3	3	2	3	3	1	2	2.3	
CO-4	1	3	2	3	3	2	2	2	2	2	2.2	
CO-5	2	2	2	2	2	3	2	1	2	3	2.1	
Mean Overall Score											2.22 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
II	21PCS2ES02A	DSE -2: INTERNET OF THINGS (IOT) (COMMON CORE/INTER DISCIPLINARY)	5	4

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	understand the characterization and significance of the Internet of Things.	K1, K2
CO-2	recognize building blocks of Internet of Things and its characteristics.	K3
CO-3	distinguish the factors that contributed to the emergence of IoT.	K4
CO-4	comprehend the revolution of Internet in Mobile Devices, Cloud & Sensor Networks.	K5
CO-5	propose IoT based solutions for up-and-coming commercial and private prospects that can benefit the society.	K6

Unit-I: Introduction

(15-Hours)

Introduction to IoT – Genesis – IoT and Digitization – IoT Impact – Convergence of IoT and OT – IoT Challenges. Smart Objects: Sensors – Actuators – Smart Objects – Micro-Electro Mechanical Systems – Sensor Networks.

Unit-II: IoT Network Architecture and Design

(15-Hours)

New Network Architectures – Comparing IoT Architectures – A Simplified IoT Architecture – The Core IoT Functional Stack – IoT Data Management and Compute Stack.

Unit-III: Connecting Smart Objects

(15-Hours)

Communications Criteria – Topology – IoT Access Technologies.

Unit-IV: Application Protocols for IoT

(15-Hours)

The Transport Layer – IoT Application Transport Methods - SCADA – COAP – MQTT.

Unit-V: Smart and Connected Cities

(15-Hours)

Strategy for Smarter Cities – Smart City IoT Architecture – Smart City Security Architecture – Smart City Use Cases. TRANSPORTATION: Transportation and Transports – Transportation Challenges – Use Cases for Transportation – IoT Architecture for Transportation.

Book for Study

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton and Jerome Henry, *IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things*, Cisco Press, USA, 2017.

Unit-I Chapter 1, Chapter 3

Unit-II Chapter 2

Unit-III Chapter 4

Unit-IV Chapter 6

Unit-V Chapter 12 and Chapter 13

Books for Reference

1. Pethuru Raj and Anupama C. Raman, *The Internet of Things Enabling Technologies, Platforms, and Use Case*, CRC Press, USA, 2017.
2. Maciej Kranz, *Building the Internet of Things: Implement New Business Models, Disrupt Competitors, Transform Your Industry*, Wiley, United Kingdom, 2016
3. Adrian McEwen and Hakim Cassimally, *Designing the Internet of Things*, John Wiley and Sons, United Kingdom, 2014.

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

Semester	Course Code	Title of the Course									Hours	Credits
II	21PCS2ES02A	DSE -2: INTERNET OF THINGS (IOT) (COMMON CORE/INTER DISCIPLINARY):									5	4
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	3	2	2	2	3	2	2	1	2.2	
CO-2	2	3	3	2	3	3	2	2	2	2	2.4	
CO-3	1	2	3	2	2	2	2	3	1	2	2.0	
CO-4	2	3	3	3	2	2	2	2	2	2	2.3	
CO-5	2	2	2	2	2	3	2	1	2	3	2.1	
Mean Overall Score											2.2 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
II	21PCS2ES02B	DSE -2: COMPILER DESIGN (COMMON CORE/INTER DISCIPLINARY):	5	4

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	define the Loop Optimization and DAG for source code.	K1
CO-2	explain the data structures for Block Structured Languages.	K2
CO-3	apply various parsing and conversion techniques for the design of a compiler.	K3
CO-4	analyze the concept of parsing techniques.	K4
CO-5	evaluate the Code Optimization and code generation techniques.	K5, K6

Unit-I: Introduction (15-Hours)

Different Phases of Compiler - Finite State Automation and Lexical analysis - A Simple Approach to the Design of Lexical Analyzers - Regular Expressions - A Language for Specifying Lexical Analyzers.

Unit-II: Syntax Specification (15-Hours)

Context Free Grammars - Parsers – Derivation and Parse trees- Shift Reduce Parsing - Operator Precedence Parsing - Top-Down Parsing – Predictive Parsers.

Unit-III: Code Generation (15-Hours)

Intermediate Code Generation - Translation - Implementation of Syntax - Directed Translators - Intermediate Code – Postfix Notation - Parse Trees and Syntax Trees - Three Address Codes, Quadruples and Triples.

Unit-IV: Symbol Tables (15-Hours)

Contents of a Symbol Table - Data Structures for Symbol Tables - Implementation of a Simple Stack Allocation Scheme - Implementation of Block Structured Languages - Storage Allocation in Block Structured Languages - Errors - Lexical Phase Error.

Unit-V: Code Optimization and Code Generation (15-Hours)

Elementary Code Optimization technique - Loop Optimization - DAG Representation of Basic Blocks - Value Numbers and Algebraic Laws - Object Programs - Problems in Code Generation - A Machine Model - A Simple Code Generator.

Book for Study

1. Alfred V. Aho, Jeffery D.Ullman, *Principles of Compiler Design*, Narosa, New Delhi, 2002.

Unit-I Chapter 1 (Sec: 1.1-1.11), Chapter 3 (Sec: 3.1-3.7)

Unit-II Chapter 4 (Sec: 4.1, 4.2), Chapter 5 (Sec: 5.1-5.5)

Unit-III Chapter 7 (Sec: 7.1-7.6)

Unit-IV Chapter 9 (Sec: 9.1, 9.2), Chapter 10 (Sec: 10.1, 10.2, 10.4),
Chapter 11 (Sec: 11.1, 11.2)

Unit-V Chapter 12 (Sec: 12.1-12.4), Chapter 15 (Sec: 15.1-15.4)

Books for Reference

1. Torben, Egidius Mogensen, *Introduction to Compiler Design*, 2nd Edition, Springer International Publishing, Denmark, 2017.
2. Seth D. Bergmann, *Compiler Design: Theory, Tools, and Examples*, Rowan University, Open Educational Resources, New Jersey, 2017.
3. Des Watson, *A Practical Approach to Compiler Construction*, Springer International Publishing, UK, 2017.

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

Semester	Course Code	Title of the Course									Hours	Credits
II	21PCS2ES02B	DSE -2: COMPILER DESIGN (COMMON CORE/INTER DISCIPLINARY):									5	4
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	3	2	2	2	3	2	2	2	2.3	
CO-2	2	3	2	2	2	3	2	2	3	2	2.3	
CO-3	2	2	3	2	2	2	3	2	2	2	2.2	
CO-4	3	2	2	3	2	2	3	2	3	2	2.4	
CO-5	2	3	2	2	3	2	2	2	3	3	2.4	
Mean Overall Score											2.3 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
II	21PSS2SE01	SEC: SOFT SKILLS	4	3

Course outcomes (COS)

Upon completion of this course, students will:

- be exposed and trained in various nuances of Soft Skills in a Professional manner responding to the requirements of national and international market
- be able to synthesize the knowledge and practical skills learnt to be personal effective in any managerial positions
- be equipped to construct plans and strategies to work for better human society
- be able to illustrate the problems at work and home and design solutions and maintain a balance of work and home
- be able to connect on a continuum and maintain growth and sustainability and creativity in employment that increases in productivity, profit for individuals and the society.

Module 1: Effective Communication & Professional communication

Effective communication: Definition of communication, Process of Communication, Barriers of Communication, Non-verbal Communication. JOHARI Window as a tool of effective communication.

Professional Communication: The Art of Listening, The passage, Kinesthetic, Production of Speech, Speech writing , Organization of Speech, Modes of delivery, Conversation Techniques, Good manners and Etiquettes, Different kinds of Etiquettes, Politeness markers.

Module II. Resume Writing & Interview Skills

Resume Writing: Meaning and Purpose. Resume Formats. Types of s Resume. Functional and Mixed Resume, Steps in preparation of Resume, Model resumes for an IT professional Chronological, Types of interviews, Creative resumes using online platforms

Interview Skills: Common interview questions, Dos and Don'ts for an interview, Attitude, Emotions, Measurement, Body Language, Facial expressions, Different types of interviews, Telephonic interviews, Behavioral interviews and Mock interviews (Centralized).

Module III: Group Discussion & Team Building

Group Discussion: Group Discussion Basics, GD as the first criterion for selecting software testers, Essentials of GD, Factors that matter in GD, GD parameters for evaluation, Points for GD Topics, GD Topics for Practice, Tips for GD participation. Video shooting of GD presentation & Evaluation (Centralized)

Team Building: Characteristics of a team, Guidelines for effective team membership, Pedagogy of team building, Team building skills. Team Vs Group – synergy, Types of synergy, Synergy relates to leadership, Stages of Team Formation, Broken Square-Exercise, Leadership, Leadership styles, Conflict styles, Conflict management strategies & Exercises

Module IV: Personal Effectiveness

Personal Effectiveness: Self Discovery: Personality, Characteristics of personality, kinds of self, Personality inventory table, measuring personality, intelligence and Exercises

Self Esteem: Types -High & Low self esteem, Ways of proving self esteem, Hypersensitive to criticism, activities. Goal setting: Goal setting process, Decision making process & Exercises.

Stress Management: Identifying stress, Symptoms of stress, Responding to Stress, Sources of stress, Coping with stress and Managing stress.

Module V: Numerical Ability

Average, Percentage, Profit and Loss, Problems of ages, Simple Interest, Compound Interest, Area, Volume and Surface Area, Illustration, Time and Work, Pipes and Cisterns, Time and Distance, Problems on Trains, Illustrations, Boats and Streams, Calendars and Clocks.

Module VI: Test of Reasoning

Verbal Reasoning: Number series, letter series, coding and decoding, logical sequence of words, Assertion and Reasoning, Data Sufficiency, Analogy, Kinds of relationships.

Non-Verbal Reasoning: Completion of Series, Classification, analogical, Pattern comparison, Deduction of figures out of series, Mirror Reflection Pattern, Hidden figures, Rotation pattern, Pattern completion and comparison, Sense of direction, Blood relations.

Text cum Exercise book

1. Melchias G, Balaiah John, John Love Joy (Eds), 2018. *Winners in the Making: A primer on soft skills*. SJC, Trichy.

References

- * Aggarwal, R.S. *Quantitative Aptitude*, S.Chand & Sons
- * Aggarwal, R.S. (2010). *A Modern Approach to Verbal and Non Verbal Reasoning*. S.Chand & Co, Revised Edition.
- * Covey, Stephen. (2004). *7 Habits of Highly effective people*, Free Press.
- * Egan, Gerard. (1994). *The Skilled Helper* (5th Ed). Pacific Grove, Brooks/Cole.
- * Khera ,Shiv (2003). *You Can Win*. Macmillan Books , Revised Edition.

Other Text Books

- * Murphy, Raymond. (1998). *Essential English Grammar*. 2nd ed., Cambridge University Press.
- * Prasad, L. M. (2000). *Organizational Behaviour*, S.Chand & Sons.
- * Sankaran, K., & Kumar, M. *Group Discussion and Public Speaking*. M.I. Pub, Agra, 5th ed., Adams Media.
- * Schuller, Robert. (2010) . *Positive Attitudes*. Jaico Books.
- * Trishna's (2006). *How to do well in GDs & Interviews*, Trishna Knowledge Systems.
- ** Yate, Martin. (2005). *Hiring the Best: A Manager's Guide to Effective Interviewing and Recruiting**

Semester	Course Code	Title of the Course	Hours	Credits
II	21PCS2EG01	GE-1(W.S): MOBILE ADHOC NETWORKS (MANET)	4	3

CO No.	CO- Statements	Cognitive Levels (K-Levels)
	On successful completion of this course, students will be able to	
CO-1	recall the knowledge of Mobile Adaptability.	K1
CO-2	illustrate the concepts in Context-Aware Computing.	K2
CO-3	develop the knowledge of Wireless Network Security Mechanisms.	K3
CO-4	classify the various techniques of AdHoc Networks.	K4
CO-5	estimate the feasible Security Mechanisms for WPAN, WLAN.	K5, K6

Unit-I: Mobile Computing (12-Hours)

Adaptability - The Key to Mobile Computing - Mechanisms for Adaptation - Development or Incorporation of Adaptations in Applications. MOBILITY MANAGEMENT: Concept of Mobility Management - Location Management - Principles and Techniques.

Unit-II: Data Dissemination (12-Hours)

Mobile Data Caching - Mobile Cache Maintenance Schemes – Mobile web Caching. Context-Aware Computing: Ubiquitous of Pervasive Computing - Various Definitions and Types of Contexts - Context Aware Computing & Applications - Middleware Support. Introduction to Mobile Middleware: Definition of Mobile Middleware - Application - Agents - Service Discovery.

Unit-III: Introduction To Ad Hoc And Sensor Networks (12-Hours)

Overview - Properties of an Ad hoc Network -Unique Features of Sensor Networks - Proposed Applications - Challenges - Constrained Resources - Security - Mobility.

Unit-IV: Wireless Security (12-Hours)

Traditional Security Issues – Mobile and Wireless Security Issues. - Problems in Ad-hoc Networks. Approaches To Security: Limit the Signal-Encryption - Integrity Codes - IPSec – Other Security Related Mechanisms.

Unit-V: Security in WPAN (12-Hours)

Security in Wireless Personal Area Networks - Basic Idea - Bluetooth Security Modes - Basic Security Mechanisms. ENCRYPTION: Authentication - Limitation and Problems. Security in WLAN: Security in Wireless Local Area Networks - Basic Ideas - Wired-Equivalent Privacy (WEP) - WEP Fixes and Best Practices.

Book for Study

1. Frank Adelstein, Sandeep K.S., Gupta, Golden G. Richard III, Loren Schwibert
Fundamentals of Mobile and Pervasive Computing, TMG Ed.Pvt.Ltd., New Delhi, 2005.

Unit-I Chapter 1, Chapter 2

Unit-II Chapter 3 Chapter 4, Chapter 5

Unit-III Chapter 8 Chapter 9

Unit – IV Chapter 12 (12.1-12.4), Chapter 13

Unit – V Chapter 14, Chapter 15

Books for Reference

1. Raj Kamal, *Mobile Computing*, 3rd Edition, Oxford University Press Pvt.Ltd., England 2019.
2. Wolfgang Osterhage, *Wireless Network Security*, 2nd Edition, CRC Press, United States, 2018.
3. Jing (Selina) He, Mr. Shouling Ji, Yingshu Li, Yi Pan , *Wireless Ad Hoc and Sensor Networks Management, Performance, and Applications*, CRC Press, United States, 2019.

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

Semester	Course Code	Title of the Course									Hours	Credit
II	21PCS2EG01	GE-1(Ws): MOBILE ADHOC NETWORKS (MANET)									4	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	2	3	3	2	2	3	3	2	2.5	
CO-2	2	3	3	3	3	1	3	2	3	3	2.6	
CO-3	2	3	2	1	3	3	3	2	2	1	2.2	
CO-4	2	3	3	1	2	2	3	2	3	3	2.4	
CO-5	1	3	2	3	2	3	2	3	3	3	2.5	
Mean Overall Score											2.44 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3CC06	CORE-6: WEB DESIGN USING PHP	5	5

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	understand the PHP basic syntax for variable types, structures and controls.	K1, K2
CO-2	identify the appropriate programming environment for developing dynamic client-side and server-side web applications.	K3
CO-3	classify the tools to create dynamic website.	K4
CO-4	distinguish the various existing libraries for developing real-time applications.	K5
CO-5	build Dynamic web sites using server-side PHP Programming and Database connectivity.	K6

Unit-I: Introduction to Dynamic Web Content

(15-Hours)

HTTP and HTML: Berners-Lee's Basics -The Request/Response Procedure -The Apache Web Server - What Is a WAMP, MAMP, or LAMP -Installing AMPPS on Windows
INTRODUCTION TO PHP: Incorporating PHP Within HTML - The Structure of PHP

Unit-II: Expressions and Control Flow in PHP

(15-Hours)

Expression -Operator – Conditionals -Looping -Implicit and Explicit Casting -PHP Dynamic Linking ESSENTIAL PHP: Creating your Development Environment- Mixing HTML and PHP - Command Line.PHP Strings and Arrays: String Function - Modifying Data in an Array -Deleting Array Elements - Array with Loops - PHP Array Functions – Sorting Array - Splitting Array - Merging Array.

Unit-III: Creating Function

(15-Hours)

Passing Function - Passing Arrays to Function - Passing by Reference - Using Default Arguments - Passing Variable Numbers of Argument - Returning Data from Function – Nesting Functions. Practical PHP: Date and Time Functions - File Handling - System Calls Reading Data in Web Pages: Setting up Web Pages to communicate with PHP - Text field - Checkbox - Radio Button - Password Controls – List Boxes -Button - Hidden Control - File Upload.

Unit-IV: PHP Browser Handling Power

(15-Hours)

PHP's Server Variables - HTTP Header - Getting the User's Browser Type - HTTP Header - Data Validation - Client-Side Data Validation. Expressions and Control Flow in Javascript: Expressions - Literals and Variables – Operators -Validating User Input with JavaScript - Regular Expressions- JavaScript Functions - JavaScript Arrays- Validating User Input with JavaScript

Unit –V: Working with Database**(15-Hours)**

Creating a MYSQL Database – Creating a New Table – Putting Data into the New Database – Accessing the Database –Update data into the Database– Insert data into the Database – Delete data from Database– Handling and Avoiding Errors – Session and Cookies. Manipulating and Creating Images: Upload Images – Converting Image Files Types- Validating User Input

Books for Study

1. Robin Nixon, *Learning PHP, MYSQL & JavaScript*, Fifth Edition, O· REILLY, USA, 2018.

Unit-I Chapter 1 (Pages 1-15), Chapter 2 (Pages 35-38)

Unit-II Chapter 4 (Pages 63-90),

Unit -III Chapter 7(Pages 139-145)

Unit- IV Chapter 14(Pages 329-338), Chapter 16(Pages 371- 380)

2. Steven Holzner, *The Complete Reference PHP*, Tata McGraw Hill Pvt.Ltd., Noida, India, 2008.

Unit-II Chapter 1 (Pages 1-15), Chapter 1 (Pages 81-120)

Unit-III Chapter 4 (Pages 123 -160), Chapter 5(Pages 169-190)

Unit-IV Chapter 6 (Pages 203 -237)

Unit-V Chapter 10 (Pages 361 -380), Chapter 11(Pages 395 -401)

Books for Reference

1. Robin Nixon, *Learning PHP, MySQL & JavaScript With jQuery, CSS & HTML5*, 5th Edition, USA, 2018.
2. Steven Holzner, *PHP: The Complete Reference*, McGraw-Hill Education, 2017.
3. Jeremy McPeak, Paul Wilton, *Beginning JavaScript* ,5th Edition, John Wiley & Sons, Inc, USA, 2015.

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21PCS3CC06	CORE 6: WEB DESIGN USING PHP									5	5
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	2	3	2	3	3	2	3	3	2.6	
CO-2	2	2	3	3	2	2	3	2	2	3	2.4	
CO-3	2	3	3	2	3	2	2	3	3	2	2.5	
CO-4	3	2	2	3	2	3	2	2	3	2	2.4	
CO-5	2	3	3	2	2	2	2	3	2	3	2.4	
Mean Overall Score											2.46	(High)

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3CC07	CORE-7: SMART DEVICE PROGRAMMING USING ANDROID	5	5

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	understand the fundamental concepts of mobile devices and types of mobile operating systems to know about comprehensive knowledge in the field of computer science.	K1
CO-2	demonstrate the android development environment and build the mobile apps for society.	K2
CO-3	develop the user interfaces by using various android widgets to be acceptable for users.	K3
CO-4	compare the major components of Android APIs for solving real time problems.	K4, K5
CO-5	build android SQLite database for managing the third-party data in safe and secure manner using the various android controls.	K6

Unit-I: Mobile Application Development

(15-Hours)

Mobile Device Evolution – Smart Phone’s- Tablet PC’s – Classic MAD Challenges – Mobile Platform – Types of Mobile Platforms (Mobile OS) – Mobile Applications - Cross Platform Mobile Apps Development- Benefits of Cross Platform MAD – Cross Platform System Architecture.

Unit-II: ANDROID

(15-Hours)

Introduction to Android – History of Android – Android Architecture – App Architecture – Activities in Depth – Services in Depth– Installing the Android SDK – Installing an Android Platform – Creating an Android Virtual Device – Starting the AVD. Creating Android Project: Starting a New Project in Eclipse -Deconstructing Your Project – Setting up an Emulator – Creating Launch Configuration – Running the Hello Android App – Understanding the Project Structure

Unit-III: User Interface Recipes

(15-Hours)

Customizing the Window – Creating and Displaying Views – Creating Popup Menu Actions – Scrolling Text View Ticker – Animating a View – Creating Drawables as Backgrounds – Applying Masks to Images

Unit-IV: Understanding Android Resources

(15-Hours)

Understanding Resources - Dimensions - Styles - Themes - Values - Menus – Colors - Working with Resources - Moving Strings into Resources - Making Your Apps Global with Resources. Turning Your Application into A Home-Screen Widget: Working with App Widgets in Android - Working with Remote Views - Using App Widget Providers - Working with Pending Intents - Understanding the Android Intent System - Understanding Intent Data -Evaluating Intents - Using Pending Intents - Creating the Home-Screen Widget -

Implementing the App Widget Provider Communicating with the App widget - Building the App Widget's Layout - Doing Work Inside an App Widget Provider.

Unit-V: Persisting Data

(15-Hours)

Persisting Data – Reading and Writing Files – Using Files As Resources - Managing Database – Querying the Database – Backing Up Data – Sharing Your Database – Sharing Your Other Data.

Books for Study

- Yonathan Akilu Redda, *Cross Platform Mobile Applications Development*, NTNU, Norway, 2012.
Unit-I Chapter 2 (Sec: 2.1, 2.2, 2.3,2.4), Chapter 3 (Sec 3.1,3.2,3.3)
- Dave smith, Jeff Friesen, *Android Recipes Problem Solution Approaches*, Apress, UK, 2011.
Unit-II Chapter 1(Sec: 1.1, 1.2, 1.3,1.4)
Unit-III Chapter 2(Sec: 2.1, 2.2, 2.8, 2.13, 2.14, 2.15, 2.17)
Unit -V Chapter 5(Sec: 5.2, 5.3, 5.4 ,5.5,5.6,5.7,5.8,5.9)
- DonnFelker, *Android Application Development for dummies*, Wiley Publishing Inc, USA,2011.
Unit-II Chapter 3(Pages 55-90)
Unit-IV Chapter 6 (Pages 155-161), Chapter7 (Pages 164-184)

Books for Reference

- Michael Burton, *Android App Development for Dummies*, 3rd Edition, Wiley Publication New Jersey, 2015
- Rick Boyer *Android 9 Development Cookbook*, 3rd Edition, Packt Publishing, India , 2018
- Sujit Kumar Mishra, *Fundamentals of Android App Development*, English Edition, BPB Publication, New Delhi, 2020

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21PCS3CC07	CORE-7: SMART DEVICE PROGRAMMING USING ANDROID									5	5
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	3	3	3	2	1	3	3	2	2.5	
CO-2	2	2	3	3	3	2	2	3	2	2	2.4	
CO-3	2	3	2	3	1	1	3	2	3	3	2.3	
CO-4	2	2	3	2	2	3	1	3	3	2	2.3	
CO-5	2	3	1	3	3	2	3	3	2	3	2.5	
Mean Overall Score											2.4 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3CP05	PRACTICAL-V: PHP	3	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	understand the Functionality of PHP Language.	K1, K2
CO-2	identify the basic Concepts of MySQL.	K3
CO-3	examine the web applications using PHP with MySQL.	K4
CO-4	decide suitable features for developing Interactive Websites using JavaScript.	K5
CO-5	create server side and client side programming, depending on the task to be performed.	K6

List of Exercises:

1. Creating simple webpage using PHP
2. Use of conditional statements in PHP
3. Use of looping statements in PHP
4. Usage of array functions
5. File manipulation using PHP
6. String Functions and Arrays
7. Functions using PHP
8. Create a session and cookies
9. Form Validation using PHP
10. Database connectivity in PHP with MySQL
11. Insertion, Updation and Deletion of rows in MYSQL tables
12. JavaScript validation

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21PCS3CP05	PRACTICAL-V: PHP									3	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	3	2	3	2	2	3	2	3	2.5	
CO-2	2	2	2	3	2	2	3	2	3	2	2.3	
CO-3	3	3	2	2	3	3	3	2	3	3	2.7	
CO-4	2	2	3	2	2	2	2	3	2	2	2.2	
CO-5	3	3	2	2	3	3	2	2	3	3	2.6	
Mean Overall Score											2.46 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3CP06	PRACTICAL-VI : ANDROID	3	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	list the various android controls and properties for problem solving in the field of computer science.	K1
CO-2	demonstrate the knowledge in computational methods and build mobile applications based on customer requirements and fulfill their needs.	K2
CO-3	choose the appropriate Android development environment, tools and apply meaningful business solutions.	K3
CO-4	compare the suitable android widgets and user interfaces for industry needs.	K4,K5
CO-5	build the mobile applications based on multi-functional software solutions for the society.	K6

List of Exercises:

1. Simple Programs using controls
2. Changing the Color properties
3. Working with Text
4. Image Manipulation
5. Menu Creation
6. Widgets
7. Implicit Intents
8. Explicit Intents
9. Adding Audio & Video
10. Animating a view
11. Create An Application Using Links
12. Data Storing & Retrieving

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21PCS3CP06	PRACTICAL-6: ANDROID									3	2
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	2	3	2	2	1	3	2	2	2.3	
CO-2	2	2	3	3	3	2	2	3	2	2	2.4	
CO-3	3	3	1	3	1	2	3	3	3	3	2.5	
CO-4	2	1	3	2	2	3	2	3	3	2	2.3	
CO-5	2	3	1	3	3	2	3	3	3	3	2.6	
Mean Overall Score											2.42 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3ES03A	DSE-3: ARTIFICIAL INTELLIGENCE	5	4

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	define the basic principles, models, and algorithms of Artificial Intelligence.	K1
CO-2	understand knowledge representation, reasoning, and machine learning techniques to real-world problems.	K2
CO-3	choose appropriate Artificial Intelligence functions and components involved in intelligent systems such as Robotic Perception, Image-Processing Operations to create optimal models.	K3, K4
CO-4	evaluate Artificial Intelligence with Human Intelligence and Traditional Information Processing.	K5
CO-5	create logical statements from informal language to propositional logic expressions.	K6

Unit-I: Artificial Intelligence

(15-Hours)

Introduction - The Turing Test - Goals of AI - Roots of AI - Artificial Consciousness - Techniques Used in AI - Sub-fields of AI - Perception, Understanding, and Action - Physical Symbol System Hypothesis - Considerations for Knowledge Representation - Knowledge Representation Using Natural Language.

Unit-II: Logic and Reasoning Patterns

(15-Hours)

Role of Knowledge - Propositional Logic - Reasoning Patterns. First Order Predicate Logic: Introduction - Representation in Predicate Logic - Syntax and Semantics - Conversion to Clausal Form - Substitutions and Unification - Resolution Principle - Complexity of Resolution Proof - Interpretation and Inferences - Most General Unifiers - Unfounded Sets.

Unit-III: Real-World Knowledge Representation and Reasoning

(15-Hours)

Introduction - Taxonomic Reasoning - Techniques for Common Sense Reasoning – Ontologies - Ontology Structures - Reasoning Using Ontologies - Ontological Engineering - Situation Calculus – Non monotonic Reasoning - Default Reasoning.

Unit-IV: Robotics

(15-Hours)

Introduction - Robot Hardware - Robotic Perception - Planning to Move - Planning Uncertain Movements – Moving - Robotic Software Architectures - Application Domains. Perception: Image Formation - Early Image-Processing Operations - Reconstructing the 3D World.

Unit-V: Philosophical Foundations

(15-Hours)

Weak AI: Can Machines Act Intelligently? - Strong AI: Can Machines Really Think? - The Ethics and Risks of Developing Artificial Intelligence - Summary, Bibliographical and Historical Notes, Exercises. AI: The Present and Future: Agent Components - Agent Architectures.

Books for Study

1. K.R.Chowdhary, *Fundamentals of Artificial Intelligence*, Springer Nature India Private Limited, New Delhi, 2020.

Unit I Chapter 1

Unit II Chapter 2 and Chapter 3

Unit III Chapter 6

2. S. Russell, P. Norvig, *Artificial Intelligence: A Modern Approach*, 3rd Edition, Prentice-Hall, Inc, New Jersey, 2010.

Unit IV Chapter 25, Chapter 24

Unit V Chapter 26, Chapter 27

Books for Reference

1. Sridhar Seshadri, *A first course in Artificial Intelligence and Agent Technology*, 1st Edition, LAP LAMBERT Academic Publishing, India, 2017.
2. Wolfgang Ertel, *Introduction to Artificial Intelligence*, Springer International Publishing G, Germany, 2017.
3. Kevin Knight, Elaine Rich, Shivashankar B. Nair, *Artificial Intelligence*, 3rd, MC Graw Hill Education, India, 2017.

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21PCS3ES03A	DSE-3: ARTIFICIAL INTELLIGENCE									5	4
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	3	2	3	3	3	3	3	2	2.8	
CO-2	3	3	3	2	2	3	3	3	3	3	2.9	
CO-3	2	3	3	3	2	3	3	2	2	2	2.5	
CO-4	3	3	3	3	3	2	2	3	3	3	2.8	
CO-5	3	3	2	3	2	3	3	3	2	3	2.7	
Mean Overall Score											2.74 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3ES03B	DSE-3: COMPUTATIONAL INTELLIGENCE	5	4

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	recall the fundamental theory and concepts of Neural Networks	K1
CO-2	explain the Perceptron and Counter Propagation Network	K2
CO-3	make use of the Fuzzy Logic and its concepts in various systems	K3
CO-4	analyze different Neural Network architectures, algorithms, applications and their limitations.	K4
CO-5	evaluate the various Genetic Algorithms and their applications	K5, K6

Unit- I: Neural Networks

(15-Hours)

Introduction: - Application of Scope of Neural Networks - Fuzzy Logic – Genetic Algorithms – Hybrid Systems – Soft Computing. Artificial Neural Network: An Introduction – Fundamental Concept – Evolution of Neural Networks – Basic Models of ANN – Important Terminologies of ANNs.

Unit – II: Supervised Learning Network

(15-Hours)

Introduction– Perceptron Networks – Adaptive Linear Network – Multiple Adaptive Linear Network – Back Propagation Network. ASSOCIATIVE MEMORY NETWORKS: Introduction – Training Algorithms for Pattern Association – Auto Associative Memory Network – Hetero Associative Memory Network – Bidirectional Associative Memory – Hopfield Networks.

Unit – III: Unsupervised Learning Network

(15-Hours)

Introduction – Kohonen Self Organizing Feature Map– Learning Vector Quantization – Counter Propagation Networks – Adaptive Resonance Theory Network.

Unit – IV: Fuzzy Logic

(15-Hours)

Fuzzy set theory – Crisp sets – Fuzzy sets – Crisp relations – Fuzzy Relations. Fuzzy Systems– Crisp Logic – Predicate Logic – Fuzzy Logic – Fuzzy Rule Based System – De fuzzification Methods.

Unit – V: Genetic Algorithms

(15-Hours)

Fundamentals of Genetic Algorithms – Genetic Algorithms: History – Basic Concepts – Creation of offspring – Working Principle – Encoding – Fitness Function – Reproduction.

Books for Study

1. Dr S N Sivanadam, S N Deepa, *Principles of Soft Computing*, 1st Edition, Wiley India (P) Ltd, India, 2008.

Unit – I Chapter 1, Chapter 2 (Sec. 2.1-2.4)

Unit - II Chapter 3(Sec. 3.1 – 3.5), Chapter 4(Sec. 4.1-4.6)

Unit – III Chapter 5(Sec. 5.1,5.3-5.6)

2. S Rajasekaran, G A Vijayalakshmi Pai, *Neural Networks, Fuzzy Logic, and Genetic Algorithms: Synthesis and Applications*, PHI Learning Private Limited, New Delhi, 2017.

Unit – IV Chapter7(Sec. 7.1-7.5)

Unit – V Chapter 10 (Sec 10.1 -10.7)

Books for Reference

1. N.K.Bose, Ping Liang, *Neural Network fundamental with Graph, Algorithms & Applications*, 1stEdition, TMH, New Delhi, 1998.
2. Rich E, Knight K, *Artificial Intelligence*, 3rd Edition, TMH, New Delhi, 2012.
3. Sandhya Bansal, Rajiv Goel, *Fundamentals of Soft Computing*, Notion Press, Chennai, 2020.

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21PCS3ES03B	DSE-3: COMPUTATIONAL INTELLIGENCE									5	4
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	2	2	2	3	3	3	2	3	2.5	
CO-2	3	2	2	2	1	3	3	3	2	3	2.4	
CO-3	2	2	3	2	1	3	3	3	2	3	2.4	
CO-4	3	2	3	2	2	2	3	3	2	3	2.5	
CO-5	3	2	2	2	2	3	3	3	1	3	2.4	
Mean Overall Score											2.5	(High)

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3ES04A	DSE-4: DIGITAL MARKETING	5	4

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	show the acquaintance of the concepts of Digital Marketing and Display Advertising.	K1,K2
CO-2	identify the concepts of Search Engine Advertising.	K3
CO-3	classify the knowledge of Facebook Marketing and Twitter Marketing.	K4
CO-4	distinguish various applications of Search Engine Optimization and social media.	K5
CO-5	elaborate various techniques of Web Analytics.	K6

Unit-I: Digital Marketing

(15-Hours)

Introduction to Digital Marketing: Internet Users – Digital Marketing Strategies – Skills Required in Digital Marketing – Digital Marketing Plan. Display Advertising: Introduction – Concept of Display Advertising – Types of Display Ads – Buying Models – Display Plan – Targeting – Make a Good Ad.

Unit-II: Advanced Display Advertising

(15-Hours)

Programmatic Digital Advertising – Analytics Tools – YouTube Advertising. Search Engine Advertising: Introduction – Pay for Search Advertising – Understanding Ad Placement – Understanding AdRanks. Social Media Marketing: Introduction – To build a Successful Strategy.

Unit-III: Facebook Marketing

(15-Hours)

Introduction – Facebook for Business- Anatomy of an Ad Campaign – Adverts - Other Marketing Tools - Other Essentials. Twitter Marketing: Introduction – Getting Started with Twitter – Building a Context Strategy – Twitter Usage - Twitter Ads – Twitter Analytics – Twitter Tools and Tips for Marketers. Instagram and Snapchat: Introduction – Instagram-snapchat

Unit-IV: Search Engine Optimisation

(15-Hours)

Introduction – Search Engine - Concept of Search Engine Optimisation- SEO Phases – On page Optimisation- Off page Optimisation- Social Media Reach – Maintenance.

Unit-V: Web Analytics

(15-Hours)

Introduction – Data Collection - Key Metrics - Marketing Web Analytics Actionable – Types of Tracking codes – Mobile Analytics.

Book for Study

- Seema Gupta, *Digital Marketing*, First Edition, Mc-Graw Hill, New Delhi, 2017.

Unit I Chapter 1, Chapter 2(pg.26-51)

Unit II Chapter 2 (pg.52- 66), Chapter 3 (pg.73- 83), Chapter 4 (pg.108- 132)

Unit III Chapter 5(pg.139- 183), Chapter 7 (pg.221 - 254), Chapter 8 (pg.259-268),
Unit IV Chapter 10
Unit V Chapter 11(353-382)

Books for Reference

1. Ian Dodson, *The Art of Digital Marketing*, Wiley, New Jersey, USA, 2018.
2. Prof. Nitin C. Kamat, Mr.Chinmay NitinKamat, *Digital Social Media Marketing*, Himalaya Publishing House Pvt. Ltd., India, 2018.
3. Ryan Deiss & Russ Henneberry, *Digital Marketing for Dummies*, 2nd Edition, John Wiley & Sons, Inc., New Jersey, 2020.

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21PCS3ES04A	DSE-4: DIGITAL MARKETING									5	4
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	2	3	1	2	2	1	3	2	2.1	
CO-2	2	1	2	3	3	1	3	2	3	3	2.3	
CO-3	2	3	2	1	3	3	3	2	2	1	2.2	
CO-4	3	1	3	3	2	2	2	3	3	3	2.5	
CO-5	2	2	3	1	2	3	3	1	3	2	2.2	
Mean Overall Score											2.26 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3ES04B	DSE-4: ETHICAL HACKING	5	4

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	recall the basic knowledge of security and various attacks to protect the user's data effectively in a real time.	K1
CO-2	explain the various foot printing tools to be aware the problems involved in daily lives and ensure protect environment.	K2
CO-3	apply the safe ethical techniques in the World Wide Web to be beneficial to the society.	K3
CO-4	examine various techniques of Keyloggers and Spyware for protect the private and public data in a real time.	K4
CO-5	evaluate the concept of penetration testing and improve testing techniques to solve problems and promote social harmony.	K5, K6

Unit-I: Introduction to Hacking

(15-Hours)

Importance of Security – Elements of Security – Phases of an Attack – Types of Hacker Attacks – Hacktivism – Vulnerability Research.

Unit-II: Foot Printing

(15-Hours)

Introduction to Foot printing – Information Gathering Methodology – Foot printing Tools – WHOIS Tools – DNS Information Tools – Locating the Network Range.

Unit-III: Scanning

(15-Hours)

Objectives – Scanning Methodology – Tools – Introduction to Enumeration – Enumeration Techniques – Enumeration Procedure – Tools.

Unit-IV: Cracking Passwords

(15-Hours)

Password Cracking Websites – Password Guessing – Password - Cracking Tools – Password Cracking – Counter measures – Escalating Privileges – Executing Applications – Keyloggers and Spyware

Unit-V: Penetration Testing

(15-Hours)

Introduction to Penetration Testing, Phases of penetration testing, tools.

Book for Study

1. Ec-Council, *Ethical Hacking and Countermeasures: Attack Phases*, Delmar Cengage Learning, USA, 2009.

Unit I Chapter 1 (Sec: 1.1 to 1.10)

Unit II Chapter 2 (Sec: 2.1 to 2.29)

Unit III Chapter 3 (Sec: 3.1 to 3.46), Chapter 4 (Sec: 4.1 to 4.35)

Unit IV Chapter 5 (Sec: 5.1 to 5.37)

Unit V Chapter 6 (Sec: 6.1 to 6.27)

Books for Reference

1. Gary Hall, *Hacking, Computer Hacking, Security Testing, Penetration Testing, and Basic Security*, Kindle Edition, Kindle Direct Publishing, USA, 2016.
2. Alan T. Norman, *Computer Hacking Beginners Guide*, Kindle Edition, Kindle Direct Publishing, USA, 2016.
3. Andrew Huang, *The Hardware Hacker*, 1st Edition No Starch Press, USA, 2017.

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21PCS3ES04B	DSE-4: ETHICAL HACKING									5	4
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	1	3	3	1	2	3	3	2	2.4	
CO-2	2	2	3	3	3	2	1	3	2	3	2.4	
CO-3	2	1	3	3	2	1	3	2	3	2	2.2	
CO-4	2	1	3	1	2	3	2	3	3	3	2.3	
CO-5	3	3	1	3	3	3	3	2	2	2	2.5	
Mean Overall Score											2.36 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3EG02	GE-2 (BS): ADVANCES IN COMPUTER SCIENCE	4	3

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	understand the basic concepts of Cloud Computing.	K1
CO-2	comprehend the basic concepts of IoT and its applications.	K2
CO-3	identify the types of Clouds, Architecture and its applications.	K3
CO-4	analyze the concept of Smart-X applications.	K4, K5
CO-5	formulate optimal solutions to IoT Related problems.	K6

Unit-I: Cloud Computing

(12-Hours)

Cloud Computing at a Glance - Historical Developments – Building Cloud Computing Environments – Computing Platforms and Technologies. CLOUD COMPUTING ARCHITECTURE: Cloud Reference Model – Types of Clouds – Economics of the Cloud.

Unit-II: Cloud Platforms in Industry

(12-Hours)

Amazon Web Services: Compute Services – Storage Services – Communication Services – Additional Services. Google AppEngine: Architecture and Core Concepts – Application Life Cycle – Cost Model. Microsoft Azure: Azure core Concepts – SQL Azure.

Unit-III: Cloud Applications

(12-Hours)

Scientific Applications – Healthcare – Biology – Geoscience – Business and Consumer Applications: CRM and ERP – Productivity – Social Networking – Media Applications. Advanced Topics in Cloud Computing: Energy Efficiency in Clouds. Federated Clouds / Inter Cloud: Characterization and Definition – Cloud Federation Stack – Aspects of Interest – Technologies for Cloud Federations.

Unit-IV: Internet of Things

(12-Hours)

Introduction- Putting the Internet of Things to the Next Level- Strategic-RESEARCH AND INNOVATION AGENDA: Internet of Things Vision - IoT Strategic Research and Innovation Directions.

Unit-V: IoT Smart- X Application

(12-Hours)

Smart Cities- Smart Energy and Smart Grid - Smart Mobility and Transport - Smart Home, Smart Buildings and Infrastructure- Smart Factory and Smart Manufacturing- Smart Health - Food and Water Tracking Security- Participatory Sensing - Smart Logistics and Retail. IoT RELATED STANDARDIZATION: The Role of Standardization Activities - Current situation- Areas for additional Consideration- Interoperability in the Internet of Things.

Books for Study

1. Raj Kumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, *Mastering Cloud Computing*, 1st Reprint, McGraw Hill Education (India) Private Limited Publications, India, 2013.

Unit-I Chapter 1, Chapter 2

Unit-II Chapter 4, Chapter 5, Chapter 6

Unit-III Chapter 7, Chapter 8, Chapter 9

2. Ovidie Vermesan, Peter Friess, *Internet of Things – From Research and Innovation to Market Deployment*, River Publisher, UK, 2018.

Unit –IV Chapter 1, Chapter 2, Chapter 3

Unit – V Chapter 6, Chapter 7, Chapter 9

Books for Reference

1. Rajkumar Buyya, James Bromberg and Andrzej Goscinski, *Cloud Computing Principles and Paradigms*, Wiley Publications, USA, 2016
2. Michael Miller, *Cloud Computing Web Based Applications that change the way you work and collaborate online*, Pearson Education, USA, 2014.
3. Arshdeep Bahga, *Internet of Things*, Universities Press in India Private Limited, India, 2015.

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

Semester	Course Code		Title of the Course								Hours	Credits
III	21PCS3EG02		GE-2 (BS): ADVANCES IN COMPUTER SCIENCE								4	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	3	2	3	3	3	3	3	3	2.3	
CO-2	3	2	2	3	3	2	3	2	1	2	2.2	
CO-3	2	3	2	2	1	2	3	2	3	2	2.2	
CO-4	3	2	3	2	1	3	3	2	2	3	2.3	
CO-5	2	3	3	3	2	3	2	3	3	3	2.3	
Mean Overall Score											2.3 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3CE01	COMPREHENSIVE EXAMINATION	-	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	comprehend the basic functionalities of PHP and MongoDB	K1, K2
CO-2	apply Python programming to real life problems	K3
CO-3	demonstrate the use of development tools in the Android development environment	K4
CO-4	explain the rich GUI web applications using Visual Studio.NET	K5
CO-5	develop solutions for a range of problems using object-oriented programming	K6

Unit-I

Programming in JAVA, Data Science using Python.

Unit-II

Programming with C# using ASP.NET, NoSQL with MongoDB.

Unit-III

Web Design using PHP, Smart Device programming using ANDROID.

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

Semester	Course Code		Title of the Course								Hours	Credits
III	21PCS3CE01		COMPREHENSIVE EXAMINATION								-	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Scores of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	1	1	2	3	2	3	3	3	2	3	2.3	
CO-2	3	3	2	2	1	3	3	3	2	3	2.5	
CO-3	3	3	2	3	2	3	3	2	3	3	2.7	
CO-4	1	1	3	3	3	3	3	2	3	3	2.5	
CO-5	3	3	3	3	2	2	3	3	2	3	2.7	
Mean Overall Score											2.54 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
III	21PCS3PW01	MINI PROJECT WORK	-	7

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	comprehend the meaning of small scale projects.	K1, K2
CO-2	apply the Software Development Life Cycle for the simple problems.	K3
CO-3	discover an appropriate tool for given problem.	K4
CO-4	develop Interpersonal Communication.	K5
CO-5	apply critical thinking, reasoning and creative thinking for Software Design.	K6

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21PCS3PW01	MINI PROJECT WORK									-	7
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	1	3	2	3	3	3	2	3	2.6	
CO-2	3	3	2	2	2	3	3	3	2	3	2.6	
CO-3	3	3	3	2	2	3	3	2	3	3	2.7	
CO-4	2	2	3	2	2	3	3	2	3	3	2.5	
CO-5	3	3	2	1	2	2	3	3	2	3	2.4	
Mean Overall Score											2.56 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
IV	21PCS4PW02	MAJOR PROJECT WORK & VIVA VOCE	30	20

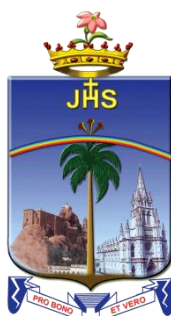
CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	comprehend the state-of-the-art requirements of the Industry.	K1, K2
CO-2	apply critical thinking, reasoning and creative thinking for Software Design in an industry as an individual or as a part of a team.	K3
CO-3	analyze the problem and provide Solution by Decision Making.	K4
CO-4	develop Interpersonal, Communication and Presentation skills.	K5
CO-5	build the modules for a specific problem.	K6

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

Semester	Course Code	Title of the Course									Hours	Credits
IV	21PCS3PW02	MAJOR PROJECT WORK & VIVA VOCE									30	20
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes(PSOs)					Mean Scores of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	3	3	3	3	3	3	2	3	2.9	
CO-2	3	3	3	3	3	3	3	3	2	3	2.9	
CO-3	3	2	3	1	3	3	3	2	3	3	2.6	
CO-4	3	2	3	2	3	3	3	2	3	3	2.7	
CO-5	3	2	3	2	3	2	3	3	2	3	2.6	
Mean Overall Score											2.74 (High)	

BCA
LOCF SYLLABUS – 2021

SCHOOLS OF EXCELLENCE
WITH CHOICE BASED CREDIT SYSTEM (CBCS)



DEPARTMENT OF INFORMATION TECHNOLOGY
SCHOOL OF COMPUTING SCIENCES
ST. JOSEPH'S COLLEGE (AUTONOMOUS)

Special Heritage Status Awarded by UGC
Accredited at A⁺⁺ Grade (IV Cycle) by NAAC
College with Potential for Excellence by UGC
DBT-STAR & DST-FIST Sponsored College
Tiruchirappalli - 620 002, Tamil Nadu, India

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

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

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

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

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

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

Human excellence in specialized areas

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

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

Credit system:

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

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

OUTCOME-BASED EDUCATION (OBE)

LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK (LOCF)

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

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

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

Some important aspects of the Outcome Based Education

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

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

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

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

Programme Specific Outcomes (PSOs):

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

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

Some important terminologies repeatedly used in LOCF.

Core Courses (CC)

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

Discipline Specific Elective Courses (DSE)

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

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

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

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

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

Generic Elective Courses

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

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

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

(open to the students of other Departments)

The Ability Enhancement Courses (AEC)

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

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

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

Skill Enhancement Courses (SECs)

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

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

There are four courses under this category

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

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

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

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

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

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

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

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

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

Undergraduate Programme:

Programme Pattern:

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

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

Part-II : General English

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

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

Part-V: Outreach Programme (SHEPHERD).

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

Value Education Courses:

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

Course Coding

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

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

N:- Numeral X :- Alphabet

Part Category

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

GE - General English

CC - Core Theory; CP- Core Practical

WS- Workshop

SP- Self Paced Learning

IS- Internship

FV- Field visit

CE- Comprehensive Examination

PW- Project Work& viva-voce

Electives Courses

ES – Department Specific Electives

EG- Generic Electives

Allied Courses

AC - Allied Compulsory

AO- Allied Optional

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

Ability Enhancement Courses

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

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

VE - Value Education/ Social Ethics/Religious Doctrine

OR – Outreach SHEPHERD & Gender Studies (Outreach)

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

CIA AND SEMESTER EXAMINATION

Continuous Internal Assessment (CIA):

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

MID-SEM & END – SEM TEST

Centralised – Conducted by the office of COE

1. Mid-Sem Test & End-Sem Test: (2 Hours each); will have Objective and Descriptive elements; with the below mentioned question pattern PART-A; PART-B; PART-C and PART D.

2. One of the CIA Component II/III for UG & PG will be of 15 marks and compulsorily a online objective multiple choice question type.

3. The online CIA Component must be conducted by the Department / faculty concerned at a suitable computer centre.

4. The 7 marks of PART-A of Mid-Sem and End-Sem Tests will comprise only: OBJECTIVE MULTIPLE CHOICE QUESTIONS.

5. The number of hours for the 5 marks allotted for Library Referencing/ work would be 30 hours per semester. The marks scored out of 5 will be given to all the courses (Courses) of the Semester.

6. English Composition once a fortnight will form one of the components for UG general English

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

Knowledge levels for assessment of Outcomes based on Blooms Taxonomy

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

WEIGHTAGE of K – LEVELS IN QUESTION PAPER

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

QUESTION PATTERN FOR SEMESTER EXAMINATION

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

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

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

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

Assessment pattern for two credit courses.

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

EVALUATION

GRADING SYSTEM

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

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

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

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

CLASSIFICATION OF FINAL RESULTS:

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

Table-1: Grading of the Courses

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

Table-2: Final Result

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

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

Declaration of Result

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

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

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

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

Mapping	<40%	$\geq 40\%$ and < 70%	$\geq 70\%$
Relation	Low Level	Medium Level	High Level
Scale	1	2	3

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

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

VISION

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

MISSION

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

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

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

PROGRAMME OUTCOMES (POs) UG

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

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

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

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

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

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

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

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

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

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

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

அலகு - 1

(12 மணிநேரம்)

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

அலகு - 2

(12 மணிநேரம்)

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

அலகு - 3

(12 மணிநேரம்)

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

அலகு - 4 : அரசியல் கவிதைகள்

(12 மணிநேரம்)

- ஈரோடு தமிழன்பன் - அகல் விளக்காக இரு

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

அலகு - 5 அயலகக் கவிதைகள்

(12 மணிநேரம்)

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

பாட நூல்கள்

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

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

Semester	Course code	Title of the Course									Hours	Credits
I	21UTA11GL01	General Tamil - I									4	3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos	
	PO-1	PO-2	PO-3	PO-4	PO-5	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5		
CO-1	2	1	2	2	3	3	3	2	3	2	2.3	
CO-2	2	1	2	2	2	3	2	2	2	2	2.0	
CO-3	2	1	2	2	3	3	3	2	3	2	2.3	
CO-4	1	2	1	2	2	3	2	2	3	2	2.0	
CO-5	1	1	2	2	3	3	3	2	3	2	2.2	
Mean overall Score											2.16	(High)

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

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

Unit – I (12 hours)

TITRE: BONJOUR CA VA ?

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

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

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

PRODUCTION ECRITE : Les formules de politesse

Unit – II (12 hours)

TITRE: SALUT ! JE M’APPELLE AGNES

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

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

PRODUCTION ORALE : Comprendre des informations essentielles

PRODUCTION ECRITE : Présentez –vous

Unit - III (12 hours)

TITRE: QUI EST-CE ?

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

LEXIQUE : Demander et répondre poliment, les professions

PRODUCTION ORALE : Parler de ses projets

PRODUCTION ECRITE : Ecrire de brefs messages

Unit - IV (12 hours)

TITRE: DANS MON SAC, J’AI ?

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

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

nombre à partir de 70

PRODUCTION ORALE : Comprendre un message sur un répondeur téléphonique

PRODUCTION ECRITE : Remplir une fiche d'identité

Unit - V

(12 hours)

TITRE:IL EST COMMENT? / ALLO?

GRAMMAIRE : les adverbes interrogatifs, les prépositions de lieu, les verbes du deuxième groupe, le verbe faire

LEXIQUE : Parler au téléphone, décrire quelqu'un, l'aspect physique, le caractère

PRODUCTION ORALE : Un jeu de rôle – la conversation téléphonique

PRODUCTION ECRITE : Décrivez votre aspect physique et votre caractère en quelques lignes

Book for Study

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

Books for Reference

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

Web Resources

1. <https://www.wikihow.com/Pronounce-the-Letters-of-the-French-Alphabet>
2. <https://français.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/exercices/exercise-french-2/exercise-french-3295.php>

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

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

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

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

Unit - I (12 Hours)

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

Unit - II (12 Hours)

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

Unit - III (12 Hours)

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

Unit - IV (12 Hours)

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

Unit - V**(12 Hours)**

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

Books for Study

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

Books for Reference

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

Web Resources

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

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

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

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

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

Unit - I (12 Hours)

Samyakthakshatra pada paricaya

Unit - II (12 Hours)

Vartmanakala prayogaha

Unit - III (12 Hours)

Samskruta varathamana kalaha

Unit - IV (12 Hours)

Shadha priyoghaa aakaarnta ikaraantha ukarantha

Unit - V (12 Hours)

Subhashitani manoharani Dasaslokani

Book for Study

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

Books for Reference

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

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

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

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

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

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

Unit-I

(15 Hours)

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

Unit-II

(15 Hours)

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

Unit-III

(15 Hours)

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

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

Unit-IV

(15 Hours)

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

Unit-V

(15 Hours)

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

Book for Study

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

Books for Reference

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

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

Web Resources

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

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

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

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

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

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

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

Unit-II: Information Technology Concepts (15 Hours)

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

Unit-III: Business Information Systems (15 Hours)

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

Unit-IV: System Development (15 Hours)

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

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

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

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

Book for Study

1. Ralph M. Stair, George W. Reynolds, *Principles of Information Systems, A Managerial Approach*, 9th Edition, Thomson Publishing, UK, 2016.

Unit-I Chapter 1 (Pages: 2-27), Chapter 2 (Pages: 42, 47)
Chapter 2 (Pages: 66-78)

Unit-II Chapter 3 (Pages: 84, 102), Chapter 5 (Pages: 180-202)
Chapter 6 (Pages 222-246)

Unit-III Chapter 8 (Pages: 309-329), Chapter 9 (Pages: 356-363)
Chapter 10(Pages: 392-446)

Unit-IV Chapter 12 (Pages: 483-523) Chapter 13 (Pages: 536-547)

Unit-V Chapter 14 (Pages: 573-604)

Books for Reference

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

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

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

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

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

Unit-I: Computer Basics

(15 Hours)

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

Unit-II: Arrays and Functions

(15 Hours)

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

Unit-III: Structures and Unions

(15 Hours)

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

Unit-IV: Pointers

(15 Hours)

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

Unit-V: File Management

(15 Hours)

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

Books for Study

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

Unit-I a Chapter 1.

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

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

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

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

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

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

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

List of Exercises:

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

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

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

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

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

Unit: I (18 Hours)

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

Unit: II (18 Hours)

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

Unit: III (18 Hours)

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

Unit: IV (18 Hours)

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

Unit: V (18 Hours)

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

Books for Study:

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

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

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

Books for Reference

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

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

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

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

Unit-I Principles of Value Education

(6 Hours)

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

Unit-II The Development of Human Personality

(6 Hours)

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

Unit-III The Dimensions of Human Development

(6 Hours)

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

Unit-IV Responsible Parenthood

(6 Hours)

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

Unit-V Gender Equality and Empowerment

(6 Hours)

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

Books for Study:

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

Books for Reference:

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

Web Sources:

<http://livingvalues.net>. Accessed 05 Mar. 2021.

<https://www.apa.org/topics/personality#>. Accessed 05 Mar. 2021.

<https://www.peacecorps.gov/educators/resources/global-issues-gender-equality-and-womens-empowerment/>. Accessed 05 Mar. 2021.

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

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

அலகு - 1

(12 மணிநேரம்)

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

அலகு - 2

(12 மணிநேரம்)

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

அலகு - 3

(12 மணிநேரம்)

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

அலகு - 4

(12 மணிநேரம்)

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

அலகு - 5

(12 மணிநேரம்)

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

பாடநூல்கள்:

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

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

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

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

Unit - I (12 hours)

TITRE:LES LOISIRS

GRAMMAIRE : les adjectifs interrogatifs, les nombres ordinaux, les verbes pronominaux

LEXIQUE : les différentes activités quotidiennes, les loisirs, les activités quotidiennes, les matières

PRODUCTION ORALE : parler sur votre passe-temps

PRODUCTION ECRITE : décrire sa journée

Unit -II (12 hours)

TITRE:LA ROUTINE

GRAMMAIRE : les pronoms personnels COD, les verbes du premier groupe en e/er/eler/eter, le verbe prendre

LEXIQUE : exprimer ses 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:OU FAIRE SES COURSES?

GRAMMAIRE : les articles partitifs, le pronom en (la quantité), très ou beaucoup

LEXIQUE : inviter et répondre à une invitation, les commerces et les commerçants, demander et dire le prix, les quantités

PRODUCTION ORALE : faire des courses pour une soirée

PRODUCTION ECRITE : écrire un message en acceptant l'invitation

Unit - IV (12 hours)

TITRE:DECOUVREZ ET DEGUSTEZ

GRAMMAIRE : l'impératif, il faut, les verbes devoir, pouvoir, savoir, vouloir

LEXIQUE : Commander et commenter sur un plat de la carte, les aliments, les services, les moyens 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**Book for Study**P.Dauda,L.Giachino and C.Baracco, *Generation AI*, Didier, Paris 2016.**Books for Reference**

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

Web Resources

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

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

Semester	Course code		Title of the Course						Hours		Credits
II	21UFR21GL02		FRENCH – II						4		3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO–1	3	3	3	3	1	3	1	2	2	2	2.2
CO–2	2	1	2	3	2	3	1	2	2	2	2.0
CO–3	3	2	3	2	2	3	3	1	3	2	2.4
CO–4	3	2	2	1	3	3	3	1	1	3	2.2
CO–5	2	1	2	2	3	3	3	2	2	2	2.2
Mean overall Score											2.2 (High)

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

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

Unit - I (12 Hours)

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

Unit - II (12 Hours)

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

Unit - III (12 Hours)

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

Unit - IV (12 Hours)

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

Unit - V**(12 Hours)**

Anuvad - 2

Sandhi

Letter writing - Nagarpalika ko Patra

Bakthikal - Visheshathayem

Books for Study

1. Viswanath Tripathy, *Kuchh Kahaniyan*, Rajkamal Prakashan Pvt. Ltd, New Delhi, 2018.

Unit-I Chapter 1

2. M.kamathaprasad Gupt, *Hindi Vyakaran*, Anand Prakashan, Kolkatta, 2020.

Unit-II, III and IV Chapter 2

3. Dr.Sadananth Bosalae, *kavya sarang*, Rajkamal Prakashan, New Delhi, 2020.

Unit-V Chapter 4**Books for Reference**

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

Web Resources

1. <https://youtu.be/tE2RHQcqlbI>
2. <https://youtu.be/Xxvco3qa284>
3. <https://youtu.be/1z8x95IFGi4>
4. <https://youtu.be/CBMYf8NRLW4>
5. <https://youtu.be/h31tMLFtHs>

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

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

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

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

Unit - I (12 Hours)

Asmath usmath tat kim (MFN)

Unit - II (12 Hours)

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

Unit - III (12 Hours)

Lang lakaaraha Kriyapadaani

Unit - IV (12 Hours)

Raguvamsaha Pratama sargaha (1 –15)

Unit – V (12 Hours)

Suvachana Prayogha

Book for Study

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

Books for Reference

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

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

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

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

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

Unit-I

(15 Hours)

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

Unit –II

(15 Hours)

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

Unit-III

(15 Hours)

26. Asking Questions

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

Unit-IV

(15 Hours)

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

Unit-V

(15 Hours)

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

Book for Study

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

Books for Reference

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

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

Web Resources

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

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

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

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

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

Unit-I: Digital Logic & Combinational Logic Circuits

(12 Hours)

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

Unit-II: Data Processing & Arithmetic

(12 Hours)

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

Unit-III: Flip-Flops, Registers & Counters

(12 Hours)

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

Unit-IV: Counters

(12 Hours)

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

Unit-V: Microprocessors, Microcomputers and Assembly Language

(12 Hours)

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

Books for Study

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

Books for Reference

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

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

Semester	Course Code	Title of the Course									Hours	Credits
II	21UBC23CC03	CORE -3: DIGITAL COMPUTER FUNDAMENTALS									4	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	1	3	2	3	3	2	2	2	2.4	
CO-2	3	3	1	3	3	3	3	2	2	2	2.5	
CO-3	3	3	2	2	1	3	3	3	2	1	2.3	
CO-4	3	3	2	2	1	3	3	2	2	2	2.3	
CO-5	3	3	3	2	1	3	3	3	2	1	2.4	
Mean Overall Score											2.38	(High)

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

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

Unit – I: Introduction to Database System

(12 Hours)

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

Unit – II: Storage and file Structure

(12 Hours)

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

Unit – III: Relational Model

(12 Hours)

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

Unit – IV: SQL

(12 Hours)

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

Unit – V: Introduction to PL/SQL

(12 Hours)

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

Books for Study

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

Edition, Tata McGraw–Hill, Singapore, 2016.

Unit-I Chapter 1, Chapter 2

Unit-II Chapter 3, Chapter 5, Chapter 6

Unit-III Chapter 8, Chapter 9, Chapter 10

Unit-IV Chapter 12, Chapter 13

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

Unit – V Chapter 2, Chapter 3

Books for Reference

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

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

Semester	Course Code	Title of the Course									Hours	Credits
II	21UBC23CC04	CORE-4: RELATIONAL DATABASE MANAGEMENT SYSTEMS									4	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	3	2	2	3	3	3	2	3	2.7	
CO-2	3	2	3	3	2	3	2	2	3	1	2.4	
CO-3	2	3	2	3	3	2	3	2	2	3	2.5	
CO-4	3	2	3	2	1	3	3	2	1	2	2.2	
CO-5	2	3	2	3	2	3	2	3	3	2	2.5	
Mean Overall Score											2.36	
Result											#High	

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

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

List of Exercises

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

PL/SQL

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

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

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

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

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

Unit-I (18 Hours)

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

Unit-II (18 Hours)

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

Unit-III (18Hours)

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

Unit-IV (18 Hours)

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

Unit-V (18 Hours)

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

Books for Study

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

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

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

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

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

Unit – IV Chapter 9 (Pages 126-139, 145-154, 166-170, 172),

Chapter 10 (Pages 245, 259-268)

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

Books for Reference

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

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

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

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

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

Unit I Introduction to Environmental Studies (6 Hours)

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

Unit II Natural Resources (6 Hours)

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

Unit III Ecosystems, Biodiversity and Conservation (6 Hours)

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

Unit IV Environmental Pollution (6 Hours)

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

Unit V Environmental Organizations and Treatise (6 Hours)

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

Books for Study

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

Books for Reference

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

4. *Conservation*. NJ: Rutgers University Press, 2001.

Web Sources:

<https://www.unep.org/>. Accessed 05 Mar. 2021.

<http://moef.gov.in/en/> Accessed 05 Mar. 2021.

<https://www.ipcc.ch/reports/>. Accessed 05 Mar.2021.

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

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

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

Introduction- Classification of Human Rights- Scope of Human Rights-Characteristics of Human Rights-NHRC-SHRC- Challenges for Human Rights in the 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-Classification of Fundamental Rights-Salient Features of Fundamental Rights- and Fundamental Duties.

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

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

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

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

Books for Study

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

Books for Reference

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

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

Web Sources:

<https://www.un.org/en/universal-declaration-human-rights/>_Accessed 05 Mar. 2021.

<https://www.ilo.org/global/lang--en/index.htm>_Accessed 05 Mar. 2021.

<https://www.amnesty.org/en/>_Accessed 05 Mar. 2021.

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

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

அலகு - 1

(12 மணிநேரம்)

பொருநராற்றுப்படை (முழுமையும்)

அலகு - 2

(12 மணிநேரம்)

நற்றிணை - 5 பாடல்கள் - (1, 19, 21, 70, 148)

ஐங்குறுநூறு - அன்னாய் வாழிப்பத்து.

யாப்பிலக்கணம் - வெண்பா, ஆசிரியப்பா

அலகு - 3

(12 மணிநேரம்)

கலித்தொகை - (குறிஞ்சிக்கலி- 62, பாலைக்கலி -22, மருதக்கலி- 87,

நெய்தற்கலி-149, முல்லைக்கலி - 116)

இலக்கிய வரலாறு - முதற்பாகம் ('தமிழ் மொழியின் தொன்மையும் சிறப்பும்' முதல் 'சங்க தொகை நூல்கள்' முடிய),

புதினம் - குடும்ப அட்டை (2022-2023)

அலகு - 4

(12 மணிநேரம்)

பதிற்றுப்பத்து - 3 பாடல்கள் (14, 32, 61)

புறநானூறு - 5 பாடல்கள் (95, 121, 130, 204, 279)

அணியிலக்கணம்

அலகு - 5

(12 மணிநேரம்)

திருக்குறள் - புறங்கூறாமை, பழமை, புலவி நுணுக்கம் ஆகிய அதிகாரங்கள்

திரிகடுகம் - 5 பாடல்கள் (2, 6, 12, 15, 42)

இலக்கிய வரலாறு - சங்க இலக்கியங்களின் தனித்தன்மைகள் முதல் இரட்டைக் காப்பியங்கள் முடிய

பாடநூல்கள் :

1. பொதுத்தமிழ் செய்யுள் திரட்டு, தமிழாய்வுத்துறை வெளியீடு, தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2, முதற்பதிப்பு, 2021
2. சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு, தமிழாய்வுத்துறை, தூய வளனார் தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி, பத்தாம் பதிப்பு, 2017
3. புதினம் (ஒவ்வொரு கல்வியாண்டிற்கும் ஒவ்வொரு புதினம்)
2022 – 2023 கல்வியாண்டுக்கு மட்டும் : வீ.செந்தில் குமார், குடும்ப அட்டை, தாமரை பப்ளிகேஷன்ஸ் பிரைவேட் லிமிடெட், சென்னை, முதற்பதிப்பு, 2009

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

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

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

Unit – I (12 hours)

TITRE:VIVRE LAVILLE

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

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

PRODUCTION ORALE : demander et indiquer une direction dans un dialogue

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

Unit - II (12 hours)

TITRE:VISITER UNE VILLE

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

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

PRODUCTION ORALE : Indiquer le chemin

PRODUCTION ECRITE : Demander des renseignements touristiques

Unit - III (12 hours)

TITRE:ON VEND OU ON GARDE

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

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

PRODUCTION ORALE : comprendre une présentation de catalogues vestimentaires en France

PRODUCTION ECRITE : adresser des souhaits à quelqu'un

Unit - IV (12 hours)

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

GRAMMAIRE : les pronoms relatifs qui et que, l'imparfait, les verbes 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:FELICITATIONS ! / ON VOYAGE!

GRAMMAIRE : les pronoms démonstratifs, les articles : particularités, les pronoms interrogatifs variables : lequel, les adverbes de manières, les verbes recevoir et conduire

LEXIQUE : les moyens de transports, les voyages, les fêtes, l'aéroport et l'avion, la gare et le train, l'hôtel

PRODUCTION ORALE : Présenter ses vœux

PRODUCTION ECRITE : Faire une réservation

Book for Study

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

Books for Reference

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

Web Resources

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

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

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

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

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

Unit - I (12 Hours)

Tera sneh na khoon
Samband Bodak
Reethikal - Namakarn
Tense

Unit - II (12 Hours)

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

Unit - III (12 Hours)

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

Unit - IV (12 Hours)

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

Unit - V (12 Hours)

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

Books for Study

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

Books for Reference

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

Web Resources

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

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

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

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

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

Unit - I (12 Hours)

Romodantam , Balakandam (1-15)

Unit - II (12 Hours)

Romodantam , Balakandam (15-30)

Unit – III (12 Hours)

Vedas – Vedangas vivaranam

Unit - IV (12 Hours)

Puranas .Upanishands

Unit - V (12 Hours)

Upasargas , Bhavishyat Kaalah

Book for Study

VEDIC LITERATURE, 2019

Books for Reference

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

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

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

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

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

Unit-I (15 Hours)

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

Unit-II (15 Hours)

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

Unit-III (15 Hours)

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

Unit-IV (15 Hours)

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

Unit-V (15 Hours)

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

Book for Study

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

Books for Reference

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

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

Web Resources

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

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

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

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

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

Unit –I: Introduction (12 Hours)

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

Unit –II: Linked Lists (12 Hours)

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

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

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

Unit –IV: Trees (12 Hours)

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

Unit – V: Algorithm (12 Hours)

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

Books for Study

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

Books for Reference

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

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21UBC33CC05	CORE 5: DATA STRUCTURES AND ALGORITHMS									4	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	3	3	3	3	3	3	3	3	3.0	
CO-2	3	3	2	2	2	3	3	3	2	3	2.6	
CO-3	3	3	3	2	2	3	3	3	3	3	2.8	
CO-4	3	3	3	3	2	3	3	3	3	3	2.9	
CO-5	3	3	2	2	3	3	3	2	2	3	2.6	
Mean Overall Score											2.78	(High)

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

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

Unit – I: Introduction to C#

(12 Hours)

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

Unit – II: OOPS

(12 Hours)

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

Unit –III: File and Streams

(12 Hours)

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

Unit –IV: Core ADO.NET

(12 Hours)

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

Unit –V: XML

(12 Hours)

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

Books for Study

1. Paul Deitel, Harvey Deitel, *C# 6 For Programmers*, Deitel Developer Series, 2017.

Unit- I Chapter 1, Chapter 2, Chapter 3.3, 3.4, 3.6

Unit- II Chapter 4, Chapter 5, Chapter 8, Chapter 11, Chapter 12

Unit-III Chapter -17

2. Christian Nagel, *Professional C# 2012 with .NET 4.5*, Wiley India, 2012.

Unit-III Chapter 6, Chapter 9, Chapter 10, Chapter 11

Unit-IV Chapter 32

Unit-V Chapter 34

Books for Reference

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

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

Semester	Course Code		Title of the Course								Hours	Credits
III	21UBC33CC06		CORE- 6: C# .NET								4	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5		
CO-1	3	2	2	1	3	2	2	1	3	2	2.1	
CO-2	2	3	3	3	2	2	3	2	3	3	2.6	
CO-3	2	3	2	1	3	3	3	2	2	1	2.2	
CO-4	2	3	3	2	2	3	3	2	3	3	2.6	
CO-5	3	3	2	3	2	1	2	3	3	2	2.4	
Mean Overall Score											2.38 (High)	

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

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

List of Exercises:

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

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

Semester	Course Code	Title of the Course									Hours	Credits
III	21UBC33CP03	SOFTWARE LAB-III: C# •NET									3	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	2	3	3	2	2	1	3	2	2.4	
CO-2	2	3	3	3	2	2	3	2	3	3	2.6	
CO-3	2	3	2	1	3	3	3	3	2	1	2.3	
CO-4	2	3	3	3	2	3	3	2	3	3	2.7	
CO-5	3	3	2	3	2	1	3	3	3	3	2.6	
Mean Overall Score											2.52	(High)

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

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

UNIT-I:

(09-Hours)

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

UNIT-II:

(09-Hours)

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

UNIT-III:

(09-Hours)

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

UNIT-IV:

(09-Hours)

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

UNIT-V:

(09-Hours)

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

Book for Study

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

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

Reference Books

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

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

Semester	Course Code	Title of the Course									Hours	Credit
III	21UBC33AO03A	ALLIED 1: FINANCIAL ACCOUNTING PACKAGE – TALLYPRIME									3	2
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	2	2	1	3	3	2	2	3	2.2	
CO-2	2	3	2	1	2	3	3	2	2	3	2.3	
CO-3	1	2	3	2	3	2	3	2	3	2	2.3	
CO-4	1	2	2	3	1	2	3	2	2	3	2.1	
CO-5	1	2	2	2	3	1	3	2	2	3	2.1	
Mean Overall Score											2.2	
Result											# High	

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

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

Exercises

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

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

Semester	Course Code	Title of the Course									Hours	Credit
III	21UBC33AP01A	Practical ALLIED 1: FINANCIAL ACCOUNTING PACKAGES – TALLY PRIME BASIC									03	02
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	2	2	1	3	3	2	2	3	2.2	
CO-2	2	3	2	1	2	3	3	2	2	3	2.3	
CO-3	1	2	2	3	1	2	3	2	2	3	2.1	
CO-4	2	3	2	1	2	3	3	2	2	3	2.3	
CO-5	1	2	2	2	3	1	3	2	2	3	2.1	
Mean Overall Score											2.2	
Result											#	High

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

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

UNIT - 1

INTRODUCTION TO ACCOUNTING

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

UNIT – 2

BASIC ACCOUNTING PROCEDURES

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

UNIT – 3

SUBSIDIARY BOOKS -1 SPECIAL PURPOSE BOOKS

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

UNIT – 4

BANK RECONCILIATION STATEMENT

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

UNIT – 5

FINAL ACCOUNTS

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

Book for Study

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

Books for Reference

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

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

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

Semester	Course Code		Title of the Course								Hours	Credit
1	21UBC33AO03B		ALLIED ACCOUNTS -1								6	4
Course Outcomes ↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs	
	PO-1	PO-2	PO-3	PO-4	PO-5	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5		
CO-1	3	2	2	3	2	3	3	2	2	3	2.5	
CO-2	2	3	2	1	2	3	3	2	2	3	2.3	
CO-3	2	2	3	2	3	2	3	2	3	2	2.4	
CO-4	1	2	2	3	1	2	3	2	2	3	2.1	
CO-5	2	2	2	2	3	1	3	2	2	3	2.2	
Mean Overall Score											2.3	
Result											# High	

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

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

Unit – I (6-Hours)

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

Unit - II (6-Hours)

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

Unit - III (6-Hours)

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

Unit - IV (6-Hours)

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

Unit - V (6-Hours)

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

Books for Study

1. Dinesh Khattar, *Quantitative Aptitude for Competitive Examinations*, 2nd Edition, Pearson Education, India, New Delhi, 2016.

Unit -I – Section (5,6,7,9)

Unit -II – Section (10,11,12,15)

Unit -III – Section (17,18,30,31)

2. Dr R S Aggarwal, *A Modern Approach to Verbal & Non-Verbal Reasoning*, 2nd Edition, S. Chand Publishing, India, New Delhi, 2017.

Unit -IV – Section (1, 2, 4, 5)

Unit - V – Section (8, 9, 14, 15)

Books for Reference

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

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

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

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

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

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

Unit-I Introduction to Social Ethics

(6-Hours)

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

Unit-II The Economic and Political System of Today

(6-Hours)

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

Unit-III Integrity in Public Life National Integration

(6-Hours)

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

Unit-IV Cyber Crime

(6-Hours)

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

Unit-V Social Integration

(6-Hours)

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

Books for Study

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

Books for Reference

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

Web Sources

<https://cybercrime.gov.in/>

<https://open.lib.umn.edu/sociology/chapter/14-2-types-of-political-systems/>

<https://www.esv.org/resources/esv-global-study-bible/social-ethics/>

https://en.wikipedia.org/wiki/Political_system

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

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

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

Books for Study

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

Books for Reference

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

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

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

அலகு – 1

(12 மணிநேரம்)

தொல்காப்பியம் :

நிலம் தீ நீர் வளி விசும்போடு (தொல்.பொருள் 635)

ஒன்றறிவதுவே (தொல்.பொருள் 571)

புறநானூறு

மண் திணிந்த நிலனும் (புறம்.2)

செஞ்ஞா யிற்றுச் செலவும் (புறம். 30)

அகநானூறு

அம்ம வாழி, தோழி (அகம்.141)

பதிற்றுப்பத்து

நிலம் நீர் வளி விசம்பு என்ற நான்கின் (பதிற்று.14)

நெடுவயின் ஒளிறு மின்னுப் பரந்தாங்கு (பதிற்று.24)

உரைநடைக்கட்டுரை : வியக்க வைக்கும் தமிழரின் அறிவியல்

அலகு- 2

(12 மணிநேரம்)

சித்தர் பாடல்கள்

பதார்த்த குண சிந்தாமணி

குளத்து சலந்தானே கொடிதான (27)

ஏரிசலம் வாதமிகு மதுவே (31)

அருவிநீர் மேக மகற்றுங் (39)

மேவிய சீவன் வடிவது சொல்லிடல் (திருமூலர்)

அணுவில் அணுவினை ஆதிபிராணை (திருமூலர்)

நட்டகல்லைத் தெய்வமென்று (சிவவாக்கியர்)

உரைநடைக்கட்டுரை: தமிழர்களின் மருத்துவ அறிவியல்

அலகு - 3

(12 மணிநேரம்)

திருக்குறள் (2 அதிகாரங்கள்)

வான் சிறப்பு, மருந்து

வலைப்பூக்கள் உருவாக்கல், பராமரித்தல்

புதிய அறிவியல் கலைச்சொல்லாக்கங்களை உருவாக்குதல்

உரைநடைக்கட்டுரை: தமிழ் இலக்கியங்களில் நீர் மேலாண்மையியல்

அலகு- 4

(12 மணிநேரம்)

புதினம்: சொர்க்கத்தீவு – சுஜாதா

நூல் - திறனாய்வு

அறிவியல் புனைவு ஆவணப்படம், திரைப்படம் - திறனாய்வு

உரைநடைக்கட்டுரை: தமிழில் அறிவியல் புனைவுகள்

அலகு - 5

(12 மணிநேரம்)

அறிவியல் கலைச்சொற்கள்

அன்றாட வாழ்வில் அறிவியல் பழமொழிகளைத் தொகுத்தல்

மூலிகைகள், கீரைகள் ஆகியவற்றின் முக்கியத்துவத்தைக் காட்சிப்படுத்துதல்.

தமிழர் அறிவியல் கண்காட்சி நடத்துதல்

உரைநடைக்கட்டுரை: அறிவியல் தமிழின் வளர்ச்சி நிலைகள்

பாட நூல்கள்

1. **அறிவியல் தமிழ்**, தமிழாய்வுத்துறை, தூய வளனார் தன்னாட்சிக் கல்லூரி,

திருச்சிராப்பள்ளி, முதற்பதிப்பு, 2022

2. சுஜாதா, **சொர்க்கத்தீவு**, விசா பப்ளிகேஷன்ஸ், சென்னை-17, ஒன்பதாம் பதிப்பு, 2009

3. மூர்த்தி அ.கி., **அறிவியல் அகராதி**, மணிவாசகர் பதிப்பகம், சென்னை, 2001

பார்வை நூல்கள்

1. குழந்தைசாமி.வா.செ., **அறிவியல்தமிழ்**, பாரதி பதிப்பகம், சென்னை-17, 6ஆம்பதிப்பு, 2001

2. நெடுஞ்செழியன், **இன்னும் மீதமிழுக்கிறது நம்பிக்கை**, பூவுலகின் நண்பர்கள் வெளியீடு, சென்னை, முதற்பதிப்பு, 2017

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

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

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

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

Unit- I: (12 hours)

TITRE:ON FAIT LE MELANGE!

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

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

PRODUCTION ORALE : comprendre le récit d'un voyage

PRODUCTION ECRITE : raconter ses actions quotidiennes

Unit - II: (12 hours)

TITRE:A PROPOS DE LOGEMENT

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

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

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

PRODUCTION ECRITE : décrire votre maison/appartement

Unit- III: (12 hours)

TITRE:TOUS EN FORME!

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

LEXIQUE : un souvenir et les événements du passés, le corps humain : extérieur, le corps humain : intérieur

PRODUCTION ORALE : échanger sur ses projets de vacances

PRODUCTION ECRITE : raconter un souvenir

Unit - IV: (12 hours)

TITRE:ACCIDENTS ET CATASTROPHES

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

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

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

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

Unit -V: (12 hours)

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

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

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

Book for Study

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

Books for Reference

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

Web Resources

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

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

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

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

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

Unit - I (12 Hours)

Computer ka yug
Prathyay
Adhunik Kal - Namakarn
Namakaran

Unit - II (12 Hours)

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

Unit - III (12 Hours)

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

Unit - IV (12 Hours)

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

Unit - V**(12 Hours)**

Sapnom Kee Home Delivery (Novel)
Anuvad - 4

Books for Study

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

Books for Reference

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

Web Resources

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

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

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

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

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

Unit - I (12 Hours)

Samskrita Vyavahara sahasri vakiya Prayogaha

Unit - II (12 Hours)

Lot Lakaarah , Prqayaogh Kartari Vaakyaani

Unit - III (12 Hours)

Naatakasya Itihaasah Vivaranam, Thuva and Tum Prathiyaha

Unit - IV (12 Hours)

Karnabhaaram , Naatakasya Visistyam

Unit - V (12 Hours)

Samskrita Rachanani priyogaha

Book for Study

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

Books for Reference

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

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

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

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

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

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

Unit-I (15 Hours)

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

Unit-II (15 Hours)

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

Unit-III (15 Hours)

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

Unit-IV (15 Hours)

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

Unit-V (15 Hours)

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

Book for Study

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

Books for Reference

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

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

Web Resources

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

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

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

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

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

Unit-I: Software Engineering

(12 Hours)

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

Unit-II: Requirements Understanding

(12 Hours)

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

Unit-III: Design Concepts

(12 Hours)

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

Unit-IV: User Interface Design

(12 Hours)

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

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

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

Books for Study

1. Roger S. Pressman, *Software Engineering - A Practitioner's Approach*, 8th Edition, McGraw-Hill, New York, 2019.

Unit-I Chapter 2, Chapter 3, Chapter 4(Sec. 4.1, 4.2), Chapter 5

Unit-II Chapter 8, Chapter 11

Unit-III Chapter 12, Chapter 13(Sec. 13.1, 13.2, 13.3 13.4)

Unit – IV Chapter 15, Chapter 19

Unit – V Chapter 22, Chapter 36

Books for Reference

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

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

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

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

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

Unit-I: Introduction to Java

(12 Hours)

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

Unit-II: Inheritance and Polymorphism

(12 Hours)

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

Unit-III: Abstract Windowing Toolkit

(12 Hours)

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

Unit-IV: Threads

(12 Hours)

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

Unit-V : Networking

(12 Hours)

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

Books for Study

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

Unit-I Chapter 1(Pages 1-6), Chapter 2(Pages 9-20), Chapter 3(Pages 22-29), Chapter 5(Pages 47-59)

Unit-II Chapter 6(Pages 62-72), Chapter 7(Pages 77-91)

Unit-III Chapter 9(Pages 118-122), Chapter 10(Pages 150-162), Chapter 12(Pages 189-202)

Unit-IV Chapter 13(Pages 203-222), Chapter 14(Pages 223-232)

Unit-V Chapter 15(Pages 248-266), Chapter 18(Pages 318-345)

Books for Reference

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

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

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

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

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

List of Exercises:

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

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

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

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

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

UNIT- I

(09-Hours)

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

UNIT-II:

(09-Hours)

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

UNIT-III:

(09-Hours)

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

UNIT-IV:

(09-Hours)

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

UNIT – V

(09-Hours)

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

Books for Study

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

Books for Reference

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

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

Semester	Course Code	Title of the Course									Hours	Credit
IV	21UBC43AO04A	ALLIED 2: FINANCIAL ACCOUNTING PACKAGE – TALLY PRIME ADVANCED									3	2
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	2	2	1	3	3	2	2	3	2.2	
CO-2	2	3	2	1	2	3	3	2	2	3	2.3	
CO-3	1	2	3	2	3	2	3	2	3	2	2.3	
CO-4	1	2	2	3	1	2	3	2	2	3	2.1	
CO-5	1	2	2	2	3	1	3	2	2	3	2.1	
Mean Overall Score											2.2	
Result											# High	

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

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

Exercises

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

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

Semester	Course Code		Title of the Course								Hours	Credit
IV	21UBC43AP02A		SOFTWARE LAB: FINANCIAL ACCOUNTING PACKAGE – TALLY PRIME ADVANCED								3	2
Course Outcomes↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	2	2	1	3	3	2	2	3	2.2	
CO-2	2	3	2	1	2	3	3	2	2	3	2.3	
CO-3	1	2	2	3	1	2	3	2	2	3	2.1	
CO-4	2	3	2	1	2	3	3	2	2	3	2.3	
CO-5	1	2	2	2	3	1	3	2	2	3	2.1	
Mean Overall Score											2.2	
Result											# High	

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

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

UNIT – 1 FINAL ACCOUNTS – ADJUSTMENTS

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

UNIT – 2 CASH BUDGET

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

UNIT – 3 PARTNERSHIP – ADMISSION

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

UNIT – 4 PARTNERSHIP – RETIREMENT OF A PARTNER.

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

UNIT – 5 COST SHEET

Preparation of cost sheet – tender quotation.

Book for Stdudy

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

Book for Reference

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

Published by Eurasia Publishing House, New Delhi,

4. Tulsian, P. C., Financial Accounting, 1st edition Published by Tata McGraw Hills, New Delhi.

Semester	Course Code	Title of the Paper									Hours	Credit
IV	21UBC430403B	ALLIED ACCOUNTS -II									6	4
Course Outcomes ↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs	
	PO-1	PO-2	PO-3	PO-4	PO-5	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5		
CO-1	3	2	2	3	2	3	3	2	2	3	2.5	
CO-2	2	3	2	1	2	3	3	2	2	3	2.3	
CO-3	2	2	3	2	3	2	3	2	3	2	2.4	
CO-4	1	2	2	3	1	2	3	2	2	3	2.1	
CO-5	2	2	2	2	3	1	3	2	2	3	2.2	
Mean Overall Score											2.3	
Result											# High	

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

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

Unit-I: Introduction

(6 Hours)

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

Unit-II: Selectors

(6 Hours)

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

Unit-III : Masks and Channels

(6 Hours)

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

Unit-IV Drawing Techniques

(6 Hours)

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

Unit-V: Compositing

(6 Hours)

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

Book for Study

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

Unit-I Chapter 1 and Chapter 2

Unit-II Chapter 3, Chapter 4 and Chapter 5

Unit-III Chapter 6 and Chapter 7

Unit-IV Chapter 8

Unit-V Chapter 9 and Chapter 11

Books for Reference

1. Scot Kelby, *The Photoshop Elements 2020 Book for Digital Photographers*, New Riders; 1st edition, 2020.

2. DT Editorial Services, *Photoshop CC in Simple Steps*, Wiley, DreamTech Press, 1st edition 2019.

3. Martin Evening, *Adobe Photoshop CC for Photographers: A professional image editor's guide to the creative use of Photoshop for the Macintosh and PC*, Routledge, USA, 2nd Edition, 2018.

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

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

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

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

Unit-I Harmony with Nature

(6-Hours)

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

Unit-II Issues Dealing with Science and Religion

(6-Hours)

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

Unit-III Public Health

(6-Hours)

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

Unit-IV Disaster Management

(6-Hours)

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

Unit-V Counselling for Adolescents

(6-Hours)

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

Book for Study

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

Books for Reference:

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

Web Sources:

https://en.wikipedia.org/wiki/Disaster_management_in_India

<https://ndma.gov.in/>

<https://talkitover.in/services/child-adolescent-counselling/>

<https://www.nipccd.nic.in/schemes/adolescent-guidance-centre-19#gsc.tab=0>

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

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

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

Books for Study

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

Books for Reference

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

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

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

Unit –I: Introduction

(12 Hours)

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

Unit –II: Testing

(12 Hours)

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

Unit –III: Interfaces

(12 Hours)

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

Unit –IV: Website Building

(12 Hours)

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

Unit – V: ASP.Net Core

(12 Hours)

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

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

Books for Study

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

Unit-I Chapter 1, Chapter 2, Chapter 3

Unit-II Chapter 4, Chapter 5

Unit-III Chapter 6, Chapter 11

Unit-IV Chapter 15, Chapter 16 (Page no. 509 – 526)

Unit-V Chapter 16 (Page no. 527- 546), Chapter 19

Books for Reference

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

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

Semester	Course Code	Title of the Course									Hours	Credits
V	21UBC53CC09	CORE- 9: PROGRAMMING WITH ASP.Net									4	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	1	2	2	3	2	3	3	2	3	3	2.4	
CO-2	2	2	2	2	3	2	2	3	2	3	2.3	
CO-3	1	3	3	3	2	3	2	2	2	3	2.4	
CO-4	2	2	2	3	3	2	2	3	2	3	2.4	
CO-5	2	2	3	2	2	2	3	2	3	3	2.4	
Mean Overall Score											2.38	(High)

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

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

Unit –I: Introduction to HTML

(12 Hours)

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

Unit –II: CSS

(12 Hours)

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

Unit –III: PHP

(12 Hours)

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

Unit –IV: PHP OBJECTS

(12 Hours)

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

Unit – V: MySQL

(12 Hours)

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

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

Books for Study

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

Books for Reference

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

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

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

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

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

List of Exercises:

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

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

Semester	Course Code	Title of the Course									Hours	Credit
V	21UBC53CP05	SOFTWARE LAB -5 : PROGRAMMING WITH ASP.NET									3	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	2	1	3	2	2	3	3	2	3	2.3	
CO-2	1	2	3	2	3	2	3	2	3	3	2.4	
CO-3	1	2	3	2	3	2	3	2	2	3	2.3	
CO-4	2	3	3	2	2	2	3	2	3	2	2.4	
CO-5	2	2	2	3	3	2	3	2	3	3	2.5	
Mean Overall Score											2.38	(High)

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

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

List of Exercises:

HTML & CSS

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

PHP with MySQL

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

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

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

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

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

Unit-I: Introduction

(15 Hours)

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

Unit-II: Process Management

(15 Hours)

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

Unit-III: Memory Management

(15 Hours)

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

Unit-IV: File Management

(15 Hours)

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

Unit-V: Protection

(15 Hours)

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

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

Books for Study

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, *Operating System Concepts*, 9th Edition., John Wiley & Sons Inc., New Delhi, 2013.

Unit-I Chapter 1 (Sec: 1.1, 1.12), Chapter 2 (Sec: 2.1, 2.3, 2.4)

Unit-II Chapter 3 (Sec: 3.1, 3.3, 3.4), Chapter 5 (Sec: 5.1, 5.2, 5.6), Chapter 6 (Sec: 6.1, 6.3, 6.6), Chapter 7 (Sec: 7.1, 7.3, 7.5, 7.7)

Unit-III Chapter 8 (Sec: 8.1, 8.2, 8.4, 8.5), Chapter 9 (Sec: 9.2, 9.4, 9.5, 9.6)

Unit – IV Chapter 11 (Sec: 11.1, 11.2, 11.3), Chapter 12 (Sec: 12.1, 12.4, 12.6), Chapter 10 (Sec: 10.2, 10.4, 10.6, 10.8)

Unit – V Chapter 14 (Sec: 14.1, 14.4, 14.8, 14.9), Chapter 15 (Sec: 15.1, 15.4, 15.5), Chapter 17 (Sec: 17.1, 17.2, 17.4)

Books for Reference

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

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

Semester	Course Code	Title of the Course									Hours	Credits
V	21UBC53ES01A	DSE-1: OPERATING SYSTEMS									5	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	3	3	3	2	1	2	3	2	2.4	
CO-2	3	2	3	3	3	2	1	3	2	3	2.5	
CO-3	2	3	2	2	1	1	2	2	3	2	2.0	
CO-4	2	2	3	1	2	3	1	3	3	3	2.3	
CO-5	3	3	1	2	3	2	3	2	2	2	2.3	
Mean Overall Score											2.3 (High)	

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

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

Unit-I: Linux Introduction and Installation

(15 Hours)

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

Unit-II: Multimedia in Red Hat Linux

(15 Hours)

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

Unit-III: System Administration

(15 Hours)

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

Unit-IV: Setting Up and Supporting Users

(15 Hours)

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

Unit-V: Security Issues

(15 Hours)

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

Book for Study

1. Christopher Negus, *Red Hat Linux 9 Bible*, Wiley Publishing Pvt. Ltd, New Delhi, 2013.

Unit-I Chapters 1, 2, 3, 5

Unit-II Chapter 8, 9

Unit-III Chapter 10

Unit-IV Chapter 11

Unit-V Chapter 14

Books for References

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

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

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

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

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

Unit – I: Introduction

(15 Hours)

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

Unit – II: Bandwidth

(15 Hours)

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

Unit – III: Network layer

(15 Hours)

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

Unit – IV: Wireless Networks

(15 Hours)

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

Unit – V: Security

(15 Hours)

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

Books for Study

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

Unit -I: Chapter 1,2,3,7 (Sec 1.1, 2.2, 2.3, 2.4, 3.1, 3.4, 7.1, 7.2)

Unit-II: Chapter 6, 8 (Sec 6.1, 6.2, 8.1, 8.2, 8.3)

Unit-III: Chapter 19, 21, 22 (Sec 19.1, 19.2, 21.1, 21.2, 21.3, 22.1) and Chapter 23 (sec 23.1, 23.2, 23.3)

- James F. Kurose, Keith Ross, *Computer Networking- a Top down Approach*, Hoboken, New Jersey: Pearson, 7th Edition, 2017.

Unit- IV: Chapter 7 (Sec 7.1, 7.2, 7.3, 7.4, 7.5, 7.7, 7.8)

Unit -V: Chapter 8 (Sec 8.1, 8.2, 8.3, 8.4, 8.5, 8.7, 8.8, 8.9)

Books for Reference

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

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

Semester	Course Code	Title of the Course									Hours	Credits
V	21UBC53ES02A	DSE-2: COMMUNICATION NETWORKS									5	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	3	3	3	3	3	3	2	2	2.8	
CO-2	3	3	3	2	2	3	3	2	3	3	2.7	
CO-3	3	3	3	2	2	2	2	3	3	3	2.6	
CO-4	3	3	3	3	2	3	2	3	3	2	2.7	
CO-5	3	3	3	3	3	3	3	2	2	3	2.8	
Mean Overall Score											2.72 (High)	

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

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

Unit –I: Introduction

(15 Hours)

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

Unit –II: Software Development Life Cycle Models

(15 Hours)

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

Unit –III: Strategies and Methods for Test case Design

(15 Hours)

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

Unit –IV: Levels of Testing

(15 Hours)

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

Unit –V: Test Management and Automation

(15 Hours)

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

Books for Study

1. Ilene Burnstein, *Practical Software Testing*, Springer International Edition, USA, 2003.
Unit -I – Chapter 1, Chapter 2, Chapter 3.
Unit -III–Chapter 4, Chapter 5.
Unit -IV–Chapter 6.
2. Srinivasan Desikan, Gopalaswamy Ramesh, *Software Testing - Principles and Practices*, Pearson Education, India, 2007.
Unit -II – Chapter 2, Chapter 3, Chapter 4.
Unit -V–Chapter 15, Chapter 16.

Books for References

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

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

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

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

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

Internship

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

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

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

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

Unit –I: Introduction

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

Unit –II: Cloud Computing Architecture

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

Unit –III: Data Intensive Computing

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

Unit –IV: Advanced Topics in Cloud Computing

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

Unit – V: Secure Distributed Data Storage in Cloud Computing

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

Books for Study

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

Unit-I: Chapter 1 (Sec 1.1, 1.2, 1.3, 1.4), Chapter 3 (Sec 3.1, 3.2, 3.3, 3.4, 3.5, 3.6)

Unit-II: Chapter 4 (Sec 4.1, 4.2, 4.3) Chapter 9 (Sec 9.1, 9.2, 9.3)

Unit-III: Chapter 8 (Sec 8.1, 8.2), Chapter 10 (Sec 10.1, 10.2)

Unit-IV: Chapter 11 (Sec 11.1, 11.2, 11.3)

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

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

Books for Reference

1. Anand Nayyar, *Handbook of Cloud Computing*, First Edition, BPB Publication, India, 2019.

2. Surbhi Rastogi, *Cloud Computing Simplified: Explore Application of Cloud, Cloud Deployment Models, Service Models and Mobile Cloud Computing*, First Edition, BPB Publications, India, 2021

3. John R. Vacca, *Cloud Computing Security Foundations and Challenges*, Second Edition, CRC Press, New York, 2020

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

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

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

Cos (Course Outcomes)

Upon completion of the course, Students will:

- be keen on developing and sustaining Soft Skills required of an educated youth
- be trained to present the best of themselves as job seekers to deal with any problem and conflict situations
- be able to transfer the skills learnt for concrete outcomes and increased productivity of companies
- be able to develop people's skills, life skills that are required to be a good human in the long run and set a living standard
- be embedded with Employability skills such as "communication", "teamwork", "initiative", "enterprise", the attributes of "reliability", "balance between work-life", "commitment" and continuous learning

Module I: Effective Communication

Definition of communication, Barriers of Communication, Verbal and Non-verbal Communication; Self introduction matrix, Conversation Techniques, Good manners and Etiquettes, Introduction to Professional Communication, Professional Grooming and Presentation Skills and exercises

Module II: Resume Writing & Interview skills

Resume Writing: Basic Resume Formats, Types of Resume - Chronological, Functional and Mixed Resume, Steps in preparation of Resume, Sample objectives, Model Resumes. **Interview Skills:** Preparation for interview, Common interview questions, Attitude, Body Language, Mock interviews and Practicum, Figuring out common interview questions and answers

Module III: Group Discussion: Definition of GD, The salient features of GD, Factors that influence GD, Outcome of GD, Tips for success in GD, Parameters of GD, Essential Points for GD preparation, GD Topics, Model GD and Practicum.

Module IV: Personal Effectiveness: Self Discovery: Personality, Traits of Personality; Personality Tests; Intelligence and Skill Assessment Form. **Goal Setting:** Goal setting Process, Questionnaires & Presentations

Module V: Numerical Ability: Average, Percentage; Profit and Loss, Area, Volume and Surface Area. (Simple Interest, Compound Interest; Time and Work, Pipes and Cisterns; Time and Distance, Problems on Trains, Illustrations, Boats and Streams; Illustrations - Optional)

Module VI: Test of Reasoning - Verbal Reasoning: Series Completion, Analogy. **Non-Verbal Reasoning**

Text Book

Melchias G, Balaiah John, John Love Joy (Eds), 2018. *Straight from the Traits: Securing Soft Skills*, SJC, Trichy.

References

Aggarwal, R.S. 2010. *A Modern Approach to Verbal and Non Verbal Reasoning*. S.Chand, New Delhi. Covey, Stephen. 2004. *7 Habits of Highly Effective People*, Free Press. Egan, Gerard. (1994).

The Skilled Helper (5th Ed). Pacific Grove, Brooks/Cole.

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

Melchias G, Balaiah John, John Love Joy (Eds), 2018. *Winners in the Making: A primer on soft skills*. SJC, Trichy.

Other books

Murphy, Raymond. 1998. *Essential English Grammar*. 2nd ed., Cambridge University Press.

Sankaran, K., & Kumar, M. *Group Discussion and Public Speaking*. M.I. Pub, Agra, 5th ed., Adams, Media.

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

Yate, Martin. 2005. *Hiring the Best: A Manager's Guide to Effective Interviewing and Recruiting**

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

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

Unit –I: Introduction

(12 Hours)

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

Unit –II: Data Pre-Processing

(12 Hours)

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

Unit –III: Digital Data

(12 Hours)

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

Unit- IV: Hadoop

(12 Hours)

Hadoop: Features of Hadoop – Key Advantages of Hadoop – Versions of Hadoop – Overview of Hadoop Ecosystems – Hadoop Distribution – Hadoop versus SQL – Integrated Hadoop Systems offered by Leading Market Vendors- Cloud based Hadoop Solution. Introducing Hadoop: Why Hadoop –Why not RDBMS – RDBMS versus Hadoop – Distributed Computing Challenges – History of Hadoop – Hadoop Overview – Use Case of Hadoop- Hadoop Distributors – HDFS.

Unit – V: MapReduce

12-Hours)

Introduction to MapReduce Programming: Introduction to HIVE - Hive- Hive Architecture – Hive Data Types- Hive File Format – Hive Query Language. Introduction to Pig: Pig – Anatomy of Pig – Pig on Hadoop –Pig Philosophy – ETL Processing – Pig Latin Overview

Books for Study

1. Jiawei Han and MichelineKamber, *Data Mining Concepts and Techniques*, Morgan Kaufmann Publishers, California, USA, 2016.

Unit –IChapter 1

Unit –IIChapter 3, Chapter 10.1, 10.2

2. Seema Acharya and Subhashini Chellappan, *Big Data Analytics*, Wiley India Pvt Ltd, 2018.

Unit-III Chapter 1, Chapter 2, Chapter 3, Chapter 4.1

Unit-IV Chapter 4.2, Chapter (5.1-5.10)

Unit-V Chapter 8, Chapter (9.1-9.5), Chapter (10.1-10.6)

Books for Reference

1. Mohammed J. Zaki, Wagner Meira, Jr, *Data Mining and Machine Learning: Fundamental Concepts and Algorithms*, Cambridge University Press, United Kingdom, 2020.
2. John D. Kelleher and Brendan Tierney, *Data Science*, The MIT Press Essential Knowledge Series, 2018.
3. Benjamin Bengfort, Jenny Kim, *Data Analytics with Hadoop*, O'Reilly Media, California USA, 2016.

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

Semester	Course Code	Title of the Course									Hours	Credits
V	21UBC53EG01	GENERIC ELECTIVE -1: FUNDAMENTALS OF DATA SCIENCE									4	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	2	3	3	2	2	3	3	2	2.6	
CO-2	2	2	3	3	2	1	3	2	3	3	2.4	
CO-3	2	3	2	1	3	3	3	2	2	1	2.2	
CO-4	1	3	3	1	2	3	3	2	3	3	2.4	
CO-5	3	3	2	3	2	3	2	3	3	3	2.7	
Mean Overall Score											2.43 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63CC11	CORE – 11: PYTHON PROGRAMMING	4	3

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	recall the basics of Python programming and control statements.	K1
CO-2	classify the skills of designing Graphical User Interfaces in Python.	K2
CO-3	infer the numerical data using Numpy to perform effective data analytics.	K3
CO-4	analyze the modular programming and differentiate mutability of various datatypes.	K4
CO-5	discover the business applications to solve the real time problems.	K4

Unit-I:Preliminaries

(12 Hours)

Python for Data Analysis - Essential Python Libraries – Installation and setup python. Python language basics: The python Interpreter- IPython Basics- Data Structure and Sequences: Tuple – list – Built-in Sequence Functions - Dict - Set Numpy basics: The Numpy ndarray – Universal Functions -Linear Algebra.

Unit-II: Pandas

(12 Hours)

Getting Started With Pandas: Introduction to Panda's data structure – Essential Functionality - Summarizing and Computing Descriptive Statistics Data Loading: Reading and Writing data in text format -Binary Data Format – Interacting with web APIs – Interaction with databases -Data Cleaning and preparation: Handling Missing data – Removing duplicates – Replacing values - String manipulation.

Unit-III: Operators

(12 Hours)

Operators in Python: Arithmetic, Assignment, Unary Relational and Bitwise Operator – Membership Operators – Identity Operators – Mathematical Functions Input and Output: Output statement – input statement – command line arguments – Control Statements Array in Python: Array – Types of Array – Attributes of an Array – Multi dimensional Array

Unit-IV: Functions

(12 Hours)

Functions: Defining a function – Formal and actual arguments – Positional Arguments – Keyword Arguments – Default Arguments Lists and Tuples : List – creating lists using range() function – Nested Lists – Tuples – Creating Tuples- Basic Operations on Tuples – Nested Tuples -Insert, Modify and Deleting Elements from tuples.

Unit-V: Plotting and Visualization

(12 Hours)

A Brief Matplotlib API Primer - Plotting with Pandas and Seaborn Time Series: Date and Time data types – Time series Basics – Time Zone Handling Dictionaries: Operations on Dictionaries – Dictionary methods Files in Python: Files – Types of files in python – Opening a file -Closing a file – The seek() and tell() method – Random Accessing of Binary Files.

Books for Study

1. Wes McKinney, *Python for Data Analysis*, Published by O'Reilly Media, USA, 2018.
Unit-I Chapter 1 (Sec: 1.2, 1.3, 1.4), Chapter 2 (Sec 2.1, 2.2), Chapter 3 (Sec 3.1)
Chapter 4 (Sec 4.1, 4.2, 4.5)
Unit-II Chapter 5 (Sec: 5.1, 5.2, 5.3), Chapter 6 (Sec 6.1, 6.2) Chapter 7 (Sec: 7.1, 7.2)
Unit-V Chapter 9 (Sec: 9.1, 9.2), Chapter 11 (Sec: 11.1, 11.2, 11.4)
2. Dr.R.Nageswara Rao, *Core Python Programming*, Dreamtech Press, New Delhi, 2017.
Unit-III Chapter 4 (Pages 71-88), Chapter 5 (Pages 96-118), Chapter 7 (Pages 151, 159, 186, 189)
Unit-IV Chapter 9 (Pages 237, 253-256), Chapter 10 (Pages 283 -285, 301 -317)
Unit-V Chapter 11 (Pages 321-324), Chapter 17 (Pages 441-444)

Books for Reference

1. Allen B. Downey, *Think Python: How to Think Like a Computer Scientist*, 2nd Edition, Updated for Python 3, Shroff/O'Reilly Publishers, USA, 2016
2. Guido van Rossum and Fred L. Drake Jr, *An Introduction to Python - Revised and Updated for Python 3.2*, Network Theory Ltd., 2018
3. Jake VanderPlas, *Python Data Science Handbook: Essential Tools for Working with Data*, 1st Edition, O'Reilly Media, USA, 2016.

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

Semester	Course Code	Title of the Course									Hours	Credits
VI	21UBC63CC11	CORE – 11: PYTHON PROGRAMMING									4	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	2	3	2	2	3	3	2	2	2.4	
CO-2	3	2	3	2	2	3	2	2	3	3	2.5	
CO-3	2	2	2	2	3	2	3	3	2	2	2.3	
CO-4	3	2	2	3	2	3	2	3	2	3	2.5	
CO-5	2	3	3	2	3	2	3	2	2	3	2.5	
Mean Overall Score											2.44	(High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63CC12	CORE – 12: MOBILE APPLICATION DEVELOPMENT USING ANDROID	4	3

CO No.	CO- Statements	Cognitive Levels (K- level)
	On successful completion of this course, students will be able to	
CO-1	understand the various dimensions of mobile computing and N- Tier Client Server Framework in the domain of mobile application	K1
CO-2	demonstrate the android development environment and understand the user interface to be user-friendly	K2
CO-3	apply the Java programming languages and to build android mobile apps for users.	K3
CO-4	design and develop the Android applications using layouts, buttons and widgets to solve the user requirements.	K4
CO-5	compare the android 2D and 3D digital graphics and animation to enrich themselves to be skillful for the society.	K4

Unit-I: Introduction to Mobile Computing

(12 Hours)

Introduction - Added Dimensions of Mobile Computing - Condition of the Mobile User – Architecture of Mobile Software Applications. Introduction to Mobile Development Frameworks and Tools: Fully Centralized Frameworks and Tools - N-Tier Client–Server Frameworks and Tools – Java.

Unit-II: Android

(12 Hours)

Getting To Know Android: Android - The Open Handset Alliance -The Android Execution Environment- Components of an Android Application - Android Activity Lifecycle -Android Service Lifecycle. Setting Android Development Environment: Creating an Android Development Environment. Android Development Environment For Real Application: Android and Social Networking - The Project Root Folder - The Source Folder - The Resource Folder - Building and Running the micro jobs Application.

Unit-III: Layouts

(12 Hours)

Layouts: Frame Layout – Linear Layout – Table Layout –Absolute Layout –Relative Layout. Building A View: Android GUI Architecture. Widget Bestiary: Android Views -Text view and Edit text -Button and Image button Adapters and Adapter views - Checkboxes, Radio buttons, and Spinners - View groups - Gallery And Grid view-List view And List activity–Scroll view.

Unit-IV Graphics

(12 Hours)

Drawing 2D and 3D Graphics: Rolling Your Own Widgets -Layout - Canvas Drawing - Drawables - Bitmaps Bling - Shadows, Gradients, and Filters- Animation -OpenGL Graphics. Inter Process Communication: Inter-Process Communication: Intents: Simple, Low Overhead IPC - Getting A Result via Inter-Process Communication

Unit-V: Location and Mapping**(12 Hours)**

Location-Based Services - Mapping - The Google Maps Activity -The Map view and Map activity.

Books for Study

1. Reza B'far , *Mobile Computing Principles Designing And Developing Mobile Applications With UML and XML*, United States of America by Cambridge University Press, New York, 2005

Unit-I Chapter 1 (Sec: 1.1, 1.2, 1.3, 1.4), Chapter 2 (Sec 2.1, 2.2, 2.3)

2. Rick Rogers, John Lombardo, ZigurdMednieks, and Blake Meike, *Android Application Development* O'Reilly, Shroft Publishers & Distributors Pvt Ltd, New Delhi, 2010.

Unit-II (Chapter 1, Chapter 2, Chapter 3)

Unit-III (Chapter 10, Chapter 11)

Unit – IV (Chapter 12, Chapter 13)

Unit – V (Chapter 9)

Books for Reference

1. Michael Burton, *Android App Development for Dummies*, 3ed, Wiley Publication, New Jersey, 2015.
2. Rick Boyer, *Android 9 Development Cookbook*, 3rd Edition, Packt Publishing, India, 2018.
3. Sujit Kumar Mishra, *Fundamentals of Android App Development*, English Edition, BPB Publication, New Delhi, 2020.

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

Semester	Course Code		Title of the Course								Hours	Credits
VI	21UBC63CC12		CORE – 12: MOBILE APPLICATION DEVELOPMENT USING ANDROID								4	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	1	3	3	3	2	1	2	3	2	2.2	
CO-2	1	2	3	3	3	2	2	3	2	2	2.3	
CO-3	2	3	2	2	1	1	2	2	3	2	2.0	
CO-4	1	2	3	2	2	3	1	3	3	2	2.2	
CO-5	2	3	1	3	3	2	3	3	2	2	2.4	
Mean Overall Score											2.22	(High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63CP07	SOFTWARE LAB-7 : PYTHON PROGRAMMING	3	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	match the programming skills to write a wide variety of problems in mathematics, science, and games.	K1
CO-2	illustrate the rich controls and conditional statement in Python	K2
CO-3	construct the applications using the Python Programming Language.	K3
CO-4	test for read and write data from & to files in Python and develop application using Pygame	K4
CO-5	analysis coding tasks related to the fundamental notions and techniques used in object-oriented programming	K4

List of Exercises:

1. Variables and data types
2. Strings and Functions
3. Loops, Arrays and sorting
4. Dictionaries, Lists and Tuples
5. Write Python applications using matrices
6. Create Calculator Program
7. Array Function using Numpy
8. Aggregation function using Numpy
9. Pandas Basics
10. Twitter API Integration for tweet Analysis

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

Semester	Course Code	Title of the Course									Hours	Credits
VI	21UBC63CP07	SOFTWARE LAB-7 : PYTHON PROGRAMMING									3	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	3	2	3	3	2	2	3	2	2	2.5	
CO-2	2	2	3	3	2	3	2	3	3	3	2.6	
CO-3	3	2	3	3	3	3	3	3	2	3	2.8	
CO-4	2	3	3	2	2	2	2	3	2	2	2.3	
CO-5	3	3	2	3	2	2	3	2	2	3	2.5	
Mean Overall Score											2.54	(High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63CP08	SOFTWARE LAB-8: ANDROID	3	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
CO-1	understand and select correct layouts to useful for different mobile applications in the real life situations.	K1
CO-2	classify the various user interface controls to be useful for mobile application development to solve many problems.	K2
CO-3	install and configure Android application development tools and develop mobile apps for industry.	K3
CO-4	design and develop user Interfaces with colours and styles for the Android users and its user friendly.	K4
CO-5	apply the various image manipulations and Analyse Java programming concepts to build various mobile app development solution to the society.	K4

List of Exercises:

1. Layout and its types
2. Simple programs using Button Controls
3. Check box
4. Radio Button
5. Student Mark sheet using controls
6. Working with Colors
7. Working With Text Using Styles
8. Image Manipulation
9. Implicit Intents
10. Explicit Intents

Semester	Course Code	Title of the Course									Hours	Credits
VI	21UBC63CP08	SOFTWARE LAB-8:ANDROID									3	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	2	3	3	3	2	1	3	3	2	2.4	
CO-2	2	1	3	3	3	2	3	3	2	2	2.4	
CO-3	2	3	2	2	1	1	2	2	3	2	2.0	
CO-4	3	1	3	2	3	3	1	3	3	3	2.5	
CO-5	3	3	2	3	3	2	3	3	2	2	2.6	
Mean Overall Score											2.38	(High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63ES03A	DSE-3: INFORMATION SECURITY	5	3

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	relate the need for security in different aspects	K1
CO-2	explain legal, ethical and professional aspects of Information Security	K2
CO-3	identify a network security threat and familiarize in intrusion detection and Prevention	K3
CO-4	apply security policy in system design and analyze network security protocols	K3
CO-5	distinguish the concept of Cryptography and recognize its Tools	K4

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

Security – Components of Information System – The System Development Life Cycle – Security Development life cycle- Security Professionals and the Organizations – Communities of Interest – Information Security.

Unit-II: Security (15 Hours)

The Need for Security: Business needs first – Threats – Attacks – Secure Software Development.

Unit-III: Law and Ethics in Information Security (15 Hours)

Legal, Ethical, and Professional Issues In Information Security: Law and Ethics in Information Security - Relevant U.S. Laws -Ethics and Information Security - Codes of Ethics and Professional Organizations. Planning for Security: Information Security Planning and Governance - Information Security Policy, Standards, and Practices - Security Education, Training, and Awareness Program.

Unit-IV: Security Technology (15 Hours)

Security Technology: Intrusion Detection and Prevention Systems, and Other Security Tools: Intrusion Detection and Prevention Systems - Scanning and Analysis Tools.

Unit-V : Cryptography (15 Hours)

Foundations of Cryptology - Cipher Methods - Cryptographic Algorithms - Cryptographic Tools - Attacks on Cryptosystems.

Books for Study

1. Michael E. Whitman, Herbert J. Mattord, *Principles of Information Security*, 4th Edition, Course Technology, Cengage Learning, USA, 2012.

Unit-I Chapter 1

Unit-II Chapter2

Unit-III Chapter 3, 5

Unit – IV Chapter7

Unit – V Chapter 8

Books for Reference

1. William Stallings, *Cryptography and Network Security Principles and Practice*, 7th Edition, Pearson Education Inc., First Impression, USA, 2017.
2. Behrouz A. Ferouzan, *Cryptography and Network Security*, 3rd Edition Tata McGraw Hill, New Delhi, 2015.
3. Mark Stamp, *Information Security: Principles and Practice*, Wiley–Blackwell Publications, Canada, 2022.

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

Semester	Course Code	Title of the Course									Hours	Credits
VI	21UBC63ES03A	DSE- 3: INFORMATION SECURITY									5	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	3	3	2	3	2	3	2	2	2.5	
CO-2	2	3	1	3	2	3	2	1	2	3	2.2	
CO-3	3	3	2	2	2	2	2	2	2	3	2.3	
CO-4	2	3	2	2	2	3	2	2	3	2	2.3	
CO-5	3	3	2	3	2	3	3	3	2	3	2.7	
Mean Overall Score											2.4 (High)	

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63ES03B	DSE- 3: BUSINESS INTELLIGENCE	5	3

CO.No	CO- Statements	Cognitive Levels (K- level)
	On successful completion of this course, students will be able to	
CO-1	recall the fundamental concepts of Business Intelligence	K1
CO-2	demonstrate various data warehouse schema	K2
CO-3	make use of association rule mining in data mining	K3
CO-4	examine decision tree classifier	K4
CO-5	function of NoSQL in big data	K4

Unit –I: Introduction to Business Intelligence (15 Hours)

Business Intelligence - Mobile Business Intelligence - Real-time Business Intelligence. DATA WAREHOUSE: The Need for an Operational Data Store (ODS) – Operational Data Store - Data Warehousing - Data Marts - Comparative Study of Data Warehouse with OLTP and ODS.

Unit –II: Data Warehouse Schema (15 Hours)

Introduction to Data Warehouse Schema - Star Schema - Snowflake Schema - Fact Constellation Schema - Comparison among Star, Snowflake and Fact Constellation Schema. Online Analytical Processing: Introduction to Online Analytical Processing– Representation of Multi-dimensional Data– Improving efficiency of OLAP by pre-computing the queries - Types of OLAP Servers - OLAP Operations.

Unit –III: Introduction to Data Mining (15 Hours)

Need of Data Mining - Data Mining Applications - Data Mining Process - Data Mining Techniques - Difference between Data Mining and Machine Learning. Data Preprocessing: Need for Data Preprocessing - Data Preprocessing Methods. Association Mining: Introduction to Association Rule Mining - Defining Association Rule Mining - Representations of Items for Association Mining - The Metrics to Evaluate the Strength of Association Rules - The Apriori Algorithm.

Unit –IV: Classification (15 Hours)

Types of Classification - Input and Output Attributes - Working of Classification - Guidelines for Size and Quality of the Training Dataset - Introduction to the Decision Tree Classifier - Naïve Bayes Method - Understanding Metrics to Assess the Quality of Classifiers.

Unit – V: Cluster Analysis (15 Hours)

Introduction to Cluster Analysis - Applications of Cluster Analysis - Desired Features of Clustering - Distance Metrics - Major Clustering Methods/Algorithms - Partitioning Clustering - Hierarchical Clustering Algorithms. BIG DATA AND NOSQL: The Rise of Relational Databases - Major Issues with Relational Databases - Challenges from the Internet Boom - Emergence of Big Data due to the Internet Boom - Possible Solutions to Handle Huge Amount of Data - The

Emergence of Technologies for Cluster Environment - Birth of NoSQL - Defining NoSQL from the Characteristics it Shares - Some Misconceptions about NoSQL - Data Models of NoSQL.

Books for Study

1. Drew Bentley, *Business Intelligence and Analytics*, Library Press, USA, 2017.

Unit-I Chapter 1

2. Parteek Bhatia, *Data Mining and Data Warehousing Principles and Practical Techniques*, Cambridge University Press, USA, 2019.

Unit-I Chapter 12

Unit-II Chapter 13, Chapter 14

Unit-III Chapter 2, Chapter 9

Unit-IV Chapter 5

Unit-V Chapter 7, Chapter 15

Books for References

1. Pedro Novo Melo, Carolina Machado, *Business Intelligence and Analytics in Small and Medium Enterprises*, CRC Press, USA, 2020.
2. Steve Williams, *Business Intelligence Strategy and Big Data Analytics*, Morgan Kaufmann, USA, 2016.
3. G Sreedhar, *Web Data Mining and the Development of Knowledge-Based Decision Support Systems*, IGI Global, USA, 2017.

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

Semester	Course Code	Title of the Course									Hours	Credit
VI	21UBC63ES00	DSE- 3: BUSINESS INTELLIGENCE									5	3
Course Outcomes(COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	2	2	3	2	2	3	2	3	2.4	
CO-2	2	2	2	3	3	2	2	2	3	3	2.4	
CO-3	2	2	3	3	3	3	2	3	2	3	2.6	
CO-4	2	3	2	3	3	2	2	3	3	2	2.5	
CO-5	2	2	3	3	2	2	3	2	3	3	2.5	
Mean Overall Score											2.48	
Result											High	

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63ES04A	DSE 4 – FUNDAMENTALS OF IoT	5	3

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	find the rudiments of the Internet and its applications.	K1
CO-2	classify the different applications of the Internet of Things.	K2
CO-3	build IoT prototype solutions for prospective commercial and social requirements.	K3
CO-4	distinguish various embedded devices and peripherals.	K4
CO-5	compare various scenarios where IoT can be applied by reviewing various Use Cases.	K4

Unit-I: Overview of IoT

(15 Hours)

The Flavour of the Internet of Things – The “Internet” of “Things” – The Technology of the Internet of Things – Enchanted Objects – Making the Internet of Things. Internet Principles – Internet Communication – IP Addresses – MAC Address – TCP and UDP Ports – Application Layer Protocols.

Unit-II: Prototyping

(15 Hours)

Thinking About Prototyping: Sketching – Familiarity – Costs vs Ease of Prototyping – Open Source vs Closed Source – Tapping into the Community. Prototyping Embedded Devices: Electronics – Embedded Computing Basics.

Unit-III: Embedded Devices

(15 Hours)

Prototyping Embedded Devices: Arduino – Raspberry PI – Beagle bone Black – Other Notable Platforms

Unit-IV: IoT Platforms

(15 Hours)

IoT Enablement Platforms: IoT Building Blocks – IoT Enablement Platforms – IoT Architectural Building Blocks – Azure IoT HUB – Amazon Web Service IoT Platform – IoT Data Virtualization Platforms – IoT Data Visualization Platforms – IoT Edge Data Analytics

Unit-V: IoT Smart Use Cases

(15 Hours)

Introduction - Governance Use Cases – Ubiquitous Connectivity – Omnipresent Devices – Collaboration Platforms – Cloud Computing - Open Standards and Service Oriented Architecture – Smart Cities – Smart Industrial Use Cases of IoT – Smart Transport Systems – Connected Cars – Consumer Use Cases of IoT – Smart Homes/Buildings – Smart Education Systems using Wearable Devices.

Books for Study

1. Adrian McEwen and Hakim Cassimally, *Designing the Internet of Things*, John Wiley and Sons, United Kingdom, 2014.
Unit-I Chapter 1, Chapter 3
Unit-II Chapter 4, Chapter 5(Pages: 87-96)
Unit-III Chapter 5(96-144)
2. Pethuru Raj and Anupama C. Raman, *The Internet of Things Enabling Technologies, Platforms, and Use Cases*, CRC Press, USA, 2017
Unit – IV Chapter 5
Unit – V Chapter 11

Books for Reference

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton and Jerome Henry, *IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things*, Cisco Press, USA, 2017.
2. MaciejKranz,, *Building the Internet of Things: Implement New Business Models, Disrupt Competitors, Transform Your Industry*, Wiley, United Kingdom, 2016.
3. CunoPfister, *Getting Started with the Internet of Things: Connecting Sensors and Microcontrollers to the Cloud*, Maker Media, USA, 2011.

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

Semester	Course Code	Title of the Course									Hours	Credits
VI	21UBC63ES04A	DSE-4 : FUNDAMENTALS OF IoT									5	3
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	3	3	2	2	2	3	2	2	2.4	
CO-2	2	3	3	2	2	3	2	1	2	2	2.2	
CO-3	2	3	3	2	2	2	2	3	3	2	2.4	
CO-4	3	2	3	2	2	2	3	2	2	1	2.2	
CO-5	3	2	2	2	3	3	2	2	2	3	2.4	
Mean Overall Score											2.32	(High)

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC63ES04B	DSE- 4: CROSS-PLATFORM APP DEVELOPMENT	5	3

CO.No.	CO- Statements	Cognitive Levels (K- level)
	On successful completion of this course, students will be able to	
CO-1	understand basic concepts of Virtual Machines	K1, K2
CO-2	understand the fundamentals of the Flutter framework	K2, K3
CO-3	design apps with Material Design, themes and assets	K1, K2, K4
CO-4	implement interactivity in the app with text input and gestures	K3, K4
CO-5	learn to retrieve local and real-time data from the web to create various apps	K1, K2, K3, K4

Unit-I: Virtual Machines

(15 Hours)

Host Requirements – Virtual Machine Features and Specifications. Installation: Installing on a Windows Host – Using the Workstation Player Window – Transferring Files and Text – Removing a Virtual Machine. Creating Virtual Machines – Understanding Virtual Machines – Guest Operating System – Importing Virtual Machines

Unit-II: Flutter

(15 Hours)

Introduction to Flutter – Other options – Native Solutions. Developing In Flutter: The Flutter Tool Chain – SDK – IDE – Dev Tools – Development Process. Foundational Flutter: Widgets – UI as Code – Value Widgets – Layout Widgets – Navigation Widgets – Other Widgets – Create custom stateless widgets – Stateless and Stateful Widgets.

Unit-III: Dart Language Basics

(15 Hours)

Variables Store References – Built-in Types – Strings – Introduction to Collections – Operators – Equality and Relational – Type Test – Assignment – Implementing Dart concepts to Flutter. Dart For Flutter Logic: Control Flow – If and Else – Conditional Expression – Looping – While and Do While – Loop Labels – Switch and Case – Constructors – Classes – Functions or Methods – Lexical Scope – Getter and Setter – Changing the UI.

Unit-IV: Widgets

(15 Hours)

Text Widget – Icon Widget – Image Widget – Input Widgets. Responding To Gestures: Button Family – Custom Gestures – Long Press – Gesture Detector – Swiping. Navigation and Routing: Stack Navigation – Drawer Navigation – Tab Navigation – Dialog Widget.

Unit-V: Firebase with Flutter

(15 Hours)

Introducing Firebase – Cloud Fire Store – Cloud Functions – Authentication – Setting up Firebase – Creating a Firebase project – Creating the Database – Creating an IOS app – Creating an Android App – Using Fire Store – Get a Collection – Query – UPSERT – DELETE.

Books for study

1. VMware, *Using VMware Workstation Player for Windows*, VMware, Inc. California, USA, 2020.

Unit-I Chapter 1, Chapter 2, Chapter 4

2. Rap Payne, *Beginning App Development with Flutter Create Cross-Platform Mobile Apps*, Apress Media, Texas, USA, 2019.

Unit-II Chapter 1, Chapter 2 and Chapter 3

Unit-IV Chapter 4, Chapter 5 and Chapter 7

Unit-V Chapter 12

3. Sanjib Sinha, *Beginning Flutter with Dart*, LeanPub, British Columbia, Canada, 2021.

Unit-III Chapter 3 and Chapter 4

Books for References

1. Alessandro Biessek, *Flutter for Beginners*, Packt, USA, 2019.
2. Alberto Miola, *Flutter Complete Reference: Create beautiful, fast and native apps for any Device*, Pub.Dev, USA, 2020.
3. Ed Freitas, *Flutter Succinctly*, Syncfusion, USA, 2019.

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

Semester	Course Code	Title of the Course									Hours	Credits
VI	21UBC63ES04B	DSE-4: CROSS-PLATFORM APP DEVELOPMENT									5	3
Course Outcomes (COs) ↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	3	3	3	2	3	1	3	3	2	2.5	
CO-2	3	2	2	2	2	2	2	2	3	2	2.2	
CO-3	3	2	2	2	2	3	2	2	3	3	2.4	
CO-4	2	2	3	3	2	2	3	1	2	2	2.2	
CO-5	3	2	2	3	3	3	2	2	2	2	2.4	
Mean Overall Score											2.34	
Result											# High	

Semester	Course Code	Title of the Course	Hours	Credit
VI	21UBC63PW01	PROJECT WORK	-	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	tell various components of a software project.	K1
CO-2	explain the Feasibility Criteria for a software project.	K2
CO-3	knowing how and when to Use Technology and Choosing the Most Appropriate Tool for the Task.	K3
CO-3	develop Communication Skills, Both for Interpersonal And Presentation Need.	K4
CO-5	visualize the problems and provide solution by Decision Making.	K4

Semester	Course Code	Title of the Course									Hours	Credit
VI	21UBC63PW01	PROJECT WORK									-	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	1	2	2	3	3	2	2	3	3	2	2.3	
CO-2	3	1	3	2	2	3	2	2	3	3	2.4	
CO-3	2	2	2	1	2	2	3	2	3	2	2.1	
CO-4	3	2	2	3	2	3	2	3	2	3	2.5	
CO-5	3	2	3	2	3	2	2	3	2	2	2.4	
Mean Overall Score											2.4	(high)

Semester	Course Code	Title of the Course	Hours	Credit
VI	21UBC63CE01	COMPREHENSIVE EXAMINATION	-	2

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	recall the basic concept of Computer System and Operating System Structure with simple examples.	K1
CO-2	summarize Java and its advance concepts in application programs.	K2
CO-3	apply the fundamental principles of digital electronics and memories to problems.	K3
CO-4	analyze the concepts of PHP with MySQL in simple problems	K4
CO-5	examine the basic concepts of OOP and Apply it in problem solving	K4

Unit – I

C Programming, Relational Database Management Systems

Unit –II

C#. Net, Digital Computer Fundamentals

Unit – III

Java, Networks

Unit – IV

ASP.Net, Web Technologies

Unit – V

Python, Android

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

Semester	Course Code	Title of the Course									Hours	Credit
VI	21UBC63CE01	COMPREHENSIVE EXAMINATION									-	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	1	2	2	3	3	2	2	3	3	2	2.3	
CO-2	3	1	3	2	2	3	2	2	3	3	2.4	
CO-3	2	2	2	1	2	2	3	2	3	2	2.1	
CO-4	3	2	2	3	2	3	2	3	2	3	2.5	
CO-5	3	2	3	2	3	2	2	3	2	2	2.4	
Mean Overall Score											2.4 (High)	

Semester	Course Code	Title of the Course	Hours	Credit
VI	21UBC64SE04A	SEC- 4 (WS): WEB DESIGN	2	1

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	find the basic elements for building Web Pages to provide practical solutions.	K1
CO-2	understand the basic methods of HTML to enhance the web pages.	K2
CO-3	apply HTML and CSS techniques to design real time application.	K3
CO-4	design Web Pages Using API's for effective outlook.	K4
CO-5	apply the various techniques of CSS to make attractive Web pages.	K4

Unit-I: Web Page Building Blocks (06 Hours)

Basic HTML Pages – Semantic HTML – Markup – Elements – Attributes – Values.

Unit-II: Text Content (06 Hours)

Links – Images – URLs. BASIC HTML STRUCTURE: Creating Header- Marking Navigation- Creating an Article- Defining a section-Specifying an aside- Creating Footer.

Unit-III: Forms (06 Hours)

Input Type – Value – Attribute – Post – Get – Buttons. TABLES: Rows – Columns – Row span – Colspan – Spacing – Editing Tables.

Unit-IV: CSS (06 Hours)

Introduction TO CSS: Cascade Rule - Style Sheets – Integration – Applying Various Styles – Importance of Location.

Unit-V: Advanced CSS (06 Hours)

Advanced CSS: Selectors – Name – Class – ID – Group – Pseudo Selectors – Formatting Fonts – Setting Color – Background – Shadow – Basic Transition.

Book for Study

1. Elizabeth Castro and Bruce Hyslop, *HTML5 and CSS3, Visual Quick Start Guide*, Peach pit Press, 7th Edition, Berkeley, 2012.

Unit-I Chapter1 (pages: 1-15)

Unit-II Chapter1 (pages: 17-23) Chapter3 (61-83)

Unit-III Chapter16, Chapter 18.

Unit -IV Chapter 7, Chapter 8.

Unit -V Chapter 9.

Books for Reference

1. Brian P. Hogan, *HTML5 & CSS3 Develop with Tomorrow's Standards Today*, Pragmatic Programmers, LLC, USA, 2010.
2. Anne Boehm, Zak Ruvalcaba, *Murach's HTML5 and CSS3*, 4th Edition, Mike Murach & Associates Inc, UK, 2018.

3. David Sawyer Mcfarland, *CSS: The Missing Manual*, O'Reilly, USA, 2015.

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

Semester	Course Code	Title of the Course									Hours	Credit
VI	21UBC64SE04A	SEC- 4 - (WS): WEB DESIGN									2	1
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	1	2	2	3	3	2	2	3	3	2	2.3	
CO-2	3	1	3	2	2	3	2	2	3	3	2.4	
CO-3	1	2	2	1	2	2	3	2	3	2	2	
CO-4	3	2	2	3	2	3	2	3	2	3	2.5	
CO-5	2	2	3	2	3	2	2	3	2	2	2.3	
Mean Overall Score											2.3 (High)	

Semester	Course Code	Title of the Course	Hours	Credit
VI	21UBC64SE04B	SEC- 4 (WS): 3D ANIMATION	2	1

CO No.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	find the various 3D environment features to design animated objects.	K1
CO-2	understand the characteristics of lighting for rendering 3D objects.	K2
CO-3	apply the fundamentals of 3D design for real time application.	K3
CO-4	experiment with multiple designs using several tools and techniques.	K3
CO-5	develop the advanced 3D models for real time modelling.	K4

Unit-I: Blender Interface

(06 Hours)

Blender Screen – User PBOOKS FOR REFERENCE– 3D Window – Window Modes – Moving in 3D Space – Blender Controls.

Unit-II: Creating Objects

(06 Hours)

Meshes – Placing objects – Moving objects – Creating Vertices – Extruding Shapes – Modifiers – Knife Tool – Sculpt Mode. LIGHTING: Lighting – Cameras.

Unit-III: Materials

(06 Hours)

MATERIALS: Settings – Buttons – New Materials – Preview – Diffuse. Texture: Mapping – Displacement – Texture painting.

Unit-IV: Animation`

(06 Hours)

Animation: Introduction - Moving – Rotating - Scaling – Keying – Editing Curves.

Unit-V: 3D TEXT

(06 Hours)

Creating 3D Text in Blender- the Object data Button “F”- Fonts – Creating text on a Curve – Converting Text to a Mesh Object – Converting Text to a Curve – Entering External Font.

Book for Study

1. John M. Blain, *The Complete Guide to Blender Graphics: Computer Modeling And Animation*, CRC Press, Florida, 2012.

Unit-I Chapter 1

Unit-II Chapter 3

Unit-III Chapter 6

Unit-IV Chapter 11

Unit – V Chapter 12

Books for Reference

1. Peter Lord, Nick Park Brian Sibley, *Cracking Animation: The Aardman Book of 3-D Animation*, Thames and Hudson; Revised and expanded edition, 2015.
2. Andy Beane, *3D Animation Essentials*, John Wiley & Sons, Inc., New Jersey, 2015.
3. Isaac V. Kerlow, *The Art of 3D Computer Animation and Effects*, Wiley, New Jersey, 2009.

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

Semester	Course Code		Title of the Course								Hours	Credit
VI	21UBC64SE04B		SEC - 4 (WS): 3D ANIMATION								2	1
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	2	2	2	3	3	2	2	3	3	2	2.4	
CO-2	3	3	3	2	2	3	2	2	3	3	2.6	
CO-3	3	2	2	2	2	2	3	2	3	2	2.3	
CO-4	3	2	2	3	2	3	2	2	2	3	2.4	
CO-5	2	2	3	2	3	2	2	3	3	2	2.4	
Mean Overall Score											2.42	
											(High)	

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UBC64EG02	GENERIC ELECTIVE-2: INDUSTRY 4.0	4	2

CONo.	CO- Statements	Cognitive Levels (K- Levels)
	On successful completion of this course, students will be able to	
CO-1	select the drivers and enablers of IoT.	K1
CO-2	outline the various systems used in a manufacturing plant and their role in an Industry 4.0 world.	K2
CO-3	identify the smartness in Smart Factories, Smart cities, Smart products and Smart services.	K3
CO-4	choose opportunities, challenges brought about by Artificial Intelligence.	K3
CO-5	analyze the power of Block chain in a networked economy.	K4

Unit-I: Introduction to Internet of Things (12 Hours)

Physical design of IoT – Logical design of IoT – IoT Enabling Technologies – IoT levels & Deployment technologies. DEMYSTIFYING THE IoT PARADIGM: The Emerging IoT flavors - The Industrial Internet of Things – Consumer Internet of Things - Social Internet of things - Semantics for The Interoperable IoT- Cognitive IoT.

Unit-II: Introducing Industry 4.0 (12 Hours)

Defining Industry 4.0 - Four Main Characteristics of Industry 4.0 - The Value Chain - Industry 4.0 Design Principles - Building Blocks of Industry 4.0 - Smart Manufacturing.

Unit-III: Smart Factories (12 Hours)

Introducing the Smart Factory - Smart Factories in Action - Smart Manufacturing is Important - Real-World Smart Factories - INDUSTRY 4.0: The Way Forward.

Unit-IV: Artificial Intelligence (12 Hours)

The History of AI - AI and Society - Agents - Knowledge-Based Systems. MACHINE LEARNING AND DATA MINING: Introduction - Data Analysis - Clustering.

Unit-V: Block chain (12 Hours)

Money - Digital Money - Cryptography - Crypto currencies - Block chain Technology.

Books for Study

1. Pethuru Raj and Anupama C. Raman, *The Internet of Things Enabling Technologies, Platforms, and Use Cases*, Taylor & Francis, CRC Press, 1st Edition, United Kingdom, 2017.
Unit-I Chapter 1(Pages 1-38)
2. Alasdair Gilchrist, *Industry 4.0- The Industrial Internet of Things*, Apress, New York, 2016.
Unit-II Chapter 13(Pages 195-216)
Unit-III Chapter 14(Pages 217-230)
3. Wolfgang Ertel, *Introduction to Artificial Intelligence*, Undergraduate Topics in Computer Science, Springer, 2017.
Unit-IV Chapter 1(Sec: 1.1-1.5), Chapter 8(Sec: 8.1, 8.9)
4. Antony Lews, *The Basics of Bit coins and Block chains*, Mango Publishing Group, USA, 2018.

Unit-V Chapters 1-4, 6

Books for Reference

1. B.K.Tripathy and J.Anuradha, *Internet of Things (IoT): Technologies, Applications, Challenges and Solutions*, CRC Press, Florida, 2018.
2. Alp Ustundag and EmreCevikcan *Industry 4.0: Managing the digital transformation*, Springer, 2018.
3. Max Tegmark, Alfred A. Knopf, *Life 3.0 - Being Human in the Age of Artificial Intelligence*, Penguin Random House LLC, New York, 2017.

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

Semester	Course Code	Title of the Course									Hours	Credits
VI	21UBC64EG02	GENERIC ELECTIVE-2: INDUSTRY 4.0									4	2
Course Outcomes (COs)↓	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO-1	3	2	3	2	3	3	3	2	2	2	2.5	
CO-2	2	3	2	2	2	3	2	3	2	3	2.4	
CO-3	2	2	3	2	3	2	2	2	3	2	2.3	
CO-4	3	3	2	3	2	2	3	3	2	2	2.5	
CO-5	2	3	2	2	3	3	2	2	2	3	2.4	
Mean Overall Score											2.42	(High)

**BACHELOR OF
COMPUTER APPLICATIONS
(B.C.A.)**

SYLLABUS - 2017

**SCHOOLS OF EXCELLENCE
with
CHOICE BASED CREDIT SYSTEM (CBCS)**



**SCHOOL OF COMPUTING SCIENCES
St. JOSEPH'S COLLEGE (Autonomous)**

Special Heritage Status Awarded by UGC
Accredited at 'A' Grade (3rd cycle) by NAAC
College with Potential for Excellence Conferred by UGC
DBT-STAR & DST-FIST Sponsored College
TIRUCHIRAPPALLI - 620 002, INDIA

**SCHOOLS OF EXCELLENCE
WITH CHOICE BASED CREDIT SYSTEM
(CBCS)**

UNDERGRADUATE COURSES

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

Each School integrates related disciplines under one roof. The school system allows the enhanced academic mobility and enriched employability of the students. At the same time this system preserves the identity, autonomy and uniqueness of every department and reinforces their efforts to be student centric in curriculum designing and skill imparting. These five schools will work concertedly to achieve and accomplish the following objectives:

- Optimal utilization of resources both human and material for the academic flexibility leading to excellence.
- Students experience or enjoy their choice of courses and credits for their horizontal mobility.
- The existing curricular structure as specified by TANSCH and other higher educational institutions facilitate the Credit-Transfer Across the Disciplines (CTAD) - a uniqueness of the choice based credit system.
- Human excellence in specialized areas
- Thrust in internship and / or projects as a lead towards research and
- The multi-discipline nature of the newly evolved structure (School System) caters to the needs of stake-holders, especially the employers.

What is Credit system?

Weightage to a course is given in relation to the hours assigned for the course. Generally one hour per week has one credit. For viability and conformity to the guidelines credits are awarded irrespective of the teaching hours. The following Table shows the correlation between credits and hours. However, there could be some flexibility because of practicals, field visits, tutorials and nature of project work.

For UG courses, a student must earn a minimum of 150 credits as mentioned in the table below. The total number of minimum courses offered by a department are given in the course pattern.

**SUMMARY OF HOURS AND CREDITS
UG COURSES**

Part	Semester	Specification	No. of Courses	Hours	Credits	Total Credits
I	I-IV	Languages (Tamil/Hindi/French/Sanskrit)	4	16	12	12
II	I-IV	General English	4	20	12	12
III	I-VI	Core Theory Practicals Project Work	11-16 3-6 1	90	60	98
	IV-VI	Core Electives	3	12	12	
	V	Self-paced Learning (Partial Online Course)	1	-	2	
	VI	Comprehensive Examination	1	-	2	
	I-VI	Allied	4/6	24	20	
	III & V	Extra Credit Courses	2	-	(4)	
IV	VI	Internship	1	-	2	23
	V	Skilled Based Electives: Between Schools (BS)	1	2	2	
	VI	Within School (WS)	1	2	2	
	V	Inter Departmental Courses (IDC) Soft Skills / NCC	1	2	2	
	I	Non-Major Courses (NMC) Communicative English	1	-	5	
	II	Computer Literacy	1	2	2	
V	III	Environmental Studies (Partial Online Course)	1	2	2	5
	I-IV	Value Education	4	8	8	
	I-V	SHEPHERD & Gender Studies	-	-	-	
	I-V	AICUF, Fine Arts, Nature Club, NCC, NSS	-	-	-	
	V	Career Guidance & Training	-	-	-	
		TOTAL		180	150	150 (+4 extra credits)

Course Pattern

The Undergraduate degree course consists of five vital components. They are as follows:

- Part-I : Languages (Tamil / Hindi / French / Sanskrit)
 Part-II : General English
 Part-III : Core Course (Theory, Practical, Core Electives, Allied, Project, Internship and Comprehensive Examinations)
 Part-IV : SBE, NMC, Value Education, Soft Skills/National Cadet Corps and Environmental Studies (EVS)
 Part-V : Community Service (SHEPHERD) and Gender Studies, AICUF, Fine Arts, Nature Club, NCC, NSS, etc.

Non-Major Courses (NMC)

There are three NMC's – Communicative English, Computer Literacy and Environmental Studies offered in the I, II & III Semesters respectively.

Extra Credit Courses

In order to facilitate the students gaining extra credits, the extra credit courses are given. There are two extra credit courses – Massive Open Online Courses (MOOC) and Skill-based Course – offered in the III and V Semesters respectively.

According to the guidelines of UGC, the students are encouraged to avail this option of enriching by enrolling themselves in the MOOC provided by various portals such as SWAYAM, NPTEL, etc. Skill based course is offered by the department apart from their regular class hours.

Value Education Courses

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

Non-Major Elective / Skill Based Elective

These courses are offered in two perspectives as electives “Within School” (WS) and “Between School” (BS).

Subject Code Fixation

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

Year of Revision	UG Code of the Dept	Semester	Specification of the Part	Subject Category	Running no. in that part
↓	↓	↓	↓	↓	↓
17	U##	x	x	xx	xx
17	UBC	1	3	2	01

For Example :

I BCA, first semester **C Programming**

The code of the paper is 17UBC130201.

Thus, the subject code is fixed for other subjects.

Subject Category

- 00 - Languages (Tamil / Hindi / French / Sanskrit)
 01 - General English
 02 - Core (Theory, Practical, Comprehensive Exams, Internship and Project)
 03 - Core Electives
 04 - Allied
 05 - Extra Credit Courses
 06 - Skill Based Electives (BS) & (WS)
 07 - Soft Skill
 08 - NMC (Communicative English, Computer Literacy/SAP)
 09 - EVS (Environmental Studies)
 10 - Value Education
 11 - Community Service (SHEPHERD) and Gender Studies
 12 - AICUF / Nature Club / Fine Arts / NCC / NSS etc.

EXAMINATION: Continuous Internal Assessment (CIA)

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

MID-SEM & END-SEM TEST

Centralised – Conducted by the office of COE

1. Mid-Sem Test & End-Sem Test: (2 Hours each); will have Objective + Descriptive elements; with the existing question pattern PART-A, PART-B, and PART-C.
2. CIA Component III for UG & PG will be of 15 marks and compulsorily objective multiple choice question type.
3. The CIA Component III must be conducted by the department / faculty concerned at a suitable computer centres.
4. The 10 marks of Part-A of Mid-Sem and End-Sem Tests will comprise only: **Objective Multiple Choice Questions; True / False; and Fill-in the Blanks.**
5. The number of hours for the 5 marks allotted for Library Referencing work would be 30 hours per semester. The marks scored out of 5 will be given to all the courses of the semester.
6. English Composition once a fortnight will form one of the components for UG General English.

SEMESTER EXAMINATION

Testing with Objective and Descriptive questions

Part-A: Objective MCQs only (30 Marks)

Answers are to be marked on OMR score-sheet. The OMR score-sheets will be supplied along with the Main Answer Book. 40 minutes after the start of the examination the OMR score-sheets will be collected

Part-B & C: Descriptive (70 Marks)

Part-B: 5 x 5 = 25 marks (Inbuilt Choice);

Part-C: 3 x 15 = 45 marks; 3 out of 5 questions (Open Choice).

The Accounts Paper of Commerce will have

Part-A: Objective = 25

Part-B: Descriptive 3 x 25 = 75 marks.

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

Grading System

1. Grading

The total marks will be calculated by adding both CIA and the end-semester examinations for each of the courses. The total marks thus obtained will then be graded as per details provided in the following Table-1.

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

$$\text{GPA} = \frac{\sum_{i=1}^n C_i G_i}{\sum_{i=1}^n C_i}, \quad \text{WAM (Weighted Average Marks)} = \frac{\sum_{i=1}^n C_i M_i}{\sum_{i=1}^n C_i}$$

where, 'C_i' is the Credit earned for the Course-i,

'G_i' is the Grade Point obtained by the student for the Course 'i',

'M' is the marks obtained for the course 'i', and

'n' is the number of Courses **Passed** in that semester.

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

2. Classification of Final Results

- i) For each of the three parts, there shall be separate classification on the basis of the CGPA, as indicated in the following Table-2.

- ii) For the purpose of declaring a candidate to have qualified for the Degree of Bachelor of Arts/Science/Commerce/Management/Literature as Outstanding/Excellent/Very Good/Good/Above average/Average, the marks and the corresponding CGPA earned by the candidate in Part-III alone will be the criterion, provided he/she has secured the prescribed passing minimum in the LCs and the ELCs.
- iii) Grade in Part-IV and Part-V shall be shown separately and it shall not be taken into account for classification.
- iv) Absence from an examination shall not be taken as an attempt.

Table-1: Grading of the Courses

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

Table-2: Final Result

CGPA	Classification of Final Results	Corresponding Grade
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-appearance

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

A Pass in SHEPHERD will continue to be mandatory although the marks will not count for the calculation of the CGPA.

Declaration of Result:

Mr./Ms. _____ has successfully completed the Under Graduate in _____ programme. The candidate's Cumulative Grade Point Average (CGPA) in Part-III is _____ and the class secured is _____ by completing the minimum of 150 credits. The candidate has acquired _____ (if any) more credits from SHEPHERD / AICUF/ Fine Arts / Sports & Games / NCC / NSS / Nature Club etc. The candidate has also acquired _____ (if any) extra credits offered by the parent department courses.

**Bachelor of Computer Application
(B. C.A.)
Course Pattern - 2017 Set**

Sem.	Part		Code	Course	Hr	Cr
I	I	Language	17UGT110001	Language – I (Tamil/Hindi/French/Sanskrit)	4	3
	II	English	17UGE120101	General English – I	5	3
	III	Core	17UBC130201	C Programming	5	3
			17UBC130202	System Software	5	3
			17UBC130203	Software Lab – I: C Programming	3	2
			17UBC130401	Allied: Mathematics I	6	5
	IV	NMC	17UCE140801	Communicative English	-	5
		V. Edn	17UFC141001	Essentials of Humanity	2	2
Total for Semester I					30	26
II	I	Language	17UGT210002	Language – II (Tamil/Hindi/French/Sanskrit)	4	3
	II	English	17UGE220102	General English – II	5	3
	III	Core	17UBC230204	Object Oriented Programming with C++	4	3
			17UBC230205	Digital Computer Fundamentals	4	2
			17UBC230206	Software Lab-II: C++ Programming	3	2
			17UBC230402	Allied: Mathematics II	6	5
	IV	NMC	14UCE240802	Computer Literacy	2	2
		V. Edn	17UFC241002	Fundamentals of Human Rights	2	2
Total for Semester II					30	22
III	I	Language	17UGT310003	Language – III (Tamil/Hindi/French/Sanskrit)	4	3
	II	English	17UGE320103	General English – III	5	3
	III	Core	17UBC330207	Relational Database Management System	4	3
			17UBC330208	Data Structures and Algorithms	4	3
			17UBC330209	Software Lab–III: RDBMS	3	2
			Extra Credit Course	17UBC330501	Massive Open Online Course	-
		Allied	17UBC330403	Allied: Accounts I	6	5
	IV	NMC	14UCE340901	Environmental Studies	2	2
		V. Edn	17UFC341003A	Formation of Youth – I: (OR)	2	2
			17UFC341003B	Religious Doctrine – I		
Total for Semester III					30	23+(2)

Sem.	Part		Code	Subject Title	Hr	Cr
IV	I	Language	17UGT410004	Language-IV (Tamil/Hindi/French/Sanskrit)	4	3
	II	English	17UGE420104	General English-IV	5	3
	III	Core	17UBC430210	Java Programming	6	4
			17UBC430211	Software Lab-IV: Java Programming with Data Structures	3	2
	Core Elective-I (WD)	17UBC430301A	Core Elective (WD)-I: Communication Networks	4	4	
		17UBC430301B	Core Elective (WD)-I: Knowledge Management			
	Allied	17UBC430404	Allied: Accounts II	6	5	
		IV	V. Edn	17UFC441004 A	Formation of Youth-II (OR)	2
17UFC441004 B	Religious Doctrine-II					
Total for Semester IV					30	23
V	III	Core	17UBC530212	Software Engineering	4	3
			17UBC530213	Advanced Java Programming	4	3
			17UBC530214	HTML5 and CSS3	4	3
			17UBC530215	Operating System	4	2
			17UBC530216	Software Lab V: Advanced Java Programming	3	2
			17UBC530217	Software Lab-VI: HTML5 and CSS3	3	2
		Core Elective-II (WS)	17UBC530302A	Core Elective (WS)-II: Business Trends in IT (OR)	4	4
			17UBC530302B	Core Elective (WS)-II: Web Technology		
	IV	Extra Credit Course	17UBC530502	Extra Credit Course	-	(2)
		SBE (BS)	17UBC540601A	SBE (BS)-I: Image Editing	2	2
			17UBC540601B	SBE (BS)-I: Fundamentals of 2D Animation		
		IDC	17USS540701A	Soft Skills / NCC	2	2
17USS540701B	National Cadet Corps (NCC)					
Total for Semester V					30	25+(2)
VI	III	Core	17UBC630219	Cryptography and Network Security	5	3
			17UBC630220	PHP with MYSQL	5	3
			17UBC630221	ASP.NET	5	3
			17UBC630222	Software Lab-VII: PHP with MYSQL	3	2
			17UBC630223	Software Lab-VIII: ASP.NET	3	2
			17UBC630224	Comprehensive Examination	-	2
			17UBC630225	Internship	-	2
			17UBC630226	Project	3	3
	Core Elective-III (WS)	17UBC630303A	Core Elective (WS)-III: Mobile operating system and its applications (OR)	4	4	
		17UBC630303B	Core Elective (WS)-III: Next Generation Networks			
	IV	SBE (WS)	17UBC640602 A	SBE (WS)-II: Fundamentals of 3D Design	2	2
			17UBC640602 B	SBE (WS)-II: Web Design		
Total for Semester VI					30	26
I- V		V	17UCW651101	Community service work (SHEPHERD) & Gender Studies Studies		5
Total Credits for All Semesters						150+(4)

Programme Outcomes (POs):

1. Undergraduate students are to be passionately engaged in initial learning with an aim to think differently as agents of new knowledge, understanding and applying new ideas in order to acquire employability/self-employment.
2. Undergraduate students are trained to take up higher learning programmes.
3. Undergraduate students are made to be competent and socially responsible citizen of India.
4. Undergraduate students are to be exposed to technical, analytical and creative skills.
5. Undergraduate students are to be imparted with a broad conceptual background in the Biological sciences / Computing sciences / Languages and culture / Management studies / Physical sciences.

Programme Specific Outcomes (PSOs):

1. Fundamental Computing Knowledge
2. Logical and Analytical Thinking
3. Analyze Problems and provide solutions in IT and IT enabled domain
4. Comprehensive knowledge of System Concepts
5. Adoption of Information Technology Concepts
6. Software Design and Development Techniques
7. Application of Web & Software Techniques

பருவம்: 1
17UGT110001

மணி நேரம்: 4
புள்ளிகள்: 3

பொதுத்தமிழ்-I**பாடத்தின் விளைவு**

- சமூக மாற்றச் சிந்தனைகளை உள்ளடக்கிய தற்கால இலக்கியப்பரப்பை அறிதல்
- புதுக்கவிதை, சிறுகதை, உரைநடை ஆகியவற்றின் இலக்கியத்திறன் கண்டறிதல்.
- சந்திப்பிழையின்றி எழுதும் திறன் பெறுதல்.
- வாழ்க்கை வரலாற்றுக் கட்டுரைகளை வாசிக்கும் திறன் பெறுதல்.
- அன்றாடப் பயன்பாட்டிலுள்ள ஆங்கிலச்சொற்களுக்குப் பொருத்தமான சொற்களை உருவாக்கச்செய்தல்
- அரசுப்போட்டித் தேர்வுகளுக்கேற்ப தமிழ்மொழியில் பயிற்சி அளித்தல்.

அலகு-1 மகாகவி பாரதியார் கவிதைகள்

பாரதிதாசன் கவிதைகள்

நாமக்கல் கவிஞர் கவிதைகள்

உரைநடை - முதல் மூன்று கட்டுரைகள் (12 மணி நேரம்)

அலகு-2 பாவலரேறு பெருஞ்சித்திரனார் பாடல்கள்

கண்ணதாசன் கவிதைகள்

இலக்கிய வரலாறு (பக். 239- 300)

இலக்கணம் -வலிமிகும் இடங்கள் (14 மணி நேரம்)

அலகு-3 சமூகக்கவிதைகள்

இலக்கிய வரலாறு (பக்.300 -362)

சிறுகதை - முதல் ஆறு சிறுகதைகள் (14 மணி நேரம்)

அலகு-4 அரசியல் கவிதைகள்

இலக்கணம் - வலி மிகா இடங்கள்

(10 மணி நேரம்)

அலகு-5 மொழிபெயர்ப்புக்கவிதைகள்

சிறுகதை- 7 முதல் 12 முடிய உள்ள சிறுகதைகள்

உரைநடை- 4முதல் 6 முடிய உள்ள கட்டுரைகள்

(10 மணிநேரம்)

பாடநூல்

1. பொதுத்தமிழ்- செய்யுள் திரட்டு- தமிழாய்வுத்துறை வெளியீடு-2017-2020
2. சமூகவியல் நோக்கில் தமிழ் இலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, தாய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2
3. உரைநடை நூல் - தமிழாய்வுத்துறை வெளியீடு.
4. சிறுகதைத்தொகுப்பு : (நாட்டுடைமையாக்கப்பட்ட படைப்பாளர்களின் சிறுகதைகள்), தமிழாய்வுத்துறை வெளியீடு.

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

Semester I	Course Code 17UGT110001	Title of the Paper கொத்துத்தமிழ்-1										Hours 4	Credits 3	
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		PSO6	PSO7	PSO8
CO1	5	5	4	3	5	5	4	4	4	3	3	4	5	4.2
CO2	5	5	5	3	4	5	4	5	4	3	3	4	5	4.2
CO3	4	4	5	4	3	4	3	5	4	3	3	4	5	3.9
CO4	5	5	4	4	4	5	5	5	4	3	5	5	5	4.5
CO5	5	5	5	4	4	4	4	5	4	3	4	5	5	4.0
CO6	5	5	5	3	4	4	4	4	4	5	4	3	5	3.8
Mean Overall Score														4.1

Result: The Score for this Course is 4.1 (Very High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semestre: I
17UGH110001

Hours/Week: 4
Credits : 3

HINDI

Course Outcomes

At the end of the course, a student should be able to demonstrate...

- * Knowledge and understanding of Hindi Conversations
- * Improvement of the writing skills.
- * Knowledge of Grammar forms
- * Effective communicative skills in Hindi.
- * The introduction of socially relevant subjects in Modern Hindi Literature
- * Appreciation the features of Modern Hindi Prose.

Unit-I 8 hours
Dr Abdul Kalam, Ling Badaliye, Vachan Badaliye, Baathcheeth-Aspathal Mein

Unit-II 12 hours
Hamara Rajchinha, Noun Ling, Kaarak Chinha, Chaar Baayee, Baathcheeth, Dookan Mein

Unit-III 12 hours
Moun hee mantra hai, Vachan, Kaarak, Vishwamitra Ka yagna, Baathcheeth, Hotel mein

Unit-IV 14 hours
Veer Shivaji, Pronoun, Danush Yagna, Baathcheeth-Maidan mein

Unit-V 14 hours
Rajatilak Kee Thaiyaree, Adjectives, Baathcheeth-Pareeksha ke baare mein

Books Recommended

1. Dakshina Bharathi Hindi Prachar Sabha, Thiagaraya Nagar, Chennai – 600 017, Subhodh Hindi Patamala-2, Bharath Milap, Bharath-1, 2016.
2. Ramdev, Vyakaran Pradeep, Hindi Bhavan, 63, Tagore Nagar, Allahabad 2, 2016.

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

Semester I	Course Code 17UGH110001	Title of the Paper Hindi-I										Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	4	4	4	3	4	2	2	2	3	4	4	3.2	
CO2	3	3	2	3	2	4	4	4	3	3	2	3.0	
CO3	3	2	2	3	4	2	2	2	3	4	4	2.8	
CO4	3	2	2	3	2	4	4	4	4	2	2	2.9	
CO5	3	3	3	3	3	3	4	4	3	3	3	3.2	
CO6	4	4	4	4	3	4	3	2	4	3	3	3.4	
Mean Overall Score												3.1	

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semestre: I
17UGF110001

Heures /Semaine: 4
Points : 3

FRANÇAIS-I

Course Outcomes:

- * Introduire la langue et la culture française aux étudiants
- * Comparer la culture de l'Inde et de la France
- * Familiariser l'étudiant avec le vocabulaire
- * la grammaire et les conversations se présenter
- * Donner des informations en Français
- * Conjuguer des verbes, Avoir Etre Aller Faire

Unit-I : A l'aéroport Kamaraj domestic de Chennai (10 heures)

Saluer, demander et dire le nom, présenter quelqu'un, se présenter, souhaiter la bienvenue a quelqu'un, demander et dire l'identité de quelqu'un.

Grammaire : Etre, s'appeler, pronoms sujets, interrogation

Unit-II : A l'Université (10 heures)

Demander comment on se porte, présenter quel qu'un, prendre congé, exprimer, l'appréciation.

Grammaire : Articles définis et indéfinis, genre des noms, adjectifs, présent de l'indicatif : verbes réguliers en er, être avoir, apprendre, prépositions a, en, au, aux.

Unit-III : Au café (10 heures)

Dire ce qu'on aime, donner des informations, exprimer l'admiration, demander des informations sur quelqu'un.

Grammaire : Adjectifs interrogatifs, présent de l'indicatif : avoir, verbes en er , savoir, qu'est ce que c'est?, adjectifs possessifs, négation ,adjectifs irréguliers

Unit-IV : A la plage (15 heures)

Proposer une sortie, accepter, refuser la proposition

Grammaire : phrases au singulier et au pluriel, pronom indéfini- on, il y a, adjectifs démonstratifs, négation, interrogation, présent de l'indicatif : faire, voir, aller, sortir, connaître

Unit-V : Un concert et chez Nalli (15 heures)

Inviter, accepter, exprimer son incapacité d'accepter, complimenter, parlé au téléphone, demander le prix, protester contre le prix.

Grammaire : Présent de l'indicatif : verbes en er, venir, pouvoir, vouloir, articles contracte, avec, a chez, le futur, interrogation est ce que, adverbes

interrogatifs, adjectifs possessifs, accord de l'adjectif, adjectifs exclamatifs, très/trop, présent de l'indicatif : acheter-regarder, l'impératif.

Manuel:

1. K.Madanagobalane, **Synchronie-1**, Samhitâ Publication, 2011.

Livre de référence:

1. Annie Berthet /B_atrix Sampsonis/ Catherine Hugot /V_ronique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/R_gineM_rieux, Connexions 1, Didier, 2011.

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

Semester I	Course Code 17UGF110001	Title of the Paper French-I										Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
	CO1	4	4	2	3	4	4	4	2	2	3	3	3.2
	CO2	3	3	3	3	4	4	4	3	3	3	2	3.2
	CO3	3	2	3	2	4	3	2	4	4	3	3	3.0
	CO4	3	3	4	3	4	2	2	3	3	2	2	2.8
	CO5	3	3	4	3	4	3	3	3	4	5	2	3.4
	CO6	3	4	3	3	3	3	3	3	2	4	3	3.1
Mean Overall Score												3.1	

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester: I
17UGS110001

Hours/Week: 4
Credits : 3

SANSKRIT-I

Course Outcomes

At the end of the course, a student should be able to demonstrate...

- * Knowledge and understanding of basic Sanskrit grammar
- * Knowledge and understanding of essential Sanskrit vocabulary
- * Introduction of the writing skills
- * Introduction of Sanskrit Aksharas.
- * Introduction of Present tense forms
- * Implementation of good thoughts from Subashitani

Unit-I 8 hours

Akharavivaranam – Svaras & Vyanjanaani – Samyukta Aksharani.

Unit-II 12 hours

Shabdadayah – Aakaaraanta, ikaar aantah. ukaaraantah.

Shabdadayah – Aakaaraanta, iikaar aantah. uukaaraantah.

Unit-III 12 hours

Anuvaada Prayogah.

Unit-IV 14 hours

Lat Lakarh – Parasmai – Pada Prayogah = Vakyarupah.

Unit-V 14 hours

Subhaashitaani

Books Recommended

1. Kulapathy, K. M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai-400 007, 2014
2. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat-678003, Kerala, South India, Shabdha Manjari, 2014
3. Balasubramaniam R., Samskrita Akshara Siksha, Vangals Publication, 14th Main Road, JP Nagar, Bangalore -78, 2015.

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

Semester I	Course Code 17UGS110001	Title of the Paper Sanskrit-I										Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
	CO1	5	3	5	4	4	3	3	3	3	4	3.1	
	CO2	4	3	4	4	4	4	4	4	3	4	3.3	
	CO3	4	3	3	4	4	3	4	4	3	4	3.1	
	CO4	4	3	3	4	3	3	4	4	3	4	3.0	
	CO5	4	4	4	3	4	4	3	3	3	4	3.1	
	CO6	5	4	4	4	4	3	3	3	3	4	3.1	
Mean Overall Score												3.1	

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
1	2	3	4	5	
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$		Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$	
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Semester: I
17UGE120101

Hours/Week: 5
Credits: 3

GENERAL ENGLISH-I

Course Outcome

- * Introduce themselves to the others
- * Narrate simple experiences in a coherent manner
- * Understand the underlying meaning in the text
- * Describe accurately what he/she observes and experiences
- * Converse with friends about their likes and dislikes
- * Write leave letters using the appropriate format and language

Unit-I:

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

Unit-II:

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

Unit-III:

22. Plural Forms of Action Words

23. Present Positive Actions
24. Present Negative Actions
25. Un/Countable Naming Words
26. Recognition of Vowel Sounds
27. Indefinite Articles
28. Un/Countable Practice
29. Listen and Match the Visual
30. Letter Spell - Check
31. Drafting Letter

Non-Detailed:

“The Merchant of Venice” from *Six Tales From Shakespeare*

Unit-IV:

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

Non-Detailed:

“The Taming of the Shrew” from *Six Tales From Shakespeare*

Unit-V:

48. Kinship Words
49. The Odd One Out
50. My Family Tree
51. Little Boy's Request

52. Occasions for Message
53. Words denoting Place
54. Words denoting Movement
55. Phrases for Giving Directions
56. Find the Destination
57. Giving Directions Practice
58. SMS Language
59. Converting SMS
60. Writing Short Messages
61. Sending SMS
62. The family debate
63. Family Today

Non-Detailed: “The Tempest” from *Six Tales From Shakespeare*

Textbook

1. Joy, J.L. & Peter, F.M. *Let's Communicate I*, New Delhi, Trinity Press, 2014. Print.

Non-Detailed Text

1. Dodd, E F. *Six Tales From Shakespeare*. London: Macmillan, 1987. Print. (First three tales)

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

Semester I	Course Code 17UGE120101	Title of the Paper General English-I										Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)							
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	4	3	4	4	4	5	4	4	4	3	3	4	4
CO2	4	3	4	4	4	5	5	4	4	4	4	4	4
CO3	4	3	4	4	4	3	3	4	4	3	3	4	4
CO4	4	3	2	4	4	4	4	3	3	5	5	4	4
CO5	4	3	4	4	4	4	4	3	3	4	4	5	5
CO6	5	4	4	3	3	4	4	3	4	4	5	4	4
Mean Overall Score													3.85

Result: The Score for this Course is 3.85 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs =	Total of Values	Mean Overall Score for COs =		Total of Mean Scores
	Total No. of POs & PSOs	Total No. of COs		

Semester I
17UBC130201

Hours/Week: 5
Credit: 3

C PROGRAMMING

Course Outcomes

1. Understand the basic terminology of algorithm, flowchart and gain awareness used in computer programming
2. Design programs involving the various concepts like decision structures, loops, functions of C language.
3. Demonstrate the single, multi-dimensional arrays, String functions and user defined functions.
4. Compare the structure and union of C and apply it to construct array of structures and structure function.
5. Understand the dynamics of memory by the use of pointers and pointers with functions.
6. Comprehend the Processing of sequential and random access file concepts.

UNIT I

12HRS

FUNDAMENTALS OF PROGRAMMING: Computer Basics- Algorithms – Simple Model of a Computer – Characteristics of Computers-Problem Solving Using Computers – Flow Chart – The Working of a Computer.
INTRODUCTION TO C LANGUAGE: Identifiers, Keywords, Constants, Variables and data types, Access Modifiers, Data Type Conversions- Operators- Conditional Controls - Loop Controls.

UNIT II

12HRS

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

UNIT III

12HRS

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

UNIT IV

12 HRS

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

UNIT V

12 HRS

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

TEXT BOOKS

1. V. Rajaraman, "Fundamentals of Computer", Asoke k. Ghosh Publications, PHI Learning Limited, 5th Ed., New Delhi, 2011. UNIT I(A)
2. E. Balagurusamy, "Programming in C", Tata McGraw Hill, 7th Ed., New Delhi, 2016. UNIT I (B) to UNIT V.

BOOK(S) FOR REFERENCE

1. Byron S. Gottfried, "Programming with C", Tata McGraw Hill, 3rd Ed., New Delhi, 2010.
2. Yashvant Kanetkar, "Working with C", BPB Publication, New Delhi, 2008.

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

Semester I	Course Outcomes (COs)	Course Code 17UBC130201		Title of the Paper C - PROGRAMMING										Hours 5	Credits 3
		Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs
		PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
	CO1	3	3	4	4	3	3	3	2	3	3	4	3	1	3.0
	CO2	4	2	3	4	3	4	3	4	4	1	2	4	3	3.1
	CO3	4	1	3	4	4	3	4	3	3	3	4	3	4	3.3
	CO4	5	1	4	5	4	1	4	3	3	3	4	4	4	3.4
	CO5	4	3	3	4	4	1	3	4	3	4	4	4	4	3.4
	CO6	4	3	2	4	4	3	4	1	4	4	3	4	3	3.3
Mean Overall Score															3.2

Result: The Score for this Course is 3.2 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester I
17UBC130202

Hours/Week: 5
Credit: 3

SYSTEM SOFTWARE

Course Outcomes:

1. Understand the basic concepts of System software.
2. Learn the basic concepts of operating system and compiler
3. Comprehend the relationship between system software and machine architecture.
4. Understand the design and implementation of assemblers, linkers and loaders.
5. Appreciate the macroprocessors.
6. Recognize the system software tools.

UNIT-I: 10 HRS

INTRODUCTION: Overview of System Software: Compiler - Assembler-loader - Linker - Text Editor - Debugger - Program Development Flow

UNIT-II: 14 HRS

ASSEMBLERS: Pentium Assembly Language - Registers - Memory Models - Addressing Modes - Instruction set - Instruction format

ASSEMBLER DESIGN: A simple manual assembler - Assembler Design Process - Major Data Structures used - Two Pass Assembler - Single Pass Assembler - Load-And-Go Assembler.

UNIT-III: 12 HRS

LINKERS and LOADERS : Linking - Static vs. Dynamic Linking - Combining Object Modules - Pass-I and II of Linking - Library Linking - Position Independent Code - Shared Library Linking - Loader - Binary Image - Types of Loaders.

UNIT-IV: 12 HRS

MACROPROCESSOR: Macro in NASM - Local labels in Macro Body - Nested Macros - Design of Macro Processors - Major Data Structures - Macro Processing Technique - Simple Macro Processor without Nesting - Macro Processing with Nested Calls - Macro Processing with Nested Calls and Definition.

UNIT-V: 12 HRS

SYSTEM SOFTWARE TOOLS: Text editors: Design of a Editor - Common Edit - Control Features - Data Structures for Text Sequences - Basic and Recursive Sequences Data Structures - Text Document Design.

DEBUGGER: Overview of Debugger Features - Breakpoint Mechanisms - Hardware Support for Debugging - Context of Debugger - Same and Separate Process Debugger

TEXT BOOK

1. Santanu Chattopadhyay, “System Software”, PHI Learning Pvt. Ltd., New Delhi, 2009.

BOOKS FOR REFERENCES

1. D. M. Dhamdhere, “Systems Programming and Operating Systems”, Tata McGraw-Hill Second Revised Edition, 1999.
2. John R. Levine, “Linkers & Loaders”, Harcourt India Pvt. Ltd., Morgan Kaufmann Publishers, 2000.
3. Leland L. Beck, “System Software – An Introduction to Systems Programming”, Pearson Education, Asia 3rd Edition, 2008.
4. Madhulika Jain, Vineeta Pillai and Satish Jain, “Computer Organization and System Software”, BPB Publications, New Delhi, 2002.

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

Semester I	Course Code 17UBC130202	Title of the Paper SYSTEM SOFTWARE												Hours 5	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	3	2	4	3	3	3	4	3	3	3	3	5	3	3.2	
CO2	4	3	3	4	5	1	3	3	3	4	3	3	3	3.2	
CO3	3	1	4	3	3	3	3	4	3	3	4	5	4	3.3	
CO4	4	4	2	3	3	3	3	1	3	5	3	3	5	3.2	
CO5	3	3	4	4	4	3	2	4	2	3	4	3	3	3.2	
CO6	3	4	4	4	5	3	3	3	2	4	2	4	4	3.5	
Mean Overall Score														3.3	

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester I
17UBC130203

Hours/Week: 3
Credit: 2

SOFTWARE LAB-I: C PROGRAMMING

Course Outcomes:

1. Design the basic concept of C Programming, and its different modules that includes conditional and looping expressions
2. Identify the Role of constants, variables, identifiers, operators, type conversion and develop Arrays, Strings and Functions programming.
3. Design the concept of structure and union programs.
4. Use of pointers to solve problems associated with array of pointers and function pointers.
5. Apply the command line arguments involving the idea of modularity.
6. Develop sequential file and random files concept for data processing

List of Practicals:

1. Simple Programs
2. Control Structures
3. Arrays
4. Function
5. String Handling
6. Structures
7. Pointers
8. Sequential File Access
9. Random File Access
10. Command Line Arguments

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

Semester	Course Code 17UBC130203	Title of the Paper Software Lab-I: C PROGRAMMING														Hours	Credits
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
CO1	4	3	3	4	1	2	4	3	4	4	3	4	3	3.2			
CO2	4	2	3	4	1	3	3	4	3	3	4	3	4	3.1			
CO3	3	2	4	3	3	4	4	4	3	2	3	3	2	3.0			
CO4	4	2	3	5	2	3	3	3	3	3	2	4	3	3.0			
CO5	4	3	2	3	3	3	2	4	3	4	4	3	3	3.1			
CO6	3	3	4	4	3	3	4	3	4	3	4	4	4	3.5			
Mean Overall Score														3.1			

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester I
17UBC130401

Hours/Week: 6
Credit: 5

Allied: MATHEMATICS-I

Course Outcomes

1. Basic concepts of matrices, eigen values and eigen vectors.
2. Knowledge on Laplace transforms and inverse Laplace transforms.
3. The concept of Fourier series and its properties.
4. The techniques of solving algebraic and transcendental equations by numerical methods.
5. The concept of interpolation,
6. Concepts of numerical integration and differentiation is introduced to students.
7. Application of Laplace Transforms
8. Properties of Even and Odd functions

Unit-I

Matrices- Rank of a matrix of order 2 and 3 - Consistency of a system of linear non-homogenous equations - Characteristic equation of a square matrix- evaluation of eigen values and eigen vectors - Cayley – Hamilton Theorem (without proof) and problems.
(Chapter 3:pages 104-126,137-151,155-164)

Unit-II

Laplace Transforms: Definition - Properties- sufficient conditions - Laplace Transform of Periodic functions - The inverse transforms.
(Chapter 7:pages 289-308)

Unit-III

Fourier series: Fourier series - Even and Odd functions - properties of odd and even functions - Half range Fourier series
(Chapter 2:pages 121-149)

Unit-IV

Solving algebraic and transcendental equations - Bisection and Newton-Raphson methods- Solving simultaneous equations – Gauss elimination - Computation of the inverse of a matrix using Gauss Elimination method- Iterative methods - Gauss seidal methods.
(Chapter 3:sec-2 (pages 82-85), sec-5 (pages 97-99))
(Chapter 4:sec-2 (pages 113-120), sec-3 (pages 121-126), sec-6 (pages 142-144))

Unit-V

Interpolation - Newton Gregory forward and backward interpolation formulae - Lagrange's interpolation formula. Numerical Integration - Trapezoidal rule and Simpson's 1/3 rule. Solving differential equations (First order differential equations only) - Euler's method - Runge Kutta 2nd order method only.
(Chapter 6:sec-3 (pages 195-206))
(Chapter 8:sec-4 (pages 253-259))
(Chapter 9:sec-8 (page 281), sec-10(pages 285-287,290-291,293-295))
(Chapter 11:sec-10 (pages 350-357),sec-14 (pages 357-364))

BOOK FOR STUDY

1. Ancillary Mathematics (Volume I) by S.Narayanan, R.Hanumantha Rao, T.K.Manicavachagom Pillay, S. Viswanathan (Printers and Publishers), PVT., LTD, 2010.
2. Ancillary Mathematics (Volume II) by S.Narayanan, R.Hanumantha Rao, T.K.Manicavachagom Pillay, S. Viswanathan (Printers and Publishers), PVT., LTD, 2010.
3. Numerical Methods In Science and Engineering by Dr. M. K. Venkatraman, MA, M.Tech., Ph.D (5th Edition)

REFERENCES

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

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

Semester I	Course Code 17UBC130401	Title of the Paper Allied: MATHEMATICS-I												Hours 6	Credits 5
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	3	3	4	4	3	3	3	2	4	3	2	2	3.1	
CO2	4	4	2	4	4	4	4	2	3	4	3	2	2	3.2	
CO3	3	4	2	4	5	4	4	2	3	4	3	2	3	3.3	
CO4	4	3	2	4	4	4	4	3	2	4	3	2	2	3.2	
CO5	4	4	2	4	4	4	3	2	3	4	4	2	2	3.2	
CO6	3	3	3	4	4	3	3	3	3	4	3	3	3	3.2	
CO7	3	4	2	4	5	4	4	2	3	4	2	2	3	3.2	
CO8	3	4	2	4	4	4	4	2	3	3	2	2	3	3.1	
Mean Overall Score														3.1	

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester I
17UFC141001

Hours/Week:2
Credits: 2

ESSENTIALS OF HUMANITY

Course Outcome

1. To ensure creating awareness among the youth on human values.
2. To ensure educating the youth, the basic principles of value education.
3. To ensure the process of analyzing, appreciating and personalizing values as our own.
4. To ensure that students develop various dimensions of human personality.
5. To ensure the youth empowering the gender sensitization, gender differences and gender roles.
6. To ensure preparing the students for the smooth transfer from the stage of teenage to earlier adulthood.

Unit-I

Principles of Value Education - Introduction - Value Education- Characteristics of Values – Kinds of Values

Unit-II

Development of Human Personality - Personality traits - Theories of Personality - Discovering self- Defense mechanism - Power of positive thinking

Unit-III

Dimensions of Human Development - Physical development – Intellectual development - Emotional development - Social Development – Moral development - Spiritual development

Unit-IV

Responsible Parenthood - Human sexuality - Sex and love - Becoming a spouse - Responsible Parenthood

Unit-V

Gender Equality and Empowerment - Historical perspective - Education & economic development -Crimes against Women-Women's rights

Text Book:

Essentials of Humanity, Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2016.

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

Semester I	Course Outcomes (COs)	Course Code 17UFC141001		Title of the Paper ESSENTIALS OF HUMANITY										Hours 2	Credits 2
		Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs			
		PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5				PSO6
	CO1	3	1	5	4	3	5	4	5	5	5	5	4	3	4.0
	CO2	2	1	5	5	3	5	4	5	5	5	5	4	3	4.0
	CO3	2	1	5	5	4	5	4	4	5	5	5	5	3	4.1
	CO4	2	2	5	4	2	5	4	4	5	4	5	5	5	4.0
	CO5	5	2	5	5	2	5	4	4	5	5	5	4	4	4.2
	CO6	2	1	5	5	4	4	4	5	5	4	4	4	3	3.8
Mean Overall Score															4.0

Result: The Score for this Course is 4.0 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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பருவம்: 2
17UGT210002

மணி நேரம்: 4
புள்ளிகள்: 3

பொதுத்தமிழ்-II

பாடத்தின் விளைவு

- சமூக மாற்றச் சிந்தனைகளை உள்ளடக்கிய தற்கால இலக்கியப்பரப்பை அறிதல்
 - பக்தி இலக்கியங்களின் வழி இறையியல் கோட்பாடுகளை அறிதல்
 - உரைநடைக் கட்டுரை எழுதும் திறன் பெறுதல்- இலக்கணமரபுகளை அறிதல்
 - பல்வேறு சமயங்களின் வாழ்வியல் கருத்துக்களை அறிந்து பின்பற்றுதல்
 - காப்பியங்களில் உள்ள சமுதாயக் கருத்துக்களை அறிந்துகொள்ளுதல்.
 - இதிகாசங்கள் உணர்த்தும் நீதிகளை அறியச்செய்தல்.
- அரசுப்போட்டித் தேர்வுகளுக்கேற்ப பொதுக்கட்டுரைகளும் மொழிப்பயிற்சியும் மாணவர்களுக்கு அளித்தல்.

அலகு: 1 (12 மணி நேரம்)

- | | |
|----------------|---|
| சிலப்பதிகாரம் | - அந்திமாலைச் சிறப்பு செய்காதை |
| இலக்கிய வரலாறு | - சைவம் வளர்த்த தமிழ் முதல் புராணங்கள் முடிய. |
| இலக்கணம் | - எழுத்திலக்கணம் |

அலகு: 2 (12 மணி நேரம்)

- | | |
|--------------|--------------------------|
| மணிமேகலை | - உலக அறவி புக்க காதை |
| பெரியபுராணம் | - தடுத்தாட்கொண்ட புராணம் |

அலகு: 3 (12 மணி நேரம்)

- | | |
|--------------|-----------------------------------|
| கம்பராமாயணம் | - கும்பகர்ணன் வதைப்படலம் |
| உரைநடை | - 7 முதல் 9 முடிய உள்ள கட்டுரைகள் |

அலகு: 4 (12 மணி நேரம்)

- | | |
|----------------|---|
| சீறாப்புராணம் | - மானுக்குப் பிணை நின்ற படலம் |
| இலக்கணம் | - சொல்லிலக்கணம் |
| இலக்கிய வரலாறு | - தமிழ் இலக்கண நூல்கள் முதல் சிற்றிலக்கியங்கள் முடிய. |

அலகு: 5 (12 மணி நேரம்)

- | | |
|----------------------|-----------------------------------|
| இரட்சணிய யாத்திரிகம் | - மரணப்படலம் |
| உரைநடை | - 10 முதல் 12 வரையிலான கட்டுரைகள் |

பாடநூல்:

- செய்யுள் திரட்டு, தமிழாய்வுத்துறை வெளியீடு, 2017-10
- சமூகவியல் நோக்கில் தமிழ் இலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2
- உரைநடை நூல் - தமிழாய்வுத்துறை வெளியீடு.

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

Semester II	Course Code 17UGT210002	Title of the Paper சொத்துத்தமிழ்-II												Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	5	4	4	4	4	5	5	5	4	4	2	4	4	4.2	
CO2	4	5	5	4	5	5	5	5	5	4	3	4	3	4.4	
CO3	5	5	4	4	5	5	5	5	4	3	3	4	3	4.3	
CO4	5	5	4	3	4	5	5	5	4	3	3	4	3	4.1	
CO5	5	5	4	3	4	5	5	5	4	3	3	4	3	4.1	
CO6	5	5	5	5	4	5	5	5	4	3	3	4	3	4.1	
Mean Overall Score														4.2	

Result: The Score for this Course is 4.2 (Very High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semestre: II
17UGH210002

Hours/Week: 4
Credits : 3

HINDI-II

Course Outcomes

At the end of the course, a student should be able to demonstrate...

- their effective communicative skills in Hindi
- the introduction of socially relevant subjects in Modern Hindi Literature
- to appreciate the features of Modern Hindi one act plays and short stories
- the ability to fill in application forms Hindi
- use Hindi vocabulary and grammar patterns in a culturally proper ways.
- the ability to write about famous Hindi authors .

Unit-I

8 hours

Paeksha, Lekak Parichaya, Khani kee Basha – Shyli, Verb, Dhathu, Artha likiye ulte Shabda likiye.

Unit-II

12 hours

Lekak Parichaya Ekanki kee, Basha Shyli, Ander Nagaree, Sankalan Traya, Pareek shaka Khani ke paatra, Kal, Vachya.

Unit-III

12 hours

Chief Kee daavath, Ekanki ke Paatra, Ekankikaar, Ne ka Prayog, Adverb

Unit-IV

14 hours

Do Kalakar, Bahoo kee Vidha, Kahaanikaar, Prepositions, conjunctions

Unit-V

14 hours

Kahani ke paatra, Ekanke ke paatra, lekak parichaya, Interjunctions, Avikari Shabda

Books Recommended

1. Dakshina Bharath Hindi Prachara Sabha, Thiagaraya Nagar, Chennai - 600 017, Subodh Hindi Patamala-2, Ekanki, Hindi, 2016.
2. Ram Dev Hindi Bhavan, Vyakaran Pradeep, 63, Tagore Nagar, Alahabad, 2, 2013.

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

Semester II	Course Code 17UGH210002	Title of the Paper Hindi-II										Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
	CO1	4	4	4	3	4	3	2	3	4	4	3.5	
	CO2	3	3	2	3	2	4	4	3	3	2	2.8	
	CO3	3	2	2	3	4	2	4	4	2	3	3.0	
	CO4	3	2	2	3	3	4	3	3	4	3	3.0	
	CO5	3	3	3	3	3	3	3	4	3	4	3.1	
	CO6	4	4	4	4	3	4	3	3	3	2	3.3	
Mean Overall Score												3.1	

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semestre: II
17UGF210002

Heures /Semaine: 4
Points : 3

FRANÇAIS-II

Course Outcomes:

- * Faire connaissance des journaux, des courriels, des lettres
- * Comprendre les conversations téléphoniques.
- * Décrire quelque chose
- * Demander son chemin
- * Parler des activités du week-end
- * Accepter, refuser, exprimer la certitude.

Unit-I: Nouvelles de L'inde (10 heures)

Montrer son inquiétude, s'excuser, exprimer son appréciation, décrire quelqu'un, décrire quelque chose

Grammaire: Présent : verbes en er,-ir, le futur, interrogation totale, féminin d'autres adjectifs.

Unit-II: A la gare Central station (10 heures)

Réserver des billets, demander des renseignements, donner des renseignements

Grammaire: pronoms compléments d'objet direct, présent l'impératif :payer ,partir/sortir, l'impératif, expression du temps, construction avec infinitif

Unit-III : Un lit dans la Cuisine (10 heures)

Donner des ordres, localiser, dire qu'une proposition est stupide ou bizarre

Grammaire : Verbes en er-ranger, mettre impératif, il faut, devoir +infinitif, prépositions de lieu

Unit-IV: Pierre apprend a conduire et mangez –vous correctement ? (15 heures)

Rassurer, exprimer l'indirection exprimer l'autorisation, avertir, demander des informations sur les habitudes de quelqu'un, offrir a manger ou a boire, accepter, refuser, exprimer la certitude.

Grammaire: impératif-être, avoir, savoir, pronoms compléments d'objet indirect, le passe compose avec avoir expression de la quantité-articles partitifs, adverbes, pronoms directs et indirects, pronom en, présent des verbes –manger, boire ,offrir ,prendre, la condition avec si.

Unit-V: Ils ont eu tort tous les deux !et Comment as-tu passe le weekend (10 heures)

Demander son chemin, indiquer le chemin a quelqu'un, reprocher / conseiller, parler des activités du week-end, demander a quelqu'un de se taire

Grammaire: le passe compose, adverbess mots interrogatifs, le passe compose avec être, faire du....pouvoir, vouloir.

Manuel:

1. K. Madanagobalane, **Synchronie -1**, Samhitâ publication, 2011.

Livre de référence:

1. Annie Berthet / B_atrix Sampsonis / Catherine Hugot / V_ronnique M kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006
2. Yves Loiseau / R_gine M-rieux, Connexions 1, Didier, 2011

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

Semester II	Course Code 17UGF210002	Title of the Paper French-II										Hours	Credits
Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)						Mean Score of COs
	PO1	PO2	PO3	PO4	PO5		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	4	4	2	3	4		3	3	2	2	3	3	3.0
CO2	3	3	3	3	4		3	3	2	2	2	3	2.8
CO3	3	2	3	2	4		3	3	2	2	3	3	2.7
CO4	3	3	4	3	4		3	3	3	3	3	3	3.2
CO5	3	3	4	3	4		2	4	4	4	4	5	3.6
CO6	3	4	3	3	3		3	4	4	3	4	4	3.5
Mean Overall Score												3.1	

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester: II
17UGS210002

Hours/Week: 4
Credits : 3

SANSKRIT-II

Course Outcomes

At the end of the course, a student should be able to demonstrate...

- * knowledge and understanding of basic Sanskrit grammar
- * knowledge and understanding of essential Sanskrit vocabulary
- * knowledge and understanding of the appropriateness of basic Sanskrit structures and expressions in a given context
- * the ability to understand short passages in written Sanskrit on everyday topics
- * the ability to produce short passages in written Sanskrit on everyday topics
- * introduction of basic grammar (Avyaya Imperfect tense and Sandirules. Samasah.)

Unit-I **8 hours**

Visheshanaah
Saravanaama shabdas.

Unit-II **12 hours**

Sandhi Niyamaah Abhyaasah.(Guna, Visarga, Dirgha, Vrddhi)

Unit-III **12 hours**

Lang lakaarah. Kriyapadaani

Unit-IV **14 hours**

Gopala Vimshathi. (1-10) slokas.

Unit-V **14 hours**

Avyayas, Tatpurusha, Karma dhaaraya samaasah.

Books Recommended

1. Paundrapuram Ashram, Srirangam -620 006. Gopalavimshathi, 2014
2. R.S. Vadhyar & Sons, book – Sellers and Publishers, Kalpathi, Palghat- 678 003, Kerala, Southe India, Shabdha Manjari, 2014
3. Kulapthy, K. M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai - 400007, 2014

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

Semester II	Course Code 17UGS210002	Title of the Paper Sanskrit-II										Hours 4	Credits 3
Course Outcomes (COs)		Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
		PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1		5	3	5	4	4	3	3	3	4	4	3	3.2
CO2		4	3	4	4	4	3	3	3	3	4	3	3.0
CO3		4	3	3	4	4	3	3	3	4	4	3	3.0
CO4		4	3	3	4	3	3	3	4	4	4	3	3.0
CO5		4	4	4	3	4	3	4	4	4	3	4	3.2
CO6		5	4	4	4	4	3	3	3	4	4	3	3.2
Mean Overall Score												3.1	

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester: II
17UGE220102

Hours/Week: 5
Credits: 3

GENERALENGLISH-II

Course Outcome

- * Ask open-ended questions in real-life situations
- * Use polite expressions in appropriate ways
- * Use correct punctuation marks and capital letters
- * Use appropriate vocabulary
- * Put ideas into a cohesive paragraph
- * Develop positive self-esteem and thereby communicate effectively

Unit-I

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

Non-Detailed:

“Julius Caesar” from *Six Tales From Shakespeare*

Unit-II:

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:

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

Unit-IV:

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 Sord Selection
43. Professional Qualities
44. Job Procedures
45. Preparing a Resume
46. Interview Questions
47. Job Cover Letter Format
49. E-mailing an Application
50. Mock Interview

Non-Detailed:

“King Lear” from *Six Tales From Shakespeare*

Unit-V:

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

Non-Detailed: “Macbeth” from *Six Tales From Shakespeare*

Textbook

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

Non-Detailed Text

1. Dodd, E F. *Six Tales From Shakespeare*. London: Macmillan, 1987. Print. (Last three tales)

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

Semester II	Course Code 17UGE120102	Title of the Paper General English-II														Hours 5	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
CO1	5	4	4	4	4	5	4	4	3	3	3	4	4	3.9			
CO2	4	3	4	4	4	5	5	4	4	4	4	4	3	4.0			
CO3	4	3	4	4	4	3	3	4	4	3	3	4	4	3.6			
CO4	4	3	3	4	4	4	4	3	3	5	5	4	4	3.8			
CO5	4	3	4	4	4	4	4	3	3	4	4	5	5	3.9			
CO6	5	4	4	3	3	4	4	3	4	4	5	4	4	3.9			
Mean Overall Score														3.8			

Result: The Score for this Course is 3.8 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$		Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$	
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Semester II
17UBC230204
OBJECT ORIENTED PROGRAMMING WITH C++

Hours/Week: 4
Credits: 3

Course Outcome

1. Learn the basic concepts in Object-Oriented programming
2. Develop programming skills by applying Object-Oriented programming
3. Discuss the function overloading and Member Functions
4. Understand the concepts of Constructors and Inheritance
5. An Ability to incorporate Exception Handling in Object-Oriented programs
6. Analyze File Input/Output Streams

UNIT I **10 HRS**

PRINCIPLES OF OBJECT ORIENTED PROGRAMMING: Object Oriented Programming Paradigm - Basic Concepts and Benefits of OOP - Object Oriented Language - Application of OOP - Structure of C++ - Applications of C++ - Tokens, Expressions - Conditional Statements and Looping Structures - Operators on C++ - Manipulators.

UNIT II **10 HRS**

FUNCTIONS IN C++: Function Prototyping - Call by Reference - Return by Reference - Inline Functions – Default Arguments - Constructor Arguments - Function Overloading - Friend and Virtual Functions - Classes and Objects - Member Functions - Nesting of Member Functions – Private Member Functions - Memory Allocation of Objects - Static Data Members - Static Member Functions - Arrays of Objects – Objects as Function Arguments .

UNIT III **10 HRS**

CONSTRUCTORS: Parameterized Constructors – Multiple Constructors - Constructor with Default Parameters - Copy and Dynamic Constructors - Destructors - Operator Overloading - Overloading Unary and Binary Operators - Overloading Operators using Friend Function.

UNIT IV **10 HRS**

INHERITANCE: Defining Derived Classes - Single Inheritance - Making a Private Member Inheritable - Multiple Inheritance – Hybrid Inheritance - Virtual Base Class - Abstract classes - Constructors in Derived Class - Member Classes - Nesting of Classes.

UNIT V **10 HRS**
STREAMS FORMATTED AND UNFORMATTED I/O: Defined Manipulators - File I/O - Reading and Writing - Various Functions. **EXCEPTION HANDLING:** try - throw - catch Statements – Re-throwing

TEXT BOOK

1. E. Balagurusamy, “Object Oriented Programming with C++”, TMG, 7th Ed., New Delhi, 2017.

BOOK(S) FOR REFERENCE

1. Robert Lafore, “Object Oriented Programming in Microsoft C++”, Galgotia Publications, New Delhi, 2000.
2. Bjarne Stroustrup, “The C++ Programming Language”, Addison- Wesley, 4th ed., 2013

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

Semester	Course Code	Title of the Paper										Hours	Credits			
II	17UBC230204	OBJECT ORIENTED PROGRAMMING WITH C++										5	3			
	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)										
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6			PSO7	PSO8	
Course Outcomes (COs)																
	CO1	4	4	3	4	3	3	3	4	3	3	3	3	3	3	3.3
	CO2	4	5	3	4	4	3	4	3	4	1	3	4	3	3	3.4
	CO3	4	4	4	3	4	4	3	3	2	4	3	3	2	3	3.3
	CO4	4	5	4	4	3	4	3	4	3	2	4	3	4	3	3.3
	CO5	5	4	3	4	4	4	3	4	4	3	3	4	2	3	3.6
	CO6	4	4	3	5	4	3	2	3	3	3	2	4	2	3	3.2
Mean Overall Score																3.3

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs =	Total of Values	Mean Overall Score for COs =		Total of Mean Scores
	Total No. of POs & PSOs			Total No. of COs

Semester II
17UBC230205

Hours/Week: 4
Credits: 3

DIGITAL COMPUTER FUNDAMENTALS

Course Outcomes:

1. Understand the functionalities of various gates in a Digital computer
2. Simplify the expressions using Karnaugh Map
3. Learn the fundamental principles of digital electronics Circuits used in Arithmetic operations
4. Discuss the design of memory using Flip-Flops, Registers and Counters
5. Comprehend the concept of A/D and D/A converters
6. Distinguish the Type of Memories and comprehend the 8085 Assembly Language programs

UNIT I

10 HRS

DIGITAL LOGIC & COMBINATIONAL LOGIC CIRCUITS: Binary Number System- The Basic Gates-Boolean Algebra - NOR Gates - NAND Gates - Boolean Laws and Theorem-Sum of Product Method- Karnaugh Simplification-Product of Sum Method-Product of Sum Simplifications.

UNIT II

10 HRS

DATA PROCESSING & ARITHMETIC: Multiplexers-Demultiplexers-Decoders: 1 of 16 Decoders-BCD to decimal decoders-Seven segment decoders-Encoders. Ex-OR gates. Binary Addition- Subtraction. Unsigned Binary Numbers-2's Complement Representation. The Adder- Subtractor. Binary Multiplication and Division.

UNIT III

10 HRS

FLIP-FLOPS, REGISTERS & COUNTERS: Flip-Flops: RS Flip-Flops-Gated Flip-Flops-Edge Triggered RS Flip-Flop-Edge Triggered D Flip-Flop-Edge Triggered JK flip-flop- JK Master/Slave-Registers-Counters: Asynchronous Counters-Synchronous Counters.

UNIT IV

12 HRS

D/A AND A/D CONVERSIONS: D/A Converters-D/A converter Simultaneous Conversion-

MICROPROCESSORS, MICROCOMPUTERS AND ASSEMBLY LANGUAGE: Microprocessors-Microprocessor Instruction Set and Computer Languages. **MEMORY:** Magnetic Memory- Memory Addressing - ROMs, PROMs, and EPROMs – SRAMs – DRAMs

UNITV

12 HRS

INTRODUCTION TO 8085 ASSEMBLY LANGUAGE PROGRAMMING:

The 8085 Programming Model – Instruction Classification – Instruction, Data Format and Storage – Data Format – To Write Assemble and Execute a Simple Program.

TEXT BOOK(s)

1. Donald P. Leach and Albert Paul Malvino, “Digital Principles and Applications”, Tata McGraw Hill, 7th Ed., New Delhi, 2011. UNITS: I, II, III & IV
2. Ramesh Gaonkar, “Microprocessor Architecture, Programming and Applications with the 8085”, Penram International Publishing (India) Private Limited, 5th Ed., 2007. UNIT: IV & V

Note: Focus is to be given towards theoretical aspects only.

BOOK(S) FOR REFERENCE

1. Thomas C. Bartee, “Digital Computer Fundamentals”, McGraw Hill, 6th ed., New Delhi, 1985.

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

Semester II	Course Code 17UBC230205	Title of the Paper DIGITAL COMPUTER FUNDAMENTALS														Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
CO1	3	4	1	3	4	4	4	3	3	3	3	2	2	3.00			
CO2	4	4	1	3	4	4	4	4	3	3	3	2	1	3.07			
CO3	3	4	1	4	4	3	4	3	2	3	2	3	1	2.85			
CO4	4	4	1	3	4	4	3	4	3	3	2	3	3	3.15			
CO5	3	4	1	3	4	4	4	3	3	3	3	2	2	3.00			
CO6	3	4	1	4	4	3	3	4	2	3	3	3	3	3.08			
Mean Overall Score														3.02			

Result: The Score for this Course is 3.0 (High Relationship)

Note:

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester II
17UBC230206

Hours/Week: 3
Credits: 2

**Software Lab -II:
C++ PROGRAMMING**

Course Outcomes:

1. An understanding of the principles behind the object oriented development process
2. Use primitive data types, selection statements, loops, functions to write programs
3. Able to design, implement, and test relatively large C++ programs
4. Competence in the use of object oriented programming language in the development of small to medium sized application programs
5. Apply and implement major object oriented concepts like function overloading, constructors and inheritance to solve real-world problems
6. Demonstrate virtual functions and Input/Output Streams

List of Practicals:

1. Classes and Objects
2. Control Statements
3. Inline Functions
4. Default Arguments
5. Recursion
6. Functions
7. Constructors and Destructors
8. Inheritance
9. Overloading and Overriding
10. Virtual Functions and Abstract Class
11. Exception Handling
12. I/O Streams

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

Semester II	Course Code 17UBC230206	Title of the Paper Software Lab-II: C++ PROGRAMMING														Hours 3	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)								Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
	CO1	4	5	4	3	2	4	4	3	4	3	2	4	3	3.4		
CO2	5	4	3	4	4	4	4	3	4	3	4	3	4	3.7			
CO3	4	4	3	5	4	3	4	2	3	3	4	2	3	3.3			
CO4	4	5	3	4	3	4	3	3	4	2	5	1	3	3.3			
CO5	4	4	4	4	3	4	3	4	2	3	2	5	3	3.4			
CO6	4	4	3	5	3	3	3	2	2	3	3	4	3	3.2			
Mean Overall Score														3.3			

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester II
17UBC230402

Hours/Week: 6
Credits: 5

ALLIED MATHEMATICS-II

Course Outcomes:

1. Gaining knowledge on Mean, Median and Mode.
2. The concepts of association of attributes and curve fitting.
3. Application of curve fitting
4. Basic Concepts of Probability
5. Classical and Axiomatic approach
6. The basic theoretical distributions such as Binomial, Poisson and Normal are introduced.
7. The concept of test of significance for attributes is introduced.
8. Application of Probability distributions

Unit - I

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

(Chapter 9: pages 126-139,145-154,156,166-170,172)

(Chapter 10: pages 245,259-268)

(Chapter 11: pages 341-348)

Unit - II

Correlation co-efficient - Rank correlation -Curve fitting - Linear.

(Chapter 12: pages 397-410,417-421)

(Chapter 15: pages 602-608)

Unit - III

Probability : Definition - Classical Approach of probability - Axiomatic approach of probability - Theorems of Probability - Independent Events - Baye's theorem.

(Chapter 18 : Pages:737-759)

Unit - IV

Theoretical Distributions: Binomial distribution - Poisson distribution - Normal distribution - Properties of distributions (only mean, variance and standard deviations) - Practical problems under distributions.

(Chapter 19 in Book 1 Page: 769-801)

Unit - V

Test of significance for attributes: Test for number of successes - Test for proportion of Successes – Test for difference between proportions (problems only). (Chapter 20: pages 814-823,826-831)

Books for Study

1. Statistics (Theory and Practice) [7th Revised Edition] by R.S.N.Pillai and Bhagavathi

References

1. Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor.
2. Mathematical Statistics by S.Venkatraman and P.R.Vittal-First Edition 1973 (Reprint 1974).
3. Statistics by Arumugam.

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

Semester II	Course Code 17UBC230402	Title of the Paper Allied: MATHEMATICS-II												Hours 6	Credits 5
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	3	3	3	4	4	4	3	2	3	3	2	2	3.1	
CO2	4	4	2	4	4	4	4	2	3	4	3	2	2	3.2	
CO3	3	4	2	4	3	4	3	2	3	4	3	2	3	3.1	
CO4	4	3	2	4	4	3	4	3	2	4	3	2	2	3.1	
CO5	4	4	2	4	4	4	3	2	3	4	4	2	2	3.2	
CO6	3	3	3	4	4	3	3	3	3	4	3	3	3	3.2	
CO7	3	4	2	4	5	4	4	2	3	4	2	2	3	3.2	
CO8	3	3	2	4	4	4	4	2	3	4	2	2	3	3.1	
Mean Overall Score														3.1	

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale Relation Quality	1-20% 1 0.0-1.0 Very poor	21-40% 2 1.1-2.0 Poor	41-60% 3 2.1-3.0 Moderate	61-80% 4 3.1-4.0 High	81-100% 5 4.1-5.0 Very High
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Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester II
17UCE240802A

Hours/Week: 2
Credit: 2

COMPUTER LITERACY

Course Outcomes

1. Understand the basics of Computer Systems
2. Familiar with the applications of MS-Office / HTML & CSS
3. Know the statistical data analysis using R
4. Aware the latest trends and technologies such as Mobile Computing, Big Data and Analytics, Cloud Computing.
5. Understand the concepts of social networking sites.
6. Knowledge in Cyber Crime and Cyber Ethics.

Unit-I: Computer System

Computer - An Introduction - Hardware Components - Input and Output Technologies - Computer Hierarchy- Software Fundamentals - Systems Software and Os- Application Software- Software Licensing - Open Systems- Open Source Software- Programming Languages- Information Systems- General It Trends.

Unit-II: (For Non-CS)

Microsoft Word: Introduction - Word Environment - Opening and Creating a New Document - Saving Documents - Proofing Features - Printing a Document - Formatting Text - Working with Shapes and Lists - Line and Paragraph Spacing- Working with Tables - Columns and Ordering- Working with Pictures- Working with Headers and Footers - Using Indents and Tabs - Using Mail Merge.

Microsoft Excel: Introduction - Document Creation - Renaming a worksheet - Office user interface - Open a New Workbook - Columns, Rows, and Cells - Selecting a cell - Basic data entry, fill handle - Insert columns - Arithmetic Calculations & Formulas - Excel Formulas- Calculate with Functions - Function Library - Graphs and Charts - Printing the Document.

Microsoft Powerpoint: Starting PowerPoint - Working with Slides - Applying Theme - Animation- Transitions – Views.

Unit-II: (For CS)

HTML: Introduction - HTML generations – HTML Tags – Headings – Paragraphs – Comments – Line Breaks – Formatting Tags – Hyperlinks – Images – Lists – Tables – Frames – Forms.

CSS: Introduction – Use of External Style Sheet – Defining Styles – Use Relative Sizing – Use Numbered Value for Color.

Unit-III: Statistical Data Analysis

Introduction - R Programming Language - Basic R Commands - Univariate and Bivariate Statistical Measures - Graphic Representation of Statistical Data - Lab Exercise.

Unit-IV: SMAC

Introduction - Understanding the Enterprise of Tomorrow - Social Networking - Mobile Computing - Big Data and Analytics - Cloud Computing

Unit-V: Cyber Crime

Definition - List of Cyber Crimes - Cyber Ethics- Unethical Behaviour - Securing information privacy and confidentiality - Internet Ethics - Indian Information Technology Act - Advantages of Cyber Laws - National e-Governance Plan (NeGP) - eCommerce - Electronic Fund Transfer (EFT)

Book for Study

1. Department of Foundation Course, “Computer Literacy”, St. Joseph’s College, 2017.

Books for Reference

1. Alexis Leon, “Introduction to computers”, Vikas Publishing House Pvt. Ltd., New Delhi, 2008.
2. Alexis Leon and Mathew Leon, “Introduction to computers with Ms Office 2000”, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2005.

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

Semester II	Course Code 17UCE240802A	Title of the Paper COMPUTER LITERACY												Hours 2	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	5	5	4	4	5	5	4	3	4	3	4	4	4	4.15	
CO2	5	5	4	4	4	4	4	4	4	3	4	4	4	4.08	
CO3	4	3	3	4	4	4	4	4	4	3	4	4	4	3.77	
CO4	5	5	4	4	4	5	4	4	4	3	4	4	4	4.15	
CO5	4	4	3	4	4	4	4	4	4	3	4	4	4	4.15	
CO6	5	5	5	4	4	5	4	4	4	4	4	4	4	4.31	
Mean Overall Score														4.10	

Result: The Score for this Course is 4.1 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation Quality	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester II
17UFC241002

Hours/Week: 2
Credits: 2

FUNDAMENTALS OF HUMAN RIGHTS

Course Outcome

1. To ensure acquiring the knowledge about the historical background of human rights.
2. To ensure sensitizing the young the values of human rights.
3. To ensure the importance of human rights in the Indian context.
4. To ensure learning the fundamental duties in the constitution of India.
5. To ensure educating the youth in respecting and protecting the rights of every other human being.
6. To ensure teaching the youth on the vulnerabilities of women and children.

Unit-I

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

Unit-II

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

Introduction, Classification of Fundamental Rights, Salient Features of Fundamental Rights, and Fundamental Duties

Unit-IV

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

Unit-V

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

Text Book:

1. **Techniques of social Analysis: Fundamentals of Human Rights**, Department of Foundation course, St. Joseph's College, Tiruchirappalli, 2015.

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

Semester II	Course Code 17UFC241002	Title of the Paper FUNDAMENTALS OF HUMAN RIGHTS														Hours 2	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
CO1	5	1	5	5	2	4	4	4	5	4	4	5	5	4.2			
CO2	4	1	5	4	2	4	4	4	4	5	5	5	5	4.0			
CO3	5	1	5	5	2	5	5	4	4	4	5	5	5	4.2			
CO4	4	1	5	5	2	2	4	3	5	5	4	4	5	3.8			
CO5	5	1	5	4	1	5	5	5	5	5	4	4	4	4.1			
CO6	3	1	5	4	1	4	3	5	5	3	4	4	5	3.6			
Mean Overall Score														3.9			

Result: The Score for this Course is 3.9 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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பருவம்: 3
17UGT310003

மணி நேரம்: 4
புள்ளிகள்: 3

பொதுத்தமிழ்-III

பாடத்தின் விளைவு

- செம்மொழியாம் தமிழ் மொழியின் சிறப்பை அறிதல்.
- பண்டை இலக்கியங்கள் உணர்த்தும் அறக்கருத்துகளை அறிதல்
- புதினம் வாயிலாகத் தற்காலச் சமுதாயச் சிக்கல்களையும், அதற்கான தீர்வுகளையும் ஆராயும் திறன் பெறுதல்
- மானுட வாழ்வில் அகம், புறம் பற்றிய பாகுபாட்டை தமிழ்ச்செய்யுள் வாயிலாக அறிதல்.
- தமிழர்களின் ஈகையும் வீரமும் எடுத்துரைக்கும் புறச்செய்திகளை அறிதல்
- நீதிநூல்கள் மனித வாழ்வை செம்மைப்படுத்தும் பாங்கினை உணர்த்துதல்.

அலகு: 1 (12 மணி நேரம்)

நெடுநல்வாடை (முழுமையும்)

அலகு: 2 (12 மணி நேரம்)

குறுந்தொகை - பாடல்கள் - (32, 323, 305, 290, 168)

யாப்பிலக்கணம் (வெண்பா, ஆசிரியப்பா)

அலகு: 3 (12 மணி நேரம்)

கலித்தொகை - பாடல்கள் - (குறிஞ்சிக்கலி-15, பாலைக்கலி-9, மருதக்கலி-15, நெய்தற்கலி-22, முல்லைக்கலி-07)

இலக்கிய வரலாறு - முதற்பாகம் ('தமிழ் மொழியின் தொன்மையும் சிறப்பும்' முதல் 'சங்க தொகை நூல்கள்' முடிய) புதினம்.

அலகு: 4 (12 மணி நேரம்)

பதிற்றுப்பத்து - பாடல்கள் (12, 24,)

புறநானூறு - பாடல்கள் (46, 86, 122, 214, 246)

அணியிலக்கணம்

அலகு: 5 (12 மணி நேரம்)

திருக்குறள் - ஈகை, ஆள்வினை உடைமை, நிறை அழிதல் ஆகிய அதிகாரங்கள் நாலடியார் - இளமை நிலையாமை(11), பிறன்மனை நயவாமை(82), பெருமை(185), அறிவின்மை(254), காமநுதலியல்.(391).

இலக்கிய வரலாறு - சங்க இலக்கியங்களின் தனித்தன்மைகள் முதல் இரட்டைக் காப்பியங்கள் முடிய

பாடநூல்கள்:

- செய்யுள் திரட்டு, தமிழாய்வுத் துறை வெளியீடு (2017-2020).
- சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, 2014.
- புதினம் (ஒவ்வொரு கல்வியாண்டும் ஒவ்வொரு புதினம்). காணாமல் போன கவிதை (2017-18).

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

Semester III	Course Code 17UGT310003	Title of the Paper பொதுத்தமிழ்-III													Hours 5	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8			
CO1	5	5	5	4	5	5	5	4	5	5	4	4	5	4.6		
CO2	5	5	4	3	4	5	4	4	5	5	4	4	5	4.4		
CO3	5	5	5	3	4	5	5	5	5	5	4	3	5	4.5		
CO4	5	5	5	5	4	5	5	5	5	5	4	5	5	4.8		
CO5	5	4	4	4	4	5	5	5	5	5	3	3	5	4.3		
CO6	5	5	5	3	4	5	5	5	5	5	4	3	5	4.5		
Mean Overall Score														4.5		

Result: The Score for this Course is 4.5 (Very High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semestre: III
17UGH310003

Hours/Week: 4
Credits: 3

HINDI-III

Course Outcomes

At the end of the course, a student should be able to demonstrate...

- * the ability to enable the students to complete the pre-reading task to comprehend the local and global issues in the lessons.
- * the ability to enable the students to complete the post-reading task centering on Grammar and Skill Development.
- * the relevance of Bhakthi Movement in Hindi Literature.
- * the ability to imagine and write poems.
- * the ability to quote poetry in Speeches.
- * the ability to write friendly and formal letters.

Unit-I 8 hours

Tera Sneh Na Kho oon, Kavi Parichaya, Patra Likne ke Kaaran, Patra Kee Avashyakatha, Sandhi keeiyee, Vighra Keejiye

Unit-II 12 hours

Ek boondh, Tera Sneh Na Kho oon kavitha kee manovygnaik stiti, Chutti Patra, Sandhi

Unit-III 12 hours

Ekloondh Kavitha Ka Uddeshya, Kabir Ke Dohe, Nagar Palika ko Patra, Samas

Unit-IV 14 hours

Vimal Indu Kee Vishal Kiranen, Rahim Ke Dohe, Naukari Keliye Avedan Patra, Upasarga

Unit-V 14 hours

Thulasi ke Dohe, Kitab Maangne Keliye Patra, Pratyaya, Kaviparichaya

Books Recommended

1. Dakshina Bharath Hindi Prachara Sabha, Thiagaraya Nagar, Subodh Hindi, Paatamala-3, Chennai-600 017, Hindi, 2016.
2. DBHP Sabha, T.Nagar, Chennai-600 017, Abihav Patralekhan, 2016
3. Ram Dev, Vyakaran Pradeep, Hindi Bhavan, 63 Tagore Nagar, Alahabad 2, 2016.

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

Semester III	Course Code 17UGH310003	Title of the Paper Hindi-III										Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	4	4	4	3	4	3	3	3	4	4	4	3.6	
CO2	3	3	2	3	2	3	3	3	5	3	5	3.0	
CO3	3	3	3	3	4	3	3	4	3	3	3	3.2	
CO4	3	2	2	3	3	3	3	3	3	3	4	2.9	
CO5	3	3	3	3	3	3	4	3	3	3	4	3.2	
CO6	4	4	4	4	3	3	3	3	3	3	3	3.3	
Mean Overall Score												3.2	

Result: The Score for this Course is 3.2 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semestre: III
17UGF310003

Heures /Semaine: 4
Points : 3

FRANÇAIS-III

Course Outcomes

- * Comparer la culture de l'Inde et de la France
- * Familiariser l'étudiant avec le vocabulaire, la grammaire et les conversations
- * Connaître des journaux, des courriels, des lettres
- * Parler des projets de vacances
- * Exprimer l'étonnement
- * Parler de ses projets d'avenir, exprimer l'opposition.

Unit-I: Un entretien et Au restaurant (10 heures)

Demander des informations personnelles à quelqu'un, donner des informations, répondre à une proposition. Réserver une table, demander la carte, commander, apprécier les plats, demander l'addition.

Grammaire: Imparfait, Imparfait et passé composé, expression du temps, expression de la conséquence. Le futur, présent des verbes peser, rejoindre, le passé récent, le présent progressif, le futur proche, Restriction-ne...que, moi aussi...

Unit-II : Enfin les vacances ! et Un autre institut (10 heures)

Raconter son emploi du temps quotidien, parler des projets de vacances, exprimer l'étonnement. Rassurer/consoler, s'indigner

Grammaire: Verbes pronominaux, pronom y, quelqu'un/ne...personne, quelque chose/ne...rien, ne...jamais, Déjà/ne...pas encore, chacun, adjectifs indéfinis. Pronoms relatifs, impératif, indicateurs de temps : de...à, à partir de...jusqu'à, depuis, pendant.

Unit-III : Un Indien célèbre visite la France et Qui dépense plus? (10 heures)

Demander des informations sur quelqu'un, demander une opinion, donner son opinion. Dire à quelqu'un d'être prudent, faire des reproches à quelqu'un, se justifier.

Grammaire: Pronoms relatifs composés, pronoms compléments d'objet directs et indirectes, opposition savoir/Connaitre, connecteurs chronologiques, nombre ordinaux. Le comparatif, c'est+ nom+ qui, il reste, encore, il y a, souvent.

Unit-IV: Penser à son avenir - (15 heures)

Parler de ses projets d'avenir, exprimer l'opposition.

Grammaire : Style direct/indirect, proposition introduite par que, mots d'enchaînement – donc, pourtant.

Unit-V: L'astrologie (15 heures)

Exprimer des conditions, dire quelque chose n'a pas d'importance, proposer quelque chose.

Grammaire: Le conditionnel – la condition.

Manuel:

1. K.Madanagobalane, **Synchronie-II**, Samhitâ Publication, 2011.

Livre de référence :

1. Annie Berthet /B_atrix Sampsonis/ Catherine Hugot /V_ronnique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/R_gineM_rieux, Connexions 1, Didier, 2011.

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

Semester III	Course Code 17UGF310003	Title of the Paper French-III					Hours 4	Credits 3				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		PSO6
CO1	4	4	2	3	4	4	2	3	3	2	2	3.0
CO2	3	3	3	3	4	4	2	3	4	2	3	3.1
CO3	3	2	3	2	4	3	4	3	3	3	3	3.0
CO4	3	3	4	3	4	2	3	3	3	4	4	3.3
CO5	3	3	4	3	4	2	3	3	4	4	4	3.4
CO6	3	4	3	3	3	3	3	3	4	4	4	3.4
Mean Overall Score												3.2

Result: The Score for this Course is 3.2 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs =	Total of Values	Mean Overall Score for COs =	Total of Mean Scores
	Total No. of POs & PSOs		Total No. of COs

**Semester: III
17UGS310001**

**Hours/Week: 4
Credits : 3**

SANSKRIT-III

Course Outcomes

At the end of the course, a student should be able to demonstrate...

- * Knowledge and understanding of essential Sanskrit vocabulary in a given topic
- * Knowledge and understanding of the appropriateness of basic Sanskrit structures in Slokas
- * Knowledge of the basic Sanskrit poetry.
- * An idea on Epics and Puranas.
- * The usage of – Upasargas.
- * The familiarization the history of Sanskrit literature Vedas – Puranas and Natakas.

Unit-I 8 hours

Romodantam. Balakandam. 1-15

Unit-II 12 hours

Romodantam. Balakandam. 15-30

Unit-III 12 hours

Vedas – Vedangas. vivaranam.

Unit-IV 14 hours

Puranas. Upanishads.

Unit-V 14 hours

Upasargas. Bhavishyat Kaalah

Books recommended:

1. Parameshwara, Ramodantam, LIFCO, Chaennai, 2015.
2. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat-678003, Kerala, South India, History of Sanskrit Literature, 2015.
3. Kulapathy, K.M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai-400 007, 2015.

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

Semester III	Course Code 17UGS310003	Title of the Paper Sanskrit-III					Hours 4	Credits 3					
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		PSO6	
	CO1	5	3	5	4	4	3	3	3	3		4	3.1
	CO2	4	3	4	4	4	4	3	3	4		4	3.1
	CO3	4	3	3	4	4	4	4	3	3		4	3.1
	CO4	4	3	3	4	3	4	4	3	4		4	3.1
	CO5	4	4	4	3	4	3	3	4	3		4	3.1
	CO6	5	4	4	4	4	3	3	3	4		3	3.1
	Mean Overall Score											3.1	

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester: III
17UGE320103

Hours/Week: 5
Credits: 3

GENERAL ENGLISH-III

Course Outcome

- * Comprehend the local and global issues through the lessons
- * Do the tasks centering on skill development and enhance their Grammar Using and Writing Skills
- * Use interactive skills
- * Train and develop the Listening and Reading Skills of the learners through teacher-led reading practice
- * Enhance their Listening, Reading, Speaking, and Writing Skills
- * Develop their Creative and Critical Thinking and Speaking Skills

Unit-I: *Suggestions to Develop Your Reading Habit

- 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
- 1.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times*.

Unit-II: *The Secret of Success: An Anecdote

- 2.0 Introduction
- 2.1 Objectives
- 2.2 Listening and Reading Skills through Teacher-led Reading Practice
- 2.3 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
- 2.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times*.

Unit-III: *The Impact of Liquor Consumption on the Society

- 3.0 Introduction
- 3.1 Objectives
- 3.2 Listening and Reading Skills through Teacher-led Reading Practice
- 3.3 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
- 3.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times*.

Unit-IV: * Dr. A.P.J. Abdul Kalam: A Short Biography

- 4.0 Introduction
- 4.1 Objectives
- 4.2 Listening and Reading Skills through Teacher-led Reading Practice
- 4.3 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
- 4.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times*.

Unit-V: *Golden Rule: A Poem

- 5.0 Introduction
- 5.1 Objectives
- 5.2 Listening and Reading Skills through Teacher-led Reading Practice
- 5.3 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
- 5.9 **Non-Detailed Text: Dickens, Charles. *Hard Times*.**

Unit-VI: *Hygiene

- 6.0 Introduction
- 6.1 Objectives
- 6.2 Listening and Reading Skills through Teacher-led Reading Practice
- 6.3 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
- 6.9 **Non-Detailed Text: Dickens, Charles. *Hard Times*.**

Textbook

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

Non-Detailed Text:

1. Dickens, Charles. *Hard Times*. Wordsworth: Printing Press, 1854. Print.

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

Semester III	Course Code 17UGE320103	Title of the Paper General English-III												Hours 5	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	5	5	5	5	4	5	5	5	5	5	5	5	4	4.84	
CO2	5	5	5	5	5	5	5	5	5	5	5	5	4	4.92	
CO3	5	5	5	5	5	5	5	5	5	5	5	5	4	4.92	
CO4	5	5	5	5	4	5	5	5	5	5	5	5	4	4.84	
CO5	5	5	5	5	4	5	5	5	5	5	5	5	4	4.84	
CO6	5	5	5	5	4	5	5	5	5	5	5	5	4	4.84	
Mean Overall Score															4.86

Result: The Score for this Course is 4.86 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester III
17UBC330207

Hours/Week: 4
Credits: 3

RELATIONAL DATABASE MANAGEMENT SYSTEM

Course Outcomes:

1. Emphasize the need, role, importance and uses of databases in application development
2. Design E-R modeling for a given situation and provide the foundation for development of relational database structure.
3. Identify the advantages of the database approach over the file based data storage system.
4. Distinguish between different models of file organizing, storing and using of data.
5. Understand the relational model and relational algebra operations.
6. Normalize the relational tables applying normalization rules.
7. Apply PL/SQL procedural interfaces statement on relational tables as per requirements.

UNIT I

10 HRS

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

UNIT II

10 HRS

STORAGE AND FILE STRUCTURE: Overview of physical storage media – Magnetic Disks – Tertiary Storage – Storage Access. **FILE ORGANIZATION:** Fixed Length Records – Variable Length Records. **ORGANIZATION OF RECORDS IN FILES:** Sequential File Organization – Multi table Clustering File Organization – Data Dictionary Storage.

UNIT III

10 HRS

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

UNIT IV

10 HRS

SQL: Background – Data Definition- Basic Structure of SQL Queries – Set Operations – Aggregate Functions –Nested sub queries – Views – Joined

Relations. **RELATIONAL DATABASE DESIGN:** Atomic Domain and First Normal Forms. **DECOMPOSITION USING FUNCTIONAL DEPENDENCIES:** Keys and Functional Dependencies – Third Normal Form – Boyce Codd Normal Form.

UNIT V

10 HRS

INTRODUCTION OF PL/SQL: Advantages of PL/SQL – The Generic PL/SQL Block. **PL/SQL:** Data types – Variables – Constants – Control Structures – Cursors – Exception Handling – Procedures and Functions – Packages – Triggers.

TEXT BOOK(S)

1. Abraham Silberschatz ,Henry F.Korth ,S.Sudarshan ,”Database System Concepts”, 6th Ed., Tata McGraw –Hill, Singapore, 2013
UNITS: I, II, III & IV
2. Ivan Bayross, “SQL & PL/SQL: The Programming Languages of Oracle”, Fourth Revised Edition, BPB Publications, New Delhi, 2010. Unit: V

BOOK(S) FOR REFERENCE

1. C.J Date ‘An Introduction to Database System”, Pearson Education, New Delhi, 2005
2. P.S.Deshpande “SQL & PL/SQL for Oracle 10g”, Dream Tech Press, New Delhi, 2007.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester III	Course Code 17UBC330207	Title of the Paper RELATIONAL DATABASE MANAGEMENT SYSTEM													Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8			
CO1	3	4	3	4	3	4	3	4	3	3	3	4	4	3.5		
CO2	3	3	4	4	3	4	3	3	4	3	4	2	3	3.3		
CO3	2	3	3	3	4	3	4	3	4	3	3	3	3	3.1		
CO4	4	3	3	4	2	4	3	3	3	4	3	4	2	3.2		
CO5	4	3	4	3	3	3	2	3	4	3	4	3	3	3.2		
CO6	3	3	3	4	3	3	4	3	4	3	3	3	3	3.2		
CO7	3	3	3	4	3	4	4	3	3	4	3	4	3	3.4		
Mean Overall Score														3.2		

Result: The Score for this Course is 3.2 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester III
17UBC330208

Hours/Week: 4
Credits: 3

DATA STRUCTURES AND ALGORITHMS

Course Outcomes:

1. Learn the fundamental Concepts of Data Structures
2. Understand the working principles of Linked List, Stack, Queue and Trees.
3. Determine the applications of Linked List, Stack, Queue and Trees.
4. Grasp various operations and searching methods applied using Binary Tree.
5. Demonstrate understanding of various sorting algorithms, including insertion sort, selection sort, merge sort, heap sort and quick sort.
6. Comprehend various Algorithm Design Strategies.

UNIT I 10 HRS

INTRODUCTION AND OVERVIEW: Introduction - Basic Terminology - Elementary Data Organization - Data Structures - Data Structure Operations.
ARRAYS: Introduction - Linear Arrays - Representation - Traversing Insertion and Deletion. **SEARCHING:** Linear Search - Binary Search.

UNIT II 10 HRS

LINKED LISTS: Introduction - Linked Lists - Representation of Linked List in Memory - Traversing a Linked List - Searching a Linked List - Memory Allocation, Garbage Collection - Insertion into a Linked List - Deletion from a Linked List.

UNIT III 10 HRS

STACKS, QUEUES AND RECURSION: Introduction - Stacks - Array Representations of Stacks - Arithmetic Expressions- Polish Notation - Recursion: Factorial Function and Fibonacci Sequence. **QUEUES:** Representation of Queues - Array Representation of Queues.

UNIT IV 10 HRS

TREES: Introduction - Binary Trees - Representing Binary Trees in Memory – Traversing Binary Trees- Binary Search Tree- Searching and Inserting in Binary Search Trees - Deleting in Binary Search Trees. **SORTING:** Introduction - Insertion Sort - Selection Sort - Merge Sort - Heap Sort – Quick Sort.

UNIT V 10 HRS

THE COMPLETE DEVELOPMENT OF AN ALGORITHM: Algorithms – Basic Steps. **ALGORITHM DESIGN METHODS:** Sub goals – Hill Climbing and Working Backward – Heuristics – Backtrack Programming – Branch and Bound.

TEXT BOOK (S)

1. Seymour Lipschutz, “Data Structures”, Tata McGraw Hill Publishing Company Limited, New Delhi, 2014. UNITS: I, II, III & IV
2. S.E. Goodman and S.T. Hedetniemi, “Introduction to the Design and Analysis of Algorithms”, Tata McGrawHill, International Edition, 1987. UNIT: V

BOOK(S) FOR REFERENCE

1. Ellis Horowitz, Sartaj Sahni and Dinesh Mehta, “Fundamentals of Data Structures in C++”, University Press (India) Pvt. Ltd., Hyderabad, 2007.
2. Yashavant P. Kanetkar, “Data Structures Through C++”, BPB Publications, 2008.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester III	Course Code 17UBC330208	Title of the Paper DATA STRUCTURES AND ALGORITHMS												Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	3	2	3	4	4	3	3	4	3	3	3	2	3.15	
CO2	3	4	2	4	3	3	4	3	3	4	3	3	2	3.15	
CO3	3	4	2	3	4	3	4	3	4	4	4	2	2	3.23	
CO4	4	3	2	3	3	3	3	3	3	4	4	2	2	3.00	
CO5	4	4	2	4	3	3	4	3	4	3	4	3	2	3.30	
CO6	4	4	2	3	4	3	4	3	3	3	4	3	2	3.23	
Mean Overall Score														3.17	

Result: The Score for this Course is 3.17 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester III
17UBC330209

Hours/Week: 3
Credits: 2

SOFTWARE LAB-III: RDBMS

Course Outcomes:

1. Populate and query a database using DML/DDI commands.
2. Design a table and apply aggregate function and set operations.
3. Normalize the database using normalization rules.
4. Apply PL/SQL for query processing.
5. Design nested sub queries and correlated sub queries for a given problem.
6. Use PL/SQL stored procedure, stored functions, cursors and packages to query the database.

List of Practicals:

SQL

1. DDL, DML and DCL Queries
2. Aggregate Functions and Set Operations
3. Normalization
4. Joins
5. Nested Sub Queries and Correlated Sub Queries
6. Views

PL/SQL

7. Cursors
8. Procedures
9. Functions
10. Packages
11. Triggers
12. Exception Handling

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester III	Course Code 17UBC330209	Title of the Paper Software Lab-III: RDBMS												Hours 3	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	3	3	4	4	3	4	3	3	4	3	4	4	3	3.5	
CO2	3	2	3	4	3	3	4	3	5	3	3	3	3	3.2	
CO3	4	2	3	3	3	3	3	4	3	4	4	3	3	3.2	
CO4	4	2	4	3	4	4	3	3	3	4	3	4	4	3.5	
CO5	4	3	3	4	3	4	4	3	3	4	2	4	4	3.5	
CO6	4	3	2	4	4	3	2	3	3	3	4	3	4	3.2	
Mean Overall Score														3.3	

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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**Semester III
17UBC330403**

**Hours/Week: 6
Credits: 5**

Allied: ACCOUNTS-I

Course Outcome

1. To enable the students to have a thorough knowledge of the fundamental concept basic principles of accountancy
2. To provide knowledge on the importance of maintaining various book of accounts.
3. Understand and explain the conceptual framework of accounting.
4. Prepare accounts for various entities under different situations.
5. To prepare accounts for non- trading concerns.
6. Differentiate single entry from double entry system.

Unit-1: INTRODUCTION TO ACCOUNTING

Need and Importance – Book –Keeping – Accounting – Accountancy, Accounting and Book-Keeping – Users of Accounting Information – Branches of Accounting – Basic accounting terms- Rules for Debiting and crediting – Books of original entry – Journal –Illustrations.

Unit-2: BASIC ACCOUNTING PROCEDURES

Ledger – Meaning – Utility – Format – Posting – Balancing an account – Distinction between journal and Ledger.

Unit-3: SUBSIDIARY BOOKS -1 SPECIAL PURPOSE BOOKS

Need – Purchase book – sales book – Returns books – Bills of exchange – bills book – Journal proper.- cash book – Kinds of cash books.

Unit-4: BANK RECONCILIATION STATEMENT

Pass book – difference between cash book and pass book – Bank Reconciliation statement – procedure for preparing bank reconciliation statement

Unit-5: FINAL ACCOUNTS

Parts of final accounts – Trading account – profit and loss account – balance sheet – preparation of final accounts – without adjustments.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester III	Course Code 17UBC330403	Title of the Paper Allied: ACCOUNTS-1												Hours 6	Credits 5
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	4	2	5	5	5	3	3	3	3	4	3	4	3.6	
CO2	5	3	2	4	4	4	3	3	4	3	4	4	4	3.6	
CO3	4	3	3	4	4	3	4	5	4	3	4	3	3	3.6	
CO4	4	4	1	2	4	4	3	4	3	5	3	3	4	3.3	
CO5	4	4	3	2	3	4	4	3	5	4	3	4	2	3.4	
CO6	4	3	1	4	4	5	4	3	4	5	3	4	3	3.6	
Mean Overall Score														3.3	

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester III
17UFC340901

Hours/Week: 2
Credits: 2

ENVIRONMENTAL STUDIES

Course Outcome

1. To ensure understanding the significance of environment in which we live.
2. To ensure imparting knowledge on the recent issues associated with environment.
3. To ensure educating the youth the causes and consequences of various types of pollutions.
4. To ensure sensitizing the youth the increasing threats to nature and the misery mankind faces.
5. To ensure the limitations of the available natural resources and the need to sustain them.
6. To ensure imparting the knowledge on the concept of biodiversity and its advantages.

Unit-I: Environmental Studies

Environment - Scope and Importance - Environmental Movements in India - Eco-feminism - Public Awareness.

Unit-II: Natural Resources

Food Resources - L and Resources - Forest Resources - Mineral Resources - Water Resources - Energy Resources

Unit-III: Ecosystems, Biodiversity and Conservation

General structure - Functions of ecosystem - Energy flow and ecological pyramids - Biodiversity and conservation - Hot spots of Biodiversity - Endangered and Endemic Species - Value of Biodiversity - Threats to Biodiversity - Conservation of Biodiversity

Unit-IV: Environmental Pollution

Air pollution - Water pollution - Oil pollution - Soil pollution - Marine pollution - Noise pollution - Thermal pollution - Radiation pollution

Unit-V: Environment, Human Population & Social Issues

Human population growth - Urgent steps required for sustainable development - Conserving water - Current Environmental Issues

Text Book:

1. **Environmental studies**, Department of Foundation course, St. Joseph's College, Tiruchirappalli-2, 2015.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester III	Course Code 17UFC340901	Title of the Paper ENVIRONMENTAL STUDIES												Hours 2	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	5	5	5	5	3	5	4	4	4	5	3	4	3	4.0	
CO2	5	4	5	5	4	4	5	5	5	4	4	4	4	4.5	
CO3	5	4	5	5	3	5	4	4	5	3	3	4	2	4.0	
CO4	5	4	4	4	4	4	4	5	4	5	4	4	3	4.2	
CO5	5	5	4	5	4	3	5	5	4	4	5	3	4	4.3	
CO6	5	5	4	4	3	4	4	3	3	4	3	2	4	3.7	
Mean Overall Score														4.1	

Result: The Score for this Course is 4.1 (Very High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester III
17UFC341003A

Hours/Week: 2
Credits: 2

FORMATION OF YOUTH-I

Course Outcome

1. To expose the students to the presence of unjust structures in society
2. To ensure that students to acquire social ethics and social responsibility.
3. To ensure the students learn to face the global challenges with determination.
4. To ensure living with integrity in personal life and the responsibilities in public life.
5. To ensure preparing the students to seek amicable solutions to common problems.
6. To ensure training the students to inculcate business ethics.

Unit-I:

Introduction to Social Ethics

Social ethics, Social ethics and Social responsibility, Social ethics play an important role of the areas, Religion influences social changes and vice versa, Social ethics and corporate dynamics, Forms of social ethics

Unit-II:

The Economic and Political Systems of Today

Planned Economy and Communism, Feudalism, Market Economy and Capitalism, Socialism, Mixed Economy, The Emerging Market Economy, Political System, Totalitarian System, Oligarchic System

Unit-III:

Characteristics of a New World

Global Challenges, The Future is with the Educated Youth, Cost of the Sacrifice, Crusaders against corruption, Responsibility of the Educated Youth, Positive Global Scenario, The right to education, Eradicating gender inequality, Sustainable human development, Social Integration, Elimination of crime, Integration with global markets

Unit-IV:

Integrity in Public Life and National Integration

What is integrity, Public Life, Integrity and Public Life, Integrity in a Democratic State, India as a Democratic State, Behaviour of an 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-V:

Business Ethics and Cyber Crime

Business Ethics, Business ethics permeates the whole organisation, 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, Countermeasures to Cyber Crime, Ethical Hacking

Text Book:

1. **Formation of Youth**, Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2016.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UFC441004A	Title of the Paper FORMATION OF YOUTH-II														Hours 2	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
CO1	4	4	5	4	5	5	3	4	5	5	4	5	4	4.4			
CO2	4	4	4	4	4	5	4	3	4	4	4	5	5	4.2			
CO3	5	3	5	4	5	4	4	3	4	4	4	5	5	4.2			
CO4	3	4	5	4	4	5	4	4	4	4	4	3	4	4.0			
CO5	2	4	4	4	5	5	4	4	5	5	5	4	5	4.3			
CO6	4	3	4	4	5	3	4	5	5	4	5	5	4	4.2			
Mean Overall Score														4.2			

Result: The Score for this Course is 4.2 (Very High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester- III
17UFC341003B

Hours/Week: 2
Credits: 2

RELIGIOUS DOCTRINE-I

Course Outcome

1. To ensure the understanding of the salvation history and experience the God.
2. To ensure enrichment of the young minds with catholic teachings.
3. To ensure the understanding the spiritual truth that human hearts depend on God.
4. To ensure the knowledge of the person of Jesus and follow his footsteps.
5. To ensure the understanding the hand of God in establishing justice and love.
6. To ensure the edification of the youth in faith and love to transcend all human barriers.

Unit: I-Salvation History

Recognizing God - Human Beings: Their worth & Gifts - The Fall - Hope of Salvation - Prophets' Promises

Unit: II-The Gospel of Jesus Christ

Introduction - According to: St. Mathew - St. Mark - St. Luke - St. John - Symbols

Unit: III-The Holy Spirit

Introduction - Holy Spirit in the Old Testament- Holy Spirit in the New Testament- Holy Spirit in Tradition-Biblical Images of the Spirit—Gifts & Fruits of the Holy Spirit

Unit: IV- Social Justice in the Prophets

Introduction-Prophet and Prophecy-Role of Prophets

Unit: V-The Catholic Church

Mystical Body of Christ-Visible Church on Earth-The Marks or Identifying Characteristics of the Church - Hierarchical Constitution of the Church - The Magisterium or Teaching of the Church - The Church and Salvation

Text Book:

1. **Life in the Lord**, Department of Foundation course, St. Joseph's College, Tiruchirappalli-2, 2011.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UFC441004B	Title of the Paper RELIGIOUS DOCTRINE-II												Hours 2	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	1	4	3	3	4	4	4	5	4	5	5	5	3.9	
CO2	4	1	4	3	3	4	4	4	5	4	5	5	5	3.9	
CO3	4	3	4	4	3	4	4	5	4	4	5	5	5	4.2	
CO4	4	1	4	3	3	4	4	4	5	4	5	5	5	3.9	
CO5	4	1	4	3	3	4	4	4	5	4	4	4	5	3.8	
CO6	4	1	4	3	3	5	5	5	5	4	5	4	4	4.0	
Mean Overall Score														3.9	

Result: The Score for this Course is 3.9 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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பருவம்: 4
17UGT410004

மணி நேரம்: 4
புள்ளிகள்: 3

பொதுத்தமிழ்-IV

பாடத்தின் விளைவு

- நாகத்தின் போக்குகள், உத்திகள், பாத்திரப்படைப்பு, உரையாடல் முறை, கற்பனைத்திறம் போன்றவற்றை அறிந்துகொள்ளுதல்.
- புதிய நாடகங்களைப் படைக்கும் திறனைப் பெறுதல்.
- நாடகங்களை நடிக்கும் திறன் பெறுதல்
- கிரேக்க, ஆங்கில நாடகங்களை அடியொற்றி தமிழ்நாடகம் தோன்றிய வரலாறு அறியச் செய்தல்.
- சங்ககாலம் தொட்டு இக்காலம் வரை காதல் பற்றிய உணர்வுகளை எடுத்துரைத்தல்.
- தமிழ் வரலாற்றின் மன்னர்களின் ஆட்சியின் சிறப்புகளையும் வீழ்ச்சிகளையும் எடுத்துக்காட்டுதல்.

அலகு-1 (12 மணி நேரம்)
மனோன்மனியம், பாயிரம், அங்கம் - 1, களம் 1 - 5 வரை.

அலகு-2 (12 மணி நேரம்)
மனோன்மனியம், அங்கம் - 2, களம் 1 - 3 வரை.
இலக்கிய வரலாறு நான்காம் பாகம் - தமிழும் பிற துறைகளும் பக்கம் (365-387).

அலகு-3 (12 மணி நேரம்)
மனோன்மனியம், அங்கம் - 3, களம் 1 - 4 வரை.
உரைநடை நாடகம் (கௌதம புத்தர்)

அலகு-4 (12 மணி நேரம்)
மனோன்மனியம், அங்கம் - 4, களம் 1 - 5 வரை.
இலக்கிய வரலாறு நான்காம் பாகம் - சமயத்தவரின் தமிழ்ப்பணி (பக்கம் 391-402)

அலகு-5 (12 மணி நேரம்)
மனோன்மனியம், அங்கம் - 5, களம் 1 - 3 வரை.
இலக்கிய வரலாறு நான்காம் பாகம் - வெளிநாடுகள் தந்த தமிழ் இலக்கியம் (பக்கம் 410-435)

பாடநூல்கள் :

1. சுந்தரனார், மனோன்மனியம், தமிழாய்வுத்துறை (பதிப்பு), தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2. (அங்கம் : 3 களம் : 4 நீங்கலாக)
2. பாலசுப்பிரமணியம். கு.வெ, கௌதம புத்தர், அய்யா நிலையம், தஞ்சாவூர்
3. சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, 2014.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UGT410004	Title of the Paper பொதுத்தமிழ்-IV													Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8			
CO1	4	3	4	5	5	5	5	5	4	4	5	5	5	4.5		
CO2	5	4	3	5	4	5	5	4	4	3	4	5	5	4.3		
CO3	4	3	3	5	4	3	3	4	3	3	4	5	5	3.7		
CO4	5	5	4	5	5	5	5	5	5	4	5	5	5	4.8		
CO5	3	4	4	5	5	4	4	4	5	4	4	4	4	4.1		
CO6	4	3	4	5	5	4	3	3	4	3	2	2	3	3.4		
Mean Overall Score														4.1		

Result: The Score for this Course is 4.1 (Very High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semestre: IV
17UGH410004

Hours/Week: 4
Credits: 3

HINDI-IV

Course Outcomes

At the end of the course, a student should be able to demonstrate...

- * the ability to empower the students with globally employable soft skills
- * the ability to translate Hindi passages to English
- * the ideas on human values
- * the ability to instruct the moral values given by the Bhakthi Saints
- * the knowledge of Indian festivals .
- * the knowledge of culture and tradition

Unit-I 8 hours

Vidyarthi, Banking Shabda, Anuvad, Anuvad Lesson – 1, Adhikal, Premchand

Unit-II 12 hours

Pusthakalaya, Nemikaryalaya Tippaniyan, Anuvadak, Anuvad lesson-2, Bakthikal-Gyan Marg, Mahadevivarma

Unit-III 12 hours

Thyohar, Anuvad Ke Gun, Anuvad lesson – 3, Bakthi, Tippaniyaan, Prem Marg, Pant

Unit-IV 14 hours

Yugpuresh Gandhi, Anuvadak Ke Gun, Anuvad Lesson – 4 Bakthikal, Bakthikal – Ram Bakthi Kal - Krishna Bakthi, Dinkar

Unit-V 14 hours

Braman, Anuvad ek kala, Swarnayug Bakthikal, Anuvad Lesson - 5, Reetikal, Chayavad

Books Recommended

1. Kendriya Sachivalaya, Hindi Parishad New Delhi, Karyalaya Sahayika, 2016.
2. Dakshin Bharat Hindi Prachar Sabha Chennai-17, Niband Radhana, Hindi, 2016.
3. DBHP Sabha, Chennai-17, Anuvad Abyas-3, Hindi, 2016
4. Rajnath Sharma, Hindi Sahitya ka Itihas, Vinkod Pustak Mandir, Agra-2, 2016.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UGH410004	Title of the Paper Hindi-IV										Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	4	4	4	3	4	3	3	4	5	4	4	3.5	
CO2	3	3	2	3	3	3	5	3	4	3	3	3.1	
CO3	3	3	3	3	4	3	3	3	4	3	3	3.1	
CO4	3	2	2	3	2	3	3	3	3	3	3	2.7	
CO5	3	3	3	3	3	3	5	3	3	4	4	3.3	
CO6	4	4	4	4	3	5	3	5	4	4	3	3.9	
Mean Overall Score												3.3	

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semestre: IV
17UGF410004

Heures /Semaine: 4
Points : 3

FRANÇAIS-IV

Course Outcomes

- * Comparer la culture de l'Inde et de la France
- * Familiariser l'étudiant avec le vocabulaire, la grammaire et les conversations
- * Connaître les auteurs français (20 auteurs) et leurs œuvres
- * Dire qu'on aime quelqu'un/ quelque chose
- * Demander des informations
- * Exprimer une opinion personnelle et Justifier son opinion.

Unit-I:

Prières du Nouvel An (10 heures)

Exprimer l'inquiétude, le regret, le souhait, l'obligation, la sympathie.

Grammaire : Le subjonctif, verbe craindre

Unit-II:

Retrouvailles (10 heures)

Marquer la surprise

Grammaire : Le subjonctif, pronoms possessifs.

Unit-III :

C'est lui le meilleur ! (10 heures)

Dire qu'on aime quelqu'un/ quelque chose, donner son opinion, insister.

Grammaire : Le superlatif, les pronoms démonstratif.

Unit-IV:

Sauvons notre Terre ! (15 heures)

Enchaînement de cause et d'effet, demander à quelqu'un de tenir compte de quelque chose.

Grammaire : Le plus-que-parfait, il y a.

Unit-V :

Le jour des élections s'approche et les auteurs français (20 auteurs) et leurs œuvres (15 heures)

Demander des informations, dire qu'une action n'est pas utile, exprimer une opinion personnelle, Justifier son opinion.

Grammaire : Le participe présent – le gérondif, la voix passive.

Manuel:

1. K.Madanagobalane, **Synchronie-II**, Samhitâ Publication, 2011.

Livre de référence:

1. Annie Berthet /Batrix Sampsonis/ Catherine Hugot /Véronique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/RégineMérieux, Connexions 1, Didier, 2011.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UGF410004	Title of the Paper French-IV					Hours 4	Credits 3				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	Mean Score of COs
	CO1	4	4	2	3	4	4	2	3	2	3	
	CO2	3	3	3	3	4	4	2	4	3	2	
	CO3	3	2	3	2	4	3	4	3	3	4	
	CO4	3	3	4	3	4	1	2	2	4	3	
	CO5	3	3	4	3	4	3	2	2	4	4	
	CO6	3	4	3	3	3	4	4	2	4	3	
Mean Overall Score												3.2

Result: The Score for this Course is 3.2 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs =	Total of Values Total No. of POs & PSOs	Mean Overall Score for COs =		Total of Mean Scores Total No. of COs

**Semester: IV
17UGS410004**

**Hours/Week: 4
Credits : 3**

SANSKRIT-IV

Course Outcomes

At the end of the course, a student should be able to demonstrate...

- * knowledge and understanding of the history of Sanskrit Drama.
- * knowledge and understanding of the Nataka vivaranam.
- * the introduction of Functional - Sanskrit conversation Letter writing.
- * the ability to apply relevant theoretical perspectives to topics within the field of study
- * the competence in academic writing and oral presentation skills.
- * the ability to work both independently and in groups on presentations and/or development of Projects.

Unit-I **8 hours**

Paataah – Asta, Nava Dasha, Sankhya prayogah.

Unit-II **12 hours**

Lot lakaarah. Prqayaogah. Kartari Vaakyaani

Unit-III **12 hours**

Naatakasya Itihaasah.

Unit-IV **14 hours**

Karnabhaaram. Naatakam.

Unit-V **14 hours**

Kathaapaatra Vailaksharnyam.

Books recommended:

1. R.S.Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat 678003, Kerala, South India, History of Sanskrit Literature, 2014.
2. Samskritha Bharathi, Aksharam 8th Cross, 2nd Phase, Giri Nagar, Bangalore. Vadatu Sanskritam – Samskara Binduhu, 2014.
3. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat 678003, Kerala, Soth India. Karnabharam, 2014.
4. Kulapathy, K.M., Saral Sanskrit Balabodh, Bharathiya vidya Bhavan, Munshimarg, Mumbai 400007, 2014.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UGS410004	Title of the Paper Sanskrit-IV				Hours 4	Credits 3					
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	Mean Score of COs
	CO1	5	3	5	4	4	3	3	3	3	4	3.1
	CO2	4	3	4	4	4	3	3	4	3	3	3.1
	CO3	4	3	3	4	4	3	4	4	4	4	3.2
	CO4	4	3	3	4	3	3	3	4	4	4	3.1
	CO5	4	4	4	3	4	3	4	3	4	4	3.0
	CO6	5	4	4	4	4	3	3	3	3	4	3.2
Mean Overall Score												3.1

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale Relation Quality	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester: IV
17UGE420104

Hours/Week: 5
Credits: 3

GENERAL ENGLISH-IV

Course Outcome

- * Comprehend the local and global issues through the lessons
- * Do the tasks centering on skill development and enhance their Grammar Using and Writing Skills
- * Use interactive skills
- * Train and develop the Listening and Reading Skills of the learners through teacher-led reading practice
- * Improve their General Writing Skills such as Note-Taking, Note-Making, Précis Writing, Paragraph Writing, and Writing Short Essays on Current Issues/General Topics
- * Understanding the social background and human character of the period

Unit-VII:

***Women through the Eyes of Media**

- 7.0 Introduction
- 7.1 Objectives
- 7.2 Listening and Reading Skills through Teacher-led Reading Practice
- 7.3 Glossary
- 7.3.1 Words
- 7.3.2 Phrases
- 7.4 Reading Comprehension
- 7.5 Critical Analysis
- 7.6 Creative Task
- 7.7 General Writing Skill: Writing Minutes of a Meeting
- 7.8 Grammar: Present Perfect Tense
- 7.9 **Non -Detailed Poem:** Thomas Hood (1799–1845): “Silence”

Unit-VIII:

***Effects of Tobacco Smoking**

- 8.0 Introduction
- 8.1 Objectives
- 8.2 Listening and Reading Skills through Teacher-led Reading Practice
- 8.3 Glossary
- 8.3.1 Words
- 8.3.2 Phrases

- 8.4 Reading Comprehension
- 8.5 Critical Analysis
- 8.6 Creative Task
- 8.7 General Writing Skill: Note-Taking
- 8.8 Grammar: Present Perfect Continuous Tense
- 8.9 **Non -Detailed Poem:** Coventry Patmore (1823-1896): “The Toys”

Unit-IX:

* Short Message Service (SMS)

- 9.0 Introduction
- 9.1 Objectives
- 9.2 Listening and Reading Skills through Teacher-led Reading Practice
- 9.3 Glossary
- 9.3.1 Words
- 9.3.2 Phrases
- 9.4 Reading Comprehension
- 9.5 Critical Analysis
- 9.6 Creative Task
- 9.7 General Writing Skill: Note-Making
- 9.8 Grammar: Past Perfect Tense
- 9.9 **Non -Detailed Poem:** Stephen Spender (1909-1995): “Daybreak”

Unit-X:

*An Engineer Kills Self as Crow Sat on his Head: A News Paper Report

- 10.0 Introduction
- 10.1 Objectives
- 10.2 Listening and Reading Skills through Teacher-led Reading Practice
- 10.3 Glossary
- 10.3.1 Words
- 10.3.2 Phrases
- 10.4 Reading Comprehension
- 10.5 Critical Analysis
- 10.6 Creative Task
- 10.7 General Writing Skill: Précis Writing
- 10.8 Grammar: Past Perfect Continuous Tense
- 10.9 **Non -Detailed Poem:** Gabriel Imomotimi Okara (1921): “Once Upon a Time”

Unit-XI:

*Traffic Rules

- 11.0 Introduction
- 11.1 Objectives
- 11.2 Listening and Reading Skills through Teacher-led Reading Practice
- 11.3 Glossary
- 11.3.1 Words
- 11.3.2 Phrases
- 11.4 Reading Comprehension
- 11.5 Critical Analysis
- 11.6 Creative Task
- 11.7 General Writing Skill: Paragraph Writing
- 11.8 Grammar: Future Perfect Tense
- 11.9 **Non -Detailed Poem:** Robert Winner (1930-1986): “Opportunity”

Unit-XII:

*A Handful of Answers: A Zen Tale

- 12.0 Introduction
- 12.1 Objectives
- 12.2 Listening and Reading Skills through Teacher-led Reading Practice
- 12.3 Glossary
- 12.3.1 Words
- 12.3.2 Phrases
- 12.4 Reading Comprehension
- 12.5 Critical Analysis
- 12.6 Creative Task
- 12.7 General Writing Skill: Writing Short Essays on Current Issues/General Topics
- 12.8 Grammar: Future Perfect Continuous Tense
- 12.9 **Non -Detailed Poem:** Ted Hughes (1930–1998): “The Harvest Moon”

Textbook

1. Jayraj, S. Joseph Arul et al. *Trend-Setter: An Interactive General English Textbook for Under Graduate Students*. New Delhi: Trinity, 2016. Print.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UCG420104	Title of the Paper General English-IV										Hours 5	Credits 3	
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	5	4	5	5	4	4	4	5	5	5	4	5	5	4.61
CO2	5	4	5	5	3	4	5	5	5	5	5	5	5	4.69
CO3	4	4	5	4	4	3	4	4	5	5	4	4	5	4.23
CO4	4	4	5	4	4	3	4	5	5	5	4	4	5	4.30
CO5	5	4	5	4	4	4	4	4	5	5	4	4	5	4.38
CO6	5	5	5	5	4	4	4	5	5	5	4	4	5	4.61
Mean Overall Score														4.47

Result: The Score for this Course is 4.47 (Very High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester IV
17UBC430210

Hours/Week: 6
Credits: 4

JAVA PROGRAMMING

Course Outcomes:

1. Understanding the principles and practice of object oriented analysis and design.
2. Learn to implement, compile, and test run Java programs.
3. Comprehend the functionality of inheritance and polymorphism in Java
4. Demonstrate the ability to use applets for web based applications.
5. Understand the concept of multithreading and File handling in Java.
6. Acquire knowledge of networking, input out streams and JDBC programing techniques in Java.

UNIT I 15 HRS

INTRODUCTION TO JAVA: Primaries – Control Statements. **CLASSES AND OBJECTS:** General form of a class – Creation of Objects –Usage of Constructors – ‘this’ keyword- Constructor overloading-Copy constructors- Static Data Members – Static Methods- ‘finalize()’ Method.

UNIT II 15 HRS

INHERITANCE AND POLYMORPHISM: Inheriting Variables in a Class – Inheriting Methods in a Class – Inheritance and Constructors – Abstract Classes – Final Classes. **INTERFACES AND PACKAGES:** Interfaces- Structure of an Interface – Implementation of an Interface – Interface Inheritance. Packages – Placing the Classes in a Package – Package Hierarchy – Access Control Modifiers.

UNIT III 15 HRS

APPLETS: The Life Cycle of an Applet – The Applet Class – Development and Execution of a Simple Applet – Syntax of Applet Tag – Methods in the Graphics Class. **ABSTRACT WINDOWING TOOLKIT:** Events – Listeners – Event Handling Methods – Inheritance Hierarchy of Control Classes - Windows and Frames – Menus – Dialogs – Mouse Events and their Listeners.

UNIT IV 15 HRS

EXCEPTION HANDLING: Default Exception Handling – Exception and Error Classes – Catch Block Searching Pattern – ‘Throw’ Statement – ‘Throws’ Statement – Custom Exceptions. **THREADS:** Life Cycle of a Thread – Creating and Running Threads – Methods in the Thread Class – Setting the priority of a thread – Synchronization – Dead Lock – Inter Thread Communication – Applets Involving Threads.

UNIT V**15 HRS**

I/O STREAMS: Input Stream and Output Stream classes – Reader and Writer classes – Data Output Stream and Data Input Stream Classes.
NETWORKING: TCP Server Socket Class – TCP Socket Class - UDP Datagram Socket and Datagram Packet Classes. **DATABASE CONNECTIVITY:** JDBC-ODBC Connection.

TEXT BOOK

1. C. Muthu, “Programming with JAVA”, 2nd ed., Vijay Nicole Imprints, Chennai, 2008.

BOOK FOR REFERENCE

1. Herbert Scheldt, “The Complete Reference Java 2.0”, 7th ed., Tata McGraw Hill, New Delhi, 2007.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UBC430210	Title of the Paper JAVA PROGRAMMING												Hours 6	Credits 4
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	3	2	4	4	4	3	3	2	3	5	3	4	3.4	
CO2	4	4	2	3	4	1	3	5	2	4	5	4	5	3.5	
CO3	4	3	2	3	4	2	4	1	3	5	5	4	5	3.4	
CO4	5	2	2	2	4	1	3	5	2	4	5	4	4	3.3	
CO5	5	5	1	3	4	2	4	1	3	5	5	4	5	3.6	
CO6	5	3	2	3	4	4	1	3	5	2	5	4	4	3.4	
Mean Overall Score														3.4	

Result: The Score for this Course is 3.4 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester IV
17UBC430211

Hours/Week: 3
Credits: 2

Software Lab-IV:
JAVAPROGRAMMINGWITHDATASTRUCTURES

Course Outcomes:

1. Develop programs using object-oriented concepts in Java
2. Write, debug and document well-structured Java applications
3. Implement Java classes from specifications and effectively create and use objects from predefined class libraries
4. Construct the program of multithreading and File handling in Java
5. Applying I/O streams concepts and create database connections using JDBC
6. Write simple networking programs

List of Practicals:

1. Constructors
2. Inheritance
3. Packages and Interfaces
4. Exception Handling
5. Threads
6. Applet and AWT controls
7. JDBC Connection
8. Linked List
9. Stack Operations
10. Queue Operations
11. Sorting
12. Searching

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UBC430211	Title of the Paper Software Lab-IV: JAVA PROGRAMMING WITH DATA STRUCTURES														Hours 3	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
CO1	4	3	2	4	4	4	3	3	2	3	5	3	4	3.4			
CO2	4	4	2	3	4	1	3	5	2	4	4	4	4	3.3			
CO3	4	3	2	3	4	2	4	1	3	5	5	4	5	3.4			
CO4	5	2	2	2	4	1	3	5	2	4	5	4	4	3.3			
CO5	5	5	1	3	4	2	4	1	3	4	5	4	4	3.4			
CO6	5	3	2	3	4	4	1	3	5	2	5	4	4	3.4			
Mean Overall Score														3.3	3		

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs =	Total of Values	Mean Overall Score for COs =	Total of Mean Scores
	Total No. of POs & PSOs		Total No. of COs

Semester IV
17UBC430301A

Hours/Week: 4
Credits: 4

**Core Elective-I (WD):
COMMUNICATION NETWORKS**

Course Outcomes:

1. Learn the basic concepts of Data Communication and different layers
2. Describe the working strategies of Wireless LAN and Wireless MAN
3. Differentiate the various protocols used in communication
4. Differentiate the IPv4 and IPv6 Addresses
5. Familiarizes the basics of GSM and CDMA
6. Understand the basic concepts and methods of mobile communication systems

UNIT I 10 HRS

DATA COMMUNICATIONS: Networks - Protocols and Standards. **NETWORK MODELS:** The OSI Model - Layers in the OSI Model - TCP / IP Protocol Suite - Addressing. **PHYSICAL LAYER AND MEDIA:** Analog and Digital - Transmission Impairment - Performance - Guided Media - Unguided Media.

UNIT II 10 HRS

DATA LINK LAYER: Error Detection and Correction - Flow and Error Control - Protocols.

WIRELESS LANS: IEEE 802.11 - Bluetooth. **WIRELESS WANS:** Satellite Networks - Categories of Satellites.

UNIT III 10 HRS

NETWORK LAYER: IPv4 Addresses - IPv6 Addresses - Address Mapping - ICMP - IGMP - Delivery - Forwarding - Unicast and Multicast Routing Protocols. **TRANSPORT LAYER:** Process-to-Process Delivery - User Datagram Protocol - TCP - Congestion - Congestion Control - Quality of Service.

UNIT IV 10 HRS

MOBILE COMMUNICATIONS OVERVIEW: Mobile Communication - Mobile Computing - Mobile Computing Architecture - Mobile System Networks - Data Dissemination - Mobility management - Security. **MOBILE SYSTEMS:** Mobile Phones - Smart Systems - Limitations of Mobile Devices.

UNIT V 10 HRS

GSM AND SIMILAR ARCHITECTURES: GSM - Services and System Architecture - Radio Interfaces - Protocols - Localization - Calling - Handover - Security. **GPRS:** Switching modes - RSS - NSS and GSS Sub Systems - SGSN - CGSN - Signaling Protocol Layers. **WIRELESS MEDIUM ACCESS CONTROL AND CDMA-BASED COMMUNICATION:** Medium Access Control - Introduction to CDMA Based Systems.

TEXT BOOKS

1. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw Hill Publications, 5th Ed., New Delhi, 2012. Units: I, II & III
2. Raj Kamal, "Mobile Computing", 2nd ed., Oxford University Press, New Delhi, 2010. Units: IV & V

BOOK(S) FOR REFERENCE

1. Andrew S. Tanenbaum, "Computer Networks", Pearson Education, 5th Ed., New Delhi, 2011.
2. William Stallings, "Data and Computer Communications", Pearson Education, 10th Ed., New Delhi 2014.
3. Jochen Schiller, "Mobile Communication", 2nd ed., Pearson Education, New Delhi, 2009.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UBC430301A	Title of the Paper Core Elective (WD)-I: COMMUNICATION NETWORKS												Hours 4	Credits 4
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	2	2	4	2	3	2	3	4	4	3	4	3	3.0	
CO2	5	2	4	3	4	1	3	5	2	4	3	5	3	3.4	
CO3	3	4	3	5	2	2	2	1	3	5	2	4	4	3.0	
CO4	5	2	1	2	4	1	3	5	3	4	2	5	3	3.0	
CO5	5	5	1	3	2	2	3	2	3	5	2	4	3	3.0	
CO6	4	3	3	3	2	4	1	3	5	2	4	4	3	3.1	
Mean Overall Score														3.0	

Result: The Score for this Course is 3.0 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester IV
17UBC430301B

Hours/Week: 4
Credits: 4

Core Elective-I (WD): KNOWLEDGE MANAGEMENT

Course Outcomes:

1. Describe the importance of knowledge as a resource in knowledge based economies.
2. Identifying and applying approaches in managing individual, group and organizational level knowledge processes.
3. Be acquainted with communication skills, especially of discussion and presentation methods.
4. Examine various latest technologies that are available for organizational knowledge management.
5. Understand the usability of artificial neural networks in determining correlations and interactions.
6. Understand technology used for data mining and data visualization

UNIT I

10 HRS

INTRODUCING KNOWLEDGE MANANGEMENT: Knowledge Management – Forces Driving Knowledge Management – Knowledge Management Systems – Issues in Knowledge Management. **THE NATURE OF KNOWLEDGE:** Knowledge – Alternative Views of Knowledge – Different Types of Knowledge – Locations of Knowledge.

UNIT II

10 HRS

KNOWLEDGE MANAGEMENT SOLUTIONS: Knowledge Management and Knowledge Management Solutions - Knowledge Management Processes - Knowledge Management Systems - Knowledge Management Infrastructure. **ORGANIZATIONAL IMPACTS OF KNOWLEDGE MANAGEMENT:** Impact on People – Impact on Processes – Impact on Products – Impact on Organizational Performance.

UNIT III

9 HRS

TECHNOLOGIES TO MANAGE KNOWLEDGE, ARTIFICIAL INTELLIGENCE: Artificial Intelligence a Definition and Historical Perspective – Knowledge Based Systems a Historical Perspective and Definition – Knowledge and Expertise – Features of Knowledge Based Systems – Other Artificial Intelligence Technologies.

UNIT IV**11 HRS**

THE COMPUTER AS A MEDIUM FOR SHARING KNOWLEDGE: World Wide Web – Web Search Engines – Network Security – Workflow Systems – Document Management via The Web. **DISCOVERING NEW KNOWLEDGE, DATA MINING:** Objectives of Data Mining – Symbolic Approach, Induction Learning Rules from Examples – Connectionist Approach: Artificial Neural Networks – Statistical Methods for Data Mining – Guidelines for Employing Data Mining Techniques – Errors and their Significance in Data Mining.

UNIT V**10 HRS**

KNOWLEDGE DISCOVERY SYSTEMS, SYSTEM THAT CREATE KNOWLEDGE: Mechanisms to Discover Knowledge – Technologies to Discover Knowledge – Designing the Knowledge Discovery System – Discovering Knowledge on the Web – Data Mining and Customer Relationship Management – Barriers to the Use of Knowledge Discovery Systems – Case Study.

TEXT BOOK

- Irma Becerra Fernandez, Avelino Gonzalez and Rajiv Sabherwal, “Knowledge Management”, Dorling Kindersley (India) Pvt, Ltd., 2nd Ed, 2014.

BOOK(S) FOR REFERENCE

- Jiawei Han, Micheline Kamber and Jian Pei, “Data Mining Concepts and Techniques”, Morgan Kaufmann Publishers an imprint of Elsevier, 3rd Ed, 2012.
- G.K. Gupta, “Introduction to Data mining with Case Studies”, PHI Learning Pvt. Ltd., 3rd ed., 2014.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UBC430301B	Title of the Paper Core Elective (WD)-I: KNOWLEDGE MANAGEMENT										Hours 4	Credits 4	
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	4	3	3	2	3	4	3	2	3	4	3	3	3	3.0
CO2	4	4	3	3	3	4	4	2	3	2	3	3	3	3.1
CO3	4	4	3	3	2	2	2	3	4	3	4	3	2	3.3
CO4	4	3	3	4	3	3	2	3	3	2	3	3	3	3.3
CO5	3	4	4	4	3	4	4	4	4	3	4	4	4	3.7
CO6	4	3	4	3	4	3	2	3	3	3	2	2	3	3.0
Mean Overall Score														3.2

Result: The Score for this Course is 3.2 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester IV
17UBC430404

Hours/Week: 6
Credits: 5

Allied: ACCOUNTS-II

Course Outcomes:

1. To impart basic knowledge of cost and management accounting.
2. To help the student to know the application of them in different situations.
3. To gain comprehensive understanding of all aspects relating to financial statements.
4. Understand knowledge on admission, retirement and death of Partnership
5. Learn on dissolution of Partnership
6. Knowledge on Insolvency Partnership

Unit-1: FINALACCOUNTS–ADJUSTMENTS

Adjustments – closing stock – outstanding expenses – prepaid Expenses – Accrued Incomes – Incomes received in Advance – Interest on Capital – Interest on Drawings – Interest on Loan – Interest on Investments – Depreciation – Bad Debts – Provision for Bad And Doubtful Debts – Provision for Discount on Debtors – Provision for Discount on Creditors – preparation of Final Accounts

Unit-2: CASH BUDGET

Budget – Definition – Characteristics – Cash Budget – Advantages – Preparation of Cash Budget – Receipts and Payments Method.

Unit-3: PARTNERSHIP–ADMISSION

Introduction – Adjustments – Revaluation of Assets and Liabilities – Undistributed Profit or Loss – Accumulated Reserve – Treatment of Goodwill – Revaluation Account, Capital Accounts and Balance sheet after Admission of Partner.

Unit-4: PARTNERSHIP–RETIREMENT OF A PARTNER.

Introduction – Adjustments - Revaluation of Assets and Liabilities – Undistributed Profit or Loss – Accumulated Reserve – Treatment of Goodwill – Revaluation Account, Capital Accounts Bank Account and Balance sheet of the Reconstituted Partnership Firm.

Unit-5: COST SHEET

Preparation of cost sheet – tender quotation.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UBC430404	Title of the Paper Allied: ACCOUNTS-II											Hours 6	Credits 5	
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
	CO1	4	4	2	5	5	4	4	3	4	4	4	4		
CO2	5	3	2	4	4	4	4	3	4	3	4	4	5	4.0	
CO3	3	4	2	5	3	4	5	4	5	3	3	4	4	3.7	
CO4	4	4	2	3	4	5	3	4	4	3	4	3	5	3.6	
CO5	4	5	3	4	3	3	3	2	4	3	4	4	3	3.4	
CO6	5	3	3	3	5	5	4	4	3	4	4	3	4	3.8	
Mean Overall Score														3.5	

Result: The Score for this Course is 3.5 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation Quality	1 0.0-1.0 Very poor	2 1.1-2.0 Poor	3 2.1-3.0 Moderate	4 3.1-4.0 High	5 4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester IV
17UFC441004A

Hours/Week: 2
Credits: 2

Allied:
FORMATION OF YOUTH-II

Course Outcome

1. To ensure preparing the students to live in harmony with nature.
2. To ensure the youth the significance of public health and the related issues.
3. To ensure sensitizing the youth about addictions and their consequences.
4. To ensure educating the youth on disaster management and First-Aid.
5. To ensure enlightening on the developmental issues and challenges of youth today.
6. To ensure the value of counselling for attaining positive mental health.

Unit-I: Harmony with Nature

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

Unit-II: Public Health

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-III: Disaster Management and First-Aid

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-IV: Issues Dealing with Science

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, Harnessing the forces of science and technology for the future

Unit-V: Counselling for the Adolescents

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.

Text Book:

1. **Formation of Youth**, Department of Foundation course, St. Joseph's College, Tiruchirappalli-2, 2016.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UFC441004A	Title of the Paper FORMATION OF YOUTH-II										Hours 2	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	4	4	5	4	5	5	3	4	5	5	4	5	4
CO2	4	4	4	4	4	5	4	3	4	4	4	5	5
CO3	5	3	5	4	5	4	4	3	4	4	4	5	5
CO4	3	4	5	4	4	5	4	4	4	4	4	3	4
CO5	2	4	4	4	5	5	4	4	5	5	5	4	5
CO6	4	3	4	4	5	3	4	5	5	4	5	5	4
Mean Overall Score											4.2		

Result: The Score for this Course is 4.2 (Very High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester IV
17UFC441004B

Hours/Week: 2
Credits: 2

RELIGIOUS DOCTRINE-II

Course Outcome

1. To ensure appreciation of the harmony of religion.
2. To ensure training the youth in the power of prayer.
3. To ensure the understanding of Mary's role in salvation history and Marian Dogmas.
4. To ensure enlightening the graces and invisible effects of the sacraments.
5. To ensure the youth with the promise that God forgives failings on repentance.
6. To ensure understanding the concept of salvation and the promise of eternal life.

Unit: I Harmony of Religions

Introduction - Religions of India - Buddhism - Jainism - Sikhism - Judaism - Confucianism - Christianity - Zoroastrianism - Islam

Unit: II The Christian Prayer

Prayer Defined - Reasons to pray - The Way to Pray - Types of Prayer - Obstacles for Prayer - Prayer in Old -The Lord's Prayer

Unit: III Mary, the Blessed Virgin, Mother of God

Introduction - Marian Dogmas - Mary in need of Redemption - Mary in the New Testament - Apparitions of Mary - Devotion to Mary

Unit: IV Sacraments of Initiation

Introduction - An Overview - Baptism - Confirmation - Holy Eucharist

Unit: V Sacraments of Healing & at the Service of the Community

Reconciliation - Anointing of the Sick - Holy Orders – Matrimony

Text Book:

1. **Life in the Lord**, Department of Foundation course, St. Joseph's College, Tiruchirappalli-2, 2011.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester IV	Course Code 17UFC441004B	Title of the Paper RELIGIOUS DOCTRINE-II												Hours 2	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	1	4	3	3	4	4	4	5	4	5	5	5	3.9	
CO2	4	1	4	3	3	4	4	4	5	4	5	5	5	3.9	
CO3	4	3	4	4	3	4	4	5	4	4	5	5	5	4.2	
CO4	4	1	4	3	3	4	4	4	5	4	5	5	5	3.9	
CO5	4	1	4	3	3	4	4	4	5	4	4	4	5	3.8	
CO6	4	1	4	3	3	5	5	5	5	4	5	4	4	4.0	
Mean Overall Score														3.9	

Result: The Score for this Course is 3.9 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
Relation	1	2	3	4	5
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17UBC530212

Hours/Week: 4
Credits: 3

SOFTWARE ENGINEERING

Course Outcomes:

1. Understand the basic concepts of software engineering and software development life cycle models
2. Emphasizes on software project management and project planning techniques
3. Comprehend the concepts of requirement analysis and specification and software design.
4. Learn Function-oriented software design and Object Oriented software development and to draw various Diagrams using UML
5. Understand User interface design and various testing
6. Recognize Software Quality, Reliability Management, Software Maintenance and CASE tools.

UNIT I

12 HRS

INTRODUCTION: Evolution: Engineering Discipline – Software Development Projects – Exploratory Style of Software Development - Emergence of Software Engineering – Changes in Software Development Practices – Computer Systems Engineering. **SOFTWARE LIFE CYCLE MODELS:** Basic Concepts - Waterfall Model and its Extensions- RAD Model – Spiral Model. **SOFTWARE PROJECT MANAGEMENT:** Responsibilities of a Software Project Manager – Project Planning – Metrics for Project Size Estimation – Project Estimation Techniques – COCOMO - A Heuristic Estimation Technique.

UNIT II

8 HRS

REQUIREMENTS ANALYSIS AND SPECIFICATION: Requirements Gathering and Analysis – Software Requirements Specification (SRS) – Formal System Specification. SOFTWARE DESIGN: Characteristics of a Good Software Design – Cohesion and Coupling – Layered Arrangement – Approaches of Software Design.

UNIT III

10 HRS

FUNCTION-ORIENTED SOFTWARE DESIGN: Overview of SA/SD Methodology – Structured Analysis – Developing the DFD model as a System – Structured Design - Detailed Design – Design Overview. **OBJECT MODELING USING UML:** Basic Object-Orientation Concepts - UML – UML Diagrams – Use Case Model – Class Diagrams – Interaction Diagrams –

Activity Diagrams – State Chart Diagram. **OBJECT-ORIENTED SOFTWARE DEVELOPMENT:** Design Patterns – An OOAD Methodology.

UNIT IV 10 HRS

USER INTERFACE DESIGN: Characteristics of a User Interface – Basic Concepts – Types of User Interfaces – Component-Based GUI Development – User Interface Design Methodology. **CODING AND TESTING:** Coding – Code Review – Testing – Unit Testing – Black-Box Testing – White-Box Testing – Debugging – Program Analysis Tools – Integration Testing – System Testing.

UNIT V 10 HRS

SOFTWARE RELIABILITY AND QUALITY MANAGEMENT: Software Reliability – Statistical Testing – Software Quality – Software Quality Management System – ISO 9000 – SEI Capability Maturity Model. **COMPUTER AIDED SOFTWARE ENGINEERING:** CASE Environment – CASE support in Software Life Cycle – Characteristics of CASE Tools – Second Generation CASE Tool – Architecture of a CASE Environment. **SOFTWARE MAINTENANCE:** Characteristics of Software Maintenance. **SOFTWARE REUSE:** Issues in any Reuse Program – Reuse Approach – Reuse at Organization Level.

TEXT BOOK:

1. Rajib Mall, Fundamentals of Software Engineering, Prentice Hall of India Private Limited, 4th Ed., 2014.

BOOK(S) FOR REFERENCE:

1. Ian Sommerville, “Software Engineering”, Addison Wesley, 10th ed., Singapore, 2015.
2. K.K. Agarwal & Yogesh Singh, “Software Engineering”, New Age Intl. Publishers, Revised Ed., 2007.
3. Roger S. Pressman, “Software Engineering – A Practitioner’s Approach”, McGraw Hill International, 9th Ed., 2008.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V	Course Code 17UBC530212	Title of the Paper SOFTWARE ENGINEERING													Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8			
CO1	4	2	3	4	3	4	3	3	4	4	3	3	3	3.3		
CO2	5	2	4	3	4	4	3	5	2	4	2	3	3	3.4		
CO3	3	4	3	5	2	2	2	3	3	5	2	4	4	3.2		
CO4	5	2	1	2	4	4	3	4	3	4	2	3	3	3.0		
CO5	5	5	1	3	2	2	3	2	3	5	2	4	3	3.0		
CO6	4	3	3	3	2	4	1	3	5	2	4	4	3	3.1		
Mean Overall Score														3.1		

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17UBC530213

Hours/Week: 4
Credits: 3

ADVANCED JAVA PROGRAMMING

Course Outcomes:

1. Understand the fundamental concepts of the J2EE Technologies
2. Comprehend the principles of J2EE programming.
3. Learn the communication of client and server in the programming paradigm.
4. Understand the concept of JSP and EJB
5. Ability to connect Spring with XML
6. Develop programming skills in Spring using web views.

UNIT I

10 HRS

J2EE OVERVIEW: J2EE and J2SE- The Birth of J2EE - J2EE. **J2EE MULTI TIER ARCHITECTURE:** The Tier - J2EE Multi-Tier Architecture - Client Tier Implementation- Classification of Clients -Web Tier Implementation. **J2EE BEST PRACTICES:** The Enterprise Application-Session Management- Presentation and Processing- Model View Controller.

UNIT II

10 HRS

JAVA REMOTE METHOD INVOCATION: RMI Concept-Remote Interface- Passing Objects - The RMI Process - Server side - Client side. **JAVA SERVLETS:** Java Servlets and Common Gateway Interface Programming- Benefits of using a Java Servlet – A simple Java Servlet – Anatomy of Java Servlet – Deployment Descriptor – Reading Data from a Client – Working with Cookies – Tracking Sessions.

UNIT III

10 HRS

JSP: JSP - JSP Tags- Variables and Objects- Methods -Control Statements- Loops -Tomcat-Request String -User Session - Cookies - Session Objects. **EJB:** Enterprise Java Beans- The EJB container- EJB Classes- EJB Interfaces- Referencing EJB- Relationship Elements -Session Java Bean –Stateless vs. Stateful - Creating a Session Java Bean-Entity Java Bean -The JAR file.

UNIT IV

10 HRS

INTRODUCTION TO SPRING – Simplifying Java Development – Containing Beans – Surveying Bean Landscape. **SPRING CONFIGURATION:** Wiring Beans – With Java – With XML

UNIT V

10 HRS

SPRING ON THE WEB: Spring MVC – Simple Controller – Request Input – Processing Forms. **WEB VIEWS:** Creating JSP Web Views – Defining Layout – JSP Libraries

TEXT BOOKS

1. Jim Keogh,” The Complete Reference J2EE “, Tata McGraw Hill, New Delhi, 2012. Units: I, II, III
2. Craig Walls, “Spring in Action” 4 Ed, Manning Publication, New York, 2015

BOOK(S) FOR REFERENCE

1. McGovern,” J2EE 1.4 Bible”, Wiley, Chennai, India, 2007.
2. Nicholas S. Williams,”Professional Java for Web Applications: Featuring WebSockets, Spring Framework, JPA Hibernate and Spring Security

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V	Course Code 17UBC530213	Title of the Paper ADVANCED JAVA PROGRAMMING														Hours 4	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
CO1	3	3	4	4	3	4	3	3	4	3	4	4	3	3.5			
CO2	3	2	3	4	3	3	4	3	5	3	3	3	3	3.2			
CO3	4	2	3	3	3	3	3	4	3	4	4	3	3	3.2			
CO4	4	2	4	3	4	4	3	3	3	4	3	4	4	3.5			
CO5	4	3	3	4	3	4	4	3	3	4	2	4	4	3.5			
CO6	4	3	2	4	4	3	2	3	3	3	4	3	4	3.2			
Mean Overall Score														3.3			

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17UBC530214

Hours/Week: 4
Credits: 3

HTML-5 & CSS-3

Course Outcomes:

1. Gain knowledge on the page structure of HTML5
2. Understand the concepts of linking the web pages.
3. Ability to style the web pages using CSS3.
4. Create different web layout styles using CSS3
5. Knowledge in formatting the text using CSS3 properties.
6. Create dynamic web pages with forms and multimedia files.(audio, video)

UNIT I 10 HRS

BASIC HTML STRUCTURE: Starting Your Web Page - Creating a Title - Creating Headings - Grouping Headings - Creating a Header - Marking Navigation - Creating an Article - Defining a Section - Specifying an Aside - Creating a Footer - Creating Generic Containers.

UNIT II 10 HRS

TEXT: Starting a New Paragraph - Creating a Figure - Specifying Time - Quoting Text - Highlighting Text- Explaining Abbreviations - Creating Superscripts and Subscripts - Creating a Line Break - **IMAGES:** Inserting Images on a Page - Specifying Image Size. **LINK:** Creating a Link to another Web Page - Creating Anchors - Linking to a Specific Anchor.

UNIT III 8 HRS

WORKING WITH STYLE SHEETS: Creating an External Style Sheet - Linking to External Style Sheets- Creating an Embedded Style Sheet- Applying Inline Styles. **DEFINING SELECTORS:** Constructing Selectors -Selecting Elements by Name- Selecting Elements by Class or ID - Selecting Elements by Context- Combining Selectors.

UNIT IV 10 HRS

FORMATTING TEXT WITH STYLES: Choosing a Font Family - Specifying Alternate Fonts - Creating Italics - Applying Bold Formatting - Setting the Font Size - Setting the Line Height - Setting All Font Values at Once - Setting the Color - Changing the Text's Background . **LAYOUT WITH STYLES:**The Box Model - Changing the Background - Setting the Height or Width for an Element - Setting the Margins around an Element - Adding Padding around an Element- Setting the Border - Positioning Elements in 3D- Displaying and Hiding Elements.

UNITV

12 HRS

LISTS: Creating Ordered and Unordered Lists - Styling Nested Lists - Creating Description Lists. **FORMS:** Creating Forms - Processing Forms - Organizing the Form Elements - Creating Text Boxes - Creating Password Boxes - Creating Radio Buttons - Creating Select Boxes - Creating Checkboxes - Creating a Submit Button - Using an Image to Submit a Form. **VIDEO, AUDIO, AND MULTIMEDIA:** Video File Formats - Adding a Single Video to Your Web Page - Adding Audio File Formats- Adding a Single Audio File to Your Web Page - Getting Multimedia Files. **TABLES:** Structuring Tables - Spanning Columns and Rows.

TEXT BOOK

1. Elizabeth Castro, Bruce Hyslop “HTML5 & CSS3”, Peachpit Press, 7th Ed., 2012.

BOOKS FOR REFERENCE

1. Alexis Goldstein, Louis Lazaris, Estelle Weyl, “HTML5 & CSS3 for the Real World”, SitePoint Pvt. Ltd., 2011.
2. Matthew MacDonald, “HTML5: The Missing Manual”, O’Reilly, 2011.
3. Kogent Learning Solutions Inc. “HTML5 Black Book: Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP and JQuery”, Dreamtech Press, 2011.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Course Code	Title of the Paper														Hours	Credits
V	17UBC530214	HTML-5 AND CSS-3														4	3
Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)								Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
	CO1	4	4	2	4	3	4	4	3	3	3	2	4	4	3.38		
	CO2	4	3	2	4	3	4	4	3	2	3	2	4	4	3.24		
	CO3	4	4	2	4	3	4	4	3	2	3	2	4	4	3.36		
	CO4	3	4	2	4	3	4	4	3	2	3	2	4	4	3.24		
	CO5	4	4	2	4	3	4	4	3	3	3	2	4	4	3.38		
	CO6	4	4	4	4	4	4	4	3	3	3	3	4	4	3.70		
Mean Overall Score															3.38		

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17UBC530215

Hours/Week: 4
Credits: 2

OPERATING SYSTEMS

Course Outcomes:

1. Understand the basic concept of Computer System and Operating System Structure
2. Gain Knowledge of the fundamental aspects of process and processor managements with deadlocks and CPU scheduling
3. Introduce memory and virtual memory techniques
4. Understand files, directories and its accessing methods and its structures
5. Ability to know mass storage devices and its scheduling
6. Understand the security on the operating system and protection mechanisms.

UNIT I 10 HRS

INTRODUCTION: Meaning – Early Systems - Multiprogrammed Batch Systems – Real-Time Systems. **COMPUTER SYSTEM STRUCTURES:** Computer-System Operation - Storage Hierarchy - General System Architecture. **OPERATING SYSTEM STRUCTURES:** System Components - System Calls - Virtual Machines - System Generation.

UNIT II 10 HRS

PROCESS MANAGEMENT: Processes - Process Concept - Operation on Processes - Inter-Process Communication. **CPU SCHEDULING:** Basic Concepts - Scheduling Algorithms - Real Time Scheduling. **PROCESS SYNCHRONIZATION:** Background - Critical-Selection Problem – Semaphores. **DEADLOCKS:** System Model - Methods for Handling Deadlocks - Deadlock Avoidance - Recovery from Deadlock.

UNIT III 10 HRS

MEMORY MANAGEMENT: Background - Swapping - Paging - Segmentation with Paging. **VIRTUAL MEMORY:** Demand Paging - Page Replacement - Allocation of Frames – Thrashing.

UNIT IV 10 HRS

FILE - SYSTEM INTERFACE: File Concept - Access Methods - Directory Structures File-System Implementation: File-system Structure - Allocation Methods - Directory Implementation - Efficiency and Performance - Recovery. **MASS STORAGE STRUCTURE:** Disk Structure - Disk Scheduling - Swap-Space Management - Stable-Storage Implementation.

UNIT V 10 HRS

PROTECTION: Goals of Protection - Access Matrix - Capability Based Systems - Language-based Protection. **SECURITY:** The Security Problem - Authentication - Security Systems and Facilities - Encryption. **DISTRIBUTED SYSTEMS:** Distributed System Structures: Background – Distribution Coordination: Mutual Exclusion- Atomicity – Concurrency Control – Deadlock Handling- Election Algorithms.

TEXT BOOK

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, 9th Ed., John Wiley & Sons Inc., New Delhi 2013.

BOOKS FOR REFERENCE

1. Harvey M. Deitel, “An Introduction to Operating System”, 3rd ed., Addison Wesley, New York, 2003.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, 4th ed., Prentice Hall, New Delhi, 2014.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V	Course Code 17UBC530215	Title of the Paper OPERATING SYSTEM										Hours 4	Credits 3		
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	5	2	3	4	3	5	4	3	4	4	2	2	4	3.5	
CO2	4	2	4	3	4	4	4	5	2	4	2	1	3	3.2	
CO3	3	4	3	5	2	5	4	3	3	5	2	2	4	3.5	
CO4	5	2	1	2	4	4	4	4	3	4	2	3	3	3.1	
CO5	5	5	1	3	2	2	4	2	3	5	2	2	3	3.0	
CO6	4	3	2	3	2	4	4	3	5	4	2	2	4	3.2	
Mean Overall Score															3.2

Result: The Score for this Course is 3.2 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17UBC530216

Hours/Week: 3
Credits: 2

Software Lab-V:
ADVANCED JAVA PROGRAMMING

Course Outcomes:

1. Demonstrate programming language concepts RMI, Servlet
2. Write, debug, and document well-structured J2EE applications
3. Demonstrate the behavior of JSP and Cookies
4. Implements JSP connection with JDBC
5. Develop programming aspect with spring based forms.
6. Apply the concept of JSP using web views

List of Practicals:

1. Remote Method Invocation
2. Servlet
3. Servlet with JDBC
4. JSP
5. JSP Cookies
6. JSP with JDBC
7. EJB: Session Bean
8. Simple Spring application
9. Spring based forms
10. JSP Web Views

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V	Course Code 17UBC530216	Title of the Paper Software Lab-V: ADVANCED JAVA PROGRAMMING										Hours 3	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)										Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	3	3	3	4	4	3	4	3	2	3	4	4	3
CO2	3	4	3	3	4	4	3	4	3	3	2	3	2
CO3	4	2	4	5	3	3	3	3	4	4	3	4	2
CO4	3	3	4	2	4	4	3	4	3	4	4	3	4
CO5	3	4	3	4	3	3	4	3	4	2	3	4	4
CO6	4	3	2	4	4	3	4	2	3	3	4	4	3
Mean Overall Score													3.3

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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**Semester V
17UBC530217**

**Hours/Week: 3
Credits: 2**

Software Lab-VI: HTML-5 & CSS-3

Course Outcomes:

1. Create a web page using HTML5 semantic elements.
2. Ability to link web pages using anchor tags.
3. Ability to style the web pages using CSS3 style sheets.
4. Integrating the concepts of HTML5 and CSS3 in creating a web page.
5. Applying different types of gradient and animation effects in a web page.
6. Create HTML5 forms and canvas in a web page.

List of Practicals:

HTML5

1. Usage of New Semantic Elements
2. Create Page Structure and Navigation
3. Create Form Input and Validation.
4. Create Image onto Canvas.

CSS3

5. Selectors and Colors
6. Text and Drop Shadows
7. Transition- Rotating Box
8. Linear Gradient and Radial gradient.
9. 2D and 3D Animations
10. SVG, Drag and Drop.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V	Course Code 17UBC530217	Title of the Paper Software Lab-V: HTML-5 & CSS-3										Hours 3	Credits 2	
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	4	4	2	4	3	4	4	3	3	3	2	4	4	3.38
CO2	4	3	2	4	3	4	4	3	2	3	2	4	4	3.24
CO3	4	4	2	4	3	4	4	3	2	3	2	4	4	3.36
CO4	3	4	2	4	3	4	4	3	2	3	2	4	4	3.24
CO5	4	4	2	4	3	4	4	3	3	3	2	4	4	3.38
CO6	4	4	4	4	4	4	4	3	3	3	3	4	4	3.70
Mean Overall Score														3.38

Result: The Score for this Course is 3.38 (High Relationship)

Note:

Mapping Scale Relation Quality	1-20% 1 0.0-1.0 Very poor	21-40% 2 1.1-2.0 Poor	41-60% 3 2.1-3.0 Moderate	61-80% 4 3.1-4.0 High	81-100% 5 4.1-5.0 Very High
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Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17UBC530302A

Hours/Week: 4
Credits: 4

Core Elective-II (WS):
BUSINESS TRENDS IN I.T.

Course Outcomes:

1. Gain knowledge on the concepts and application of Business Systems
2. Understand the Various Business Intelligent System in IT
3. Define and analyze the principles of E-commerce and basics of World Wide Web
4. To evaluate the concept of Electronic Data Interchange and its legal, social and Technical aspects.
5. Express the security issues over the web, the available solutions and future aspects of e-commerce security
6. Understand the concepts of E-banking, electronic payment system

UNIT I 10 HRS

INTRODUCTION: Business and IT - Information Age - Reality Check - Information System - **INFORMATION TECHNOLOGIES IN THE MODERN ORGANIZATION:** Basic Concepts - Structure and IT Support - IT Support at Different Organization Levels - Managing IT in Organization - IT People and Careers.

UNIT II 10 HRS

ELECTRONIC COMMERCE: Business - to-Customer Applications - Market Research, Advertising and Customer Service -Business-to-Business and Collaborative Commerce Applications - Innovative Applications of E-Commerce - Infrastructure and E-Commerce Support services -Legal and Ethical Issues in E-Commerce.

UNIT III 10 HRS

COMPUTER-BASED SUPPLY CHAIN MANAGEMENT AND INFORMATION SYSTEMS INTEGRATION: Supply Chains and their Management - Supply Chain Problems and Solution - IT Supply Chain Support and Systems Integration - ERP - E-Commerce and Supply Chain Management - Order Fulfillment in E-Commerce.

UNIT IV 10 HRS

DATA, KNOWLEDGE AND DECISION SUPPORT: Management and Decision Making - Data Transformation and Management - Decision Support Systems - Enterprise Decision Support - Data and Information Analysis and

Mining - Data Visualization Technologies - Knowledge Management and Organizational Knowledge Bases.

UNIT V

10 HRS

INTELLIGENT SYSTEMS IN BUSINESS: Artificial Intelligence and Intelligent Systems - Expert Systems - Other Intelligent Systems - Intelligent Agents - **VIRTUAL REALITY:** An Emerging Technology - Ethical and Global Issues of Intelligent Systems.

TEXT BOOK

1. Turban, Rainer and Potter, "Introduction to Information Technology", Wiley India Pvt. Ltd, 3rd Ed., New Delhi, 2005.

BOOK FOR REFERENCE

1. WS Jawadekar, "Management Information System", 5th ed., Tata McGraw Hill Publishing Company Ltd., New Delhi, 2013.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V	Course Code 17UBC530302A	Title of the Paper Core Elective (WS): BUSINESS TREND IN I.T.													Hours 4	Credits 4
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8			
CO1	4	3	2	4	4	2	5	2	4	4	5	4	3	3.5		
CO2	4	4	2	3	4	3	3	5	2	4	4	5	4	3.6		
CO3	4	3	2	3	4	2	4	1	3	5	2	4	4	3.2		
CO4	5	2	1	2	4	2	3	5	2	4	4	5	3	3.2		
CO5	5	5	1	3	4	2	4	1	3	5	2	4	4	3.3		
CO6	5	3	2	3	4	2	1	3	5	2	4	4	3	3.1		
Mean Overall Score														3.3		

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17UBC530302B

Hours/Week: 4
Credits: 4

Core Elective-II (WS):
WEB TECHNOLOGY

Course Outcomes:

1. Understand the fundamental concepts of web technology.
2. Learn the basics of server side programming.
3. Infer web services, UDDI and WSDL.
4. Build online applications using web technology.
5. Demonstrate the database connectivity.
6. Discuss online security and payment processing mechanisms.

UNIT I **10 HRS**

INTRODUCTION: Internet Principles – Basic Web Concepts – Client / Server Model – Retrieving Data from Internet – HTML – Scripting Languages.

UNIT II **10 HRS**

SERVER SIDE PROGRAMMING: Dynamic Web Content – Server Side Technologies – Dynamic HTML – XML – Server Side Include Directives – Firewalls.

UNIT III **10 HRS**

WEB SERVICES: Introducing Web Services – The Web Services Technologies Architecture – UDDI- Public versus Private Registries – Web Service Description Language (WSDL)

UNIT IV **10 HRS**

ONLINE APPLICATIONS: Simple Applications – Online Databases – Monitoring User Events – Plug-ins – Database Connectivity – Internet Information Services [IIS] – Internet Commerce.

UNIT V **10 HRS**

ONLINE SECURITY AND PAYMENT PROCESSING MECHANISMS: Secure Socket Layer (SSL)- Credit Card Processing Models – Secure Electronic Transaction (SET) – SSL Versus SET – 3D Secure Protocol – Electronic Money.

TEXT BOOKS

1. R.Bremnath, C.S.Senthil Raja, V.Sivakumar, “Web Technology version 1.0”, Pratheeba Publications, Coimbatore, 2004. UNITS: I, II & IV

2. Frank P. Coyle, “XML, Web Services and Data Revolution”, Pearson Education, New Delhi, 2007. UNIT: III
3. Achyut S. Godbole, Atul Kahate, “Web Technologies”, Tata McGraw Hill Pvt. Ltd., New Delhi, 2013. UNIT: V

BOOK(S) FOR REFERENCE

1. Xavier.C, “Web Technology and Design”, New Age International Publishers, New Delhi, 2017.
2. Kogent, “Web Technologies”, Learning Solutions, New Delhi Biztantra, 2017.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V	Course Code 17UBC530302B	Title of the Paper Core Elective (WS): WEB TECHNOLOGY												Hours 4	Credits 4
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	3	4	2	3	4	3	3	4	3	4	3	4	3	3.3	
CO2	3	3	4	4	4	3	3	2	3	4	2	3	3	3.2	
CO3	4	2	3	5	3	3	3	3	4	4	3	3	2	3.2	
CO4	5	3	3	4	5	3	3	3	2	3	4	3	3	3.4	
CO5	3	3	4	3	3	4	4	3	3	3	3	3	2	3.2	
CO6	2	3	3	4	2	3	3	2	4	4	4	4	4	3.2	
Mean Overall Score														3.2	

Result: The Score for this Course is 3.2 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17UBC530218

Credits: 2

Self Paced Learning (Partial Online Course): CLOUD COMPUTING

Course Outcomes:

1. Gain knowledge on the concepts of Mobile Computing
2. Identify the various terminologies for cellular systems
3. Describe the basic concepts of Cloud Computing and its applications.
4. Understand the concept of Virtualization Techniques with examples
5. Gain idea about the Big Data with Map Reduce concept.
6. Extend their knowledge of big data analytics in Enterprises

UNIT I

INTRODUCTION: Cloud Computing at a Glance - Historical Developments – Building Cloud Computing Environments – Computing Platforms and Technologies. **VIRTUALIZATION:** Introduction – Characteristics of Virtualized Environments – Taxonomy of Virtualization Techniques – Virtualization and Cloud Computing – Pros and Cons of Virtualization – Technology Examples.

UNIT II

CLOUD COMPUTING ARCHITECTURE: Cloud Reference Model – Types of Clouds – Economics of the Cloud. **CLOUD PLATFORMS IN INDUSTRY:** Amazon Web Services: Compute Services – Storage Services – Communication Services – Additional Services. Google AppEngine: Architecture and Core Concepts – Application Life Cycle – Cost Model. Microsoft Azure: Azure core Concepts – SQL Azure.

UNIT III

DATA INTENSIVE COMPUTING: Map-Reduce Programming – Characterizing Data-Intensive Computations – Challenges ahead – Historical Perspective – Technologies for Data-Intensive Computing – Programming Platform. **CLOUD APPLICATIONS:** Scientific Applications – Healthcare – Biology – Geoscience – Business and Consumer Applications: CRM and ERP – Productivity – Social Networking – Media Applications.

UNIT IV

ADVANCED TOPICS IN CLOUD COMPUTING: Energy Efficiency in Clouds. **MARKET BASED MANAGEMENT OF CLOUDS:** Market-Oriented Cloud Computing – A Reference Model for MOCC – Technologies and

Initiatives supporting MOCC. **FEDERATED CLOUDS / INTER CLOUD:** Characterisation and Definition – Cloud Federation Stack – Aspects of Interest – Technologies for Cloud Federations.

UNIT V

SECURE DISTRIBUTED DATA STORAGE IN CLOUD COMPUTING:

Introduction - Cloud Storage: from LANs TO WANs - Technologies for Data Security in Cloud Computing. **DATA SECURITY IN THE CLOUD:** An Introduction to the Idea of Data Security - The Current State of Data Security in the Cloud - Homo Sapiens and Digital Information - Cloud Computing and Data Security Risk - Cloud Computing and Identity - The Cloud, Digital Identity, and Data Security - Content Level Security—Pros and Cons.

TEXT BOOKS

1. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, “Mastering Cloud Computing”, McGraw Hill Education (India) Private Limited Publications, First Reprint, 2013. UNIT I, II, III and IV.
2. Rajkumar Buyya, James Broberg, Andrzej Goscinski, “Cloud Computing – Principles and Paradigms”, John Wiley & Sons, Inc. Publications, 2011. UNIT V.

BOOK(S) FOR REFERENCE

1. Michael Miller, “Cloud Computing Web Based Applications that change the way you work and collaborate online”, Pearson Education, 2009.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V	Course Code 17UBC530218	Title of the Paper CLOUD COMPUTING														Hours	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
CO1	4	4	3	3	4	3	4	3	3	4	4	3	3	3.4			
CO2	4	5	4	4	4	4	3	4	3	4	4	3	4	3.8			
CO3	4	4	3	4	3	4	3	4	4	4	3	4	3	3.6			
CO4	4	3	3	4	4	4	3	4	3	4	4	3	3	3.5			
CO5	4	4	3	4	3	4	4	3	4	4	4	4	3	3.6			
CO6	4	4	3	4	3	4	2	3	4	3	4	4	3	3.4			
Mean Overall Score														3.5			

Result: The Score for this Course is 3.5 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17UBC540601A

Hours/Week: 2
Credits: 2

Skill Based Electives-I (BS) :
IMAGE EDITING

Course Outcomes:

1. Understand basic concepts of Images
2. Differentiate various types of Images and File Types
3. Be Familiar with managing Digital Images.
4. Understand the implementation of various drawing tools and techniques
5. Design digital artwork using vector and raster techniques
6. Implement advance animation and design techniques using digital images

UNIT-I **5 HRS**

INTRODUCTION: Image Editing Concepts – Using the Photoshop Workspace – Navigating in Photoshop CS3.

IMAGE MANAGEMENT: Opening, Duplicating, and Saving Images – Saving Images to Disk.

UNIT-II **5 HRS**

PAINTING AND BRUSHES: Basic Techniques- Brush Sizes and Shape.

FILLING AND STROKING: Filling Selection with Color or Patterns – The Paint Bucket Tool – Backspaces and Delete Key Techniques- Applying Gradient Tools.

RETOUCHING AND RESTORING: Cloning and Healing.

UNIT-III **5 HRS**

WORKING WITH LAYERS: Layer Basics- Moving, Linking, and Aligning Layers – 3D Image Editing.

UNIT-IV **5 HRS**

SHAPES AND STYLES: Drawing Polygon, Lines, and Custom Shapes – Modifying and Saving Effects.

TEXT: The Five Flavours of Text – Text as Art – Using the Type Tool – Applying Character Formatting.

UNIT-V **5 HRS**

MAPPING AND ADJUSTING COLORS: Color Effects and Adjustment – Quick and Automatic Color Effects – Quick and Automatic Corrections.

ANIMATION AND VIDEO: Working with Video, Image, and Animation.

TEXT BOOK

1. Louri Ulrich Fuller & Robert C. Fuller, “Photoshop CS3 Bible”, Wiley India (P) Ltd, New Delhi, 2011.

BOOK FOR REFERENCE

1. Peter Bauer, “Photoshop CS3 for Dummies”, Wiley India (P) Ltd., New Delhi, 2007.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V	Course Code 17UBC540601A	Title of the Paper SBE (BS)-I: IMAGE EDITING												Hours 2	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	3	2	5	3	4	3	3	2	3	4	3	3	3.2	
CO2	4	4	2	5	4	4	1	2	3	2	3	3	5	3.2	
CO3	4	3	3	5	4	3	2	3	3	3	3	4	4	3.4	
CO4	4	3	2	5	4	3	3	3	3	2	4	4	4	3.4	
CO5	4	3	3	5	4	3	2	2	3	4	3	3	3	3.2	
CO6	4	4	2	5	5	3	3	3	4	3	4	4	5	3.8	
Mean Overall Score														3.3	

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17UBC540601B

Hours/Week: 2
Credits: 2

Skill Based Electives-I (BS) : FUNDAMENTALS OF 2D ANIMATION

Course Outcomes:

1. Understand basic concepts of Vector Art
2. Get acquainted with the Animation Workspace
3. Gain Familiarity with creating Shapes and Symbols
4. Use various tools and animation techniques to create animated movies
5. Edit and modify Video and Sound using non-linear editors
6. Conceptual study of Interactive Animation and application

UNIT I 5 HRS

INTRODUCTION: Animate CC vs. Flash Professional CC - Getting Acquainted with Animate CC - Major Interface Features.

UNIT II 5 HRS

DESIGN A VECTOR ANIMATION : Creating the Project Document - Drawing Vector Assets - Working with Vector Shapes - Time to Animate! - Modify Animation through Easing - Publishing the Animation for Flash.

UNIT III 5 HRS

CONSTRUCT AN INTERNET MEME IMAGE : Starting the Project - Using External Graphics - Managing Bitmap Images - Creating Black Vector Shapes - Working with Text Elements - Generating an Image.

UNIT IV 5 HRS

COMPOSE AN ANIMATED HTML5 GREETING : Creating a New HTML5 Canvas Document - Laying Out the Background Elements - Drawing the Flowerpot - Editing the Flower Graphic Symbol - Animating the Flower Stalk with Inverse.

UNIT V 5 HRS

GENERATE A PROMOTIONAL VIDEO : Video Project Setup - Creating Dynamic Backgrounds with animated Shape Masking - Design a 3D Rotating Headshot - Animating Your Name with MotionPresets.

TEXT BOOK

1. Joseph Labrecque, Rob Schwartz "Learn Adobe Animate Cc For Interactive Media", Adobe Certified Associate Exam Preparation, 2016.

WEBREFERENCE

1. Adobe Animate cc help, "https://helpx.adobe.com/pdf/animate_reference.pdf"

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V	Course Code 17UBC540601B	Title of the Paper SBE (BS)-I: FUNDAMENTALS OF 2D ANIMATION												Hours 2	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	3	2	5	3	4	3	3	2	3	4	3	3	3.2	
CO2	4	4	2	5	4	4	1	2	3	3	3	3	4	3.2	
CO3	4	3	3	5	4	3	2	2	3	3	3	4	5	3.4	
CO4	4	3	2	5	4	3	3	3	3	2	4	4	4	3.4	
CO5	4	3	3	5	4	3	2	2	3	3	3	3	4	3.2	
CO6	4	4	2	5	5	3	3	3	4	3	4	4	5	3.8	
Mean Overall Score														3.3	

Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester V
17USS540701A

L P C
2 - 2

Inter Departmental Courses (IDC): SOFT SKILLS

Course Outcomes

1. To augment the level of confidence in articulation oif the students in their communication.
2. To ensure that the students learn to speak and interact with one another as social beings
3. To equip them and train to present the best of themselves as job seekers.
4. To equip with conversation techniques, presentation skills and grooming
5. To prepare them write their own resume and enhance their interview skills required by employers
6. To ensure that the students learn the parameters of group dynamics a key component of conversation

Module I

Basics of Communication: Definition of communication, Barriers of Communication, Grooming, Presentations & Practicum.

Module II

Resume Writing & Interview Skills: Resume Writing: What is resume? Types of Resume - Chronological, Functional and Mixed Resume, Steps in preparation of Resume. **Interview Skills:** Preparation

Module III

Group Discussion: Basics of Group Discussion, Parameters of GD, Essential Points for GD preparation, and GD Topics and Practicum.

Module IV

Personal Effectiveness: Self Discovery; and Goal Setting; Questioneers & Presentations for interview, Common interview questions, Attitude, Body Language, The mock interviews and Practicum

Module V

Numerical Ability: Calendar, Average, Percentage; Profit and Loss, Simple Interest, Compound Interest; Time and Work, Pipes and Cisterns; Time and Distance, Problems on Trains, Boats and Streams; Ratios and Proportions.

Module VI

Test of Reasoning - Verbal Reasoning: Series Completion, Analogy; Data Sufficiency, Assertion and Reasoning; and Logical Deduction. **Non-Verbal Reasoning:** Series; and Classification

Textbook

1. JASS, 2016. *Straight from the traits: Securing the soft skills*. St. Joseph's College, Trichy

References

1. Aggarwal, R.S. 2010. *A Modern Approach to Verbal and Non Verbal Reasoning*. S.Chand, New Delhi.
2. Aggarwal, R.S. 2001. *Quantitative Aptitude*. S.Chand. New Delhi
3. Covey, Stephen. 2004. *7 Habits of Highly effective people*, Free Press. Egan, Gerard. (1994). *The Skilled Helper* (5th Ed). Pacific Grove, Brooks/ Cole.
4. Khera ,Shiv 2003. *You Can Win*. Macmillan Books , Revised Edition.
5. Murphy, Raymond. 1998. *Essential English Grammar*. 2nd ed., Cambridge University Press. Sankaran, K., & Kumar, M. *Group Discussion and Public Speaking*. M.I. Pub, Agra, 5th ed., Adams, Media.
6. Trishna's 2006. *How to do well in GDs & Interviews*, Trishna Knowledge Systems.
7. Yate, Martin. 2005. *Hiring the Best: A Manager's Guide to Effective Interviewing and Recruiting*.

Evaluation Pattern

Modules	Topic	Examination Pattern	
		CIA	Online
I	Basics of Communication	15	5
II	Resume Writing & Interview Skills	15	5
III	Group Discussion	10	10
IV	Personal Effectiveness	10	10
V	Numerical Ability (Common Session)	-	10
VI	Test of Reasoning (Common Session)	-	10
	Total	50	50

Semester V
17USS540701B

Hours/Week: 2
Credits: 2

Inter Departmental Courses (IDC): NATIONAL CADET CORPS

Course Outcomes

1. NCC 'C' and 'B' certificates are very much useful and increase credit marks in UPSC and SSB examinations..
2. They learnt discipline punctual and leadership quality.
3. They got physical fitness for Army and Police selection.
4. They learnt general knowledge find political issue.
5. They got trained for social service and volunteers for disaster.
6. They will be the best citizens of India.

Unit-I: About NCC - Personality Development - Self Awareness (6 hours)

NCC Aims and objectives of NCC - Organization and training and NCC song Incentives for cadets in NCC - NCC ranks Religion, culture , traditions and customs of India.- National integration – importance and necessity - Freedom struggle and nationalist movement in India - Personality development - Introduction to personality development - Factors influencing / shaping personality – Physical , social, psychological and philosophical Self awareness – know yourself / insight . - Change your mindset.

Unit-II: Interpersonal Relationship and Communication - NDMA (6 hours)

Interpersonal relationship and communication - Communication skills Leadership traits - Types of leadership Attitude – assertiveness and negotiation - Time management - Effects of leadership with historical examples - Stress management skills - Interview skills - Conflict motives.- Importance of group – team work - Disaster Management - Civil defence organization and its duties – NDMA Types of emergencies / natural disasters- Assistance during natural / other calamities / floods / cyclone / earth quake / accident - Setting up of relief camp during disaster Management - Collection and distribution of aid material .

Unit-III: Social Awareness and Community Development - Hygiene and Sanitation (6 hours)

Social awareness and community development - Basics of social service- weaker sections of our society and their needs - Health and Hygiene Structure and functioning of the human body - Hygiene and sanitation- Physical and mental health - Infectious and contagious diseases and its prevention -

Basic of home nursing and first aid in common medical emergencies - Wounds and fractures - Introduction to yoga and exercises

Unit-IV: AIR-WING (6 hours)

Principles of flight – Elementary Mechanics – Atmosphere - Venturi effect and Bernoulli's theorem - Glossary of terms; Aero engines – Aero-engine components; Aircraft components – Airframe structure; Meteorology – Importance of Meteorology in Aviation; Air Navigation – Why a pilot should study Navigation; Airmanship – Airmanship; Aeromodelling – History of Aeromodelling – Materials used in Aeromodelling – Types of Aeromodels.

Unit-V: NAVAL (6 hours)

Naval orientation - history of Indian Navy – Navy head quarters commands fleets- ships shore establishment war ships and their role - induction to Anti submarine warfare.- Types of war ships - types anchor parts of anchor - GPS RACON RADAR - types of firewater making in the ships- NBCD organization and structure - Damage flooding.

Text Book

1. Cadet's hand book published by the Directorate General, National Cadet Corps, Ministry of Defence, R. K. Puram, New Delhi 110022, 2008.

Semester VI
17UBC630219

Hours/Week: 5
Credits: 3

CRYPTOGRAPHY AND NETWORK SECURITY

Course Outcomes:

1. Explain the basics of number theory and compare various encryption techniques.
2. Understand the manner in which message Authentication code and hash function work and the functionality of public key cryptography.
3. Familiarize in intrusion detection and firewall design
4. Examine the different types of security systems and applications.
5. Discuss different levels of security and services.
6. Recognize various security policies

Unit-I **12 HRS**

NETWORK SECURITY: Security Trends - The OSI Architecture - Security Attacks – Security Services - Security Mechanisms - A model for Network Security. **CLASSIC ENCRYPTION TECHNIQUES:** Symmetric Cipher Model - Substitution Techniques – Transposition techniques - Rotor Machines - Steganography.

Unit-II **12 HRS**

BLOCK CIPHERS AND DATA ENCRYPTION STANDARDS: Block Cipher- Principles – Data Encryption Standard - The strength of DES – Differential and Linear Cryptanalysis – Block Cipher design principles - **ADVANCED ENCRYPTION STANDARD:** The AES Cipher.

Unit-III **15 HRS**

PUBLIC KEY ENCRYPTION AND DIGITAL SIGNATURES: Principles of Public Key Crypto Systems - The RSA algorithm. **Message Authentication:** Authentication Requirements - Authentication Functions - Message Authentication codes - Hash Functions - Security of Hash Functions and MAC. **DIGITAL SIGNATURES:** Authentication Protocols.

Unit-IV **13 HRS**

AUTHENTICATION APPLICATIONS: Kerberos - X.509 Authentication Service – PKI. **ELECTRONIC MAIL SECURITY:** Pretty Good Privacy - S/MIME. **WEB SECURITY:** Web Security Considerations- - SSL and Transport Layer Security.

Unit-V**13 HRS**

SYSTEM SECURITY: Intruders - Intrusion Detection - Password Management. **Firewalls:** Firewall Design Principles - Trusted Systems.

TEXT BOOK

1. William Stallings, “Cryptography and network Security - Principles and Practices”, Prentice Hall (Pearson Education), 7th Ed., 2016.

BOOKS FOR REFERENCE

1. AtulKahate, “Cryptography and Network Security”, Tata McGraw Hill Publications, New Delhi, 2009.
2. Charles P. Pfleeger, Shari L. Pfleeger, “Security in Computing”, Prentice Hall, 5th Ed., 2015.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester VI	Course Code 17UBC630219	Title of the Paper CRYPTOGRAPHY AND NETWORK SECURITY																		Hours 5	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)													Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8								
CO1	4	3	5	3	4	4	3	2	4	3	3	2	2	2	3.2						
CO2	3	4	3	3	3	3	3	4	3	3	2	2	2	4	3.0						
CO3	3	4	2	4	3	4	3	4	3	4	2	4	3	3.3							
CO4	4	3	2	2	4	3	3	3	3	2	4	4	3	3.0							
CO5	4	3	2	4	3	4	3	3	2	3	3	3	3	3.0							
CO6	4	5	3	2	3	4	3	4	2	3	4	3	3	3.3							
Mean Overall Score															3.1						

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester VI
17UBC630220

Hours/Week: 5
Credits: 3

PHP with MYSQL

Course Outcomes:

1. Understand the Functionality of PHP Language
2. Understand the basic Concepts of MySQL
3. Develop Applications using PHP with MySQL
4. Learn to Produce dynamic PHP forms
5. Associate the syntax and functions available to deal with file processing for files on the server as well as processing web URLs
6. Design the paradigm for dealing with AJAX FORMS using PHP

UNIT I

13 HRS

ESSENTIAL PHP: Creating your Development Environment- Mixing HTML and PHP – Command Line PHP – Working with Variables – Creating Constants – Understanding PHP’s Internal Data Types – Operators and Flow Control

UNIT II

13 HRS

STRINGS AND ARRAYS: String Function – Modifying Data in an Array – Deleting Array Elements – Array with Loops – PHP Array Functions – Sorting Array – Splitting Array – Merging Array. **CREATING FUNCTION:** Passing Function – Passing Arrays to Function – Passing by Reference – Using Default Arguments – Passing Variable Numbers of Argument – Returning Data from Function - Nesting Functions.

UNIT III

13 HRS

READING DATA IN WEB PAGES: Setting up Web Pages to communicate with PHP – Text field – Checkbox – Radio Button – Password Controls – List Boxes – Button – Hidden Control – File Upload. **PHP BROWSER HANDLING POWER:** PHP’s Server Variables – HTTP Header – Getting the User’s Browser Type – HTTP Header – Data Validation – Client Side Data Validation.

UNIT IV

13 HRS

WORKING WITH DATABASE: Creating a MYSQL Database – Creating a New Table – Putting Data into the New Database – Accessing the Database – Update data into the Database – Insert data into the Database – Delete data from Database – Handling and Avoiding Errors.

UNIT V

13 HRS

AJAX: Writing AJAX – Creating XMLHttpRequest Object – Passing Data to the server with GET AND POST – Handling XML with PHP.

TEXT BOOK

1. Steven Holzner, “The Complete Reference PHP”, Tata McGraw Hill Pvt. Ltd., 2008

BOOK FOR REFERENCE

1. Leon Atkinson, “Core PHP Programming”, Pearson Education, 2004.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester VI	Course Code 17UBC630220	Title of the Paper PHP with MYSQL												Hours 5	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	3	3	4	3	4	3	1	3	1	3	4	2	2.90	
CO2	4	4	3	4	4	3	3	1	4	3	3	1	2	3.00	
CO3	4	4	4	3	4	3	3	3	4	1	4	2	2	3.15	
CO4	4	4	3	3	3	4	1	2	4	4	4	3	2	3.15	
CO5	3	4	3	3	4	4	2	4	3	2	1	4	2	3.00	
CO6	4	4	4	2	4	4	2	4	4	4	3	4	3	3.50	
Mean Overall Score														3.11	

Result: The Score for this Course is 3.11 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester VI
17UBC630221

Hours/Week: 5
Credits: 3

ASP.NET

Course Outcomes:

1. Understand the fundamental concepts of .NET frame work
2. Discuss the use of various web controls and rich controls
3. Infer State Management techniques in asp.net webpages
4. Discuss and extend data list and data grid controls
5. Demonstrate the database connectivity in ASP.NET
6. Comprehend the need for XML in performance tuning

UNIT I 13 HRS

INTRODUCTION: The .NET Framework – Learning .NET Languages – Understanding Namespaces & Assemblies – Setting up ASP.NET and IIS.
USING VISUAL STUDIO.NET: Starting VS.NET Project – Web Form Designer – Writing Code.

UNIT II 13 HRS

WEB CONTROLS: Stepping Up to Web Controls – Web Control Classes – AutoPostBack and Web Control Events. **VALIDATION & RICH CONTROLS:** Calendar – AdRotator – Validation Controls – Server Side Validation – Understanding Regular Expression.

UNIT III 13 HRS

STATE MANAGEMENT: View State – Transferring Information-Cookies – Session State – Session State Configuration – Application State. **ADO.NET OVERVIEW:** Characteristics of ADO.NET – ADO.NET Object Model

UNIT IV 13 HRS

ADO.NET DATAACCESS: Creating a Connection – Using Command with Data Reader – Updating Data – Accessing Disconnected Data. **DATALIST AND DATAGRID** – Using Templates with DataList – Data Binding with Multiple Templates – Selecting Items – Editing Items – Paging with DataGrid – Sorting with DataGrid.

UNIT V 13 HRS

USING XML: Basics – XML Classes – XML Validation – XML Display and Transforms – XML in ADO.NET – **CACHING AND PERFORMANCE TUNING:** Caching – Data Caching

BOOK FOR STUDY

1. Mathew MacDonald, "ASP.NET: The Complete Reference", Tata McGraw Hill Ltd., New Delhi, 2017.

BOOK(S) FOR REFERENCE

1. Dr. C. Muthu, "ASP.NET", Shalom InfoTech Pvt. Ltd., 2011.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester V1	Course Code 17UBC630221	Title of the Paper ASP.NET																		Hours 5	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)													Mean Score of COs		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8								
CO1	5	3	1	3	3	4	4	4	3	3	3	4	3	3.3							
CO2	4	4	1	4	3	4	5	4	3	3	3	4	4	3.5							
CO3	3	3	1	4	3	4	4	3	3	4	3	5	4	3.3							
CO4	4	4	1	4	4	4	4	3	3	4	3	4	4	3.5							
CO5	4	4	1	5	4	4	5	4	4	4	4	4	4	3.9							
CO6	4	4	1	4	4	4	5	4	2	3	4	4	4	3.6							
Mean Overall Score															3.5						

Result: The Score for this Course is 3.5 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester VI
17UBC630222

Hours/Week: 3
Credits: 2

Software Lab-VII
PHP with MYSQL

Course Outcomes:

1. Create a simple web-based system
2. Develop, Test and debug a simple PHP scripts.
3. Design PHP scripts that are used to create and populate database
4. Apply distributed techniques cookies manipulation in web-based systems.
5. Test and debug object-oriented PHP scripts
6. Design and Manipulate forms to provide user authentication.
7. Perform cookies manipulation

List of Practicals:

1. Simple Programs
2. String Functions
3. Arrays
4. Functions
5. Create a Home Page Design using PHP
6. Form Validation
7. Create Database and Tables using PHP
8. Database Operations – Insert, Update and Delete
9. Cookies Manipulation
10. File Upload and AJAX

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester VI	Course Code 17UBC630222	Title of the Paper Software Lab-VII: PHP with MYSQL												Hours 3	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	4	4	5	3	4	3	1	3	3	3	4	2	3.20	
CO2	4	4	3	5	4	3	3	4	3	4	4	1	3	3.50	
CO3	3	4	4	3	3	3	3	2	4	1	4	3	2	3.00	
CO4	4	4	4	3	4	4	1	3	4	2	3	3	3	3.20	
CO5	3	4	3	4	4	4	2	4	4	4	1	3	2	3.20	
CO6	4	3	3	2	4	4	2	3	4	4	3	4	3	3.30	
Mean Overall Score														3.23	

Result: The Score for this Course is 3.2 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester VI
17UBC630223

Hours/Week: 3
Credits: 2

**Software Lab-VIII
ASP.NET**

Course Outcomes:

1. Design forms using various web controls
2. Apply rich controls and validation controls to the web page
3. Illustrate cookies, session and application state in a web page
4. Create and manipulate the data in the database using ADO.NET.
5. Create a template using data list and data grid
6. Build an application using XML

List of Practical's:

1. Form Design using Various Web Controls
2. Ad Rotator and Calendar Control, Login Control (Page should expire after 3 wrong attempts)
3. Validation Controls
4. Cookie Manipulation
5. State Management (using Session and Application)
6. Data Retrieval, Updating using ADO.NET (using Stored Procedure)
7. Template Creation using DataList and DataGrid
8. Sorting and Paging using DataGrid
9. Day Planner Preparation using XML and ADO.NET
10. Data Caching

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester VI	Course Code 17UBC630223	Title of the Paper Software Lab-VIII: ASP.NET														Hours 3	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
CO1	5	3	1	4	3	4	4	4	3	3	3	5	3	3.5			
CO2	4	4	1	4	3	4	5	4	3	3	3	5	4	3.5			
CO3	3	3	1	4	3	4	4	3	3	4	3	5	4	3.3			
CO4	4	4	1	4	4	4	4	3	3	4	3	5	4	3.5			
CO5	4	4	1	5	4	4	5	4	4	4	4	5	4	4.0			
CO6	4	4	1	5	4	4	5	4	2	3	4	5	4	3.7			
Mean Overall Score														3.5			

Result: The Score for this Course is 3.5 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester VI
17UBC630303A

Hours/Week: 4
Credits: 4

Core Elective-III (WS):

MOBILE OPERATING SYSTEM AND ITS APPLICATIONS

Course Outcomes:

1. Identify the different features of real time and mobile operating systems.
2. Understand the development of mobile operating systems and development environment.
3. Use the JAVA programming language to build android mobile apps.
4. Design Android application using layouts, buttons and widgets.
5. Create digital content including 2D and 3D digital graphics and animation.
6. Learn to develop mobile applications with the framework resources to store application data in Persistent storage

UNIT I 10 HRS

MOBILE APPLICATION DEVELOPMENT: Mobile Device Evolution – Smart Phone's- Tablet PC's – Classic MAD Challenges – Mobile Platform – Types of Mobile Platforms(Mobile OS) – Mobile Applications - Cross Platform Mobile Apps Development- Benefits Of Cross Platform MAD .

UNIT II 10 HRS

GETTING TO KNOW ANDROID: Android - The Open Handset Alliance - The Android Execution Environment- Components of an Android Application - Android Activity Lifecycle -Android Service Lifecycle. **SETTING ANDROID DEVELOPMENT ENVIRONMENT:** Creating an Android Development Environment. **ANDROID DEVELOPMENT ENVIRONMENT FOR REAL APPLICATION:** Android and Social Networking - The Project Root Folder - The Source Folder - The Resource Folder -Building and Running the Micro Jobs Application.

UNIT III 10 HRS

LAYOUTS: Frame Layout – Linear Layout – Table Layout –Absolute Layout –Relative Layout. **BUILDING A VIEW:** Android GUI Architecture. **WIDGET BESTIARY:** Android Views -Textview and Edittext -Button and Imagebutton-Adapters and Adapter views - Checkboxes, Radiobuttons, and Spinners - Viewgroups - Gallery And Gridview - Listview And Listactivity – Scrollview.

UNIT IV 10 HRS

DRAWING 2D AND 3D GRAPHICS: Rolling Your Own Widgets -Layout - Canvas Drawing -Drawables - Bitmaps Bling - Shadows, Gradients, and

Filters- Animation -OpenGL Graphics. **INTER PROCESS COMMUNICATION:** Inter-Process Communication: Intents: Simple, Low-Overhead IPC - Getting A Result Via Inter-Process Communication.

UNIT V 10 HRS

PERSISTENT DATA STORAGE: Sqlite Databases and Content Providers - Databases Basic Structure of the Micro jobs Database Class - Reading Data from the Database - Modifying the Database – Content Providers -Consuming a Content Provider. **LOCATION AND MAPPING:** Location-Based Services - Mapping - The Google Maps Activity -The Map view and Map activity.

TEXT BOOKS

1. Yonathan Akilu Redda, "Cross Platform Mobile Applications Development" NTNU, 2012. UNIT I.
2. Rick Rogers, John Lombardo, Zigurd Mednieks, and Blake Meike," Android Application Development "O'Reilly, Shroft Publishers & Distributors Pvt Ltd, New Delhi, 2010. UNIT II, III, IV, V.

BOOKS FOR REFERENCE

1. Dave smith, Jeff friesen "Android Recipes a Problem Solution Approaches" A press, 2011.
2. Wei -MengLee" Beginning Android Application Development", Wiley Publishing Limited, 2011

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester VI	Course Code 17UBC630303A	Title of the Paper - Core Elective-III (WS): MOBILE OPERATING SYSTEM AND ITS APPLICATIONS												Hours 4	Credits 4
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	3	3	4	1	2	4	3	4	4	3	4	3	3.2	
CO2	4	2	3	4	1	3	3	4	3	3	4	3	4	3.1	
CO3	4	2	3	5	2	3	3	3	3	3	2	4	3	3.0	
CO4	4	2	3	5	2	3	3	3	3	3	2	4	3	3.0	
CO5	4	3	2	3	3	3	2	4	3	4	4	3	3	3.1	
CO6	3	3	4	4	3	3	4	3	4	3	4	4	4	3.5	
Mean Overall Score														3.1	

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester VI
17UBC630303B

Hours/Week: 4
Credits: 4

Core Elective-III (WS): NEXT GENERATION NETWORKS

Course Outcomes:

1. Understand the concept of Next Generation Networks
2. State out various NGN requirements on technology and management
3. Recognize networks evaluation towards Next Generation Networks
4. Defend the NGN functional architecture
5. Learn various Development areas of NGN
6. Summarize the knowledge in Corporate Responsibility for NGN

UNIT-I

10 Hrs

NEXT GENERATION NETWORKS: Introduction: Challenge: To Become More Than an ISP- To Apply a Model of Operation Driven by Customer Needs-NGN - NGN Aims at Improving Life Quality and Bringing New Life Experience - The Network Evolution Towards NGN -The Telecom Environment and Corporate Responsibility.**NGN VISION, SCENARIOS AND ADVANCES:** NGN Networks: Perspectives and Potentials - Some Possible Scenario - Home Networks - Machine-to-machine Communication - NGN Advances.

UNIT-II

10 Hrs

NGN REQUIREMENTS ON TECHNOLOGY AND MANAGEMENT: NGN Requirements on Technology- NGN Requirements on Management. **NGN FUNCTIONAL ARCHITECTURE:** The ITU NGN Functional Architecture- The Proposed NGN Functional Architecture.

UNIT-III

10 Hrs

NGN OPERATOR, PROVIDER, CUSTOMER AND CTE: NGN Network Operator - NGN Service Provider - NGN Customer and CTE. **NETWORK AND SERVICE EVOLUTION TOWARDS NGN:** Major Evolution Steps for the Networks and Services of Today - Fixed Network Evolution - Mobile Network Evolution - Cable Network Evolution - Internet Evolution - IP Network Problems Critical to be Solved.

UNIT-IV

10 Hrs

NGN KEY DEVELOPMENT AREAS: Terminal Area - Terminal Area - Access Network Area - Backhaul Network Area - Core Transport Network Area - Service Creation Area- Network Control and Management Area - Service

Control and Management - Advanced Technologies for Network and Service Management.

UNIT-V

10 Hrs

NGNS AND CORPORATE RESPONSIBILITY: Unsustainable Growth – Sustainable Development and Corporate Responsibility-The Purpose of Corporate Responsibility - The Fundamentals and the Limits of Corporate Responsibility-Standards and Tools of Corporate Responsibility - Guiding Concepts - Corporate Responsibility and NGN.

TEXT BOOK

1. Jingming Li Salina and Pascal Salina, “Next Generation Networks Perspectives and Potentials” John Wiley & Sons Ltd, England, 2008.

BOOK(S) FOR REFERENCE

1. Monique J. Morrow, Azhar Sayeed, “MPLS and Next Generation Networks: Foundations for NGN and Enterprise Virtualization”, Pearson Education India, First impression, India, 2008.
2. Ina Minie, Julian Lucek, “MPLS enabled Applications – Emerging developments and new technologies”, John Wiley & sons Ltd., 3rdEd, United Kingdom, 2011.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Course Code	Title of the Paper										Hours	Credits	
V1	17UBC630303B	Core Elective-III (WS): NEXT GENERATION NETWORKS										4	4	
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	4	3	2	4	4	4	2	2	3	4	2	3	3	3.0
CO2	4	4	2	3	4	1	3	5	2	4	2	5	3	3.2
CO3	4	3	2	3	4	2	4	1	3	5	2	4	3	3.0
CO4	5	2	2	2	4	1	3	5	2	4	2	5	3	3.0
CO5	5	5	1	3	4	2	4	1	3	5	2	4	3	3.2
CO6	5	3	2	3	3	4	4	1	3	5	2	4	3	3.2
Mean Overall Score														3.1

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$		Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$	
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Credits: 2

Course Outcomes:

1. Analyze the basic concepts of OOP and Apply it in problem solving.
2. Apply the fundamental principles of digital electronics and memories to problems.
3. Relate Java and its advance concepts in application programs.
4. Review the basic concept of Computer System and Operating System Structure with simple examples.
5. Review concepts of PHP with MySQL in simple problems.
6. Determine the basic building blocks of Dot Net in Building Web Applications.

C Programming, Object Oriented Programming with C++

Relational Database Management System, Digital Computer Fundamentals

Java Programming HTML5 and CSS3

VB, •NET, ASP•NET

Operating Systems, PHP with MYSQL

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester VI	Course Code 17UBCG30224	Title of the Paper COMPREHENSIVE EXAMINATION												Hours	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	3	4	2	4	3	3	4	2	3	4	4	3	3	3.2	
CO2	3	2	4	5	2	4	3	4	5	3	3	3	4	3.5	
CO3	4	4	3	3	3	4	5	2	1	3	3	4	3	3.2	
CO4	4	3	4	3	2	3	4	2	3	3	4	3	3	3.2	
CO5	5	2	3	3	2	3	4	2	3	3	3	5	4	3.2	
CO6	4	1	3	3	3	3	3	3	4	4	4	3	3	3.2	
Mean Overall Score														3.7	

Result: The Score for this Course is 3.2 (High Relationship)

Note:

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of DOs \& DCOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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INTERNSHIP

Course Outcomes:

- * Develop new technical skills with respect to industry standards.
- * Ability to Acquire, Evaluate, Organize and Maintain Information.
- * Improving problem-solving and critical thinking skills.
- * Learn to manage time and other resources effectively.
- * Develop appropriate workplace attitudes, behaving ethically and professionally.
- * Demonstrate Effective utilization of new software tools to complete tasks.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester VI	Course Code 17UBC630225	Title of the Paper INTERNSHIP												Hours	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	3	4	4	4	4	3	4	4	3	4	4	3	3	3.6	
CO2	3	3	4	4	4	4	3	4	5	3	3	4	4	3.7	
CO3	4	4	3	4	4	4	5	4	4	3	3	4	3	3.8	
CO4	4	4	4	3	3	3	4	4	3	3	4	3	3	3.5	
CO5	4	3	3	3	4	3	4	4	3	3	3	5	4	3.5	
CO6	4	3	3	3	3	3	3	3	4	4	4	3	3	3.3	
Mean Overall Score														3.5	

Result: The Score for this Course is 3.5 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester VI
17UBC630226

Hours/Week: 3
Credits: 3

PROJECT

Course Outcomes:

- * Learn to plan, Design and Analyze the modules.
- * Understand the Feasibility Criteria.
- * Ability to perform Critical Thinking, Reasoning, and Creative Thinking.
- * Develop Communication Skills, Both for Interpersonal And Presentation Needs.
- * Ability to visualize the problems and Provide Solution by Decision Making.
- * Knowing how and When to Use Technology and Choosing the Most Appropriate Tool for the Task.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester VI	Course Code 17UBC630226	Title of the Paper PROJECT												Hours 3	Credits 3
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	3	4	4	4	4	3	4	4	3	4	4	3	3	3.6	
CO2	3	4	4	4	4	4	3	4	5	3	4	4	4	3.8	
CO3	4	4	3	4	4	4	5	4	4	3	4	4	4	3.9	
CO4	4	4	4	3	3	3	4	4	4	4	4	3	4	3.7	
CO5	4	3	3	3	4	3	4	4	4	3	3	5	4	3.6	
CO6	4	3	3	4	4	3	4	3	4	4	4	4	3	3.6	
Mean Overall Score														3.7	

Result: The Score for this Course is 3.7 (High Relationship)

Note:

Mapping Scale	1-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
Relation Quality	0.0-1.0 Very poor	1.1-2.0 Poor	2.1-3.0 Moderate	3.1-4.0 High	4.1-5.0 Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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Semester VI
17UBC640602A

Hours/Week: 2
Credits: 2

Skill-Based Elective-II (WS):
FUNDAMENTALS OF 3D DESIGN

Course Outcomes:

1. Identify characteristics of rendering 3D objects for optimal system processing and analysis
2. Create a 3D environment featuring lighting and texture
3. Create basic 3D models and animations
4. Evaluate digital 3D projects, identify items for improvement, and implement changes.
5. Understand the fundamentals of strong 3D design
6. Construct multiple designs using several tools.

UNIT-I **5 HRS**

INTRODUCTION:

Computer Modeling and Animation – Types of Images - Raster - Vector – Different Dimensions – User Interface - Controls.

UNIT-II **5 HRS**

BLENDER INTERFACE:

Blender Screen – User Preferences – 3D Window – Window Modes – Moving in 3D Space – Blender Controls.

UNIT-III **5 HRS**

CREATING OBJECTS:

Meshes – Placing objects – Moving objects – Creating Vertices – Extruding Shapes – Modifiers – Knife Tool – Sculpt Mode.

LIGHTING: Lighting – Cameras.

UNIT-IV **5 HRS**

MATERIALS:

Settings – Buttons – New Materials – Preview – Diffuse.

TEXTURE:

Mapping – Displacement – Texture painting.

UNIT-V **5 HRS**

ANIMATION:

Introduction - Moving – Rotating - Scaling – Keying – Editing Curves.

RENDERING:

Settings – Video Clip – Ray Tracing.

TEXT BOOK

1. John M. Blain, “The Complete Guide to Blender Graphics: Computer Modeling and Animation”, CRC Press, Florida, 2012.

BOOK FOR REFERENCE

1. Lance Flavell, “Beginning Blender Open Source 3D Modeling, Animation, and Game Design”, A press Publication, USA, 2010.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester VI	Course Code 17UBC640602A	Title of the Paper SBE-II (WS): FUNDAMENTALS OF 3D DESIGNS														Hours 2	Credits 2
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)								Mean Score of COs			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8				
CO1	4	3	3	4	3	3	2	3	4	4	3	2	3	3.1			
CO2	4	3	3	4	3	3	3	3	4	3	3	4	3	3.2			
CO3	3	4	3	4	3	3	4	3	3	3	3	4	3	3.2			
CO4	4	3	4	3	4	4	3	3	4	4	3	2	3	3.1			
CO5	4	3	3	4	3	3	3	4	4	4	3	3	2	3.3			
CO6	3	4	3	4	3	4	4	3	4	4	3	3	2	3.0			
Mean Overall Score														3.1			

Result: The Score for this Course is 3.1 (High Relationship)

Note:

Mapping Scale	1-20%	21-40%	41-60%	61-80%	81-100%
	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$
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**Semester VI
17UBC640602B**

**Hours/Week: 2
Credits: 2**

Skill-Based Elective-II (WS): WEB DESIGN

Course Outcomes:

- Understand the fundamental elements of Design
- Comprehend various methods of building Web Pages.
- Design web pages using tables and forms
- Learn to design Lay outs using HTML and CSS techniques
- Utilize CSS to stylize Web Sites
- Use knowledge of HTML and CSS code and an HTML editor to create personal/business websites

UNIT I 5 HRS

WEB PAGE BUILDING BLOCKS – Basic HTML Pages – Semantic HTML – Markup – Elements – Attributes – Values.

UNIT II 5 HRS

TEXT CONTENT: Links – Lists – Images – URLs – Structuring Elements – Div – Semantic elements.

UNIT III 5 HRS

FORMS: Input Type – Value – Attribute – Post – Get – Buttons. **TABLES:** Rows – Columns – Rowspan – Colspan – Spacing – Editing Tables.

UNIT IV 5 HRS

INTRODUCTION TO CSS: Cascade Rule - Style Sheets – Integration – Applying Various Styles – Importance of Location.

UNIT V 5 HRS

ADVANCED CSS : Selectors – Name – Class – ID – Group – Pseudo Selectors – Formatting Fonts – Setting Color – Background – Shadow – Basic Transition.

TEXT BOOK

- Elizabeth Castro and Bruce Hyslop, “HTML5 and CSS3, Visual Quick Start Guide”, Peachpit Press, 7th Ed., Berkeley, 2012.

BOOK FOR REFERENCE

- Brian P. Hogan, “HTML5 & CSS3 Develop with Tomorrow’s Standards Today”, Pragmatic Programmers, LLC, 2010.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

[illegible]

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Result: The Score for this Course is 3.3 (High Relationship)

Note:

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very poor	Poor	Moderate	High	Very High

Values Scaling:

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of PQs \& PSOs}}$$

$$\text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

Notes

This image shows a full page of white paper with horizontal dotted lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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Notes

This image shows a full page of a worksheet designed for handwriting practice. It consists of approximately 20 horizontal rows. Each row is defined by two parallel dotted lines, creating a series of uniform gaps for writing. The entire page is otherwise blank, with no margins, text, or other markings.