



# PERIYAR UNIVERSITY

PERIYAR PALKALAI

NAGARSALEM-636011

## B.Sc.INFORMATIONSCIENCE

*CHOICEBASEDCREDITSYSTEM*

### OBE REGULATIONSANDSYLLABUS

(SEMESTER PATTERN)

( For Candidates admitted in the Colleges affiliated  
to Periyar University from 2021-2022 onwards)

**OUTCOMEBASEDEUCATIONREGULATIONSANDSYLLABUS**

(Witheffectfromtheacademicyear2021-2022onwards)

**1. PREAMBLE**

The programme prepares under Graduates in **Information Science** with strong theoretical inputs and relevant practical knowledge, who can be employed in industries. The programme develops requisite professional skills and problem solving abilities to pursue a successful career in software industry and for pursuing higher studies in Information Science.

**2. GRADUATE ATTRIBUTES**

1. Computational Knowledge
2. Problem Analysis & Solving
3. Design & Development of Solutions
4. Modern Tool Usage
5. Communications skills
6. Innovation & Entrepreneurship
7. Societal & Environmental concern

**3. PROGRAMME SPECIFIC QUALIFICATION ATTRIBUTES**

The programme specific qualification attributes meant to be achieved through subjects in the programme in terms of

1. Knowledge and understanding level (K1 and K2)
2. Application level (K3)
3. Analytical level (K4)
4. Evaluation capability level (K5)
5. Scientific or Synthesis level (K6)

**4. ELIGIBILITY FOR ADMISSION**

A candidate who has passed in Higher Secondary Examination with Mathematics or Business Mathematics or Computer Science or Statistics (Academic stream or Vocational stream) as one of the subjects under Board of Higher Secondary Examination, Tamil Nadu as per norms set by the Government of Tamil Nadu or an Examination accepted as equivalent thereto by the syndicate, subject to such conditions as may be prescribed are permitted to appear and qualify for the **Bachelor of Science in Information Science** degree examination of this university after a programme of study of three academic years.

## 5. PROGRAMME OBJECTIVES AND OUTCOMES

### ➤ Programme Educational Objectives (PEOs)

**PEO1:** Graduates are prepared to be employed in IT industries by providing expected domain Knowledge.

**PEO2:** Graduates are provided with practical training, hands-on and project experience to meet the industrial needs.

**PEO3:** Graduates are motivated in their career and entrepreneurial skill development to become a global leader.

**PEO4:** Graduates are trained to demonstrate creativity, develop innovative ideas and to work in teams to accomplish a common goal.

**PEO5:** Graduates are trained to address social issues and guided to approach problems with solutions.

### ➤ Programme Specific Outcomes (PSOs)

**After completion of the program the graduates will be able**

**PSO1:** To understand the important elements of computer system, including hardware and networking.

**PSO2:** To Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.

**PSO3:** To communicate effectively in both verbal and written form in industry and society.

**PSO4:** To Apply the technologies in various fields of Computer Science.

### ➤ Programme Outcomes (POs)

After completion of the programme, the graduates will be able

**PO1:** To develop fundamental knowledge of scientific theories and methods in computer science.

**PO2:** To Design, and analyze precise specifications of algorithms, procedures, and interaction behavior to express clearly on academic issues.

**PO3:** To apply the technologies in various fields of Information Science, including Mobile applications, Website development and management, databases, and computer networks.

**PO4:** To communicate effectively in both verbal and written form in such a way as to demonstrate their ability to present information clearly, logically in industry and society.

**6. DURATION OF THE PROGRAMME**

The programme shall extend over a period of three years comprising of six semesters with two semesters in one academic year. There shall not be less than 90 working days for each semester. Examinations shall be conducted at the end of every semester for the respective subjects.

**7. COURSE OF STUDY**

The programme of study shall comprise instruction in the following subjects according to the syllabus and books prescribed from time to time. The syllabus for various subjects shall be clearly demarcated into five units in each subject. Part -I, Part-II, Part – III, Part – IV and Part-V subjects are as prescribed in the scheme of examination. The Extension Activities are a must for each student to take part in at least in any one of the activities like NSS, YRC, SPORTS and RRC for the fulfillment of the degree.

**8. EXAMINATIONS**

The theory examination shall be three hour duration for each paper at the end of every semester. The candidate failing in any subject(s) will be permitted to appear in the subsequent examination. The practical examinations for core subjects and SBEC should be conducted at the end of the every semester.

**Submission of record notebooks for practical examinations**

Candidates appearing for practical examinations should submit bonafide Record notebooks prescribed for practical examinations, otherwise the candidates will not be permitted to appear for the practical examinations. However, in genuine cases where the students who could not submit their record notebooks, they may be permitted to appear for the practical examinations, provided the concerned Head of the Department certified that the candidate has performed the experiments prescribed for the course. For such candidates zero (0) marks will be awarded for record notebooks.

**9. Revision of Regulations and Curriculum**

The University may revise/amend/ change the Regulations and Scheme of Examinations, if found necessary.

**10. PASSING MINIMUM**

**(a) Theory**

The candidate shall be declared to have passed the examination if the candidate **secures not less than 40 marks** put together out of 100 marks (CIA+EA). **Minimum 40% should be secured (30 out of 75) in EA** of each theory subject.

**(b) Practical/Project vivavoce**

The candidate shall be declared to have passed the examination if the candidate **secures not less than 40 marks** put together out of 100 marks (CIA + EA). **Minimum 40% should be secured (24 out of 60) in EA** of each Practical subject.

**11. MarksDistribution andQuestion PaperPatternforB.Sc.,IS**

**11.1Theory–MarksDistribution**

MaximumMarks : 100Marks  
 External[EA] :75Marks  
 Internal[CIA] :25Marks

**(a). Theory-QuestionPaperPattern [External] (Total Marks:75)**

Part	Approaches	MarkPattern
A	Oneword(Answerallquestions&Threequestions from each unit)	15X1 = 15 (MultipleChoiceQuestions)
B	100to200words(AnsweranyTwooutoffive questions & One question from eachunit)	2X5=10(Analyticaltypequestions)
C	500 to 1000 words(Answer ALL questions &One question from each unit with InternalChoice)	5X10=50(Essaytypequestions)

**(b)Theory-InternalMarksDistribution**

(TotalMarks:25)Attendance :  
 5Marks

Assignment : 5Marks  
 Test : 15Marks

**11.2. Practical – Marks**

**Distribution**MaximumMarks: 100  
 MarksExternal[EA] : 60Marks  
 Internal[CIA] : 40Marks

**(a) Practical-ExternalMarks Distribution(TotalMarks:60)**

Foreachpractical questionthemarksshouldbeawardedasfollows(External)

- i) Algorithm/flowchart -20%
- ii) Writingthe program in themain answerbook -30%
- iii) Testand debugthe program -30%
- iv) Printingthecorrectoutput -20%

(Marksmaybeproportionatelyreducedfortheerrors committed ineach ofthe above)

**PracticalQuestionPaperPattern**

**Studentshouldattendtwoquestions(eitherorpattern)**

Note:

- (i) Practical ItoPracticalVIIandSBECPractical hasesamepattern
- (ii) Core&SBECPracticalExaminationmust beconductedattheendofeverySemester

**(b) Practical-InternalMarks Distribution(TotalMarks:40)**

- Record :15Marks
- InternalPracticalexaminations : 25Marks

**11.3ProjectEvaluation:**

ContinuousInternalAssessment	:40Marks
Evaluation(External)	:40Marks
Viva-voce(jointly)	:20Marks

**12. COMMENCEMENTOFTHIS REGULATION:**

These regulations shall take effect from the academic year 2021-2022, i.e, for students who are to beadmittedtothefirstyear oftheprogrammeduringtheacademicyear2021-2022andthereafter.

**Scheme of Examinations from the Academic Year 2021-  
2022CreditDistributionas pertheUniversity Norms.**

<b>SEMESTER</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>TotalCredits</b>
PART-I	3	3	3	3	-	-	12
PART- II	3	3	3	3	-	-	12
ALLIED	4	6	4	6	-	-	20
CORETHEORY	5	10	9	4	12	5	45
COREPRATICAL	2	2	2	2	4	8	20
ELECTIVE	-	-	-	-	4	8	12
SBECN	-	-	-	-	3	3	6
MSDC	-	2	2	2	2	2	10
NMEC	-	-	2	2		-	4
PROFESSIONALENGLISH	4	4	-	-	-	-	8
EVS	-	-	-	-	-	-	-
ADD-ONCOURSE	-	-	-	-	-	-	-
VALUEEDUCATION	2	-	-	-	-	-	2
EXTENSIONACTIVITY	-	-	-	-	-	1	1
<b>CumulativeTotalCredits</b>	<b>23</b>	<b>30</b>	<b>25</b>	<b>22</b>	<b>25</b>	<b>27</b>	<b>152</b>

## COURSE OF STUDY AND SCHEME OF EXAMINATION

SEM	PART	SUB CODE	TITLE OF THE SUBJECT	Hrs.		CRE	MARKS		
				Lect.	Lab	DIT	CIA	EA	TOTAL
<b>SEMESTER – I</b>									
I	I	21UFTA01	Tamil I	6	-	3	25	75	100
	II	21UFEN01	English I	6	-	3	25	75	100
	III	21UIS01	Core I: Problem Solving Through C	6	-	5	25	75	100
	III	21UISP01	Practical II: C Programming	-	3	2	40	60	100
	III		Allied I	7	-	4	25	75	100
	IV	21UVE01	Value Education	2	-	2	25	75	100
	IV		Professional English – Physical Science I	4	-	4	25	75	100
			<b>Total</b>	<b>31</b>	<b>3</b>	<b>23</b>	<b>190</b>	<b>510</b>	<b>700</b>
<b>SEMESTER – II</b>									
II	I	21UFTA02	Tamil II	6	-	3	25	75	100
	II	21UFEN02	English II	4	-	3	25	75	100
			NMSDC- I Effective Learning	2	-	2	25	74	100
	III	21UIS02	Core II: Data Structure and Algorithms	3	-	5	25	75	100
	III	21UISP02	Practical III: Data Structure using C	-	3	2	40	60	100
	III	21UIS03	Core III: Computer Organization and Architecture	4	-	5	25	75	100
	III		Allied II	5	-	4	25	75	100
	III		Allied – Practical		2	2	40	60	100
	IV	21UES01	Environmental Studies	1	-	-	25	75	100
	IV		Professional English – Physical Science II	4	-	4	25	75	100
			<b>Total</b>	<b>29</b>	<b>5</b>	<b>30</b>	<b>280</b>	<b>720</b>	<b>1000</b>
	<b>SEMESTER – III</b>								
III	I	21UFTA03	Tamil – III	6	-	3	25	75	100
	II	21FEN03	English – III	6	-	3	25	75	100
	III	21UIS04	Core IV: Relational Database Management Systems	3	-	5	25	75	100
	III	21UISP03	Practical III: SQL and PL/SQL	-	2	2	40	60	100
	III	21UIS05	Core V: Operating System	3	-	4	25	75	100
	III		Allied III	6	-	4	25	75	100
	III		Allied-Practical	-	-	-	-	-	-
	IV		NMSDC- II Programming Essentials for Employability (Fundamentals of Coding and Cloud)	2	-	2	25	75	100
	IV	NMEC-1	Non-Major Elective Course – I	2	-	2	25	75	100
			<b>Total</b>	<b>28</b>	<b>2</b>	<b>25</b>	<b>215</b>	<b>585</b>	<b>800</b>



SEM	PART	SUB CODE	TITLE OF THE SUBJECT	Hrs.		CRE DIT	MARKS		
				Lect.	Lab		CIA	EA	TOTAL
<b>SEMESTER –IV</b>									
IV	I	21UFTA04	Tamil–IV	6	-	3	25	75	100
	II	21UFEN04	English–IV	6	-	3	25	75	100
	III	21UIS06	CoreVI: Programmingin Java	4	-	4	25	75	100
	III	21UIISP04	Practical IV:Javaprogramming	-	3	2	40	60	100
	III		AlliedIV	5	-	4	25	75	100
	III		Allied-Practical Lab	-	2	2	40	60	100
	IV	NMSDC	DigitalSkillsforEmployability-OfficeFundamentals	2	-	2	25	75	100
	IV	NMEC-2	Non-MajorElective–II	2	-	2	25	75	100
	IV	Add-on	Add-onCourseInternshipProgramme	-	-	-	-	-	-
			<b>Total</b>	<b>25</b>	<b>5</b>	<b>22</b>	<b>230</b>	<b>570</b>	<b>800</b>
<b>SEMESTER –V</b>									
V	III	21UIS07	CoreVII:InformationSecurity	4	-	4	25	75	100
	III	21UIS08	CoreVIII:Web Technology	4	-	4	25	75	100
	III	21UIISP05	PracticalV:WebTechnologyLab	-	3	2	40	60	100
	III	21UIS09	CoreIX:OpenSource Technology	5	-	4	25	75	100
	III	21UIISP06	PracticalVI:OpenSourceTechnologyLab	-	4	2	40	60	100
	III	21UISE01/02/0/03	Elective–I	5	-	4	25	75	100
	IV		<b>NMSDC –Cloud and IT Essentials for Employability-Cyber Security</b>	<b>2</b>	<b>-</b>	<b>2</b>	<b>25</b>	<b>75</b>	<b>100</b>
	IV	21UISSP03	SBECIII-MobileApplicationDevelopment	-	3	3	40	60	100
			<b>Total</b>	<b>20</b>	<b>10</b>	<b>25</b>	<b>245</b>	<b>555</b>	<b>800</b>
<b>SEMESTER –VI</b>									
VI	III	21UIS10	CoreX:Programmingin Python	6	-	5	25	75	100
	III	21UIISP07	PracticalVII:PythonProgramming	-	4	3	40	60	100
	III	21UISPR01	MiniProject	-	5	5	40	60	100
	III	21UISE04/05/06	Elective-II	5	-	4	25	75	100
	III	21UISE07/08/09	Elective-III	5	-	4	25	75	100
	IV	21UISS01	SBEC IV-Quantitative Aptitude	3	-	3	25	75	100
	IV	NMSDC-III	EmergingTechnologyforEmployability-Cyber Security	2	-	2	-	75	100
	V	21UEX01	ExtensionActivities	-	-	1	-	-	-
			<b>Total</b>	<b>21</b>	<b>9</b>	<b>27</b>	<b>205</b>	<b>495</b>	<b>700</b>

PracticalExaminationsshouldbeconductedinthesamesemester

**ELECTIVESUBJECTS**

**Elective–I**

<b>Sem</b>	<b>Part</b>	<b>SubjectCode</b>	<b>Subject</b>
<b>V</b>	<b>III</b>	21UISE01	ArtificialIntelligence
		21UISE02	ComputerNetwork
		21UISE03	MobileComputing

**Elective–II**

<b>Sem</b>	<b>Part</b>	<b>SubjectCode</b>	<b>Subject</b>
<b>VI</b>	<b>III</b>	21UISE04	DataMiningand Warehousing
		21UISE05	WirelessNetwork
		21UISE06	ComputerGraphics

**Elective–III**

<b>Sem</b>	<b>Part</b>	<b>SubjectCode</b>	<b>Subject</b>
<b>VI</b>	<b>III</b>	21UISE07	SoftwareTesting
		21UISE08	NetworkSecurity
		21UISE09	InternetofThings

**NonMajorElectiveCourse–(NMEC)**

**ExtraDisciplinarySubjectsofferedbytheDepartmentofInformationScience**

The department can offer any one of these subjects to the other major subject students in each semester.

PART	SEM	SUB CODE	TITLE OF THE SUBJECT	Lect. Hours	Credit	MARKS		
						CIA	EA	TOTAL
IV	III	21UISN01	NMEC I: Basics Of Computers	2	2	25	75	100
		21UISN02	NMEC I: Computer Applications for Automation	2	2	25	75	100
	IV	21UISN03	NMEC II: Basics of Internet	2	2	25	75	100
		21UISN04	NMEC II: Image Editing Tool	2	2	25	75	100

**SBEC–SkillBasedElectiveCourses**

SEM	PART	SUB CODE	TITLE OF THE SUBJECT	Hrs.		CRE DIT	MARKS		
				Lect.	Lab		CIA	EA	TOTAL
III	IV	21UISSP01	SBEC -I: Office Automation Lab	-	2	3	40	60	100
IV									
V	IV	21UISSP03	SBEC-III: Mobile Application Development	-	3	3	40	60	100
VI	IV	21UISS01	SBEC-IV: Quantitative Aptitude	3	-	3	25	75	100

## Allied Subjectsfor anyDegree offeredbytheDepartmentof Computer/InformationScience

### SYLLABUS-CBCSPATTERN

#### EFFECTIVEFROMTHEACADEMICYEAR2021-2022

All subjects should be handled and valued by Computer Science Department only. ForUniversity practical examinations bothInternaland External examiners should be appointedfromDepartment of Computer/Information Science.

#### **FIRSTOPTION(AlliedComputerScience) FirstYear/SecondYear(SelectanyoneoftheSubjectwithPractical)**

PART	SEMESTER	TITLEOFTHE SUBJECT	Hrs.		CRE DIT	MARKS		
			Lect.	Lab		CIA	EA	TOTAL
III	I/III 21UISA01	AlliedPaper–I FundamentalofComputers	7	-	4	25	75	100
	II/IV 21UISA02	AlliedPaper–II ComputerApplicationsinOffice	5	-	4	25	75	100
	21UISAP01	AlliedPractical OfficeAutomation	-	2	2	40	60	100

#### **SECONDOPTION(Allied ComputerScience) FirstYear/SecondYear(SelectanyoneoftheSubjectwithPractical)**

PART	SEMESTER	TITLEOFTHE SUBJECT	Hrs.		CRE DIT	MARKS		
			Lect.	Lab		CIA	EA	TOTAL
III	I/III 21UISA03	AlliedPaper–I DatabaseSystems	7	-	4	25	75	100
	II/IV 21UISA04	AlliedPaper–II E-CommerceTechniques	5	-	4	25	75	100
	21UISAP02	AlliedPractical HTMLProgramming	-	2	2	40	60	100

**Allied Subjects for Computer  
Science/InformationScience /BCA**

**SYLLABUS-CBCSPATTERN**

**EFFECTIVEFROMTHEACADEMICYEAR2021-2022**

**FIRSTOPTION**

**FirstYear/SecondYear(SelectanyoneoftheSubjectwithPractical)**

PART	SEMESTER	TITLEOFTHESUBJECT	Hrs.		CRE DIT	MARKS		
			Lect.	Lab		CIA	EA	TOTAL
III	I/III	AlliedPaper–I StatisticalmethodsandtheirapplicationsI	7	-	4	25	75	100
	II/IV	AlliedPaper–II StatisticalmethodsandtheirapplicationsII	5	-	4	25	75	100
		AlliedPractical StatisticalPractical	-	2	2	40	60	100

**SECONDOPTION**

**FirstYear/SecondYear(SelectanyoneoftheSubjectwithPractical)**

PART	SEMESTER	TITLEOFTHESUBJECT	Hrs.		CRE DIT	MARKS		
			Lect.	Lab		CIA	EA	TOTAL
III	I/III	AlliedPaper–I PrinciplesofAccounting	7	-	4	25	75	100
	II/IV	AlliedPaper II CostandManagementAccounting	5	-	4	25	75	100
		AlliedPractical CommercePractical	-	2	2	40	60	100

**THIRDOPTION**

**FirstYear/SecondYear(SelectanyoneoftheSubjectwithPractical)**

PART	SEMESTER	TITLEOFTHE SUBJECT	Hrs.		CRE DIT	MARKS		
			Lect.	Lab		CIA	EA	TOTAL
III	I/III	AlliedMathematicsPaper-I	7	-	4	25	75	100
	II/IV	AlliedMathematicsPaper-II	5	-	4	25	75	100
		AlliedMathematicsPractical	-	2	2	40	60	100

**FOURTHOPTION**

**FirstYear/SecondYear(SelectanyoneoftheSubjectwithPractical)**

PART	SEMESTER	TITLEOFTHE SUBJECT	Hrs.		CRE DIT	MARKS		
			Lect.	Lab		CIA	EA	TOTAL
III	I/III	AlliedPhysicsPaper-I	7	-	4	25	75	100
	II/IV	AlliedPhysicsPaperII	5	-	4	25	75	100
		AlliedPhysicsPractical	-	2	2	40	60	100

**FIFTHOPTION**

**FirstYear/SecondYear(SelectanyoneoftheSubjectwithPractical)**

PART	SEMESTER	TITLEOFTHE SUBJECT	Hrs.		CRE DIT	MARKS		
			Lect.	Lab		CIA	EA	TOTAL
III	I/III	AlliedElectronicsPaper-I	7	-	4	25	75	100
	II/IV	AlliedElectronicsPaperII	5	-	4	25	75	100
		AlliedElectronicsPractical	-	2	2	40	60	100

## SEMESTER I

<b>SubjectTitle</b>	<b>PROBLEMSOLVINGTHROUGHHC</b>	<b>Semester</b>	I
<b>SubjectCode</b>	<b>21UIS01</b>	<b>Specialization</b>	NA
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	86:6:0:5

### CourseObjective:

1. Itaimstoprovideexposuretoproblem-solvingthroughprogramming.
2. To apprehend the basic concepts of C- Programming language. This course introducesfundamentalconcepts such as arrays andstructures.
3. Itcoversconcepts suchasarrays,pointersandfile handlingmethods.
4. Itprovidestechnical skillstodesignanddevelopvariousapplications.

CO Number	COStatement	KnowledgeLevel
CO1	RecognizetheBasicTerminologiesofC Programming.	K1
CO2	Understandingthe statement structureand apply simpleproblems.	K2,K3
CO3	Understandandapplythepre-definedfunctions anduserdefined functionsandthenapplythesimpleproblems.	K3
CO4	DemonstratetheoperationofStructuresand unions.	K3,K4
CO5	Recognizetheoperation ofFiles.	K3,K4

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

SubjectTitle	PROBLEMSOLVINGTHROUGH C	Semester	I	
SubjectCode	21UIS01	Specialization	NA	
Type	Core:Theory	L:T:P:C	86:6:0:5	
Unit	Contents	Levels	Sessions	
I	OverviewofComputersandProgramming:ElectronicComputersThenandNow,ComputerHardware,Computer Software , The Software Development Method,Applying the Software Development Method , ProfessionalEthicsforComputerProgrammersFundamentals ofCLanguages:History ofC,CharacterSet,IdentifiersandOverview of C:- Introduction - character set - C tokens -keyword & identifiers – constants – variables - data types – Declarationsofvariables,operators-expressions-Evaluationofexpression-Mathematicalfunctions-Formattedinput and output	K1	17	
II	Decision Statements: If, if else, switch, break, continue - the?Operator-TheGOTOstatement.– LoopControlStatements: Introduction – for, nested for loops – while,do-whilestatements–Arrays:One-dimensional-Twodimensional -Multidimensional arrays	K2,k3	17	
III	Character string handling - Declaring and initializing stringvariables - Reading strings from terminal - Writing stringstoscreen-Stringhandlingfunctions-User-definedfunctions:Needforuserdefinedfunctions– Typesoffunctions - calling a function category of functions - noarguments and no return values - Arguments but no returnvalues-Argumentswithreturnvalues–Recursion- functions with arrays - The scope and lifetime of variablesinfunctions	K2,K3	17	
IV	Structure: Definition- Structure initialization - Comparisonof structure variables - Arrays of structures - Arrays withinstructures - Structures within structures – unions. Pointers:understandingpointers-accessingthe address ofavariab le - declaring and initializing pointers - accessing a variablethrough its pointers - pointer expressions - pointers andarrays-pointersandcharacterstrings- pointersandfunctions -pointers and structures	K3,K4	17	



**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>V</b>	FileManagementinC:definingandopeningafile-closing file - I/O operations on files - error handling duringI/O operations - Random access to files - command linearguments. Preprocessors	<b>K3,K4</b>	<b>18</b>
<b>LearningResources</b>			
<b>TextBooks</b>	1. ProblemsolvingandprogramdesigninC/JeriR.Hanly, ElliotB.Koffman .—7th ed.,PEARSON 2. E.Balagurusamy, ProgramminginANSIC, fifthedition, TataMcGraw-Hill.		
<b>Reference Books</b>	1.V.RajaramanComputerProgramminginCPrenticeHallofIndiaPvtLtd, 1st Edition, 2004 2YashwvantKanetkar LetusCBPBPublications 13thEdition, 2014		
<b>Website /Link</b>	<a href="http://www.learn-c.org/http://crasseux.com/books/tutorial/">http://www.learn-c.org/http://crasseux.com/books/tutorial/</a>		

**MappingwithProgrammeOutcomes**

CO Number	PO1	PO2	PO3	PO4
CO1	S	S	S	-
CO2	S	M	M	S
CO3	S	L	L	M
CO4	M	S	M	S
CO5	S	L	S	S

S-Strong, M-Medium, L-Low

<b>Subject Title</b>	<b>PRACTICALI:C-PROGRAMMING</b>	<b>Semester</b>	<b>I</b>
<b>Subject Code</b>	<b>21UIISP01</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Practical</b>	<b>L:T:P:C</b>	<b>45:0:3:2</b>

**CourseObjective:**

1. To impart Practical Training in C Programming Language.
2. Familiarize the different control and decision making statements in -C.
3. Build programs using arrays and strings.
4. Provide knowledge on working with files and functions.

**LIST OF PROGRAMS**

1. Develop a C program to print prime numbers within the range of integers given..
2. Develop a C Program to find the sum and average of given N numbers.
3. Develop a C Program using all decision making and looping statements.
4. Develop a C Program to arrange the given numbers in ascending/descending order.
5. Develop a C Program to perform matrix multiplication.
6. Develop a C Program to manipulate string functions.
7. Develop a C Program to find the Fibonacci series for a given number using recursive function.
8. Develop a C Program to show Call by Value and Call by Reference.
9. Develop a C program to swap two numbers using pointers.
10. Develop a C Program to update the student's details using various file modes.
11. Develop a C Program to copy the content of one file to another file.

**COURSE OUTCOME:**

1. Study all the Basic Statements in C Programming.
2. Practice the usage of branching and looping statements.
3. Apply string functions and arrays usage.
4. Analyze the use of pointers and files.

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>DATA STRUCTURES ANDALGORITHMS</b>	<b>Semester</b>	<b>II</b>
<b>SubjectCode</b>	<b>21UIS02</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>45:3:0:5</b>

**CourseObjective:**

1. Understandthebasicconceptofalgorithms.
2. Tointroducethevariousdatastructuresandtheirimplementations.
3. Evaluatetheperformance ofvarious sortingalgorithms.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
CO1	Remembertheconcept ofalgorithms.	K1
CO2	Understandingthestackandqueues.	K2
CO3	Applylinkedlist forother data structures.	K2,K3
CO4	Evaluatethe trees and sortingmethods.	K3,K4
CO5	Analyzethesortingandfileorganizations.	K5

**B.Sc-Information Science Syllabus under CBCS Pattern with effect from 2021-2022 Onwards**

<b>Subject Title</b>	<b>DATA STRUCTURES AND ALGORITHMS</b>	<b>Semester</b>	<b>II</b>	
<b>Subject Code</b>	<b>21UIS02</b>	<b>Specialization</b>	<b>NA</b>	
<b>Type</b>	<b>Core: Theory</b>	<b>L:T:P:C</b>	<b>45:3:0:5</b>	
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>	
<b>I</b>	Introduction of algorithms, analyzing algorithms, Arrays: Representation of Arrays, Implementation of Stacks and queues, Application of Stack: Evaluation of Expression - Infix to postfix Conversion- Multiple stacks and Queues, Sparse Matrices.	<b>K1</b>	<b>8</b>	
<b>II</b>	Linked list: Singly Linked list- Linked stacks and queues- polynomial addition- More on linked Lists- Doubly linked List and Dynamic Storage Management- Garbage collection and compaction.	<b>K2</b>	<b>8</b>	
<b>III</b>	Trees: Basic Terminology- Binary Trees- Binary Tree representations- Binary trees- Traversal- More on Binary Trees - Threaded Binary trees- counting Binary trees. Graphs: Terminology and Representations- Traversals, connected components and spanning Trees, Single Source Shortest path problem.	<b>K2, K3</b>	<b>8</b>	
<b>IV</b>	Symbol Tables: Static Tree Tables- Dynamic Tree Tables- Hash Tables Hashing Functions- overflow Handling. External sorting: Storage Devices- sorting with Disks: K-way merging- sorting with tapes.	<b>K3, K4</b>	<b>10</b>	
<b>V</b>	Internal Sorting: Insertion sort - Quick sort - 2 way Merge sort - Heap sort - shell sort - sorting on keys. Files: Files, Queries and sequential organizations - Index Techniques- File organization	<b>K5</b>	<b>11</b>	
<b>Learning Resources</b>				
<b>Text Books</b>	Ellis Horowitz, Sartaj Shani, Fundamentals of Data Structures, Galgotia publication.			
<b>Reference Books</b>	1. Data structures Using C Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J. Augenstein, Kindersley (India) Pvt. Ltd., 2. Data structure and Algorithms, Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, Pearson Education Pvt. Ltd.,			
<b>Website/ Link</b>	1. <a href="http://www.fretechbooks.com/a-practical-introduction-to-data-structures-and-algorithm-analysis-third-edition-c-version-t804.html">www.fretechbooks.com/a-practical-introduction-to-data-structures-and-algorithm-analysis-third-edition-c-version-t804.html</a> 2. <a href="http://www.nptel.ac.in/courses/106101060/">http://www.nptel.ac.in/courses/106101060/</a> 3. <a href="http://www.nptel.ac.in/courses/106104019/">http://www.nptel.ac.in/courses/106104019/</a>			

**Mapping with Programme Outcomes**

<b>CO Number</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	S	S	-
<b>CO2</b>	S	M	M	S
<b>CO3</b>	S	L	L	M
<b>CO4</b>	M	S	M	S
<b>CO5</b>	S	L	S	S

S-Strong, M-Medium, L-Low

## B.Sc-Information Science Syllabus under CBCS Pattern with effect from 2021-2022 Onwards

<b>Subject Title</b>	<b>DATA STRUCTURES USING C</b>	<b>Semester</b>	<b>II</b>
<b>Subject Code</b>	<b>21UIISP02</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core: Practical</b>	<b>L:T:P:C</b>	<b>45:0:3:2</b>

### **Course Objective:**

1. To impart Practical Training in C Programming Language.
2. Understanding the data structures stack and queues.
3. Apply linked list for other data structures.
4. Analyze the sorting and file organizations.

### **LIST OF PROGRAMS:**

1. Write a C program to create two array list of integers. Sort and store the elements of both of them in third list.
2. Write a C program to multiply two matrices A and B and store the resultant matrix in C using arrays.
3. Write a C program to experiment the operation of STACK using array.
4. Write a C program to create menu driven optionsto implement QUEUE to perform the following  
(i) Insertion (ii) Deletion (iii) Modification (iv) Listing of elements
5. Write a C program to create Linked list representation of employee records and do the following operations using pointers.  
(i) To add a new record.  
(ii) To delete an existing record.  
(iii) To print the details about an employee.  
(iv) To find the number of employees in the structure.
6. Write a C Program to count the total nodes of the linked list and to insert a new element at the end of the linked list.
7. Write a C program to insert a new element at the beginning of a doubly linked list.
8. Write a C program to display the hashtable, using the mid square method.
9. Write a C program to traverse the given binary tree using all traversal methods.
10. Write a C program to insert a new element in a binary tree.

### **COURSE OUTCOME:**

1. Study all the Basic operation of matrices and stack.
2. Practice the usage of branching and looping statements in hashtable.
3. Apply arrays for stack and queue.
4. Analysis the use of pointers for linked list, doubly linked list and tree traverse.

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>COMPUTERORGANIZATIONAND ARCHITECTURE</b>	<b>Semester</b>	<b>II</b>
<b>SubjectCode</b>	<b>21UIS03</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>56:4:0:5</b>

**CourseObjective:**

1. ToknowStructureand functionsofComputerarchitectureandorganizations.
2. Observethecharacteristics ofvariouscomputermemoryconcepts.
3. Tounderstandthecomputerarithmeticandmachineinstructions.
4. Understandtheparallelprocessingconcepts.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
CO1	Recognizethe BasicNumbersystemandlogic gates	K1
CO2	UnderstandingtheflipflopsandKarnaughmaps	K2,K3
CO3	Understandandapplymicrooperation anddatatransfer	K3
CO4	Demonstratethecomputerarithmeticand addressing modes.	K3,K4
CO5	AnalyzethememoryandI/Oorganizations.	K3,K4

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

Subject Title	<b>COMPUTER ORGANIZATION AND ARCHITECTURE</b>	Semester	<b>II</b>
Subject Code	<b>21UIS03</b>	Specialization	<b>NA</b>
Type	<b>Core:Theory</b>	L:T:P:C	<b>56:4:0:5</b>
Unit	Contents	Levels	Sessions
<b>I</b>	Digital Principles: Definition for digital signals – Digital waveforms – Digital logic – Moving and Storing Digital Information – Digital Operations – Digital computers – Digital Integrated Circuits. Digital Logic: The Basic Gates – NOT, OR, AND – Universal Logic Gates – NOR, NAND – AND-OR-Invert Gates – Positive and Negative Logic.	<b>K1</b>	<b>12</b>
<b>II</b>	Combinational Logic Circuits: Boolean Laws And Theorems – Sum-of-products Method – Truth Table to Karnaugh Map – Pairs, Quads, and Octets – Karnaugh Simplification – Don't-care Conditions – Product-of-sums Simplification. Data-Processing Circuits: 16-to-1 Multiplexer – 1-to-16 De-multiplexer – BCD-to-decimal Decoder – Decimal-to-BCD Encoder – Exclusive-or Gates – Parity Generation and Application.	<b>K2,K3</b>	<b>12</b>
<b>III</b>	Number Systems and Codes: Binary Number System – Binary-to-decimal Conversion – Decimal-to-binary Conversion – Octal Numbers – Hexadecimal Numbers – The ASCII Code – The Excess-3 Code – The Gray Code. Arithmetic Circuits: Binary Addition – Binary Subtraction – Unsigned Binary Numbers – Sign-magnitude Numbers – 2'S Complement Representation – 2'S Compliment Arithmetic.	<b>K2,K3</b>	<b>12</b>
<b>IV</b>	Arithmetic Circuits: Arithmetic Building Blocks – The Adder – subtractor – Fast Adder – Arithmetic Logic Unit – Binary Multiplication and Division. Clocks and Timing Circuits: Clock Waveforms. Flip-Flops: RS Flip-flops – Edge-triggered D Flip-flops – Edge triggered JK Flip-flops – JK Master-slave Flip-flops.	<b>K3,K4</b>	<b>12</b>
<b>V</b>	Registers: Serial-In Serial-Out – Serial-In Parallel-Out – Parallel-In Serial-Out – Parallel-In Parallel-Out. Memory: Introduction – Magnetic Memory – Optical Memory – Memory Addressing – ROMs, PROMs, EPROMs and EEPROM – RAMs. A Simple Computer Design.	<b>K3,K4</b>	<b>12</b>
	<b>Learning Resources</b>		
<b>Text Books</b>	Donald P Leach, Albert Paul Malvino and Goutam Saha, – Digital Principles and Applications, 8 <sup>th</sup> Edition, TMH, 2006.		

## B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards

<b>Reference Books</b>	<ol style="list-style-type: none"><li>1. MorrisMano,"DigitalLogic andComputerDesign,"4<sup>th</sup>Edition,Pearson,2008</li><li>2. Thomas C Bartee, "Digital Computer Fundamentals," sixth edition, McGraw-Hill,1985</li><li>3. PradeepK.Sinha,PritiSinha,"ComputerFundamentals,"SixthEdition,BPBPublishations,2007</li></ol>
<b>Website /Link</b>	<a href="http://www.javatpoint.com/computer-organization-and-architecture-tutorial">www.javatpoint.com/computer-organization-and-architecture-tutorial</a>

### **MappingwithProgrammeOutcomes**

<b>CONumber</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	S	S	-
<b>CO2</b>	S	M	M	S
<b>CO3</b>	S	L	L	M
<b>CO4</b>	M	S	M	S
<b>CO5</b>	S	L	S	S

S-Strong,M-Medium,L-Low



**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>RELATIONAL DATABASEMANAGEMEN TSYSTEMS</b>	<b>Semester</b>	<b>III</b>
<b>SubjectCode</b>	<b>21UIS04</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>41:3:0:5</b>

**CourseObjective:**

1. UnderstandthebasicconceptofDataBaseanddatabasemanagementsystem.
2. UnderstandandapplytheSQLfundamentals.
3. EvaluatetheRelationaldatabasedesign.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
CO1	Remembertheconceptofdatabase.	K1
CO2	Understandingthedata models andERDiagram.	K2
CO3	ApplySQLcommands.	K2,K3
CO4	EvaluatetheDBMSinSQL.	K3,K4
CO5	AnalyzetheTransactionmanagement.	K5

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

Subject Title	RELATIONAL DATABASEMANAGEMENT SYSTEMS	Semester	III	
Subject Code	21UIS04	Specialization	NA	
Type	Core:Theory	L:T:P:C	41:3:0:5	
Unit	Contents	Levels	Sessions	
I	Introduction:DatabaseSystemApplications-PurposeofDatabaseSystems-ViewofData-DatabaseLanguages-Transaction Management-Database Architecture-Database usersandAdministrators. Relational Model: Structure of Relational Databases – DatabaseDesign–ERModel-OverviewoftheDesignProcess–The Entity – relationship Model – Constraints – Entity RelationshipDiagrams.	K1	6	
II	RelationalAlgebraOperations–RelationalLanguages:TheTuple Relational Calculus –The Domain Relational Calculus – SQL:Background–DataDefinition–BasicStructureofSQL Queries – Set Operations – Aggregate Functions – Null Values – NestedSub-Queries–Views–Modification oftheDatabase.	K2	9	
III	DataNormalization: PitfallsinRelational DatabaseDesign– Decomposition – Functional Dependencies – Normalization – FirstNormalForm– Second NormalForm – ThirdNormalForm – Boyce-Codd Normal Form – Fourth Normal Form– FifthNormalForm–De-normalization– DatabaseSecurity:DataSecurityRequirements– ProtectingtheDatawithinthe Database – Granting and Revoking Privileges – DataEncryption.	K2,K3	9	
IV	PL/SQL: A programming Language: History - Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration–Assignmentoperation–Bindvariables– SubstitutionVariables–Printing– ArithmeticOperators.ControlStructuresandEmbeddedSQL:Contr olStructures–NestedBlocks–SQLINPL/SQL–DataManipulation- TransactionControlstatements.PL/SQLCursorsandExceptions:Cu rsors–Implicit&ExplicitCursorsandAttributes –CursorFORloops–SELECT...FORUPDATE–WHERE CURRENTOFclause–CursorwithParameters–CursorVariables– Exceptions–Typesof Exceptions.	K3,K4	9	
V	PL/SQL Composite Data Types: Records – Tables – Varrays.Named Blocks: Procedures – Functions – Packages - Triggers –DataDictionaryViews.	K5	8	
<b>LearningResources</b>				
<b>Text Books</b>	1. –DatabaseSystem Concepts  ,AbrahamSilberschatz, HenryF.Korth, S.Sudarshan, TMH 5 <sup>th</sup> Edition (Units–I,II) 2. –Fundamentals ofDatabaseManagement Systems  , AlexisLeon, Mathews Leon,VijayNicoleImprintsPrivateLimited. (Unit-III) 3. –DatabaseSystemsUsingOracle  NileshShah,2 <sup>nd</sup> edition,PHI.UNIT-IV:			

## B.Sc-InformationScience Syllabusunder CBCSPatternwiththeeffectfrom2021-2022Onwards

	Chapters10&11 UNIT-V:Chapters12,13&14.
<b>Reference Books</b>	AlexixLeon&MathewsLeon,"EssentialofDBMS",2ndreprint,VijayNicolePublications, 2009.
<b>Website /Link</b>	1. <a href="https://www.w3schools.com/sql">https://www.w3schools.com/sql</a> 2. <a href="https://www.tutorialspoint.com/sql">https://www.tutorialspoint.com/sql</a> 3. <a href="https://livesql.oracle.com">https://livesql.oracle.com</a>

### MappingwithProgrammeOutcomes

CO Number	PO1	PO2	PO3	PO4
CO1	S	S	S	-
CO2	S	M	M	S
CO3	S	L	L	M
CO4	M	S	M	S
CO5	S	L	S	S

S-Strong,M-Medium,L –Low

## B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards

<b>SubjectTitle</b>	<b>PRACTICALIII–SQL and PL/SQL</b>	<b>Semester</b>	<b>III</b>
<b>SubjectCode</b>	<b>21UISP03</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Practical</b>	<b>L:T:P:C</b>	<b>30:0:2:2</b>

### **CourseObjective:**

1. To impart Practical Training in DDL Commands.
2. Familiarize the different DML Commands.
3. Build queries with SQL Commands.
4. Provide knowledge on working with big tables.

### **LIST OF PROGRAMS:**

**NOTE:** Demonstrate the following SQL commands and can take any backend RDBMS

system for implementation purpose.

1. Data Definition of Base Tables.
2. DDL with Primary key constraints.
3. DDL with constraints and verification by insert command.
4. Data Manipulation of Base Tables and Views.
5. Demonstrate the Query commands.
6. Write a PL/SQL code block that will accept an account number from the user and debit an amount of Rs. 2000 from the account if the account has a minimum balance of 500 after the amount is debited. The process is to fire on the Accounts table.
7. Write a PL/SQL code block to calculate the area of the circle for a value of radius varying from 3 to 7. Store the radius and the corresponding values of calculated area in a table Areas. Areas – radius, area.
8. Write a PL/SQL block of code for reversing a number. (Example: 1234 as 4321).
9. Create a transparent audit system for a table Client\_master (client\_no, name, address, Bal\_due). The system must keep track of the records that are being deleted or updated. The functionality being when a record is deleted or modified the original record details and the date of operation are stored in the audit client (client\_no, name, bal\_due, operation, userid, update) table, then the delete or update is allowed to go through.

### **COURSE OUTCOME:**

1. Study all the Basic DDL and DML Commands.
2. Practice the usage of SQL Statements.
3. Apply PL/SQL code usage.
4. Analyze the use of PL/SQL for complex problems.

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>OPERATINGSYSTEM</b>	<b>Semester</b>	<b>III</b>
<b>SubjectCode</b>	<b>21UIS05</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>71:5:0:4</b>

**CourseObjective:**

1. TounderstandthefundamentalconceptsandroleofOperatingSystem.
2. TolearntheProcess ManagementandSchedulingAlgorithms.
3. TounderstandtheMemoryManagement policies.
4. TogaininsightonI/OandFilemanagementtechniques.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	Understand the structure and functions of OperatingSystem.	K1
<b>CO2</b>	ComparetheperformanceofSchedulingAlgorithms.	K2
<b>CO3</b>	Understandandorganizethememory.	K1,K3
<b>CO4</b>	Evaluatethedeadlockmeasures.	K3,K4
<b>CO5</b>	AnalyzetheI/Ohardwareandsoftware.	K5

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>Subject Title</b>	<b>OPERATINGSYSTEM</b>	<b>Semester</b>	<b>III</b>
<b>Subject Code</b>	<b>21UIS05</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>71:5:0:4</b>
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>
<b>I</b>	Introduction–Historyofoperatingsystem-Differentkindsof operatingsystem–Operationsystemconcepts-Systemcalls- Operatingsystemstructure.	<b>K1</b>	<b>15</b>
<b>II</b>	ProcessesandThreads:Processes–threads– threadmodelandusage– inter process communication.	<b>K2</b>	<b>15</b>
<b>III</b>	Scheduling-MemoryManagement:MemoryAbstraction– Virtual Memory-pagereplacement algorithms.	<b>K1,K3</b>	<b>15</b>
<b>IV</b>	Deadlocks:Resources-introductiontodeadlocks– deadlockdetectionandrecovery–deadlocksavoidance–deadlock prevention.Multipleprocessorsystem:multiprocessors– multicomputers.	<b>K3,K4</b>	<b>15</b>
<b>V</b>	Input/Output:principlesofI/O hardware- principlesofI/Osoftware.Filesystems:Files–directories- filesystemsimplementation– FileSystemManagementandOptimization.	<b>K5</b>	<b>11</b>
	<b>LearningResources</b>		
<b>TextBooks</b>	AndrewS. Tanenbaum, -Modern OperatingSystems, 2ndEdition, PHIprivate Limited,NewDelhi,2008.		
<b>Reference Books</b>	1. WilliamStallings,—OperatingSystems– Internals&DesignPrinciples,5thEdition,Prentice– Hall of India privateLtd,NewDelhi, 2004. 2. SridharVaidyanathan,-OperatingSystem,1stEdition,VijayNicole Publications, 2014.		
<b>Website /Link</b>	1. <a href="http://www.wikipedia.org/wiki/Operating_system">www.wikipedia.org/wiki/Operating_system</a> 2. <a href="http://www.freetechbooks.com/introduction-to-operating-systems-t340.html">http://www.freetechbooks.com/introduction-to-operating-systems-t340.html</a>		

**MappingwithProgrammeOutcomes**

<b>CONumber</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	S	S	-
<b>CO2</b>	S	M	M	S
<b>CO3</b>	S	L	L	M
<b>CO4</b>	M	S	M	S
<b>CO5</b>	S	L	S	S

S-Strong,M-Medium,L –Low

## B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards

<b>Subject Title</b>	<b>SBECI-OFFICEAUTOMATION LAB</b>	<b>Semester</b>	<b>III</b>
<b>Subject Code</b>	<b>21UISSP01</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>SBEC:Practical</b>	<b>L:T:P:C</b>	<b>30:0:2:3</b>

### CourseObjective:

1. Toacquireknowledgeon editor,spreadsheet andslidepreparation.
2. Toimprovecreativethinkinginpresentationsoftware.

### LISTOFPROGRAMS:

#### I. MS-WORD

1. TextManipulation:Writeaparagraphaboutyour institutionandChangethefontsizeandtype,Spell check, Aligningand justification of Text.
2. Biodata:PrepareaBio-data.
3. FindandReplace:Writeaparagraphaboutyourselfanddothefollowing.FindandReplace-UseNumberingBullets,FooterandHeaders.
4. Tablesandmanipulation:Creation,Insertion,Deletion(ColumnsandRows).Createamarksheet.
5. Mail Merge: Prepare an invitation to invite your friends to your birthday party. Prepare atleastfiveletters.

#### II. MS-EXCEL

1. Datasorting-AscendingandDescending(bothnumbersandalphabets).
2. Marklistpreparation forastudent.
3. IndividualPayBillpreparation.
4. InvoiceReportpreparation.
5. DrawingGraphs. Takeyourowntable.

#### III. MS-POWERPOINT

1. Createasideshow presentationforaseminar.
2. PreparationofOrganizationCharts.
3. Createasideshowpresentationtodisplaypercentageofmarksineachsemesterforallstudents
  - (i) Usebarchart(X-axis: Semester,Y-axis:%marks).
  - (ii) Usedifferent presentationtemplatedifferenttransition effect foreachslide.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
CO1	Remembertheconceptofwordprocessing.	K1
CO2	UnderstandingthetoolsinMicrosoft word.	K2
CO3	UnderstandandApplyExcel Features.	K3
CO4	Evaluate the EXCELfunctions.	K3,K4
CO5	AnalyzethedifferentdesignsofMSPresentations.	K5

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>Subject Title</b>	<b>PROGRAMMINGINJAVA</b>	<b>Semester</b>	<b>IV</b>
<b>Subject Code</b>	<b>21UIS06</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>60:4:0:4</b>

**CourseObjective:**

1. TounderstandtheconceptsofObjectOrientedProgramming.
2. Tolearnaboutthecontrol structures,class withattributesandmethodsused inJava.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
CO1	RemembertheconceptsofOOPS.	K1
CO2	UnderstandthebasicTerminologiesoflanguagesand statements.	K2
CO3	Demonstratetheuseclassesandobjects.	K2,K3
CO4	Evaluatethepackages and exception handlingmethods.	K3,K4
CO5	AnalyzetheI/OStreams andgraphicsclasses.	K5



**B.Sc-Information Science Syllabus under CBCS Pattern with effect from 2021-2022 Onwards**

<b>Subject Title</b>	<b>PROGRAMMING IN JAVA</b>	<b>Semester</b>	<b>IV</b>	
<b>Subject Code</b>	<b>21UIS06</b>	<b>Specialization</b>	<b>NA</b>	
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>60:4:0:4</b>	
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>	
<b>I</b>	Introduction to OOPS: Paradigms of Programming Languages – Basic concepts of Object Oriented Programming – Differences between Procedure Oriented Programming and Object Oriented programming - Benefits of OOPs – Application of OOPs. Java:History–Java features–Java Environment–JDK–API.Introduction to Java:Types of java program–Creating and Executing a Java program–Java Tokens–Java Virtual Machine (JVM) – Command Line Arguments–Comments in Java program.	<b>K1</b>	<b>10</b>	
<b>II</b>	Elements:Constants–Variables–Data types–Scope of variables–Type casting–Operators:Special operators–Expressions – Evaluation of Expressions. Decision making and branching statements- Decision making and Looping– break –labeled loop–continue statement.Arrays:One Dimensional Array–Creating an array–Array processing–Multidimensional Array – Vectors – ArrayList – Advantages of ArrayList over Array Wrapper classes.	<b>K2</b>	<b>10</b>	
<b>III</b>	Class and objects:Defining a class–Methods–Creating objects –Accessing class members–Constructors–Method overloading–Static members–Nesting of Methods–this keyword–Command line input.Inheritance:Defining inheritance –types of inheritance– Overriding methods – Final variables and methods – Final classes – Final methods - Abstract methods and classes – Visibility Control- Interfaces: Defining interface–Extending interface-Implementing Interface-Accessing interface variables.Strings:String Array–String Methods– StringBuffer Class.	<b>K2,K3</b>	<b>10</b>	
<b>IV</b>	Packages:Java API Packages–System Packages–Naming Conventions –Creating & Accessing a Package –Adding Class to a Package – Hiding Classes. Exception Handling: Limitations of Error handling –Advantages of Exception Handling –Types of Errors–Basics of Exception Handling–try blocks–throwing an exception–catching an exception–finally statement. Multithreading: Creating Threads – Life of a Thread –Defining & Running Thread– Thread Methods–Thread Priority – Synchronization –Implementing Runnable interface – Thread Scheduling.	<b>K3,K4</b>	<b>15</b>	
<b>V</b>	I/O Streams: File – Streams – Advantages - The stream classes – Byte streams –Character streams. Applets: Introduction – Applet Lifecycle–Creating & Executing an Applet–Applet tags in	<b>K5</b>	<b>15</b>	

## B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards

	HTML – Parameter tag – Aligning the display - Graphics Class:Drawing and filling lines – Rectangles – Polygon – Circles –Arcs –Line Graphs – Drawing Bar charts AWT Componentsand Even Handlers: Abstract window tool kit – Event Handlers –Event Listeners – AWT Controls and Event Handling: Labels –TextComponent–ActionEvent–Buttons–CheckBoxes–ItemEvent–Choice–Scrollbars–LayoutManagers-InputEvents– Menus.		
	<b>LearningResources</b>		
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. E.Balagurusamy,-<i>Programming with Java</i>  , TataMc-GrawHill, 5<sup>th</sup>Edition.</li> <li>2. Sagayaraj, Denis,Karthickand Gajalakshmi, -<i>Java Programming forCore andadvancedlearners</i>  ,UniversitiesPress(INDIA)PrivateLimited2018.</li> </ol>		
<b>Reference Books</b>	HerbertSchildt, - <i>The completereferece Java</i>   ,TataMc-GrawHill,7 <sup>th</sup> Edition.		
<b>Website /Link</b>	<ol style="list-style-type: none"> <li>1. NPTEL &amp; MOOC courses titled Java<a href="https://nptel.ac.in/courses/106105191/">https://nptel.ac.in/courses/106105191/</a></li> <li>2. <a href="https://www.geeksforgeeks.org/">https://www.geeksforgeeks.org/</a></li> <li>3. <a href="https://www.tutorialspoint.com/java/">https://www.tutorialspoint.com/java/</a></li> </ol>		

### MappingwithProgrammeOutcomes

CO Number	PO1	PO2	PO3	PO4
CO1	S	S	S	-
CO2	S	M	M	S
CO3	M	S	L	M
CO4	M	S	M	S
CO5	S	S	-	-

S-Strong,M-Medium,L-Low

## B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards

<b>SubjectTitle</b>	<b>PRACTICALIV-JAVAPROGRAMMING</b>	<b>Semester</b>	<b>IV</b>
<b>SubjectCode</b>	<b>21UIISP04</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Practical</b>	<b>L:T:P:C</b>	<b>45:0:3:2</b>

### **CourseObjective:**

1. To impart Practical Training in JAVA Programming Language.
2. Familiarize the different control and decision making statements in JAVA.
3. Build programs using Packages.
4. Provide knowledge on working with Exception handling functions.

### **LIST OF PROGRAMS:**

- 1 Write a program to find the Area of Square, Rectangle and Circle using Method Overloading.
- 2 Write a program to sort the list of numbers using Command Line Arguments.
- 3 Write a program to multiply the given two matrices.
- 4 Write a program to design a class to represent a bank account. Include the following:  
Data Members: Name of the depositor, Account number, Type of account, and Balance amount in the account.  
Methods: To assign initial values, To deposit an amount, To withdraw an amount after checking balance, and To display the name and balance.
- 5 Write a program that imports the user-defined package and accesses the Member variable of classes that are contained by Package.
- 6 Write a program to handle the Exception using try and multiple catch blocks.
- 7 Write a program to illustrate the use of multi threads.
- 8 Write a program to create a student registration form using an applet with Name, Address, Sex, Class, Email-id.
- 9 Write a program to draw the line, rectangle, oval, text using the graphics method.
- 10 Write a program to create a sequential file that could store details about five products. Details include product code, cost, and number of items available and are provided through the keyboard. Compute and print the total value of all the five products

### **COURSE OUTCOME:**

1. Study all the Basic Statements in java Programming.
2. Practice the use of branching and looping statements.
3. Apply Packages and Interfaces.
4. Analyze the use of graphic tools in JAVA.

**B.Sc.(Computer Science)/BCA/B.Sc.(Information Science)**

**Semester IV: Add-on Course Internship Programme**

**OBJECTIVES:**

- To make students acquire practical knowledge by going to a company and learn in a live environment
- To make students learn teamwork and work ethics
- To make students to know the recent trends in Web/Mobile Application Development, Networking or any other areas relevant to their study
- To make students analyse their skills and interests
- To help students examine academic and career goals

**OUTCOME:**

At the end of this internship programme the students will be able to

- apply theory to real life
- work as a part of team
- learn from the company experts
- learn latest trending technologies
- come out with a high morale
- enrich CV

**About the internship programme:** The internship programme provides students with practical, real-world experience and a valuable complement to their academic training. It enhances the students' skills in problem solving by making him/her work in a live environment in which systematic problem solving methods are practised.

**Duration:** Internship requires students to spend a minimum of 15 days (during vacation) employed, full-time, as IT interns or trainees during vacation at the end of fourth semester. During this period, they are engaged in work of direct relevance to their programme of study.

**Areas:** Some of the fields that are open to students include:

- Online Publishing and Editing
- Online Advertising
- Web/Mobile Application Development
- E-Marketing/Online Marketing
- Any other field related to Computer Science/Applications/ Information Science

**Certificate:** A certificate is to be obtained from the organization in which the student undergoes internship programme. This certificate is to be submitted to the college within fifteen days after the college reopens for the next semester.

**Credits:** The Internship programme does not carry any credit.

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>INFORMATIONSECURITY</b>	<b>Semester</b>	<b>V</b>
<b>SubjectCode</b>	<b>21UIS07</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>71:5:0:4</b>

**CourseObjective:**

1. Understandthebasicsofinformationsecurity.
2. Abletomanagetheinformationanddetects threatsandvulnerabilitiesthatareaffectingthedata.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	Rememberthebasicsof security.	K1
<b>CO2</b>	Understandorganizationalsecurity.	K2
<b>CO3</b>	Demonstratetheprotectionofinformation.	K3
<b>CO4</b>	Studytheprotection ofsystem.	K4
<b>CO5</b>	Analyzecloudcomputingsecurity.	K5

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

Subject Title	INFORMATIONSECURITY	Semester	V	
Subject Code	21UIS07	Specialization	NA	
Type	Core:Theory	L:T:P:C	71:5:0:4	
Unit	Contents	Levels	Sessions	
<b>I</b>	TheLanguage of Security-Threatsand Vulnerabilities:Threats-PhysicalThreats-Vulnerabilities-TheInformationSecurityManager -InformationSecurityJobRoles-Training,Experience,andProfessionalism-GettingStarted inSecurityManagement	<b>K1</b>	<b>15</b>	
<b>II</b>	OrganizationalSecurity:SecurityinOrganizationalStructures-WorkingwithSpecialistGroups-WorkingwithStandardsandRegulations-WorkingwithRiskManagement-WorkingwithEnterpriseArchitecture-WorkingwithFacilitiesManagement-InformationSecurityImplementation:IntegrationwithRiskManagement -SecureDevelopment- Standards,Frameworks,Guidelines,andLegislation:WhyDoWeNeedStandards?-Legislation-TheISO/IEC27000SeriesofStandards-BusinessContinuity-RiskManagementStandards-COBIT-PaymentCard Industry Data Security Standard - Health Insurance Portability andAccountabilityAct	<b>K2</b>	<b>15</b>	
<b>III</b>	Protection of Information : Information Classification-Identification,Authentication,andAuthorization- ProtectionofPeople:HumanVulnerabilities-BuildingaSecurityCulture- PersonnelSecurityLife Cycle-ProtectionofPremises:WhatIsPhysicalSecurity?- StartwithaRiskAssessment-PerimeterDesign- InternalBuildingSecurity	<b>K3</b>	<b>15</b>	
<b>IV</b>	ProtectionofSystems-IntroducingMalware-ThreatVectors-- TechnicalCountermeasures- Network Security-DigitalEvidenceandIncidentResponse:TheDigitalForensicProcess- Forensic Readiness- Incident Response and Digital Investigations- InvestigatingaMalwareOutbrea	<b>K4</b>	<b>15</b>	
<b>V</b>	Cloud Computing Security: Cloud Computing 101- Cloud Security - Cloud Security Architectures-API Security: An Old Threat with NewTargets-Virtualization- IndustrialControlSystems:ICSArchitectures- ICS Security- Secure Systems Development: SecureDevelopment- SecureDevelopmentBusinessProcesses-Security Testing-Auditing	<b>K5</b>	<b>11</b>	
	<b>LearningResources</b>			
<b>Text Books</b>	TonyCampbellBurnsBeach,Practical InformationSecurityManagement:ACompleteGuideto PlanningandImplementation ,Apress,2016( <a href="http://file.allitebooks.com/20161204/Practical%20Information%20Security%20Management.pdf">http://file.allitebooks.com/20161204/Practical%20Information%20Security%20Management.pdf</a> )			

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>Reference Books</b>	1. MarkRhodesOusley,TheInformationsecuritythecompleteReference,SecondEdition,2013 2. JosiahDykstra,EssentialCyberSecurityScience,FirstEdition, 2016
<b>Website/ Link</b>	<a href="http://www.geeksforgeeks.org/Informationsecurity">www.geeksforgeeks.org/Informationsecurity</a>

**MappingwithProgrammeOutcomes**

<b>CONumber</b>	<b>PS01</b>	<b>PS02</b>	<b>PS03</b>	<b>PS04</b>
<b>CO1</b>	S	M	M	L
<b>CO2</b>	M	M	L	L
<b>CO3</b>	S	M	L	M
<b>CO4</b>	M	S	M	L
<b>CO5</b>	S	M	L	L

S-Strong,M-Medium ,L-Low



**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>WEBTECHNOLOGY</b>	<b>Semester</b>	<b>V</b>
<b>SubjectCode</b>	<b>21UIS08</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>71:5:0:4</b>

**CourseObjective:**

1. To understand the fundamental concepts and role of Web Technology.
2. To learn the Process of CSS.
3. To understand the web pages.
4. To gain insights on script objects.

<b>CO Number</b>	<b>CO Statement</b>	<b>Knowledge Level</b>
<b>CO1</b>	Understand the structure of the documents in Web.	K1
<b>CO2</b>	Remember and understand the table handling tags.	K2
<b>CO3</b>	Understand and organize CSS.	K1,k3
<b>CO4</b>	Implement scripts in web page.	K3,K4
<b>CO5</b>	Evaluate script objects.	K5

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

SubjectTitle	WEBTECHNOLOGY	Semester	V	
SubjectCode	21UIS08	Specialization	NA	
Type	Core:Theory	L:T:P:C	71:5:0:4	
Unit	Contents	Levels	Sessions	
<b>I</b>	Structuring Documents for the Web: Introducing HTMLandXHTML,BasicTextFormatting,PresentationalElements,PhraseElements,Lists,EditingText,CoreElementsandAttributes,AttributeGroups.LinksandNavigation:BasicLinks,CreatingLinkswiththe<a>Element, Advanced E-mail Links.Images, Audio, andVideo: Adding Images Using the <img> Element, UsingImagesasLinksImageMaps,ChoosingtheRightImage Format, Adding Flash, Video and Audio to your webpages.	<b>K1</b>	<b>15</b>	
<b>II</b>	Tables: Introducing Tables, Grouping Section of a Table,NestedTables,AccessingTables.Forms:IntroducingForms, Form Controls, Sending Form Data to the Server.Frames: Introducing Frameset, <frame> Element, CreatingLinksBetweenFrames,SettingaDefaultTargetFrame Using <base> Element,NestedFramesets, Inline orFloatingFrameswith<iframe>.	<b>K2</b>	<b>15</b>	
<b>III</b>	CascadingStyleSheets:IntroducingCSS,WhereyoucanAdd CSSRules.CSSProperties:ControllingText,TextFormatting, TextPseudoClasses,Selectors,Lengths,IntroducingtheBox Model.MoreCascadingStyleSheets:Links,Lists,Tables,Outlines,The:focusand:activatePseudoclassesGeneratedContent ,MiscellaneousProperties,AdditionalRules,Positioningand Layoutwit, PageLayoutCSS, DesignIssues.	<b>K1,K3</b>	<b>15</b>	
<b>IV</b>	Java Script: How to Add Script to Your Pages, VariablesandDataTypes– StatementsandOperators,ControlStructures,ConditionalStatements,LoopStatements– Functions - Message box, Dialog Boxes, Alert Boxes,Confirm Boxes, PromptBoxes	<b>K3,K4</b>	<b>15</b>	
<b>V</b>	WorkingwithJavaScript:PracticalTipsforWritingScripts, JavaScript Objects: Window Object - Documentobject-BrowserObject-FormObject-Navigatorobject Screen object - Events, Event Handlers, Forms – Validations,FormEnhancements,JavaScriptLibraries.	<b>K5</b>	<b>11</b>	
	<b>LearningResources</b>			
<b>TextBooks</b>	JonDuckett,BeginningHTML,XHTML,CSSandJavascript,WileyPublishing			
<b>Reference Books</b>	1. ChrisBates,-Web ProgrammingII, WileyPublishing3d Edition. 2. M. Srinivasan, -Web Technology:TheoryandPracticeII, PearsonPublication			
<b>Website/Link</b>	<a href="http://www.geeksforgeeks.org/webtechnology">www.geeksforgeeks.org/webtechnology</a>			

**MappingwithProgrammeOutcomes**

<b>CO Number</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	S	S	-
<b>CO2</b>	S	M	M	S
<b>CO3</b>	S	L	L	M
<b>CO4</b>	M	S	M	S
<b>CO5</b>	S	L	S	S

S-Strong,M-Medium ,L-Low

## B.Sc-Information Science Syllabus under CBCS Pattern with effect from 2021-2022 Onwards

<b>Subject Title</b>	<b>PRACTICAL V: WEB TECHNOLOGY LAB</b>	<b>Semester</b>	<b>V</b>
<b>Subject Code</b>	<b>21UI SP05</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core: Practical</b>	<b>L:T:P:C</b>	<b>45:0:3:2</b>

### **Course Objectives:**

1. To impart Practical Training in Control panel tools.
2. Familiarize with HTML Tags.
3. Build programs using Javascript.
4. Provide knowledge on working with events and methods.

### **LIST OF PROGRAMS:**

1. Create a form having number of elements (Textboxes, Radio buttons, Checkboxes, and soon). Write JavaScript code to count the number of elements in a form.
2. Create a HTML form that has number of Textboxes. When the form runs in the Browser fill the Text boxes with data. Write JavaScript code that verifies that all textboxes has been filled. If a textboxes has been left empty, popup an alert indicating which textbox has been left empty.
3. Develop a HTML Form, which accepts any Mathematical expression. Write JavaScript code to Evaluate the expression and Displays the result.
4. Create a page with dynamic effects. Write the code to include layers and basic animation.
5. Write JavaScript code to find the sum of N natural Numbers. (Use user-defined function)
6. Write a JavaScript code block using arrays and generate the current date in words, this should include the day, month and year.
7. Create a form for Student information. Write JavaScript code to find Total, Average, Result and Grade.
8. Create a form for Employee information. Write JavaScript code to find DA, HRA, PF, TAX, Gross pay, Deduction and Net pay.
9. Create a form consists of two Multiple choice lists and one single choice list (a) The first multiple choice list, displays the Major dishes available (b) The second multiple choice list, displays the Starters available. (c) The single choice list, displays the Soft drinks available.

### **COURSE OUTCOME:**

1. Study all the Basic tools.
2. Practice the usage of webpage creation and useable objects.
3. Apply various effects on webpage.
4. Analysis the use of javascript and html code.

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>OPENSOURCETECHNOLOGY</b>	<b>Semester</b>	<b>V</b>
<b>Subject Code</b>	<b>21UIS09</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>71:5:0:4</b>

**Courseobjective:**

1. TousePHPandMySQLtodevelopdynamicwebsitesforuserontheInternet.
2. Todevelopwebsitesrangingfromsimpleonlineinformationformstocomplexecommercesiteswith MySQLdatabase,building,connectivity,andmaintenance.

<b>CO Number</b>	<b>CO Statement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	Understandtherelationshipwithopensourceandfreesoftware.	K1
<b>CO2</b>	Understandtheflowcontrolinprograms.	K2
<b>CO3</b>	ImplementArrays.	k3
<b>CO4</b>	Evaluatefunctionsandclasses.	K4
<b>CO5</b>	Analyzedatabase andSQL.	K5

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>OPENSOURCETECHNOLOGY</b>	<b>Semester</b>	<b>V</b>	
<b>SubjectCode</b>	<b>21UIS09</b>	<b>Specialization</b>	<b>NA</b>	
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>71:5:0:4</b>	
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>	
<b>I</b>	Introduction: Open Source, Free Software, Free Software vs. Open Source software Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.	<b>K1</b>	<b>15</b>	
<b>II</b>	Controlling Program Flow: Writing Simple Conditional Statements – Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.	<b>K2</b>	<b>15</b>	
<b>III</b>	Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms – Working with Array Functions – Working with Dates and Times.	<b>K3</b>	<b>15</b>	
<b>IV</b>	Using Functions and Classes: Creating User-Defined Functions – Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files – Writing Files – Processing Directories.	<b>K4</b>	<b>15</b>	
<b>V</b>	Working with Database and SQL : Introducing Database and SQL – Using MySQL – Adding and modifying Data – Handling Errors – Using SQLite Extension and PDO Extension. Introduction XML – Simple XML and DOM Extension.	<b>K5</b>	<b>11</b>	
	<b>Learning Resources</b>			
<b>Text Books</b>	Vikram Vaswani, — PHP A Beginner's Guide, Tata McGraw Hill 2008.			
<b>Reference Books</b>	Steven Holzner, — The PHP Complete Reference, Tata McGraw Hill, 2007. Steven Holzner, — Spring into PHP, Tata McGraw Hill 2011, 5th Edition.			
<b>Website /Link</b>	1. <a href="https://www.w3schools.com/php/">https://www.w3schools.com/php/</a> 2. <a href="https://www.phptpoint.com/php-tutorial-pdf/">https://www.phptpoint.com/php-tutorial-pdf/</a>			

**Mapping with Programme Outcomes**

<b>CO Number</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	S	M	---
<b>CO2</b>	M	M	M	S
<b>CO3</b>	S	M	L	M
<b>CO4</b>	M	S	M	S
<b>CO5</b>	S	M	L	L

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**  
S-Strong,M-Medium ,L-Low

<b>SubjectTitle</b>	<b>PRACTICALVIII:OPENSOURCET ECHNOLOGYLAB</b>	<b>Semester</b>	<b>V</b>
<b>SubjectCode</b>	<b>21UIISP06</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Practical</b>	<b>L:T:P:C</b>	<b>60:0:4:2</b>

**CourseObjectives:**

1. Todeveloptechnicalsolutionsforproblemsusingtheopensourcesoftware'sreadilyavai  
lableatfree ofcost.
2. ToinstallWampServer.
3. ProvideknowledgeonworkingwithPHPSCRIPTS.

**LISTOFPROGRAMS**

1. CreateasimpleHTMLformandaccepttheusernameanddisplaythenamethroughPHPechostate  
ment.
2. WriteaPHPscript to redirectauser toadifferentpage.
3. WriteaPHPfunctiontotestwhetheranumberisgreaterthan30,20or10usingternaryoperator.
4. CreateaPHPscriptwhichdisplaythecapitalandcountry namefromthegivenarray.Sortthe list  
bythename of thecountry.
5. WriteaPHPscripttocalculateanddisplayaveragetemperature,fivelowestandhighesttemperatur  
es.
6. Createascriptusingaforlooptoaddalltheintegersbetween0and30anddisplaythetotal.
7. WriteaPHPscript usingnestedforloopthatcreates achess board.
8. WriteaPHPfunctionthatchecksifastringis alllowercase.
9. WriteaPHP scripttocalculate thedifferencebetween twodates.
10. WriteaPHPscript to displaytimein aspecified time zone.

**COURSEOUTCOME:**

1. Knowall TheBasiccommands
2. Practicetheusageofhtml Tags andPHPstatements.
3. Applyvariouscommands inPHPfor simpleprograms
4. Analysisitheuseoftimeanddateoperations.



## B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards

<b>SubjectTitle</b>	<b>SBECIII:MOBILEAPPLICATION DEVELOPMENT</b>	<b>Semester</b>	<b>V</b>
<b>Subject Code</b>	<b>21UISSP03</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>SBEC:Practical</b>	<b>L:T:P:C</b>	<b>45:0:3:3</b>

### **COURSEOBJECTIVE:**

1. To impart Practical Training in android development tools.
2. Build programs using Flutter/Android Studio environment.
3. Provide knowledge on working with simple android apps.

### **LIST OF PROGRAMS:**

1. Sample application about Android Resources
2. Sample application about Layouts.
3. Sample application about Intents.
4. Sample application about User Interfaces.
5. Sample application about Animations.
6. Create calculator app in Android.
7. Create sample android Camera Application.
8. Create basic list view demo in Android.

### **COURSE OUTCOME:**

1. Study all the Basic Tools.
2. Practice the usage of control panel objects.
3. Apply various commands for layouts and animations.
4. Analyze the use of SQLite I.

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>PROGRAMMINGINPYTHON</b>	<b>Semester</b>	<b>VI</b>
<b>SubjectCode</b>	<b>21UIS10</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:5</b>

**CourseObjective:**

1. To understand the basic components of computer programming using the Python language.
2. To demonstrate significant experience with the Python program development environment.

<b>CONumber</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	Understand the Basic Programming Logic.	K1
<b>CO2</b>	Understand the basic Statements.	K2
<b>CO3</b>	Implement Files and SQL.	K3
<b>CO4</b>	Evaluate Graphics in python.	K4
<b>CO5</b>	Analyze Version control system.	K5

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

Subject Title	PROGRAMMING IN PYTHON	Semester	VI	
Subject Code	21UIS10	Specialization	NA	
Type	Core: Theory	L:T:P:C	86:6:0:5	
Unit	Contents		Levels	Sessions
I	Python – origins – features – variable and assignment - Python basics – statement and syntax – Identifiers – Basic style guidelines – Python objects – Standard types and other built-in types – Internal types – Standard type operators – Standard type built-in functions.		K1	15
II	Numbers – Introduction to Numbers – Integers – Double precision floating point numbers – Complex numbers – Operators – Numeric type functions – Sequences: Strings, Lists and Tuples – Sequences – Strings and strings operators – String built-in methods – Lists – List type Built-in Methods – Tuples.		K2	11
III	Mapping type: Dictionaries – Mapping type operators – Mapping type Built-in and Factory Functions - Mapping type built in methods – Conditionals and loops – if statement – else statement – elif statement – conditional expression – while statement – for statement – break statement – continue statement – pass statement – Iterators and the iter( ) function - Files and Input/Output – File objects – File built-in functions – File built-in methods – File built-in attributes – Standard files – command line arguments.		K3	20
IV	Functions and Functional Programming – Functions – calling functions – creating functions – passing functions – Built-in Functions: apply(), filter(), map() and reduce() – Modules – Modules and Files – Modules built-in functions - classes – class attributes – Instances.		K4	20
V	Database Programming – Introduction - Basic Database Operations and SQL - Example of using Database Adapters, Mysql - Regular Expression – Special Symbols and Characters – REs and Python.		K5	20
<b>Learning Resources</b>				
<b>Text Books</b>	Title of Book Publisher Year of Publication   Wesley J. Chun Core Python Programming Pearson Education Publication 2012			
<b>Reference Books</b>	1 Wesley J. Chun Core Python Application Programming Pearson Education Publication 2015 2 Eric Matthes Python crash course William pollock 2016 3 Zed Shaw Learn Python the hard way Addition Wesley 2017 4 Mark Lutz Python pocket reference O'Reilly Media 2014 Pedagogy			
<b>Website /Link</b>	1. <a href="https://www.tutorialspoint.com/python/">https://www.tutorialspoint.com/python/</a> 2. <a href="http://www.spoken-tutorial.org">www.spoken-tutorial.org</a>			

## B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards

### MappingwithProgrammeOutcomes

CONumber	PO1	PO2	PO3	PO4
CO1	S	S	M	---
CO2	M	M	M	S
CO3	S	M	L	M
CO4	M	S	M	S
CO5	S	M	L	L

S-Strong,M-Medium,L-Low

## B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards

<b>Subject Title</b>	<b>PYTHONPROGRAMMING</b>	<b>Semester</b>	<b>VI</b>
<b>Subject Code</b>	<b>21UIISP07</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Core:Practical</b>	<b>L:T:P:C</b>	<b>60:0:4:3</b>

### **CourseObjectives:**

1. To impart Practical Training in basic python statements.
2. Familiarize with control flow tools.
3. Build programs using data structure concepts.
4. Provide knowledge on working with exception and string handling.

### **LIST OF PROGRAMS:**

1. Create a simple calculator to do all the arithmetic operations.
2. Write a program to use control flow tools like if.
3. Write a program to use for loop.
4. Data structures
  - a. use list as stack.
  - b. use list as queue.
  - c. tuple, sequence.
5. Create a new module for mathematical operations and use in your program.
6. Write a program to read and write files, create and delete directories.
7. Write a program with exception handling.
8. Write a program using classes.
9. Connect with MySQL and create address book
10. Write a program using string handling and regular expressions

### **COURSE OUTCOME:**

1. Study all the Basic commands.
2. Practice the usage of control flow statements.
3. Apply various commands in files and directories.
4. Analyze the use of MySQL to connect database.

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>QUANTITATIVEAPTITUDE</b>	<b>Semester</b>	<b>VI</b>
<b>Subject Code</b>	<b>21UISS01</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Theory</b>	<b>L:T:P:C</b>	<b>41:3:0:3</b>

**CourseObjective:**

1. Toimprovethequantitativeskillsof thestudents.
2. Topreparethestudents forvariouscompetitiveexams.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	Remember thebasicmathematicalfunctions.	K1
<b>CO2</b>	Understandtheproblemsofages,profitsandloss.	K2
<b>CO3</b>	Demonstratetherelationshipoftimewithworkanddistance.	k3
<b>CO4</b>	Implementpermutationandcombinationsproblem.	K4
<b>CO5</b>	Analyzedatarepresentationmethods.	K5

**B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

<b>SubjectTitle</b>	<b>QUANTITATIVEAPTITUDE</b>	<b>Semester</b>	<b>VI</b>	
<b>Subject Code</b>	<b>21UISS01</b>	<b>Specialization</b>	<b>NA</b>	
<b>Type</b>	<b>SBEC:Theory</b>	<b>L:T:P:C</b>	<b>41:3:0:3</b>	
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>	
<b>I</b>	Numbers-HCFandLCMofnumbers-Decimalfractions-Simplification-Squarerootsandcuberoots-Average-problemsonNumbers.	<b>K1</b>	<b>8</b>	
<b>II</b>	ProblemsonAges-SurdsandIndices-percentage-profitsandloss-ratioand proportion -partnership-Chainrule.	<b>K2</b>	<b>8</b>	
<b>III</b>	Timeandwork-pipesandcisterns-TimeandDistance-problemson trains-Boatsandstreams-simpleinterest-compoundinterest-Logarithms -Area-Volumeand surface area-racesandGamesofskill.	<b>K3</b>	<b>8</b>	
<b>IV</b>	Permutationandcombination-probability-TrueDiscount-BankersDiscount-HeightandDistances-Oddmanout&Series.	<b>K4</b>	<b>8</b>	
<b>V</b>	Calendar-Clocks-stocksandshares-Data representation-Tabulation -BarGraphs-Piecharts - Linegraphs.	<b>K5</b>	<b>9</b>	
<b>LearningResources</b>				
<b>TextBooks</b>	-Quantitative Aptitudel,R.S. AGARWAL., S. Chand &CompanyLtd.,			
<b>Reference Books</b>	-Quantitative Aptitudefor Competitive examinations AbhijitGuha– 4 <sup>th</sup> edition – TataMH			
<b>Website /Link</b>	1. <a href="https://textbook.com/aptitude">https://textbook.com/aptitude</a> 2. <a href="http://www.carrierbless.com/aptitude/qa/home.php">www.carrierbless.com/aptitude/qa/home.php</a>			

**MappingwithProgrammeOutcomes**

<b>CO Number</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	S	M	---
<b>CO2</b>	M	M	M	S
<b>CO3</b>	S	M	L	M
<b>CO4</b>	M	S	M	S
<b>CO5</b>	S	M	L	L

S-Strong,M-Medium,L–Low

## **MINI PROJECT**

**III YEAR/ VI SEM**

### **OBJECTIVES:**

The aim of the mini project is that the student has to understand the real time software development environment. The student should gain a thorough knowledge in the problem and language/ software which he/she has selected for their project work.

### **Project Planning:**

B.Sc (Computer Science /Information Science)/BCA Mini Project is an involved exercise, which has to be planned well in advance. The topic should be chosen in the beginning of final year itself. Related reading training and discussions of project should be completed in the first term of final year.

### **I Selection of Team**

To meet the stated objectives, it is imperative that mini project is done through a team effort. Though it would be ideal to select the team members at random and this should be strongly recommended, due to practical consideration students may also be given the choice of forming themselves into teams with Two members. A team leader shall be selected. Team shall maintain the minutes of meeting of the team members and ensure that tasks have been assigned to every team member in writing. Team meeting minutes shall form a part of the project report. Even if students are doing project as groups, each one must independently take different modules of the work and must submit their report.

### **II Selection of Tools**

No restrictions shall be placed on the students in the choice of platform/tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of tools in the evaluation of the project.

### **III Project Evaluation:**

Continuous Internal Assessment	:	40 Marks
Evaluation (External)	:	40 Marks
Viva-voce (jointly)	:	20 Marks

There shall be a common written examination conducted for all the candidates in each group together for a minimum of 10 minutes.

- (i) Requirement Specification of Project
- (ii) Design of Project
- (iii) Testing and Implementation of Project

### **IV REGULATIONS OF PROJECT WORK**

- Three copies of the project report must be submitted by each student..
- The final outer dimensions of the project report shall be 21 cm X 30 cm.



## **B.Sc-InformationScience Syllabusunder CBCSPatternwitheffectfrom2021-2022Onwards**

- Onlyhardbindingshouldbedone.Thetextofthereportshouldbesetin12pt,Times New Roman, 1.5 spaced.
- Headingshouldbesetasfollows:CHAPTERHEADINGS16pt,Arial,Bold,All caps, Centered.
- SectionHeadings14ptBookmanoldstyle,Bold, Leftadjusted.
- SectionSub-heading12 pt,Bookmanoldstyle.
- Title of figures tables etc are done in 12 point, Times New Roman, Italics,centered.
- Only 1.5 space need be left above a section or subsection heading andnospacemaybeleft after them.
- References shall be IEEE format (see any IEEE magazine for detail) Whiledoing the project keep note of all books you refer, in the correct format andincludethem in alphabetical order inyour referencelist.
- The Candidate should submit the filled in format as given in Annexure-I to thedepartmentforapproval duringtheFirst Week ofDecember.
- Periodicallytheproject shouldbereviewed.
- ASampleformatisenclosedinAnnexure-II.
- FormatoftheTitlepage andCertificateareenclosedinAnnexureIII.
- Thestudentsmayusepowerpoint presentationduringtheirvivavoceexamination.

**ANNEXURE-I**

**PERIYARUNIVERSITY**

NameoftheCollege :

Programme :

NameoftheStudent :

RegisterNumber :

TitleoftheProjectWork :

AddressofOrganization/Institution:

Nameofthe Internal Guide :

Qualification :

Place:

Date:

SignatureofInternalGuide

CONTENTS

Chapter	PageNo.
COLLEGE BONAFIDE CERTIFICATE	
ACKNOWLEDGEMENT	
SYNOPSIS	
1. INTRODUCTION	
1.1 ORGANIZATION PROFILE (optional)	
1.2 SYSTEM SPECIFICATION	
1.2.1 HARDWARE CONFIGURATION	
1.2.2 SOFTWARE SPECIFICATION	
2. SYSTEM STUDY	
2.1 EXISTING SYSTEM	
2.1.1 DESCRIPTION	
2.1.2 DRAWBACKS	
2.2 PROPOSED SYSTEM	
2.2.1 DESCRIPTION	
2.2.2 FEATURES	
3. SYSTEM DESIGN AND DEVELOPMENT	
3.1 FILE DESIGN	
3.2 INPUT DESIGN	
3.3 OUTPUT DESIGN	
3.4 CODE DESIGN	
3.5 DATABASE DESIGN	
3.6 SYSTEM DEVELOPMENT	
3.6.1 DESCRIPTION OF MODULES (Detailed explanation about the project work)	
4. TESTING AND IMPLEMENTATION	
5. CONCLUSION	
6. BIBLIOGRAPHY	
APPENDICES	
A. DATA FLOW DIAGRAM	
B. TABLE STRUCTURE	
C. SAMPLE CODING	
D. SAMPLE INPUT	
E. SAMPLE OUTPUT	

*A. Format of the title page*

TITLE OF THE PROJECT WORK

A Project Work submitted in partial fulfillment  
of the requirements for the degree of

**Bachelor of Science in  
Computer Science/Information Science**

to the

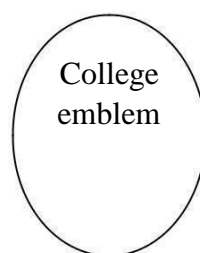
**Periyar University, Salem-11**

By

*NAME OF*

*THE STUDENT REG.*

*NO.*



College  
emblem

***COLLEGE NAME***

**(AFFILIATED TO PERIYAR UNIVERSITY)**

PLACE with Pin Code

**MONTH- YEAR**

***B. FormatoftheCertificate***

NameandAddressoftheInternal Guide

Date

**CERTIFICATE**

Thisisto certifythattheProjectWorkentitled\_\_\_\_\_ submitted in partial fulfillment of the requirements of the degree of Bachelor of Science in ComputerSciences/Information Science/Computer Applications to the Periyar University, Salem is a record ofbonafideworkcarried outby ..... Reg. No.under mysupervisionandguidance.

HeadoftheDepartment

InternalGuide

DateofViva-voice:

InternalExaminer

ExternalExaminer

**ELECTIVE I**

<b>SubjectTitle</b>	<b>SEMESTER – V PAPER – IARTIFICIALINTELLIGENCE</b>	<b>Semester</b>	<b>V</b>
<b>SubjectCode</b>	<b>21UISE01</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Elective:Theory</b>	<b>L:T:P:C</b>	<b>71:5:0:4</b>

**CourseObjective:**

1. To makethestudentunderstandtheconcepts ofArtificialIntelligence.
2. To familiarwithvariousAITechniquesandExpert Systems.
3. To haveenrichedknowledge regardingheuristicsearch,  
KnowledgerepresentationandExpertsystems

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	Rememberthebasic conceptsofArtificial Intelligence.	K1
<b>CO2</b>	UnderstandingHeuristicSearchtechniques.	K1,K2
<b>CO3</b>	ApplyKnowledgerepresentations.	K3
<b>CO4</b>	EvaluateUsingPredicateLogic.	K4
<b>CO5</b>	ImplementExpertSystem.	K5

SubjectTitle	SEMESTER – V PAPER – IARTIFICIALINTELLIGENC E	Semester	V	
Subject Code	21UISE01	Specialization	NA	
Type	Elective:Theory	L:T:P:C	71:5:0:4	
Unit	Contents		Levels	Sessions
I	Introduction:AIProblems–AItechniques– Criteriaforsuccess.Problems,ProblemSpaces,Search:Statespac e search–ProductionSystems–ProblemCharacteristics–Issues in design of Search.		K1	15
II	HeuristicSearchtechniques:GenerateandTest–HillClimbing – Best-Fist, Problem Reduction, Constraint Satisfaction,Means-endanalysis.		K1,K2	15
III	Knowledge representation issues: Representations andmappings– ApproachestoKnowledgerepresentations– IssuesinKnowledge representations–FrameProblem.		K3	15
IV	Using Predicate Logic: Representing simple facts in logic – RepresentingInstanceandIsarelationships– Computablefunctionsandpredicates–Resolution – Naturaldeduction.		K4	15
V	Representingknowledgeusingrules:ProceduralVsDeclarative knowledge – Logic programming – Forward VsBackward reasoning – Matching – Control knowledge BriefexplanationofExpertSystems-Definition-Characteristics- architecture-KnowledgeEngineering-ExpertSystemLife Cycle-Knowledge Acquisition Strategies- Expert SystemTools.		K5	11
<b>LearningResources</b>				
<b>TextBooks</b>	ElaineRichandKevinKnight,ShivaShankarNair,- <i>ArtificialIntelligence</i> ll, McGraw-Hill Companies, 3rd edition.			
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. StuartRussell&amp;PeterNorvig,-<i>ArtificialIntelligenceAModernApproach</i>ll, Perason, 2<sup>nd</sup>Edition.</li> <li>2. GeorgeFLuger ,-<i>ArtificialIntelligence</i>”, Pearson2002, 4<sup>th</sup>Edition.</li> <li>3. VSJanakiRaman,KSarukesi, PGopalakrishnan, -<i>Foundationsof ArtificialIntelligentandExpertSystems</i>ll,MacMillanIndialimited.</li> </ol>			
<b>Website/ Link</b>	NPTEL&MOOCcoursestitledArtificial IntelligenceandExpertSystems1. <a href="https://nptel.ac.in/courses/106106140/2.htm">https://nptel.ac.in/courses/106106140/2.ht</a> <a href="https://nptel.ac.in/courses/106106126/">tps://nptel.ac.in/courses/106106126/</a>			

**MappingwithProgrammeOutcomes**

<b>CO Number</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	M	S	M	L
<b>CO2</b>	S	M	M	L
<b>CO3</b>	S	M	M	L
<b>CO4</b>	M	S	M	L
<b>CO5</b>	S	M	L	L

S-Strong,M-Medium ,L-Low



<b>SubjectTitle</b>	<b>SEMESTER–VPAPER–II COMPUTER NETWORKS</b>	<b>Semester</b>	<b>V</b>
<b>SubjectCode</b>	<b>21UISE02</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Elective:Theory</b>	<b>L:T:P:C</b>	<b>71:5:0:4</b>

**CourseObjective:**

1. To understand the concept of Computer Network.
2. To impart knowledge about networking and internet devices.

<b>CO Number</b>	<b>CO Statement</b>	<b>Knowledge Level</b>
CO1	Remember the concept of networks and its types.	K1
CO2	Understanding the wireless communications.	K2
CO3	Understand and Apply data link protocols.	K3
CO4	Evaluate the network design issues.	K3, K4
CO5	Analyze the connection issues.	K5

<b>Subject Title</b>	<b>SEMESTER – V PAPER – II COMPUTERNETWORKS</b>	<b>Semester</b>	<b>V</b>	
<b>Subject Code</b>	<b>21UISE02</b>	<b>Specialization</b>	<b>NA</b>	
<b>Type</b>	<b>Elective: Theory</b>	<b>L:T:P:C</b>	<b>71:5:0:4</b>	
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>	
<b>I</b>	Introduction–NetworkHardware-Software-ReferenceModels-OSandTCP/IPModels-ExampleNetworks:Internet,ATM,EthernetandWirelessLANs-PhysicalLayer -TheoreticalBasisforDataCommunication-GuidedTransmission Media.	<b>K1</b>	<b>15</b>	
<b>II</b>	Wireless Transmission - Communication Satellites - TelephoneSystem:Structure,LocalLoop,Trunksand MultiplexingandSwitching.DataLinkLayer:DesignIssues-ErrorDetectionandCorrection.	<b>K2</b>	<b>15</b>	
<b>III</b>	Elementary Data Link Protocols - Sliding Window Protocols - Data Link Layer in the Internet - Medium Access Layer - Channel Allocation Problem - Multiple Access Protocols - Bluetooth.	<b>K3</b>	<b>15</b>	
<b>IV</b>	NetworkLayer-DesignIssues-RoutingAlgorithms-Congestion Control Algorithms - IP Protocol - IP Addresses - InternetControl Protocols.	<b>K3,K4</b>	<b>15</b>	
<b>V</b>	TransportLayer-Services-ConnectionManagement-Addressing,EstablishingandReleasingaConnection - SimpleTransportProtocol-InternetTransportProtocols(ITP)-NetworkSecurity:Cryptography.	<b>K5</b>	<b>11</b>	
	<b>LearningResources</b>			
<b>Text Books</b>	A.S.Tanenbaum,—ComputerNetworks‡,Prentice-HallofIndia2008,4thEdition.			
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Stallings,-DataandComputerCommunications‡,PearsonEducation2012,7th Edition.</li> <li>2. B. A. Forouzan, -Data Communicationsand Networking‡,Tata McGrawHill 2007, 4th Edition.</li> <li>3. F. Halsall, -Data Communications, Computer Networksand Open Systems‡, PearsonEducation 2008.</li> </ol>			
<b>Website/ Link</b>	NPTEL&MOOCcoursestitledComputerNetworkshtt ps://nptel.ac.in/courses/106106091/			

**MappingwithProgrammeOutcomes**

<b>CONumber</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	S	S	-
<b>CO2</b>	S	M	M	S
<b>CO3</b>	S	L	L	M
<b>CO4</b>	M	S	M	S
<b>CO5</b>	S	L	S	S

S-Strong,M-Medium,L –Low

<b>SubjectTitle</b>	<b>SEMESTER – V PAPER – IIIMOBILECOMPUTIN G</b>	<b>Semester</b>	<b>V</b>
<b>Subject Code</b>	<b>21UISE03</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Elective: Theory</b>	<b>L:T:P:C</b>	<b>71:5:0:4</b>

**CourseObjective:**

1. Tomakethestudent understandtheconcepts ofmobilecomputing.
2. Tofamiliarwiththenetworkprotocolstack.
3. Tobeexposedto Ad-Hocnetworks.
4. Gainknowledge aboutdifferentmobileplatformsandapplicationdevelopment.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	Rememberthebasicconcepts ofmobile computing.	K1
<b>CO2</b>	Understandingmobile IP.	K1,K2
<b>CO3</b>	ApplyMobileTelecommunicationsystem.	K3
<b>CO4</b>	Evaluatemobileadhocsystem.	K4
<b>CO5</b>	Implementmobileoperatingsystem.	K5

Subject Title	SEMESTER–VPAPER–III MOBILE COMPUTING	Semester	V	
Subject Code	21UISE03	Specialization	NA	
Type	Elective: Theory	L:T:P:C	71:5:0:4	
Unit	Contents	Levels	Sessions	
I	Introduction-Mobile Computing– Mobile Computing Vs wireless Networking– Mobile Computing Applications–Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols– Wireless MAC Issues Fixed Assignment Schemes–Random Assignment Schemes –Reservation Based Schemes	K1	15	
II	Mobile Internet Protocol and Transport Layer-Overview of Mobile IP–Features of Mobile IP–Key Mechanism in Mobile IP–route Optimization. Overview of TCP/IP– Architecture of TCP/IP- Adaptation of TCP Window – Improvement in TCP Performance.	K1,K2	15	
III	Mobile Telecommunication System-Global System for Mobile Communication(GSM)– General Packet Radio Service(GPRS)– Universal Mobile Telecommunication System(UMTS).	K3	15	
IV	Mobile Ad-Hoc Networks-Ad-Hoc Basic Concepts– Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols–Vehicular Ad Hoc networks(VANET)– MANET Vs VANET–Security.	K4	15	
V	Mobile Platforms and Applications-Mobile Device Operating Systems – Special Constraints & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone– M-Commerce– Structure– Pros & Cons – Mobile Payment System – Security Issues.	K5	11	
<b>Learning Resources</b>				
<b>Text Books</b>	Prasant Kumar Pattnaik, Rajib Mall, – <i>Fundamentals of Mobile Computing</i>   , PHI Learning Pvt. Ltd, New Delhi 2012.			
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Jochen H. Schiller, –<i>Mobile Communications</i>   , Pearson Education, New Delhi, 2007, 2<sup>nd</sup> Edition.</li> <li>2. Dharma Prakash Agarwal, Qing and An Zeng, "<i>Introduction to Wireless and Mobile Systems</i>", Thomson Asia Pvt Ltd. 2005.</li> <li>3. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, –<i>Principles of Mobile Computing</i>   , Springer 2003.</li> </ol>			

<b>Website/ Link</b>	NPTEL & MOOC courses titled Mobile Computing1. <a href="https://www.smartzworld.com/notes/mobile-computing-pdf-notes-mc-notes-pdf/2">https://www.smartzworld.com/notes/mobile-computing-pdf-notes-mc-notes-pdf/2</a> . <a href="https://www.vidyarthiplus.com/vp/Thread-IT6601-Mobile-Computing-Lecture-Notes-All-Uni">https://www.vidyarthiplus.com/vp/Thread-IT6601-Mobile-Computing-Lecture-Notes-All-Uni</a>
--------------------------	--

**MappingwithProgrammeOutcomes**

<b>CONumber</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	M	S	M	L
<b>CO2</b>	S	M	M	L
<b>CO3</b>	S	M	M	L
<b>CO4</b>	M	S	M	L
<b>CO5</b>	S	M	L	L

S-Strong,M-Medium ,L-Low

**ELECTIVEII**

<b>SubjectTitle</b>	<b>SEMESTER – VI PAPER - IDATAMININGANDWAREHOUSING</b>	<b>Semester</b>	<b>VI</b>
<b>SubjectCode</b>	<b>21UISE04</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Elective:Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>

**CourseObjective:**

1. Tointroducethebasicconceptsandtechniquesof DataMining.
2. Tostudythebasicconcepts of cluster analysis.
- 3 Tostudyasetoftypicalclusteringmethodologies,algorithms andapplications.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	Rememberthebasic concepts ofdatamining anddatapreprocessing.	K1
<b>CO2</b>	Understandingthe data miningprimitives.	K2
<b>CO3</b>	Applymining associationrule.	K3
<b>CO4</b>	EvaluateclassificationandPrediction.	K4
<b>CO5</b>	Implementclusteranalysis.	K5

<b>Subject Title</b>	<b>SEMESTER – VI PAPER – IDATAMININGANDWAREHOUSING</b>	<b>Semester</b>	<b>VI</b>	
<b>Subject Code</b>	<b>21UISE04</b>	<b>Specialization</b>	<b>NA</b>	
<b>Type</b>	<b>Elective: Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>	
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>	
<b>I</b>	Introduction:Dataminingapplication–data miningtechniques–dataminingcasestudies-thefutureofdatamining–dataminingsoftware-Associationrulesmining;basics-taskandanaïvealgorithm-Apriorialgorithm– improve the efficient of theApriorialgorithm–miningfrequentpatternwithoutcandidate generation(FP-growth)–performanceevaluationofalgorithms.	<b>K1</b>	<b>17</b>	
<b>II</b>	Classification:Introduction–decisiontree–overfittingandpruning-DTrules-Naivebayesmethod-estimationpredictive accuracyofclassificationmethods-otherevaluationcriteriaforclassificationmethod–classificationsoftware.	<b>K2</b>	<b>17</b>	
<b>III</b>	Cluster analysis: cluster analysis – types of data – computingdistances-typesofclusteranalysismethods-partitionedmethods–hierarchical methods –density based methods– dealing withlarge databases– qualityandvalidityofclusteranalysismethods-clusteranalysissoftware.	<b>K3</b>	<b>17</b>	
<b>IV</b>	Webdatamining:Introduction-webterminologyandcharacteristics-locality and hierarchy in the web- web contentmining-web usage mining- web structure mining – web miningsoftware - Search engines: Search engines functionality-searchenginesarchitecture–rankingofwebpages.	<b>K4</b>	<b>17</b>	
<b>V</b>	Data warehousing: Introduction – Operational data sources-datawarehousing - Data warehousing design – Guidelines for datawarehousingimplementation-Datawarehousingmetadata-Onlineanalyticalprocessing(OLAP):Introduction–OLAPcharacteristicsofOLAPsystem–Multidimensionalviewand data cube - Data cube implementation - Data cube operationsOLAPimplementationguidelines.	<b>K5</b>	<b>18</b>	
	<b>LearningResources</b>			
<b>Text Books</b>	G.K.Gupta,-IntroductiontoDataminingwithcasestudies,2 <sup>nd</sup> Edition,PHI Privatelimited, NewDelhi, 2011			
<b>Reference Books</b>	Arun KPujari,-DataMiningTechniques, 10 <sup>th</sup> .impression, UniversityPress,2008.			
<b>Website/ Link</b>	NPTEL & MOOC courses titled Data Mining1. <a href="http://nptel.iitm.ac.in/video.php?subjectId=106106092">http://nptel.iitm.ac.in/video.php?subjectId=106106092</a> . <a href="http://cecs.louisville.edu/data_mining/PDF/0471228524.pdf">http://cecs.louisville.edu/data_mining/PDF/0471228524.pdf</a>			



**MappingwithProgrammeOutcomes**

<b>CONumber</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	S	M	-
<b>CO2</b>	S	L	M	S
<b>CO3</b>	S	M	L	M
<b>CO4</b>	M	S	-	S
<b>CO5</b>	S	L	M	S

S-Strong,M-Medium ,L-Low

<b>SubjectTitle</b>	<b>SEMESTER – VI PAPER – II WIRELESS NETWORK</b>	<b>Semester</b>	<b>VI</b>
<b>SubjectCode</b>	<b>21UISE05</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Elective:Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>

**CourseObjective:**

1. To understand about Wireless Networks.
2. To be familiar with Protocol Stack and Standards.
3. To be exposed to 3G/4G Services.
4. Gain knowledge about its Protocols and Applications.

<b>CO Number</b>	<b>CO Statement</b>	<b>Knowledge Level</b>
<b>CO1</b>	Remember the basic concepts of WLAN technologies.	K1
<b>CO2</b>	Understanding mobile IP.	K2
<b>CO3</b>	Apply TCP enhancements.	K3
<b>CO4</b>	Evaluate UTM.	K4
<b>CO5</b>	Implement 4G.	K5

Subject Title	SEMESTER–VIPAPER– I IWIRELESSNETWORK	Semester	VI	
Subject Code	21UISE05	Specialization	NA	
Type	Elective:Theory	L:T:P:C	86:6:0:4	
Unit	Contents	Levels	Sessions	
I	Introduction-WLAN Technologies: Infrared, UHF Narrowband,Spread Spectrum -IEEE802.11: System Architecture, ProtocolArchitecture, Physical Layer, MAC Layer, 802.11b, 802.11a – HiperLAN:WATM,BRAN,HiperLAN2– Bluetooth:Architecture,RadioLayer,BasebandLayer,LinkManagerProtocol,Security–IEEE802.16- WIMAX:PhysicalLayer,MAC, Spectrum Allocation for WIMAX.	K1	18	
II	Introduction–MobileIP:IPPacketDelivery,AgentDiscovery, Tunneling And Encapsulation, IPV6-Network LayerInTheInternet-MobileIPSessionInitiationProtocol–Mobile Ad-Hoc Network: Routing, Destination Sequence DistanceVector,DynamicSourceRouting.	K2	18	
III	TCP Enhancements For Wireless Protocols – Traditional TCP:CongestionControl,FastRetransmit/FastRecovery,ImplicationsOfMobility– ClassicalTCPImprovements:IndirectTCP,SnoopingTCP,Mobile TCP,TimeOutFreezing, Selective Retransmission, Transaction Oriented TCP – TCPOver3GWireless Networks.	K3	18	
IV	Overview Of UTMS Terrestrial Radio Access Network-UMTSCore Network Architecture: 3G-MSC, 3G-SGSN, 3G-GGSN,SMS-GMSC/SMS-IW MSC, Firewall, DNS/DHCP-High SpeedDownlinkPacketAccess(HSDPA)- LTENetworkArchitectureAnd Protocol.	K4	18	
V	4GIntroduction – 4G Vision – 4G Features And Challenges – ApplicationsOf4G– 4GTechnologies:MulticarrierModulation,SmartAntennaTechniques,OFDM-MIMOSystems,AdaptiveModulationAnd Coding WithTime SlotScheduler,CognitiveRadio.	K5	14	
<b>LearningResources</b>				
<b>Text Books</b>	1. JochenSchiller,  MobileCommunications  ,SecondEdition,PearsonEducation2012.(UnitI,II,III) 2. VijayGarg,-WirelessCommunicationsAndNetworking  ,FirstEdition, Elsevier2007.(UnitIV,V)			
<b>Reference Books</b>	1. Erik Dahlman, Stefan Parkvall, Johan SkoldAndPer Beming, -3GEvolution HSPAAndLTEForMobileBroadband  ,SecondEdition,AcademicPress,2008. 2. AnuragKumar,D.Manjunath,JoyKuri,-WirelessNetworking  ,FirstEdition, Elsevier2011. 3. Simon Haykin , Michael Moher, David Koilpillai, -Modern WirelessCommunications  , First Edition, Pearson Education 2013			

<b>Website/ Link</b>	1.www2.scut.edu.cn2. <a href="http://www.iqyttechnicalcollege.com">www.iqyt echnicalcollege.com</a> 3. <a href="http://www.rejinPaul.com">www.reji nPaul.com</a>
--------------------------	--

**MappingwithProgrammeOutcomes**

<b>CONumber</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	M	S	S	L
<b>CO2</b>	S	S	M	L
<b>CO3</b>	S	M	L	L
<b>CO4</b>	M	S	L	L
<b>CO5</b>	S	M	M	L

S-Strong,M-Medium ,L-Low

<b>SubjectTitle</b>	<b>SEMESTER – VI PAPER – III COMPUTER GRAPHICS</b>	<b>Semester</b>	<b>VI</b>
<b>SubjectCode</b>	<b>21UISE06</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Elective:Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>

**CourseObjective:**

1. Tounderstandabout ComputerGraphics.
2. TofamiliarwithscanandI/Odevices.
3. Tobeexposedto2DTransformations andclipping.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	RememberthebasicconceptsofGraphics system.	K1
<b>CO2</b>	Understandingscansystem and I/ODevices.	K2
<b>CO3</b>	Apply2DTransformations.	K3
<b>CO4</b>	Evaluate3DTransformations.	K4
<b>CO5</b>	Implementvisualsurfacetechiques.	K5

<b>Subject Title</b>	<b>SEMESTER – VI PAPER – III COMPUTER GRAPHICS</b>	<b>Semester</b>	<b>VI</b>	
<b>Subject Code</b>	<b>21UISE06</b>	<b>Specialization</b>	<b>NA</b>	
<b>Type</b>	<b>Elective: Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>	
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>	
<b>I</b>	Overview of graphics Systems: Video Display Device – Refresh Cathode-Ray tubes Raster–Scan Displays Random–Scan Displays–Color CRT Monitors–Direct view Storage tubes Flat–Panel Displays Three–Dimensional Viewing Devices. Stereoscopic and Virtual–Reality Systems.	<b>K1</b>	<b>18</b>	
<b>II</b>	Raster–Scan Systems Video Controller–Random–Scan Systems Video Controller–Random–Scan Systems–Input device–Keyboard Mouse–Trackball and Spaceball. Joysticks – Data Glove – Digitizers- Image Scanners – Touch Panels – Lightpens. Voice Systems–Hard-Copy Devices–Line Drawing Algorithms DDA Algorithms–Circle generating Algorithm Properties of Ellipses	<b>K2</b>	<b>18</b>	
<b>III</b>	Two Dimensional Geometric Transformation: Basic Transformation s- Translation–Rotation–Scaling – Matrix Representations and Homogeneous Coordinates–Other Transformations Reflections Two Dimensional Viewing: Window to viewpoint coordinate Transformations–Clipping Operations – Point Clipping – Line Clipping – Curve Clipping – Text Clipping– Exterior Clipping.	<b>K3</b>	<b>18</b>	
<b>IV</b>	Three Dimensional Concepts: Three Dimensional Display method – Parallel projection – Depth cueing - visible line and surface– Three Dimensional Geometric and modeling Transformations: Translation – Rotation - Scaling – Composite Transformations. Three Dimensional Viewing: Viewing pipeline – Viewing Coordinates– Projections – Parallel Projections – Perspective Projections.	<b>K4</b>	<b>18</b>	
<b>V</b>	Visible Surface Detection Methods: Classification Visible Surface Detection Algorithms–Back Face Detection–Depth–Buffer Method–A-Buffer Method–Scan line method–Depth sorting method –BSP tree method – Area Subdivision Method.	<b>K5</b>	<b>14</b>	
	<b>Learning Resources</b>			
<b>Text Books</b>	Donald Hearn & M. Pauline Baker, –Computer Graphics I, 2 <sup>nd</sup> Edition, 1996			
<b>Reference Books</b>	John F. Hughes, Andries Van Dam, Morgan McGuire, David F. Sklar, James D. Foley, Steven K. Feiner, Kurt Akeley, –Computer Graphics Principles and Practice II 3 <sup>rd</sup> Edition, Pearson Education, 2014.			
<b>Website /Link</b>	1. <a href="http://www.javatpoint.com/computer-graphics">www.javatpoint.com/computer-graphics</a> 2. <a href="http://www.taylorfrancis.com">www.taylorfrancis.com</a>			

**MappingwithProgrammeOutcomes**

<b>CO Number</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	M	S	M	L
<b>CO2</b>	S	M	M	M
<b>CO3</b>	S	M	L	L
<b>CO4</b>	M	S	L	M
<b>CO5</b>	S	S	M	L

S-Strong,M-Medium ,L-Low

**ELECTIVEIII**

<b>SubjectTitle</b>	<b>SEMESTER–VIPAPER– ISOFTWARETESTING</b>	<b>Semester</b>	<b>VI</b>
<b>Subject Code</b>	<b>21UISE07</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Elective:Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>

**CourseObjective:**

1. Tostudyvarious Software techniques.
2. To studyfundamental conceptsin softwaretesting.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	RememberthebasicconceptsofSDLC.	K1
<b>CO2</b>	UnderstandingBlockbox testing.	K2
<b>CO3</b>	Applsystemtesting.	K3
<b>CO4</b>	Evaluateperformancetesting.	K4
<b>CO5</b>	Implementtestplanning.	K5



Subject Title	SEMESTER–VIPAPER–I SOFTWARE TESTING	Semester	VI	
Subject Code	21UISE07	Specialization	NA	
Type	Elective: Theory	L:T:P:C	86:6:0:4	
Unit	Contents	Levels	Sessions	
I	SOFTWARE DEVELOPMENT LIFE CYCLE MODELS: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases- Life Cycle models. White-Box Testing: Static Testing – Structural Testing – Challenges in White-Box Testing	K1	18	
II	BLACK-BOX TESTING: What is Black-Box Testing? - Why Black-Box Testing? – When to do Black-Box Testing? – How to do Black-Box Testing? Integration Testing: Integration Testing as Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing- Defect Bash	K2	18	
III	SYSTEM AND ACCEPTANCE TESTING: System Testing Overview – Why is System testing done? – Functional versus Non-functional Testing- Functional System Testing- Non-Functional Testing- Acceptance Testing- Summary of Testing Phases	K3	18	
IV	PERFORMANCE TESTING: Factors Governing Performance Testing – Methodology for Performance Testing - Tools for Performance Testing- Process for Performance Testing- Challenges. Regression Testing: What is Regression Testing? – Types of Regression Testing – When to do Regression Testing? – How to do Regression Testing? – Best Practices in Regression Testing	K4	18	
V	TEST PLANNING, MANAGEMENT, EXECUTION AND REPORTING: Test Planning – Test Management- Test Process – Test Reporting. Quick Test Professional (QTP): Overview of QTP – Testing an Application using QTP – Creating CheckPoints – Testing Database Application – Testing a Web Application	K5	14	
<b>Learning Resources</b>				
<b>Text Books</b>	Srinivasan Desikan, Gopalaswamy Ramesh Software Testing Principles and Practices, Pearson Education 2012			
<b>Reference Books</b>	1. Dr. K. V. K. K. Prasad, Software Testing Tools, Dreamtech Press 2012 2. Renu Rajani, Testing Practitioner, Handbook Packt Publishing Limited 2017 3. Naresh Chauhan, Software Testing, Oxford University Press 2 <sup>nd</sup> edition, 2016			
<b>Website/ Link</b>	<a href="https://s3_ap_southeast-1.amazonaws.com/tv-prod/documents%2F7619-2.software+system+principles+and+practices_srinivasan+desikan_gopalaswamy+ramesh.pdf">https://s3_ap_southeast-1.amazonaws.com/tv-prod/documents%2F7619-2.software+system+principles+and+practices_srinivasan+desikan_gopalaswamy+ramesh.pdf</a>			

**MappingwithProgrammeOutcomes**

<b>CO Number</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	M	L	L
<b>CO2</b>	S	M	L	M
<b>CO3</b>	S	M	L	L
<b>CO4</b>	L	S	M	M
<b>CO5</b>	S	M	M	L

S-Strong,M-Medium ,L-Low

<b>SubjectTitle</b>	<b>SEMESTER – VI PAPER – IINetworkSecurity</b>	<b>Semester</b>	<b>VI</b>
<b>SubjectCode</b>	<b>21UISE08</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Elective:Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>

**CourseObjective:**

1. ToUnderstand OSISecurityArchitecture.
2. Toacquirefundamentalknowledgeoffinitefieldsand numbertheory.
3. ToUnderstandvariousblockcipherandstreamciphermodels.
4. Studytheprinciples ofsymmetric&publickeycryptosystems.
5. Tolearn thesystemsecuritypractices.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	RemembertheOSISecurityArchitecture.	K1
<b>CO2</b>	UnderstandingNumber theoryandfinitefields.	K2
<b>CO3</b>	ApplyBlockCiphersand DataEncryption Std.	K3
<b>CO4</b>	EvaluatePublicKeyCryptographyand RSA.	K4
<b>CO5</b>	ImplementHashfunctions.	K5

Subject Title	SEMESTER–VIPAPER– IINetworkSecurity	Semester	VI	
Subject Code	21UISE08	Specialization	NA	
Type	Elective:Theory	L:T:P:C	86:6:0:4	
Unit	Contents		Levels	Sessions
I	OSISecurityArchitecture– Securityattacks,servicesandmechanisms – Network security Model – Classical encryptiontechniques: Symmetric cipher model, Substitution techniques –Transposition techniques– Rotor machines–Steganography		K1	18
II	Numbertheoryandfinitefields:TheEuclideanalgorithm–Modular arithmetic-Groups,RingsandFields–Finite fieldsof theFormGF(p)–Polynomialarithmetic–primenumbers– Fermat’sand eulerstheorems		K2	18
III	Block Ciphers and Data Encryption Standard: Traditional blockcipherstructure–DataEncryption–Strengthsof DES– BlockCipherDesignPrinciples–AdvancedEncryption Standard – AES structure – AES transformation functions – AES Keyexpansion–implementation		K3	18
IV	Public Key Cryptography and RSA – Principles of Public-keyCryptosystems–RSAalgorithm-Diffie– HellmanKeyexchange-Elgamal Cryptographic System		K4	18
V	Hash functions – Applications – two simple hash functions – Hash functions based on Cipher block chaining - Secure HashAlgorithm (SHA)		K5	14
<b>LearningResources</b>				
<b>Text Books</b>	WilliamStallings,- <i>CryptographyandNetworkSecurity:PrinciplesandPractice</i> ll, PearsonEducation 2013,6 <sup>th</sup> Edition.			
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. BehrouzA. Ferouzan, -<i>Cryptography&amp;NetworkSecurity</i>ll, Tata McGraw Hill2007.</li> <li>2. Man YoungRhee, -<i>Internet Security: CryptographicPrinciples,Algorithms andProtocols</i>ll, WileyPublications2003.</li> <li>3. CharlesPfleeger, -<i>Security in Computing</i>ll, Prentice Hall of India 2006, 4<sup>th</sup>Edition.</li> <li>4. UlysessBlack,-<i>Internet SecurityProtocols</i>”, PearsonEducation Asia2000.</li> <li>5. Charlie Kaufman and RadiaPerlman, Mike Speciner, -<i>NetworkSecurity, PrivateCommunicationinPublicWorld</i>ll,PHI2002,2<sup>nd</sup>Edition.</li> </ol>			
<b>Website /Link</b>	NPTEL & MOOC courses titled NetworkSecurity <a href="https://nptel.ac.in/courses/106105031/">https://nptel.ac.in/courses/106105031/</a>			

**MappingwithProgrammeOutcomes**

<b>CO Number</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	M	M	L
<b>CO2</b>	S	M	L	L
<b>CO3</b>	S	M	L	L
<b>CO4</b>	M	L	S	M
<b>CO5</b>	S	M	M	L

S-Strong,M-Medium ,L-Low

<b>SubjectTitle</b>	<b>SEMESTER–VIPAPER–III INTERNETOFTHINGS</b>	<b>Semester</b>	<b>VI</b>
<b>SubjectCode</b>	<b>21UISE09</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Elective:Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>

**CourseObjective:**

1. UseofDevices,Gateways andDataManagementinIoT.
2. DesignIoTapplications indifferentsdomainandbeabletoanalyzetheirperformance
3. ImplementbasicIoTapplications onembeddedplatform.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	RememberIoTandWebtechnology.	K1
<b>CO2</b>	UnderstandingM2M toIoT.	K2
<b>CO3</b>	ApplyIoTArchitecture.	K3
<b>CO4</b>	Evaluate IoTApplications.	K4
<b>CO5</b>	ImplementIoTPrivacy,Securityand Governance.	K5

Subject Title	SEMESTER–VIPAPER–III INTERNETOFTHINGS	Semester	VI	
Subject Code	21UISE09	Specialization	NA	
Type	Elective:Theory	L:T:P:C	86:6:0:4	
Unit	Contents	Levels	Sessions	
I	IoT& Web Technology, The Internet of Things Today, Time forConvergence,TowardstheIoT Universe,Internetof ThingsVision, IoT Strategic Research and Innovation Directions, IoTApplications,FutureInternetTechnologies,Infrastructure,Net works and Communication, Processes, Data Management,Security,Privacy&Trust,DeviceLevelEnergyIssues ,IoT Related Standardization, Recommendationson ResearchTopics.	K1	18	
II	M2MtoIoT–ABasicPerspective– Introduction,SomeDefinitions,M2MValueChains,IoTValueChai ns,Anemerging industrial structure for IoT, The international drivenglobal value chain and global information monopolies. M2M toIoT-AnArchitectural Overview–Buildingan architecture,Main design principles and needed capabilities, An IoT architectureoutline,standardsconsiderations.	K2	18	
III	IoTArchitecture-StateoftheArt– Introduction,Stateoftheart,Architecture.ReferenceModel- Introduction,ReferenceModelandarchitecture,IoTreferenceMode l,IoTReferenceArchitecture- Introduction,FunctionalView,InformationView,Deploymentand OperationalView,OtherRelevant architecturalviews	K3	18	
IV	IoTArchitectureIntroduction,IoTApplicationsforindustry:Future Factory Concepts, Brownfield IoT, Smart Objects, SmartApplications, Four AspectsinyourBusiness toMasterIoT, ValueCreationfromBigDataandSerialization,IoTfor RetailingIndustry,IoTForOilandGasIndustry,Opinionson IoT Application and Value for Industry, Home Management, e-Health.	K4	18	
V	Internet of Things Privacy, Security and GovernanceIntroduction,OverviewofGovernance,Priv acyandSecurityIssues,ContributionfromFP7Projects,Security,Priv acyandTrustinIoT-Data- PlatformsforSmartCities,FirstStepsTowardsaSecurePlatform,S martieApproach.DataAggregation fortheIoTin Smart Cities, Security	K5	14	
	<b>LearningResources</b>			
<b>Text Books</b>	VijayMadisetiandArshdeepBahga,– <i>InternetofThings:(AHands-onApproach)</i> ll, Universities Press (INDIA) PrivateLimited 2014,1 <sup>st</sup> Edition.			

<b>Reference Books</b>	<ol style="list-style-type: none"><li data-bbox="423 144 1390 214">1. MichaelMiller,-<i>TheInternetofThings:HowSmartTVs,SmartCars,SmartHomes,andSmartCitiesAre ChangingtheWorld</i>  ,PearsonEducation2015.</li><li data-bbox="423 219 1365 242">2. FrancisdaCosta,-<i>RethinkingtheInternetofThings:AScalableApproachto</i></li></ol>
----------------------------	--



	<p><i>Connecting Everything</i>, Apress Publications 2013, 1<sup>st</sup> Edition.</p> <p>3. Walteneus Dargie, Christian Poellabauer, " <i>Fundamentals of Wireless Sensor Networks: Theory and Practice</i> ", Wiley 2014.</p> <p>4. Cuno Pfister, - <i>Getting Started with the Internet of Things</i> , O'Reilly Media 2011.</p>
<b>Website /Link</b>	<p>1. <a href="https://github.com/connectIOT/iottoolkit">https://github.com/connectIOT/iottoolkit</a> 2. <a href="https://www.arduino.cc/3">https://www.arduino.cc/3</a> 3. <a href="http://www.zettajs.org/">http://www.zettajs.org/</a></p>

**Mapping with Programme Outcomes**

CO Number	PO1	PO2	PO3	PO4
CO1	S	M	M	L
CO2	S	M	M	L
CO3	S	M	M	M
CO4	M	L	S	M
CO5	S	L	M	L

S-Strong, M-Medium, L-Low

**NONMAJORELECTIVECOURSE(NMEC)-I**

<b>Subject Title</b>	<b>SEMESTER – III PAPER – IBASICSOF COMPUTERS</b>	<b>Semester</b>	<b>III</b>
<b>Subject Code</b>	<b>21UISN01</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>NMEC:Theory</b>	<b>L:T:P:C</b>	<b>26:2:0:2</b>

**CourseObjective:**

1. ToUnderstandthebasicsofcomputers.
2. Topreparethestudentsforanalyzedataprocessing.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	Rememberthebasicsof computers.	K1
<b>CO2</b>	Understandnumbersystem.	K2
<b>CO3</b>	Demonstratethefunctionsofcomputersystem.	k3
<b>CO4</b>	Studytheinput andoutputsystem.	K4
<b>CO5</b>	Analyzedataprocessing.	K5

<b>Subject Title</b>	<b>SEMESTER – III PAPER – IBASICSOF COMPUTERS</b>	<b>Semester</b>	<b>III</b>	
<b>Subject Code</b>	<b>21UISN01</b>	<b>Specialization</b>	<b>NA</b>	
<b>Type</b>	<b>NMEC:Theory</b>	<b>L:T:P:C</b>	<b>26:2:0:2</b>	
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>	
<b>I</b>	IntroductiontoComputer:Introduction–Typesofcomputers – Characteristics of Computers. Generations of Computers: FirstGeneration–SecondGeneration–ThirdGeneration– FourthGeneration– FifthGeneration.ClassificationofDigitalComputers:Introduction– Microcomputers–PersonalComputer – Portable Computers – Mini Computers – Super Computers – MainFrames.	<b>K1</b>	<b>5</b>	
<b>II</b>	Number System: Introduction – Decimal Number System – BinaryNumber System – Binary-Decimal Conversion – Decimal BinaryConversion–BinaryAddition–BinarySubtraction– Complements–9'sComplement–10'sComplement–1'sComplements – 2's Complements – BCD - Bits, Bytes, Words –Octal– HexadecimalNumberSystem.	<b>K2</b>	<b>5</b>	
<b>III</b>	AnatomyofDigitalComputer:FunctionsandComponentsofComputer –CentralProcessingUnit–ControlUnit–Arithmetic– LogicUnit–Memory–Registers– Addresses.MemoryUnits:RAM,ROM,PROM, EPROM, EEPROM, AndFlash Memory	<b>K3</b>	<b>5</b>	
<b>IV</b>	InputDevices:Introduction–Keyboard–Mouse–TypesofMice – Connections – Mouse pad – Trackball – joystick – DigitizingTablet – Scanners – Digital Camera – MICR – OCR – OMR – BarCode Reader – Speech Input Device- Touch Screen – Touch Pad –LightPen.OutputDevices:Introduction–Monitor– Classification of Monitors – Monochrome – Gray Scale – Color – DigitalMonitor–AnalogMonitor–Characteristicsofmonitor– Printers.	<b>K4</b>	<b>5</b>	
<b>V</b>	Computer Software: Introduction – Operating System – Utilities – CompilerandInterpreters–WordProcessor–Spreadsheets– PresentationGraphics–DBMS–ProgrammingLanguages:Machine Language – Assembly Language – High level language – TypesofHighLevelLanguage.DataProcessing:DataVS Information – File Processing – Sequential File Processing – DirectAccessfileProcessing.	<b>K5</b>	<b>6</b>	
	<b>LearningResources</b>			
<b>Text Books</b>	AlexisLeon and MathewsLeon,–FundamentalsofComputerScience and Communication EngineeringI,Leon Tech world,1998.			
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. BRam and SanjayKumar,–ComputerFundamentalsI,5<sup>th</sup>Edition, NewAge International Publishers,2014.</li> <li>2. PradeepKSinha, PritiSinha,–ComputerFundamentalsI, BPBPublications, 2004.</li> <li>3. AnitaGoel,–ComputerFundamentalsI,1<sup>st</sup> Edition, Pearson EducationIndia, 2010.</li> </ol>			

<b>Website/ Link</b>	<a href="https://www.gopeaople.edu/blog/the_basics_of_computer_science_how_to_get_started/www.tutorialspoint.com&gt;basics_of_computer">https://www.gopeaople.edu/blog/the_basics_of_computer_science_how_to_get_started/ www.tutorialspoint.com&gt;basics_of_computer</a>
--------------------------	--

### MappingwithProgrammeOutcomes

<b>CONumber</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	M	M	---
<b>CO2</b>	M	M	-	S
<b>CO3</b>	S	M	L	M
<b>CO4</b>	M	S	M	-
<b>CO5</b>	S	M	-	L

S-Strong,M-Medium ,L-Low

## NONMAJORELECTIVECOURSE(NMEC)-I

<b>SubjectTitle</b>	<b>SEMESTER – III PAPER – II COMPUTER APPLICATIONS FOR AUTOMATION</b>	<b>Semester</b>	<b>III</b>
<b>SubjectCode</b>	<b>21UISN02</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>NMEC:Theory</b>	<b>L:T:P:C</b>	<b>26:2:0:2</b>

**CourseObjective:**

1. To acquire knowledge on editor, spreadsheet and slide preparation.
2. To improve creative thinking in presentation software.

<b>CO Number</b>	<b>CO Statement</b>	<b>Knowledge Level</b>
<b>CO1</b>	Remember the basics of computers.	K1
<b>CO2</b>	Understand MS word.	K2
<b>CO3</b>	Demonstrate the functions of MS excel.	k3
<b>CO4</b>	Study the basics of MS power point.	K4
<b>CO5</b>	Analyze data processing with MS Access.	K5

Subject Title	SEMESTER – III PAPER – II COMPUTER APPLICATIONS FOR AUTOMATION	Semester	III	
Subject Code	21UISN02	Specialization	NA	
Type	NMEC:Theory	L:T:P:C	26:2:0:2	
Unit	Contents	Levels	Sessions	
I	Introduction to Computers: Introduction-Importance-History-Anatomy	K1	5	
II	MS-Word: Basics – Do's and Don'ts – Menus – Commands – Tool Bars – Icons – Word Formatting Tool Bar	K2	5	
III	MS-Excel: Basics – Do's and Don'ts – Menus – Commands – Tool Bars – Icons	K3	5	
IV	MS-PowerPoint: Basics – Menus – Tool Bars – Navigation	K4	5	
V	MS-Access: Introduction – Parts of an Window: - Creating a New Data Base – Table Wizard – Renaming – Saving the Database – Relationships – Query – Form – Reports – Exiting MS-Access	K5	6	
<b>Learning Resources</b>				
<b>Text Books</b>	Sanjay Saxena, –MS-Office 2000 for everyone, Vikas Publishing House Pvt. Ltd, Reprint 2006			
<b>Reference Books</b>	1. Nellai Kannan, –MS-Office, Nels Publications, 3 <sup>rd</sup> Edition, 2004. 2. John Walkenbach, Herb Tyson, Michael R. Groh, Faithe Wempen and Lisa A. Bucki, –Microsoft Office 2010 Bible–, Wiley India Pvt. Ltd, Reprint 2010			
<b>Website/ Link</b>	1. <a href="https://ptgmedia.pearsoncmg.com/images/9780735623026/samplepages/9780735623026.pdf">https://ptgmedia.pearsoncmg.com/images/9780735623026/samplepages/9780735623026.pdf</a> 2. <a href="https://www.dit.ie/media/ittraining/msoffice/MOAC_Excel_2016_Core.pdf">https://www.dit.ie/media/ittraining/msoffice/MOAC_Excel_2016_Core.pdf</a> 3. <a href="https://ptgmedia.pearsoncmg.com/images/9780735697799/samplepages/9780735697799.pdf">https://ptgmedia.pearsoncmg.com/images/9780735697799/samplepages/9780735697799.pdf</a>			

**Mapping with Programme Outcomes**

CO Number	PO1	PO2	PO3	PO4
CO1	S	M	M	---
CO2	S	M	-	-
CO3	S	S	L	M
CO4	M	S	M	-
CO5	S	M	M-	L

S-Strong, M-Medium, L-Low

## NONMAJORELECTIVECOURSE(NMEC)–II

<b>SubjectTitle</b>	<b>SEMESTER – IV PAPER – IBASICS OFINTERNET</b>	<b>Semester</b>	<b>IV</b>
<b>Subject Code</b>	<b>21UISN03</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>NMEC: Theory</b>	<b>L:T:P:C</b>	<b>26:2:0:2</b>

**CourseObjective:**

1. Toimprovetheskillsofsurfinginternet.
2. Topreparethestudentsfor developingwebpageusingHTML.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	RememberthebasicsofInternet.	K1
<b>CO2</b>	Understandinternettechnologies.	K2
<b>CO3</b>	DemonstratetagsinHTML.	K3
<b>CO4</b>	Studythe basics ofcreatelist and tables.	K4
<b>CO5</b>	Analyzeframesandforms.	K5

<b>Subject Title</b>	<b>SEMESTER – IV PAPER – IBASICSOFINTERNET</b>	<b>Semester</b>	<b>IV</b>	
<b>Subject Code</b>	<b>21UISN03</b>	<b>Specialization</b>	<b>NA</b>	
<b>Type</b>	<b>NMEC:Theory</b>	<b>L:T:P:C</b>	<b>26:2:0:2</b>	
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>	
<b>I</b>	Introduction To The Internet: ComputerinBusiness– Networking–Internet–E-mail–ResourceSharing–Gopher– WorldWideWeb–Telnet–BulletinBoardService– WideAreaInformationService.	<b>K1</b>	<b>5</b>	
<b>II</b>	InternetTechnologies:Modem–Internetaddressing– Physicalconnections–TelephoneLines– Internetbrowsers – Internet Explorer–NetscapeNavigator.	<b>K2</b>	<b>5</b>	
<b>III</b>	IntroductiontoHTML:Designingahomepage –HTML documents–Anchorstag–Hyper Links. Traditionaltextandformatting	<b>K3</b>	<b>5</b>	
<b>IV</b>	Types of lists: Ordered, Unordered – Nesting Lists – Othertags:Marquee,HR,BR–UsingImages– CreatingHyperlinks ,Tables: Creating basic Table, Table elements, Caption – Tableandcell alignment – Rowspan,Colspan –Cellpadding	<b>K4</b>	<b>5</b>	
<b>V</b>	Frames: Frameset–Targeted Links–Noframe– Forms:Input,Textarea, Select,Option.	<b>K5</b>	<b>6</b>	
<b>LearningResources</b>				
<b>TextBooks</b>	1. C Xavier,–World Wide Web withHTML, TataMcGrawHill Education, 2000. 2. H.M.Deital,P.J.Deital,—InternetandWorldWideWeb– HowtoProgram,4 <sup>th</sup> Edition –PHILearning.			
<b>Reference Books</b>	Laura Lemay,– <i>HTMLComplete Reference,Teach YourselfWeb Publishing with HTML</i> ”.			
<b>Website/ Link</b>	1.NPTEL&MOOC coursesitled HTML. 2. <a href="https://www.codecademy.com/learn/learn-html/">https://www.codecademy.com/learn/learn-html/</a>			

### MappingwithProgrammeOutcomes

<b>CONumber</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	S	M	---
<b>CO2</b>	S	M	-	-
<b>CO3</b>	S	S	M	L
<b>CO4</b>	M	S	L	-
<b>CO5</b>	S	L	M-	L

S-Strong,M-Medium ,L–Low



**NONMAJORELECTIVECOURSE(NMEC)–II**

<b>SubjectTitle</b>	<b>SEMESTER – IV PAPER – II IMAGE EDITING TOOL</b>	<b>Semester</b>	<b>IV</b>
<b>SubjectCode</b>	<b>21UISN04</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>NMEC:Theory</b>	<b>L:T:P:C</b>	<b>26:2:0:2</b>

**CourseObjective:**

1. To impart Practical Training in PHOTO SHOP image editing Tool.
2. Familiarize the different text and filter effects.
3. Build programs using stamp tools.
4. Provide knowledge on working with several layouts.

<b>CO Number</b>	<b>CO Statement</b>	<b>Knowledge Level</b>
<b>CO1</b>	Remember the basics of Photoshop.	K1
<b>CO2</b>	Understand the working with images.	K2
<b>CO3</b>	Demonstrate the layering in Photoshop.	k3
<b>CO4</b>	Implement the layer style.	K4
<b>CO5</b>	Analyze the action concept.	K5

Subject Title	SEMESTER – IV PAPER – II IMAGE EDITING TOOL	Semester	IV	
Subject Code	21UISN04	Specialization	NA	
Type	NMEC:Theory	L:T:P:C	26:2:0:2	
Unit	Contents	Levels	Sessions	
I	Getting Started with Photoshop CS5: Launching Photoshop CS5 - Exploring the Interface - Using Screen Modes - Opening an Existing Image - Opening an Image Using Adobe Bridge - Exploring Commonly Used Tools in the Tools Panel - Creating a New Document - Saving a Document - Reverting a Document - Selecting a Workspace - Creating a New Workspace - Deleting a Workspace - Working with Panels in Photoshop CS5 - Keyboard Shortcuts and Menu Settings - Customizing Preferences.	K1	5	
II	Working with Images: Differences between Bitmap and Vector Images - Understanding Image Resolution Editing Images - Different Color Modes in Photoshop CS5 - Making Color Adjustments - File Formats in Photoshop CS5 - Creating a PDF File in Photoshop CS5 - Importing a PDF File into Photoshop CS5 - Making a Selection with Selections Tools - Modifying a Selection - Transforming a Selection - Transforming Pixels.	K2	5	
III	Mastering Layers in Photoshop CS5: Exploring LAYERS Panel - Working with Layers - Organizing Layers Working with Opacity and Blend Modes - Working with Adjustment Layers - Masking in Photoshop CS5 - Setting the Current Foreground and Background Colors - Filling a Selection with the Current Foreground Color - Using the Content-Aware Feature - Exploring Drawing Tools - Exploring Painting Tools - Exploring Retouching Tools.	K3	5	
IV	Working with Layer Styles and Filter Effects: Understanding Layer Styles - Working with Smart Objects - Understanding Filters.	K4	5	
V	Animation, 3D, and Printing in Photoshop CS5: Working with Actions - Working with Automate Commands - Exploring 3D in Photoshop - Working with Animation in Photoshop CS5 - Printing in Photoshop CS5.	K5	6	
<b>Learning Resources</b>				
<b>Text Books</b>	C Kogent Learning Solutions Inc., - Photoshop CS5 in Simple Steps II, Dreamtech Press, New Delhi, 2012.			
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Brie Gyncild, - Adobe Photoshop CS6 Classroom in a Book II, Adobe Press/Peachpit, 2012</li> <li>2. Lisa Danae Dayley, Brad Dayley, - Adobe Photoshop Cs6 Bible II, Wiley India Pvt Ltd.</li> <li>3. Edward Bailey, - Photoshop: 7 Ways to Use Adobe Photoshop Like a Pro II, Create space Independent Publishing Platform</li> </ol>			
<b>Website/ Link</b>	<ol style="list-style-type: none"> <li>1. <a href="http://www.online_image_editor.com">www.online_image_editor.com</a></li> <li>2. <a href="http://www.cs5_on_demand_sampler.pdf">www.cs5_on_demand_sampler.pdf</a></li> </ol>			

### MappingwithProgrammeOutcomes

<b>CO Number</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	M	L	---
<b>CO2</b>	S	M	-	L
<b>CO3</b>	S	M	L	L
<b>CO4</b>	M	S	L	L
<b>CO5</b>	S	L	-	M

S-Strong,M-Medium ,L-Low

## ALLIEDOPTIONI

<b>SubjectTitle</b>	<b>SEMESTER I/III PAPER – IFUNDAMENTALSOFCOMPUTERS</b>	<b>Semester</b>	<b>I/III</b>
<b>SubjectCode</b>	<b>21UISA01</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Allied:Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>

**CourseObjective:**

1. Tounderstandthebasicsofcomputers.
2. Topreparethestudentsfortheanalyzeofdataprocessing.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	Rememberthebasicsof computers.	K1
<b>CO2</b>	Understandthenumbersystem.	K2
<b>CO3</b>	Demonstratethefunctionsofcomputersystem.	K3
<b>CO4</b>	Studytheinput and output system.	K4
<b>CO5</b>	Analyzethedataprocessing.	K5

<b>Subject Title</b>	<b>SEMESTER I/III PAPER – IFUNDAMENTALSOFCOMPUTERS</b>	<b>Semester</b>	<b>I/III</b>	
<b>Subject Code</b>	<b>21UISA01</b>	<b>Specialization</b>	<b>NA</b>	
<b>Type</b>	<b>Allied:Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>	
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>	
<b>I</b>	IntroductiontoComputer:Introduction–Typesofcomputers –CharacteristicsofComputers.  Generations of Computers: First Generation – Second Generation – ThirdGeneration–FourthGeneration–FifthGeneration.ClassificationofDigitalComputers:Introduction–Microcomputers – Personal Computer – Portable Computers – MiniComputers– SuperComputers– Main Frames.	<b>K1</b>	<b>17</b>	
<b>II</b>	Number System: Introduction – Decimal Number System – BinaryNumber System – Binary-Decimal Conversion – Decimal BinaryConversion–BinaryAddition–BinarySubtraction–Complements–9'sComplement–10'sComplement–1's Complements – 2's Complements – BCD - Bits, Bytes, Words – Octal– Hexadecimal NumberSystem.	<b>K2</b>	<b>17</b>	
<b>III</b>	AnatomyofDigitalComputer:FunctionsandComponentsofComputer –CentralProcessingUnit– Control Unit– Arithmetic–LogicUnit–Memory–Registers– Addresses.MemoryUnits:RAM,ROM,PROM,EPROM,EEPROM,And FlashMemory.	<b>K3</b>	<b>17</b>	
<b>IV</b>	InputDevices:Introduction–Keyboard–Mouse–TypesofMice – Connections – Mouse pad – Trackball – joystick – DigitizingTablet – Scanners – Digital Camera – MICR – OCR – OMR – BarCode Reader – Speech Input Device- Touch Screen – Touch Pad –Light Pen. Output Devices: Introduction – Monitor – ClassificationofMonitors –Monochrome– GrayScale– Color– DigitalMonitor – AnalogMonitor–Characteristicsofmonitor–Printers.	<b>K4</b>	<b>17</b>	
<b>V</b>	Computer Software: Introduction – Operating System – Utilities – CompilerandInterpreters–WordProcessor–Spreadsheets– PresentationGraphics–DBMS–ProgrammingLanguages:Machine Language – Assembly Language – High level language – TypesofHighLevelLanguage.DataProcessing:DataVS Information – File Processing – Sequential File Processing – DirectAccessfileProcessing.	<b>K5</b>	<b>18</b>	
	<b>LearningResources</b>			
<b>Text Books</b>	AlexisLeon and MathewsLeon,-Fundamentalsof ComputerScience and CommunicationEngineeringI,LeonTechworld,1998.			
<b>Reference Books</b>	1. BRam and SanjayKumar,-ComputerFundamentalsI,5 <sup>th</sup> Edition, NewAge International Publishers,2014. 2. PradeepKSinha, PritiSinha,-ComputerFundamentalsI, BPBPublications,2004. AnitaGoel,—ComputerFundamentalsI,1 <sup>st</sup> Edition,PearsonEducationIndia,2010\			

<b>Website/ Link</b>	1. <a href="https://www.gopeople.edu/blog/the_basics_of_computer_science_how_to_get_started">https://www.gopeople.edu/blog/the_basics_of_computer_science_how_to_get_started</a> 2. <a href="http://www.tutorialspoint.com&gt;basics_of_computer">www.tutorialspoint.com&gt;basics_of_computer</a>
--------------------------	---

**MappingwithProgrammeOutcomes**

<b>CONumber</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	M	M	---
<b>CO2</b>	M	M	-	S
<b>CO3</b>	S	M	L	M
<b>CO4</b>	M	S	M	-
<b>CO5</b>	S	M	-	L

S-Strong,M-Medium ,L-Low

<b>SubjectTitle</b>	<b>COMPUTER APPLICATIONS IN OFFICE</b>	<b>Semester</b>	<b>II/IV</b>
<b>SubjectCode</b>	<b>21UISA02</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Allied:Theory</b>	<b>L:T:P:C</b>	<b>56:4:0:4</b>

**CourseObjective:**

1. To improve the quality of students in office automation process.
2. To prepare the students for various ability to prepare reports and presentations.

<b>CO Number</b>	<b>CO Statement</b>	<b>Knowledge Level</b>
<b>CO1</b>	Remember the basics of MS word	K1
<b>CO2</b>	Understand MS word	K2
<b>CO3</b>	Demonstrate the functions of MS excel	k3
<b>CO4</b>	Study the basics of MS excel workbooks	K4
<b>CO5</b>	Analyze of data processing with MS powerpoint	K5

<b>Subject Title</b>	<b>COMPUTERAPPLICATIONSINOFFICE</b>	<b>Semester</b>	<b>II/IV</b>
<b>Subject Code</b>	<b>21UISA02</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Allied:Theory</b>	<b>L:T:P:C</b>	<b>56:4:0:4</b>
<b>Unit</b>	<b>Contents</b>	<b>Levels</b>	<b>Sessions</b>
<b>I</b>	MSWordExploringWord2007:WorkingintheWordEnvironment– Opening,MovingAroundin,andclosingDocument – Creating and Saving A Document – Previewing andPrintingDocument– EditingandProofreadingDocuments:Making Changes to document – Inserting Saved Text– Findingthe MostAppropriateWord– Reorganizing aDocumentOutline– Finding andReplacing Text– Correcting spelling andGrammatical errors –FinalizingDocument	<b>K1</b>	<b>12</b>
<b>II</b>	MS Word Changing the Look of Text: Quickly Formatting TextandParagraphs–Manually changing the lookof characters– Manuallychangingthelookofparagraphs–Creatingandmodifying Lists-Presenting Information in Columns and Tables :PresentingInformationinColumns–CreatingTabularList– PresentingInformationinaTable–FormattingTableInformation – Performing Calculations in a Table- Using a Table to controlPage Layout.	<b>K2</b>	<b>12</b>
<b>III</b>	MSExcelSettingUpaWorkbook:CreatingWorkbooks–Modifying Workbooks - Modifying Worksheets – Working withData and Data Tables : Entering and Revising Data– MovingDatawithinaWorkbook-FindingandReplacingData– Correcting and Expanding Upon Worksheet Data – Defining aTable – Performing Calculations on Data :Naming Groups ofData–CreatingFormulastoCalculateValues–Summarizing Data that meets Specific Conditions –Finding and CorrectingErrorsinCalculations- ChangingDocumentAppearance.	<b>K3</b>	<b>12</b>
<b>IV</b>	MS-Access:Introduction–PartsofanWindow:-CreatingaNew DataBase–TableWizard–Renaming–SavingtheDatabase– Relationships –Query–Form–Reports –ExitingMS-Access	<b>K4</b>	<b>10</b>
<b>V</b>	MS PowerPoint Starting a New Presentation – Working with SlideText : Entering Text – Editing Text – Adding and ManipulatingText Boxes –Correcting and Sizing text – Checking Spelling –Findingandreplacingtextandfonts– Changingthesize,Alignment,Spacing– AdjustingtheSlideLayout,Order and Look :ChangingtheLayoutofaslide–RearrangingSlidesinaPresentation – Applying a theme -Switching to a Different ColorScheme – Adding Shading and texture to the background ofaslide– DeliveringaPresentation Electronically.	<b>K5</b>	<b>10</b>
	<b>LearningResources</b>		
<b>TextBooks</b>	<ol style="list-style-type: none"> <li>1. StepbyStep2007MicrosoftOfficeSystem- JoyceCoxandTeam,PHIlearningPrivate ltd,Newdelhi 2009</li> <li>2. SanjaySaxena,-MS-Office2000foreveryoneII,VikasPublishingHousePvt. Ltd, Reprint 2006</li> </ol>		



<b>Reference Books</b>	<p>1. NellaiKannan,-MS-Officell, NelsPublications, 3<sup>rd</sup>Edition, 2004.</p> <p>2. John Walkenbach, Herb Tyson, Michael R.Groh, FaitheWempen and LisaA.Bucki,-MicrosoftOffice2010Bible-,WileyIndiaPvt.Ltd,Reprint 2010</p>
<b>Website/ Link</b>	<p>1.<a href="https://ptgmedia.pearsoncmg.com/images/9780735623026/samplepages/9780735623026.pdf">https://ptgmedia.pearsoncmg.com/images/9780735623026/samplepages/9780735623026.pdf</a>2.<a href="https://www.dit.ie/media/ittraining/msoffice/MOAC_Excel_2016_Core.pdf">https://www.dit.ie/media/ittraining/msoffice/MOAC_Excel_2016_Core.pdf</a>3.<a href="https://ptgmedia.pearsoncmg.com/images/9780735697799/samplepages/9780735697799.pdf">https://ptgmedia.pearsoncmg.com/images/9780735697799/samplepages/9780735697799.pdf</a>2010</p>

**MappingwithProgrammeOutcomes**

CNumber	PO1	PO2	PO3	PO4
CO1	S	M	M	M
CO2	S	M	L	M
CO3	S	S	L	M
CO4	M	S	L	M
CO5	S	M	M-	L

S-Strong,M-Medium ,L-Low

<b>Subject Title</b>	<b>OFFICE AUTOMATION LAB</b>	<b>Semester</b>	<b>II/IV</b>
<b>Subject Code</b>	<b>21UISAP01</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Allied:Practical</b>	<b>L:T:P:C</b>	<b>30:0:2:2</b>

**CourseObjective**

1. ToenablethestudentstodesignanddeveloptheOfficeapplications.
2. Toqualifythestudents workingineditor, spread sheet and slidepreparation.
3. Toimprovecreativethinkinginpresentation software.

**LISTOFPROGRAMS**

**I. MS-WORD**

1. TextManipulation:Writeaparagraphaboutyour institutionandChangethefontsizeandtype,Spellcheck, Aligning and justification ofText.
2. Biodata:PreparaBio-data.
3. FindandReplace:Writeaparagraphaboutyourselfanddothefollowing.FindandReplace- UseNumberingBullets,Footerand Headers.
4. Tablesandmanipulation:Creation,Insertion,Deletion(ColumnsandRows).Createamarksheet.
5. Mail Merge:Prepareaninvitationtoinviteyourfriendstoyourbirthdayparty.Prepareatleastfiveletters.

**II. MS-EXCEL**

1. Datasorting- AscendingandDescending(bothnumbersandalphabets).
2. Marklist preparation for a student.
3. IndividualPayBillpreparation.
4. InvoiceReport preparation.
5. DrawingGraphs. Take yourowntable.

**III. MS-POWERPOINT**

1. Createasideshowpresentationforaseminar.
2. PreparationofOrganization Charts.
3. Createasideshowpresentationtodisplaypercentageofmarksineachsemesterforall students
4. Usebarchart(X-axis: Semester, Y-axis: % marks).
5. Usedifferentpresentation templatedifferenttransitioneffectforeachslide.

**CourseOutcome**

Onsuccessfulcompletionofthecourse,thestudents will.

1. Understandthefeatures inMSWord.
2. Selectandapplyworksheet andfunctionsinMSEXCEL.
3. CombinemultiplefeaturesinMSPOWERPOINTtopreparepresentations.

**ALLIEDOPTIONII**

<b>SubjectTitle</b>	<b>DATABASESYSTEMS</b>	<b>Semester</b>	<b>I/III</b>
<b>Subject Code</b>	<b>21UISA03</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Allied:Theory</b>	<b>L:T:P:C</b>	<b>86:6:0:4</b>

**CourseObjective:**

1. Toimprovetheunderstandingofdatatabase theoryand practices.
2. Topreparethestudents implementdataseamanipulation inSQL.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	RememberthebasicsofDatabase.	K1
<b>CO2</b>	UnderstandDatabaseSystemsConceptandArchitecture.	K2
<b>CO3</b>	DemonstratethefunctionsoftheRelationalDataModel andSQL.	K3
<b>CO4</b>	StudythebasicsofBasics SQL.	K4
<b>CO5</b>	AnalyzeadvancedSQLcommandsandstatements.	K5

Subject Title	DATABASESYSTEMS	Semester	I/III	
Subject Code	21UISA03	Specialization	NA	
Type	Allied:Theory	L:T:P:C	86:6:0:4	
Unit	Contents		Levels	Sessions
I	IntroductiontoDatabases–Introduction-Characteristicsofthe DatabaseApproach-AdvantagesofUsingtheDBMSApproach-ABrief HistoryofDatabaseApplications.		K1	18
II	DatabaseSystemsConceptandArchitecture:DataModels,Schemas,an dInstances-ThreeSchemaArchitectureandDataIndependence- DatabaseLanguagesandInterfaces- -TheDatabase System Environment - Centralized and Client/Server ArchitecturesforDBMSs-ClassificationofDatabaseManagement Systems.		K2	18
III	TheRelationalDataModelandSQL-DatabaseConstraints- RelationalModelConcepts-Keyconcepts-RelationalModel ConstraintsandRelationalDatabaseSchemas- UpdateOperations,Transactions, and DealingwithConstraintViolations.		K3	18
IV	BasicSQL-SQLDataDefinitionandDataTypes- SpecifyingConstraintsinSQL-BasicRetrievalQueriesinSQL- INSERT, DELETE,andUPDATEStatementsinSQL- AdditionalFeaturesofSQL.		K4	18
V	MoreSQL:ComplexQueries,Triggers,Views,andSchemaModificatio n-MoreComplexSQLRetrievalQueries-Specifying Constraints as Assertionsand Actions asTriggers-Views (VirtualTables)in SQL.		K5	14
<b>LearningResources</b>				
<b>Text Books</b>	RamezElmasri andShamkantB. Navathe,-Fundamentals of database systemsll,6 <sup>th</sup> Edition,Addison-WesleyPublication,2011.			
<b>Reference Books</b>	RaghuRamakrishnan,Madison,JohannesGehrke,—DatabaseManagementSystemsll,3 <sup>r</sup> <sup>d</sup> Edition,McGraw-HillHigherEducation, 2003.			
<b>Website/ Link</b>	1. <a href="http://www.db-book.com/db7">www.db-book.com/db7</a> ,2.www.mh education.co.in			

### MappingwithProgrammeOutcomes

CONumber	PO1	PO2	PO3	PO4
CO1	S	S	M	M
CO2	S	M	L	S
CO3	S	M	L	M
CO4	M	S	M	M
CO5	S	M	L	L

S-Strong,M-Medium ,L–Low

<b>SubjectTitle</b>	<b>E-COMMERCETECHNIQUES</b>	<b>Semester</b>	<b>II/IV</b>
<b>SubjectCode</b>	<b>21UISA04</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Allied:Theory</b>	<b>L:T:P:C</b>	<b>56:4:0:4</b>

**CourseObjective:**

1. ToimprovetheunderstandingofE-COMMERCEandE-payments.
2. TopreparethestudentsimplementHTMLandE-mailcreation.

<b>CO Number</b>	<b>COStatement</b>	<b>KnowledgeLevel</b>
<b>CO1</b>	RememberthebasicsofE-commerceandIndianBusiness.	K1
<b>CO2</b>	Understand WWW.	K2
<b>CO3</b>	DemonstratetheEpaymentsystem.	K3
<b>CO4</b>	Studythe basics Webdesigning.	K4
<b>CO5</b>	AnalyzeEmailcomponents.	K5

Subject Title	E-COMMERCETECHNIQUES	Semester	II/IV	
Subject Code	21UISA04	Specialization	NA	
Type	Allied:Theory	L:T:P:C	56:4:0:4	
Unit	Contents	Levels	Sessions	
I	HistoryofE-commerceandIndian BusinessContext:E-Commerce –EmergenceoftheInternet–EmergenceoftheWWW–AdvantagesofE-Commerce–TransitiontoE-CommerceinIndia –TheInternetandIndia–E-transitionChallengesforIndianCorporate. Business Models for E-commerce: Business Model – E-businessModelsBasedon theRelationshipof TransactionParties- E-businessModelsBasedontheRelationshipofTransactionTypes..	K1	12	
II	EnablingTechnologiesoftheWorldWideWeb:WorldWideWeb – Internet Client-Server Applications – Networks and Internets – Software Agents – Internet Standards and Specifications – ISP.E-Marketing:TraditionalMarketing–IdentifyingWebPresence Goals–OnlineMarketing–E-advertising–E-branding.	K2	12	
III	E-Payment Systems: Main Concerns in Internet Banking – DigitalPaymentRequirements–DigitalToken-basede-paymentSystems –ClassificationofNewPaymentSystems– PropertiesofElectronicCash– ChequePaymentSystemsontheInternet.Information systems for Mobile Commerce: Introduction – Wireless Applications – Cellular Network – Wireless Spectrum – TechnologiesforMobile Commerce–WirelessTechnologies.	K3	12	
IV	HTMLandWeb Designing:BriefHistoryofHTML–HTMLTags –TableCreation–Hyperlink–Reference–Headings–Alignment –SimpleWeb PageCreation.	K4	10	
V	E-mail: Email – Email Components - use of Email–Email creation–browsing–search engines–downloads.	K5	10	
<b>LearningResources</b>				
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. P.T.Joseph, -E-Commerce-AnIndian Perspectivel, 4<sup>th</sup>Edition,PHILearning, 2012.</li> <li>2. C Xavier,-World Wide Web Design with HTML, 13<sup>th</sup>Reprint, TataMcGraw Hill, 2006.</li> <li>3. A.Leonand M.Leon,-Introduction toInformationTechnology, 1<sup>st</sup>Edition, Vijay NicolePublications, 2013.</li> </ol>			
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. David Whiteley,-E-CommerceStrategy, TechnologiesandApplications,1<sup>st</sup>Edition,Tata Mc-Graw-Hill, 2001.</li> <li>2. KamaleshKBajajand DebjaniNag,-E-Commerce– Thecuttingedgeof Business,2<sup>nd</sup>Edition, TataMcGraw-HillEducation, 2005.</li> </ol>			

	<p>3. AlexisLeon and MathewsLeon,-Internet forEveryoneII, 15<sup>th</sup>AnniversaryEdition, LeonTechworld, UBS Publications, 2012.</p> <p>4. RitendraGoel,-e-commercell,NewAgeInternational Publishers, 2016.</p>
<b>Website/ Link</b>	<p>1.<a href="https://e_commerce_pdf_download.peatix.com/">https://e_commerce_pdf_download.peatix.com/</a></p> <p>2.<a href="http://www.tutorialpoints.com/html">www.tutorialpoints.com/html</a></p> <p>3.<a href="https://books.google.com/books/about/a/_wide_web_design_with_html.html?id=6apoxl=z4nwc">https://books.google.com/books/about/a/_wide_web_design_with_html.html?id=6apoxl=z4nwc</a></p>

**MappingwithProgrammeOutcomes**

<b>CO Number</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>CO1</b>	S	M	L	L
<b>CO2</b>	S	M	L	L
<b>CO3</b>	S	M	L	L
<b>CO4</b>	M	S	M	M
<b>CO5</b>	S	M	M	L

S-Strong,M-Medium ,L-Low

**Note:Thispapershouldbehandledandvaluedby DepartmentofComputerScience.**

<b>Subject Title</b>	<b>ALLIED PRACTICAL - IIHTMLPROGRAMMING</b>	<b>Semester</b>	<b>II/IV</b>
<b>Subject Code</b>	<b>21UISAP02</b>	<b>Specialization</b>	<b>NA</b>
<b>Type</b>	<b>Allied:Practical</b>	<b>L:T:P:C</b>	<b>30:0:2:2</b>

**CourseObjective**

1. Toenablethestudentstodesign anddeveloptheWEBPAGES.
2. Toqualifythestudents workingwith tags intable.
3. Toimprovecreativethinkinginforms,listsandframes.

**LISTOFPROGRAMS**

1. WriteHTMLcodeto developa webpagethatcontains thedifferent backgroundand foregroundcolor,with various styles.
2. WriteHTMLcodetocreate aWebpagethatcontains anImageat its left handsideofthepagewhen user clicks on the image; it should open another web page that displays the details of thatimage.
3. CreateawebPageusingHREFtaghavingthe attributeALINK,VLINKetc.
4. Createawebpage,whenuserclicksonthelinkitshouldgotothebottomof thepage.
5. WriteaHTMLcodeto createawebpageofpink colorand displaymovingmessagein redcolor.
6. Createawebpage,showinganorderedlistofnameof yourfive friendsandunorderedlist ofanyfive your hobbies.
7. Create a HTMLdocument containinganested list showingthecontent page ofanybook.
8. Createastudent mark listin HTMLusingTables.
9. CreateaHTMLpagetodemonstratetheusageof Frames.Choosethecontent ofthepageonYourown.
10. Design anapplication forpayslipthroughHTMLforms

**CourseOutcome**

Onsuccessfulcompletionofthecourse,thestudents will

1. UnderstandthefeaturesinHTML.
2. Selectand applytags forcreatetext, listand table.
3. Combinemultiplefeaturesinforms,framesandtexts.

**Note:ForUniversity PracticalExam,bothInternalandExternalshouldbeappointedfrom DepartmentofComputerScience/InformationScience.**



