DEPARTMENT OF COMPUTER SCIENCE

Nallamuthu Gounder Mahalingam College
(Autonomous)
(An ISO 9001:2015 Certified Institution)
Re-Accredited with 'A' Grade by NAAC
Pollachi-642001

SYLLABUS

B. Sc. COMPUTER SCIENCE
BATCH 2018-2021

NGM COLLEGE

Vision

Our dream is to make the College an institution of excellence at the national level by imparting quality education of global standards to make students academically superior, socially committed, ethically strong, spiritually evolved and culturally rich citizens to contribute to the holistic development of the self and society.

Mission

Training students to become role models in academic arena by strengthening infrastructure, upgrading curriculum, developing faculty, augmenting extension services and imparting quality education through an enlightened management and committed faculty who ensure knowledge transfer, instil research aptitude and infuse ethical and cultural values to transform students into disciplined citizens in order to improve quality of life.

DEPARTMENT OF COMPUTER SCIENCE

Vision

Our vision is to make the department, a department of excellence at the international level by imparting need based Information Technology education of global industry standards to make students academically and technically sound, enriched with rich spiritual quotients, contribute to the overall development of the self, society and country.

Mission

Developing students to become role models as technocrats by imparting technical knowledge, recent curriculum in catering the needs of Information Technology industry and quality education through dedicated faculty and rejuvenate students into technically sound, in order to make globally fit and improve the standard of life.

B.Sc. – COMPUTER SCIENCE DEGREE COURSE
(FOR THE CANDIDATES ADMITTED FROM THE ACADEMIC YEAR 2018 ONWARDS)
I to VI SEMESTERS : SCHEME OF EXAMINATIONS

Part	Course Code	Title of the Paper	Hrs	Dur. Hrs	MAX.MARKS			Credits
					CIA	ESE	Total	
I SEMESTER								
I	18UTL101/ 18UHN101/ 18UFR101	Tamil Paper-I/ Hindi Paper-I/ French Paper-I	6	3	25	75	100	3
II	18UEN101	English Paper-I	6	3	25	75	100	3
III	18UCS101	Core I: Programming in C	4	3	25	75	100	4
	18UCS102	Core II: Digital Computer Fundamentals and Organization	4	3	25	75	100	4
	18UCS1A1	Allied-1: Mathematics-I	4	3	25	75	100	4
	18UCS103	Core Lab I: Programming Lab in C	4	3	20	30	50	2
IV	18HEC101	Human Excellence: Personal Values& SKY Yoga Practice-1	1	2	25	25	50	1
	18UHR101	Human Rights in India	1	2	-	50	50	2
V		Extension Activities (NSS, NCC, Sports & Games)						
Total							**650**	**23**
II SEMESTER								
I	18UTL202/ 18UHN202/ 18UFR202	Tamil Paper-II/ Hindi Paper-II/ French Paper-II	6	3	25	75	100	3
II	18UEN202	English Paper – II	5	3	25	75	100	3
III	18UCS204	Core III: Object Oriented Programming Using C++	4	3	25	75	100	4
	18UCS205	Core IV: Data and File Structure	4	3	25	75	100	4
	18UCS2A2	Allied -2: Mathematics-II (Discrete Mathematics)	4	3	25	75	100	4
	18UCS206	Core Lab II: Programming Lab in C++	4	3	20	30	50	2
IV	18HEC202	Human Excellence: Family Values& SKY Yoga Practice-2	1	2	25	25	50	1
	18EVS201	Environmental Studies	2	2	-	50	50	2
V		Extension Activities (NSS, NCC, Sports & Games)						
Total							**650**	**23**

Part	Course Code	Course Title	Hrs	Dur. Hrs	MAX.MARKS			Credits
					CIA	ESE	Total	
III SEMESTER								
III	18UCS307	Core V: Java Programming	4	3	25	75	100	4
	18UCS308	Core VI: Relational Database Management System and Oracle	5	3	25	75	100	4
	18UCS309	Core VII: Operating System	4	3	25	75	100	4
	18UCS3A3	Allied -3 : Computer Based Optimization Techniques	5	3	25	75	100	4
	18UCS310	Core Lab III: Programming Lab in Java	5	3	20	30	50	2
	18UCS311	Core Lab IV: Programming Lab in RDBMS	5	3	20	30	50	2
IV	18HEC303	Human Excellence Paper: Professional Values& SKY Yoga Practice-3	1	2	25	25	50	1
	18UCS3N1/ 18UCS3N2	Non-Major Elective Paper-I Photoshop Lab/ Advanced Applications in MS Excel Lab	1	2	-	50	50	2
V		Annexure-I						
Total							**600**	**23**
IV SEMESTER								
III	18UCS412	Core VIII: . NET Programming	4	3	25	75	100	4
	18UCS413	Core IX: Web Technology	4	3	25	75	100	4
	18UCS414	Core X: Data Communication and Computer Networks	4	3	25	75	100	4
	18UCS4A4	Allied -4 : Accountancy for Decision Making	6	3	25	75	100	4
	18UCS415	Core Lab V: . NET Programming Lab	5	3	20	30	50	2
	18UCS416	Core Lab VI: Web Technology Lab	5	3	20	30	50	2
IV	18HEC404	Human Excellence Paper : Social Values & SKY Yoga Practice-4	1	2	25	25	50	1
	18UCS4N1/ 18UCS4N2	Non-Major Elective Paper-II Flash Lab/ Internet Services and Applications Lab	1	2	-	50	50	2
V		Annexure-I				50	50	1
Total							**650**	**24**

Part	Course Code	Course Title	Hrs	Dur. Hrs	MAX.MARKS			Credits
					Int	Ext	Total	
V SEMESTER								
III	18UCS517	Core XI: Linux	4	3	25	75	100	3
	18UCS518	Core XII: Kotlin Programming	4	3	25	75	100	3
	18UCS519	Core XIII: Cyber Security	4	3	25	75	100	2
	18UCS5E1/ 18UCS5E2/ 18UCS5E3	Core Elective-I:	6	3	25	75	100	5
	18UCS520	Core Lab VII: Linux Lab	5	3	40	60	100	3
	18UCS521	Core Lab VIII: programming Lab using Kotlin	5	3	40	60	100	3
IV	18UCS5S1/ 18UCS5S2 / 18UCS5S3	Skill Based Elective-I	1	2	-	50	50	2
	18HEC505	Human Excellence Paper: National Values& SKY Yoga Practice-5	1	2	25	25	50	1
	18GKL501	General Knowledge	SS	2	-	50	50	2
Total							**750**	**24**

List of Electives-I
18UCS5E1 Software Testing
18UCS5E2 Distributed Computing
18UCS5E3 Client/Server Technology

Skill Based Elective I
18UCS5S1 Word Press
18UCS5S2 Dream Weaver
18UCS5S3 Quantitative Aptitude Skills

VI SEMESTER								
III	18UCS622	Core XIV: Python Programming	4	3	25	75	100	3
	18UCS6E4 18UCS6E5 18UCS6E6	Core Elective – II	6	3	25	75	100	5
	18UCS6E7 18UCS6E8 18UCS6E9	Core Elective – III	6	3	25	75	100	5
	18UCS623	Core Lab IX: Python Programming Lab	5	3	40	60	100	3
	18UCS624	Core Lab X: Advanced Applications in MS Excel Lab	4	3	20	30	50	2
	18UCS625	Project	4	-	-	100	100	3
IV	18UCS6S4/ 18UCS6S5/ 18UCS6S6	Skill based Elective-II	1	2	-	50	50	2
	18HEC606	Human Excellence Paper: Global Values & SKY Yoga Practice-6	2	2	25	25	50	1

Total	**650**	**24**
Grand Total	**3900**	**140**

List Of Electives-II	**List of Electives-III**	**Skill Based Elective-II**
18UCS6E4 Data mining and Warehousing	18UCS6E7 Multimedia Packages	18UCS6S4 Joomla
18UCS6E5 Enterprise Resource Planning	18UCS6E8 Big data Analytics	18UCS6S5 Macromedia Director
18UCS6E6 Grid and Cloud Computing	18UCS6E9 Android Programming	18UCS6S6 Soft Skills

Annexure-I

List of Part – V Subjects

S.No	Course Code	Title
1.	18UNC401	NCC
2.	18UNS402	NSS
3.	18USG403	Sports and Games
4.	18URO404	Rotract Club
5.	18URR405	Red Ribbon Club
6.	18UYR406	Youth Red Cross
7.	18UCA407	Consumer Awareness Club
8.	18UED408	Entrepreneurship Development Cell
9.	18UCR409	Center for Rural Development
10.	18USS410	Student Guild of Service
11.	18UGS411	Green Society
12.	18UEO412	Equal Opportunity Cell
13.	18UFA413	Fine Arts Club

Bloom's Taxonomy Based Assessment Pattern

K1-Remember; **K2**- Understanding; **K3**- Apply; **K4**-Analyze; **K5**- Evaluate

1. Part I,II & III--Theory: 75 Marks

(i) TEST- I & II and ESE:

Knowledge Level	Section		Marks	Description	Total
K1 & K2	A(Answer all)	Q.1 to 5	10x1=10	MCQ	75
		Q.6 to 10		Define	
K3	B (Either or pattern)	Q.11 to 15	5x5=25	Short Answers	
K4 & K5	C (Answer 4 out of 6)	Q.16 is compulsory	4x10=40	Descriptive/ Detailed	
		Q.17 to 21 (Answer 3 out of 5)			

2. Part IV--Theory: 50 Marks

Knowledge Level	Section		Marks	Description	Total
K1 & K2	A(Answer all)	Q.1 to 5	10x1=10	MCQ	50
		Q.6 to 10		Define	
K3, K4 & K5	B (Answer 5 out of 8)	Q.11 to 18	5 x 8=40	Descriptive/ Detailed	

3. Practical Examinations:

Knowledge Level	Section	Marks	Total
K3	Practical & Record work	30	50
K4		20	
K5			

Note:

1. Question paper pattern for Non-Major Elective(NME) Practical Paper (Maximum Marks: 50 Marks)

   Two questions from Computer Science Practical - 40 marks
   Marks for Record - 10 marks

Components of Continuous Assessment

Components		Calculation	CIA Total
Test 1	75	$\frac{75+75+25}{7}$	25
Test 2	75		
Assignment/Seminar	25		

Programme Outcomes

PO1: To inculcate the strong fundamentals of mathematics and to develop competence in computer science.

PO2: To trigger the creativity and programming skills with enhanced knowledge and hands-on practical skill.

Programme Specific Outcomes

PSO1: To impart mathematical foundations of the algorithmic approach and computer science theory in the sculpting and design of computer based systems.

PSO2: Ability to apply the computer science knowledge in all domains and to inculcate strong problem solving skills through the courses of Computer Science.

PSO3: Ability to propose creativity and solutions, and to design modern, user-friendly applications that are greatly useful to the society.

PSO4: Ability to train the students in project based assignments as well as to analyze and interpret data.

PSO5: To impress upon students the importance of good ethical practices, right professional conduct and responsible team leadership, and to develop and update the skill required for IT industry.

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS101	**Title:**	**Batch :**	2018-2021
		Core I: Programming in 'C'	**Semester:**	I
Hrs/Week:	04		**Credits:**	04

Course Objective

The course objective is to know the basic components of the computer and working of each device, the student gain experience about structured programming, understand the implementation of C language and understand various features in C.

Course Outcomes (CO)

K1	CO1	To keep in mind the fundamentals of C programming
K2	CO2	To understand the loops and decision making statements to solve the problem
K3	CO3	To implement different operations on arrays and use functions to solve the given problem.
K4	CO4	To review the C program that uses pointers, structures and files

Syllabus

Units	Contents	Hrs
Unit I	**Introduction to C** :Development of program logic skills through flowchart and algorithm– Constants – C character set – Delimiters – Keywords – Identifiers – Constants– Variables – Rules for defining variables- Data types, – Declaring and initializing variables – Type conversion– Operators – precedence of arithmetic – operators precedence & associativity – expressions – Mathematical functions - Input/Output statements.	10
Unit II	**Control Statements:** IF, IF..ELSE Statements, ELSE...IF ladder – Switch Statement – GOTO Statement – WHILE Statement – Do Statement – FOR Statement – Jumps in Loops –Flowchart Symbols **Arrays:** One dimensional Arrays – Two Dimensional Arrays – Multi Dimensional Arrays – Structures – Arrays within Structures – Structures within structures – Structures and Functions-Union – Size of structures. **Characteristics of Arrays & String manipulation:** Introduction - Declaring & Initializing variables – Reading string from terminal, writing string to screen – Arithmetic operations and characters– string handling Functions.	10
Unit III	**Functions:** User-defined functions- A-Multi-function programme- Elements of user defined function, definition of function-return value &their types, function calls & declarations-category of functions: No arguments & No return values-arguments that No return values – arguments with return values-No arguments that return a value-Nesting of functions-recursion & passing arrays & strings to functions. The scope, Visibility and lifetime of Variables in functions.	11
Unit IV	**Pointers:** Introduction-Accessing, Declaring & Initializing pointer variables-Chain of pointers-Pointer expression, increments-Pointer Arrays-Pointers and Character strings-Array of pointers-Pointers as function arguments-function returning pointers-pointers to functions-Pointers and Structures-Troubles with pointers.	10
Unit V	**Files:** Defining and opening a file – Closing a file –I/O operations of file – Error handling during I/O operations – Random access files – Command line argument-preprocessor – Macro Substitution – File Inclusion – Compiler control directives.	9
	Total Contact Hrs	**50**

	**Italicized* texts are for self study	
	Power point Presentations, Seminar, and Assignment	
TEXT BOOKS	1.E.Balagurusamy, "Programming in Ansi C", Tata McGraw-Hill Publishing Co& Ltd.,Sixth Edition, 2016. 2.E Balagurusamy, "Computing fundamentals & C programming" ,Tata McGraw-Hill, Second Reprint 2008. 3.Anil Bikas Chaudri,"The Art of Programming through Flowcharts and algorithms",Laxmi publication,First Edition,2005	
REFERENCES	1. Yaswanth Kanishkar, "LET US C", BPB Publications, Seventh Edition, 2007. 2.Byron Gottfried,"Proramming with C",Schaum's Outlines series, Second Edition, 1996 3.Ashok N. Kamthane, "Programming with ANSI and Turbo C",Seventh Impression,2009	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	L	M
CO2	M	S	S	S	S
CO3	M	S	S	S	S
CO4	S	S	S	S	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr. M. Sakthi M.Malathi	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS102	**Title:**	**Batch :**	2018-2021
		Core II: Digital Computer Fundamentals and Organization	**Semester:**	I
Hrs/Week:	4		**Credits:**	04

Course Objective

On completion of this course, the students can understand the design of combinational and sequential digital logic circuits. Students will also have knowledge on Programmable Logic devices and its usage.

Course Outcomes (CO)

K1	CO1	To recollect the fundamental concepts and techniques used in digital electronics.
K2	CO2	To get the idea of basic postulates of Boolean Algebra and to apply the methods of simplifying Boolean expressions
K3	CO3	To apply knowledge about internal circuitry and logic behind any digital system and to design various synchronous and asynchronous circuits.
K4	CO4	To analyze the concept of memories, and to introduce microcontroller case study.

Syllabus

Units	**Contents**	**Hrs**
Unit I	Number System and Binary Codes-logic circuits: AND, OR, NOT, NOR, NAND gates-Boolean Laws and Theorem-Karnaugh map simplification-Combination of circuit of design with Gates, Arithmetic Building blocks: Half Adder, *Full Adder*, Subtractors.	10
Unit II	Decoders, Encoders, Multiplexer, Flip-Flops: SR, D, JK. Shift Registers, Counters: Binary ripple, Up-down, Ring, Block Diagram of Computer: CPU- Memory-Input Output Units-Machine Instructions -Operation Code, Operand location –Fetch and Execute cycle.	11
Unit III	Stack Organization: PUSH and POP Operations-Instruction formats-Addressing Modes-Instruction formats Zero, Single, Double. Data Transfer and Manipulation Instructions. Computer Arithmetic: Addition and Subtraction Algorithms for signed magnitude.	10
Unit IV	Peripheral Devices-Input-Output interface- Asynchronous data transfer -Modes of transfer-Priority interrupt- Direct Memory Access-Input- Output Processor.	9
Unit V	Memory Hierarchy- Main Memory - Auxiliary Memory – Associative Memory – *Cache memory* – Virtual memory.	10
	Total Contact Hrs	**50**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Assignment and Case study	
TEXT BOOKS	1. M.Morris Mano, "Computer System Architecture", Prentice Hall of India, Third Edition,2007 2.Albert Paul Malvino, Donald P Leach ,"Digital Principles and Applications", TMH,1996 3.Ramesh S Goankar, "Microprocessors and its Applications", 2013	

REFERENCES	1.V .K Puri ,“ Digital Electronics”, Tata McGraw Hill, Reprint 2011. 2.T.C.Bartee,” *Digital computer Fundamentals*”, Tata McGraw Hill, Sixth edition,1986. 3. William Gear,” *Computer organization and Programming*”, Tata McGraw Hill Publication, First Edition,1985. 4. Chatterjee,” Digital Computer Technology “, Khanna Publishing ,Second Editon, 1986

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	M
CO2	H	S	S	S	H
CO3	H	S	S	S	S
CO4	H	S	S	S	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
K. Kannika Parameswari	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS1A1	**Title :**	**Batch :**	2018-2021
		Allied-1: Mathematics-I	**Semester:**	I
Hrs/Week:	4		**Credits:**	04

Course Objective

To make the students to understand and apply the central tendencies deviation, correlation, probability, Statistical Inference tests - To enable the students to solve linear algebra existences, numerical integration and differential equation using numerical methods.

Course Outcomes (CO)

K1	CO1	To recollect the definition of matrix and determinants and perform various operations on it
K2	CO2	To evaluate various Numerical Methods problems and find better result based on given information
K3	CO3	To understand different sampling test techniques such as t-test and F-variance ratio test for Large sample and Small sample
K4	CO4	To figure out appropriate statistical methods like Mean, Median, Mode and apply them in various data analysis problems

Syllabus

Units	Contents	Hrs
Unit I	Matrices –Introduction –Determination –Inverse of a matrix –Rank of a Matrix–Eigen value Problems.	10
Unit II	**Statistics**: Mean, Median, Mode, Range, Quartile Deviation, *Standard Deviation*, Rank Correlation, Co-efficient of Correlation, Regression.	10
Unit III	**Large Sample test:** Standard error- Test of Significance of Large Samples – Tests for (i) single proportion (ii) Difference of two proportions (iii) difference of two means (iv) difference of two standard deviations.Small sample test based on t, – t-test for (i) single mean (ii) Difference of two means (iii) Observed sample correlation co-efficient. F- Variance Ratio Test	10
Unit IV	**Probability:** *Permutation*, combination, trail, event, sample space, mutually exclusive cases, exhaustive events, Independent events, dependent events, simple and compound events. Measurement: Classical, relative frequency, theory of probability, Limitations, personalistic view of probability and Axiomatic Approach of probability, addition and multiplication theorem, odds, miscellaneous illustrations question	11
Unit V	**Numerical Methods:** Gauss-Seidal method for linear algebric system-Newton's Rapshon method for polynomial system-Newton forward and backward interpolation-Trapezoidal rule-Simpson 1/3 rule and 3/8 rule for Numerical Integration.	9
	Total Contact Hrs	**50**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, and Assignment	

TEXT BOOKS	1. Dr. M.K.Venkataraman , "Engineering Mathematics", National Publishing Company, Chennai. 2.RSN Pillai & Bagavathi ,"Statistics Theory and Practice", S.Chand& Company Ltd. July 2011 3. P.Kandasamy, K.Thilagavathy, K.Gunavathy, "Numerical Methods", Sultan Chand & Co. Ltd., Third Edition,2002.
REFERENCES	1. S.P. Gupta, "Statistical Methods", Sultan Chand & Sons Publishers, Thirty-third Edition, 2002. 2. M.Venkatraman, "Numerical Methods in Science and Engineering", The National Publications, Fifth Edition,1999. 3. "Computer Oriented Statistics and Numerical Methods", S.Chand and Co Delhi. 2009

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	M	H	S
CO2	H	M	H	S	H
CO3	M	S	S	M	M
CO4	M	H	H	L	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
K. Srinivasan R. Revathi	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS103	**Title :**	**Batch :**	2018-2021
		Core Lab I: Programming Lab In 'C'	**Semester:**	I
Hrs/Week:	4		**Credits:**	02

Course Objective

The purpose of this course is to introduce students to the field of programming using C language. The students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in C.

Course Outcomes (CO)

K3	CO1	To implement different operations on arrays and use functions to solve the given problems.
K4	CO2	To evaluate the C program that uses pointers, structures and files
K5	CO3	To validate programs with pointers and arrays, perform pointer arithmetic, and use the pre processor

Syllabus

Units	Contents	Hrs
	SET A • Program to find the greatest number among n numbers. • Program to Generate a Fibonacci series. • Program to check whether the given number is Armstrong number or not. • Program to find Prime numbers between a given range. • Program for finding Sum of individual digits. • Program to display the Numbers in Ascending order. • Program to display the Numbers in Descending order. • Program to display the Names in Alphabetic order. • Program to find whether a given string is a palindrome or not • Program to calculate the Matrix addition. • Program to calculate the Matrix multiplication. • Program to illustrate the concept of structures. **SET B** • Program to find the values of the following Series Sin(X), Cos(X), E^x, Log(1+X). • Program to perform the Sequential search. • Program for Binary search. • Program to generate the Piglatin. • Program to find a Mean, median & mode for given values. • Program to find Standard deviation & variance for given values.	

- Program to find the Transpose of a Matrix.
- Program to count vowels, consonants, white spaces in a given sentence.
- Program to illustrate the concept of Pointers.
- Program to illustrate the concept of subroutine functions.
- Program to create a file.
- Program for processing a file.
- Program using command line arguments

INTERNAL MARK (20 Marks)

Observation Record Note	**5 Marks**
Practical Skills	**5 Marks**
Model Exam	**10 marks**

EXTERNAL MARK (30 Marks)

Record Note	**5 Marks**
Set A	**10 Marks**
Set B	**15 marks**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M
CO2	H	H	S	S	S
CO3	H	S	H	S	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr. M. Sakthi M.Malathi	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS204	**Title :**	**Batch :**	2018-2021
		Core III: Object Oriented Programming Using C++	**Semester:**	II
Hrs/Week:	4		**Credits:**	04

Course Objective

On successful completion of the course the students should understand all the features of C++ and make the students to apply the same for writing programming for solving problem.

Course Outcomes (CO)

K1	CO1	To remember the basic OOPs concepts such as Class, Inheritance, Abstraction, Polymorphism etc.
K2	CO2	To understand how C++ differentiates between object oriented programming and procedural programming and the use of function, operator overloading.
K3	CO3	To implement programs using more advanced features such as composition of Objects, Operator overloads, Inheritance, Polymorphism, Dynamic memory allocation etc.
K4	CO4	To evaluate C++ programs using File I/O, Command line Arguments and Exception Handling.

Syllabus

Units	Contents	Hrs
Unit I	Object oriented programming - software evolution - procedure oriented programming- object oriented programming paradigm - basic concepts of object oriented programming-benefits of OOPS- object oriented languages- applications of OOPS.	8
Unit II	What is C++- applications of C++-structure of C++ program-tokens, expressions- *Basic data types*-user defined data types-derived data types -symbolic constants –declaring data types-reference variables-operators in C++ -Manipulators –Expressions and Implicit conversions-control structures-function in C++ - call by reference-inline functions-default arguments – constant arguments-Classes and Objects-defining member functions-nesting member function-private member function-static member function.	9
Unit III	Array of objects-friend function-returning objects-constant member function-pointer to members-constructors-parameterized constructor-constructors with default arguments-copy constructor-dynamic constructor-destructor-operator overloading and type conversions-rules for operator overloading –function overloading with arguments-special features of function overloading.	10
Unit IV	Inheritance- single inheritance-type of base classes-types of derivation-public- private-protected inheritance –multi level inheritance-multiple inheritance –hierarchical inheritance-hybrid inheritance-polymorphism-virtual functions-pure virtual function-pointer to derived classes.	11
Unit V	Istream–OStream,IOstream,fstream,istream,ofstream,filebuf,instream,outstream-unformatted-formatted I/O operation-classes for file stream operations-opening and closing a file-file pointers-ios flags and curr header files of C++. Templates**:** class templates-function templates	12
	Total Contact Hrs	**50**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, and Assignment	

TEXT BOOKS	1. E. Balagurusamy,"Object Oriented Programming with C++",Tata McGraw Hill publication, sixth edition, 2013. 2. Ashok Kamathane-"Programming in C++" Prentice Hall 2015 3. Rabort Lafore, "Object Oriented Programming with C++", Galgotia Publication Pvt. Ltd, fourth edition, 2002
REFERENCES	1. D.Ravichandran.J, "Programming with C++", Tata McGraw Hill publication, fourteenth edition, 2001. 3. Yashwant kanetkar,"Let us C++",BPB publication, second edition, 2015.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	H
CO2	H	M	M	S	S
CO3	M	M	S	H	S
CO4	H	S	H	S	H

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.Antony Selvadoss Thanamani S.S.Shanthi	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS205	**Title:**	**Batch :**	2018-2021
		Core IV: Data and File Structure	**Semester:**	II
Hrs/Week:	4		**Credits:**	04

Course Objective

On successful completion of the course the students are able to understand the concepts of array, stack, queue, list, linked list, tree, graph theory, searching and sorting.

Course Outcomes (CO)

K1	CO1	To keep in mind the basic static and dynamic data structures and relevant standard algorithms for them.
K2	CO2	To get the idea about advantages and disadvantages of specific algorithms and data structures.
K3	CO3	To implement new solutions for programming problems or improve existing code using learned algorithms and data structures.
K4	CO4	To evaluate algorithms and data structures in terms of time and memory complexity of basic operations.

Syllabus

Units	**Contents**	**Hrs**
Unit I	Introduction – Creation of Programs – Analysis of programs – Arrays – representation of Arrays – Ordered Lists – Polynomials – Stacks and Queues – fundamentals – Evaluation of Expressions – Multiple stacks and queues.	9
Unit II	Linked List – Singly Linked lists – Linked Stacks and Queues – Polynomial addition using stack – Functions of Linked list – *Doubly Linked List* – Dynamic Storage Management – Garbage collection and Compaction.	10
Unit III	Trees – Basics – Binary Trees – Binary Trees Representation – Binary Trees Traversal – Binary tree representation of Trees. Symbol Tables: Introduction –Hash table.	11
Unit IV	Searching and Sorting – Linear search, Binary search & Fibonacci search – Sorting – Insertion, Quick, Merge (2-way), Heap, and Radix.	11
Unit V	Files: Files, Queries and Sequential Organizations: *Storage device types*-Query types, Mode of Retrieval, Mode of update– Indexing techniques: Cylinder-Surface Indexing-Hashed Indexes – File Organizations: Sequential Organizations-Random Organizations-Linked Organization-Storage Management.	9
	Total Contact Hrs	**50**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, and Assignment	
TEXT BOOKS	1. Ellis Horowitz & Sartaz Sahani, "Fundamentals of Data Structures" Galgotia Book Source, 1999. 2. ISRD GROUP, "Data Structures using C" , Tata McGraw Hill ,Seventh Reprint,2010	

REFERENCES	1. Jean Paul Tremblay and Paul G. Sorenson, "An Introduction to Data Structures with Applications" Tata McGraw Hill Publication, Second Edition, 2008. 2. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, "Fundamentals of Data Structures in C", Universities Press (India) Private Limited, 2008. 3. R.Krishnamurthy and G. IndiraniKumaravel, "Data Structures using C", Tata McGraw – Hill Publishing Company Limited, New Delhi, 2008.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	M
CO2	H	M	H	S	H
CO3	M	H	S	H	S
CO4	M	S	M	S	H

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
K. Srinivasan P.Jayapriya	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS2A2	**Title :**	**Batch :**	2018-2021
		Allied-2: Mathematics-II (Discrete Mathematics)	**Semester:**	II
Hrs/Week:	4		**Credits:**	04

Course Objective

On successful completion of the course the students are able to understand the concepts and principles of relations, functions, fuzzy sets, partial ordering, algebraic structures, mathematical logic, and formal languages and graph theory.

Course Outcomes (CO)

K1	CO1	To keep in mind about the fundamental ideas and notation of discrete mathematics with examples
K2	CO2	To get the idea of relations and its types and fuzzy sets and its operations
K3	CO3	To analyze the formal language such as formation of words with examples ,groups and monoids.
K4	CO4	To Understand some basic properties of graphs and types of graphs, and be able to relate these to practical examples

Syllabus

Units	Contents	Hrs
Unit I	**Mathematical logic:** Connectives – Tautology and contradiction-Equivalence of Propositions-Duality law- Normal forms – Disjunctive and conjunctive normal Forms-PDNF-PCNF– Worked examples-Predicate calculus – Quantifiers – Free and bound variables(Definitions only).	10
Unit II	**Relations:** Types of relations-some operation of relation- Composition of Relations – Properties of relation-Equivalence Classes-matrix representation of a relation-Worked Examples. ***Fuzzy Sets:*** Fuzzy sets – Crisp Sets –Overview of operations on fuzzy sets – Fuzzy complement – Fuzzy union – Fuzzy intersection – Aggregation operations.	9
Unit III	**Functions:** Representation of function-*Types of function*- Composition of functions – Inverse of functions-Worked Examples. **Partial ordering:** Hasse diagrams for partial ordering-terminology related to posets-Lattice-Properties of Lattices Worked Examples.	10
Unit IV	**Algebric Structure:** Semigroups & monoids- Homomorphism of semigroups and monoids- sub semigroups and submonoids-groups **Formal languages:**Basic definitions-phase structure grammar- types of phase structure grammar-Worked examples	10
Unit V	**Graph Theory:** Graph –Degree of the vertex – some special simple graphs-*Matrix representation of graphs*-Paths, Cycles and connectivity- Eulerian Graphs - Hamiltonian graphs- Connectedness in directed graphs- Shortest path algorithm-Dijkstra's Algorithm-Worked Examples.	11
	Total Contact Hrs	**50**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, and Assignment	

TEXT BOOKS	1. T.Veerarajan, "Discrete mathematics", Tata McGraw Hill, 2007. 2. GeorgeKlir& Tina A Folger,"Fuzzy Sets, Uncertainity& Information", Prentice hall of India, Eighth Edition, 2003. 3.Narasingh Deo,"Graph theory with applications to Engineering and computerscience",Prentice hall, 2008
REFERENCES	1. V. Sundaresan, K.S. Ganapathi Subramanian, K. Ganesan, "Discrete Mathematics", A.P.Publications, Sirkali, 2006. 2. RaniSironmani," Formal Languages ",The Christian Literature Societry, First Edition,1984. 3.J.P.Tremplay & R. Manohar"Discrete Mathematical structures with Applications to computer Science ", McGraw Hill Publication 19751.NarsingDeo, "Graph Theory ", Prentice hall of India, New Delhi, 2008.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	M	H	S
CO2	H	M	H	S	H
CO3	M	S	S	M	M
CO4	M	H	H	L	H

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M. Malathi S. Vallinayagam	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS206	**Title :**	**Batch :**	2018-2021
		Core Lab II : Programming Lab in C++	**Semester:**	II
Hrs/Week:	4		**Credits:**	02

Course Objective

The prime purpose of C++ programming was to add object orientation to the C programming language and also to enhance problem solving and programming skills using OOPs concepts in various domains.

Course Outcomes (CO)

K3	CO1	To apply the basic concepts of C++ such as function, friend functions and array of objects to solve a particular problem.
K4	CO2	To analyze programs using more advanced OOPs concepts such as Constructor/Destructor, Operator overloading, Inheritance, and Polymorphism.
K5	CO3	To validate programs using Dynamic memory allocation and Virtual functions.

Syllabus

Units	Contents	Hrs
	SET A • Program to print Floyd's triangle. • Program to illustrate the concept of class and object. • Program to illustrate the concept of function without return statement. • Program to illustrate the concept of function with return statement. • Program to illustrate the concept of Inline function. • Program to illustrate the concept of Default argument. • Program to illustrate the concept of Friend function. • Program to illustrate the concept of function overloading. • Program to illustrate the concept Array of Object. • Program to illustrate the concept of objects as Function argument. • Program to illustrate the concept of returning by objects. • Program to illustrate the concept of constructors. • Program to illustrate formatting with manipulators. **SET B** • Program to illustrate the concept of destructors. • Program to illustrate the concept copy constructor. • Program to illustrate the concept overloading unary operators. • Program to illustrate the concept overloading binary operators.	

- Program to illustrate the concept of single inheritance.
- Program to illustrate the concept of multiple inheritances.
- Program to illustrate the concept pointers to objects
- Program to illustrate the concept pointers to derived objects.
- Program to illustrate the concept virtual function.
- Program to illustrate formatted console I/O operations.
- Program to illustrate working with single file.
- Program to illustrate working with multiple files

INTERNAL MARK (20 Marks)

Observation Record Note	**5 Marks**
Practical Skills	**5 Marks**
Model Exam	**10 marks**

EXTERNAL MARK (30 Marks)

Record Note	**5 Marks**
Set A	**10 Marks**
Set B	**15 marks**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	H
CO2	H	M	M	S	S
CO3	M	M	H	H	M

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.Antony Selvadoss Thanamani S.S.Shanthi	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS307	**Title :**	**Batch :**	2018-2021
		Core V: Java Programming	**Semester:**	III
Hrs/Week:	4		**Credits:**	04

Course Objective

The objective of this course is to make the students to understand the various features of Java such as Packages, Applets, AWT controls, Stream classes and Files and make the students to apply the same for writing the programs.

Course Outcomes (CO)

K1	CO1	To remember the OOPs concepts such as class, methods, inheritance, encapsulation and polymorphism etc.
K2	CO2	To understand the differences between application programs and applets, applet lifecycle and graphics programming.
K3	CO3	To implement programs using Thread, Applet and AWT controls like Text Fields, Buttons, Checkboxes, Radio Buttons and Layouts etc.,
K4	CO4	To evaluate java programs using stream classes and files.
K5	CO5	To access the data using File classes.

Syllabus

Units	**Contents**	**Hrs**
Unit I	Java Evolution-Overview of Java Language-Constants, Variables & Datatypes-Operators & Expressions-*Decision making & branching*-Decision making & looping.	10
Unit II	Classes, Objects & methods- Arrays, Strings & Vectors-Interfaces: Multiple Inheritance-Packages: Putting classes together - Multithreaded Programming.	10
Unit III	Managing Errors & Exceptions- Applet Programming***:*** Introduction-How Applets differ from application-Writing Applets-Building applet code- lifecycle-Executable Applet-*Designing Web page*-Applet tag-Adding & Running Applet using HTML File-Passing Parameters to Applets - Graphics Programming.	11
Unit IV	AWT: Labels, Buttons, Checkboxes, Radio Buttons(CheckBoxGroups), Choice and List Controls. AWT –Managing Scrollbars-TextFields-Text Areas. AWT: Layout Managers: FlowLayout-BorderLayout- Event Handling.	10
Unit V	Managing Input/Output in files in Java: Introduction-Concept of Streams-Stream Classes-Byte Stream classes-Character Stream Classes-Using Streams-Using I/O Classes, File Class-I/O Exceptions-Creation of Files-Reading/Writng Characters & Bytes-Handling primitive data types-Random Access Files-Interactive I/O-Other Stream Classes.	11
	Total Contact Hrs	**52**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1. E.Balagurusamy,"Programming with Java – A Primer", Tata McGraw Hill Publishing Company Limited, New Delhi, 5th Edition, 2014. (Units-I ,I,III and V) 2. Herbert Schildt,"The Complete Reference-Java2", Tenth Edition, TataMcGraw Hill Publishing Company Limited, New Delhi, 2017. (Unit-IV)	
REFERENCES	1. Kogent Solutions Inc., "JAVA 6 Programming Black Book", Dream TechPress , New Delhi, 2009 2. K.Somasundram, "Programming in Java2", Jaico Publishing House, Chennai, 2005. 3. ISRD Group," Introduction to Object Oriented Programming through Java", Tata McGraw Hill Publishing Company, New Delhi, 2007.	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	H
CO2	M	M	S	S	S
CO3	S	H	S	H	S
CO4	H	M	H	S	S
CO5	H	S	M	H	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.R.Manickachezian N.Arul kumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS308	**Title :**	**Batch :**	2018-2021
		Core VI: Relational Database Management System and Oracle	**Semester:**	III
Hrs/Week:	5		**Credits:**	04

Course Objective

The objective of this course is to make the students to understand and apply the principles of data modeling using Entity Relationship and normalization techniques and understand the use of Structured Query Language (SQL) and its syntax.

Course Outcomes (CO)

K1	CO1	To remember the basic concepts and applications of database systems and SQL.
K2	CO2	To understand the relational database theory, and be able to write relational algebra expressions for queries
K3	CO3	To apply design principles using the E-R method and normalization approach
K4	CO4	To interpret SQL interface of a relational DBMS package to create, secure, populate, maintain, and query a database and PL/SQL programming using Triggers and Cursors.
K5	CO5	To evaluate database design, normal forms, working with multiple tables, cursors and exceptions

Syllabus

Units	**Contents**	**Hrs**
Unit I	**Database Concepts: A Relational Approach:** An Introduction- Relationships- Database Management System- The Relational Database Model – Integrity Rules – Theoretical Relational Languages – Relational Algebra, Applications of Relational Algebra, Relational Calculus. **Database Design:** Data Modeling – Dependency – Database Design – Entity – Relationship Model – DFD Diagrams – Codd's Rules for RDBMS.	13
Unit II	**Normalization:** Normal Forms (1NF, 2NF, 3NF, BCNF, 4NF) – Dependency Diagrams – *Denormalization.* **Oracle9i:** An Introduction – The SQL*Plus Environment – Structured Query Language – (SQL) – Logging into SQL*plus – SQL*plus Commands – Errors and Help – Alternate Text Editors – SQL*Plus Worksheet – iSQL*Plus	12
Unit III	**Working with Table: Data Management and Retrieval:** DML – Adding a new Row /Record – Customized Prompts – Updating and Deleting an existing Rows/Records – Retrieving data from table – Arithmetic Operations – Restricting data with WHERE Clause – Sorting – Revisiting substitution variables – DEFINE Command – CASE structure. Functions and Grouping: Built-in functions- Grouping Data	13
Unit IV	**Multiple Tables: Joins and Set Operations:** Join – Set Operations. **PL/SQL:** Introduction – Block Structure – Comments – *Data types* – Other data types – Declaration – Assignment Operators. **Control Structures and Embedded SQL:** Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control Statements.	14
Unit V	**PL/SQL Cursors and Exceptions:** Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR Loops – SELECT…FOR UPDATE – WHERE CRRENT OF Clause – Cursor with parameters – Cursor Variables – Exceptions – Types of Exceptions. **PL/SQL: Composite Data Types:** Records – Tables – VArrays - Triggers – Data Dictionary Views.	13
	Total Contact Hrs	**65**

	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1.NileshShah,"Database System Using Oracle-A Simplified Guide to SQL and PL/SQL", 2nd Edition, Pearson Education,2005. 2.Ivan Bayross, "*SQL, PL/SQL-The programming language of Oracle*", BPB Publication, 3rd edition.	
REFERENCES	1.Ivan Bayross, "Commercial Application Development Using Oracle", BPB Publication, 2000. 2.George Koch,"The Complete Reference - Oracle 8i ",Tata McGraw Hill publication.2000.	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	M
CO2	M	M	S	M	S
CO3	M	M	M	H	S
CO4	S	S	M	S	M
CO5	S	H	S	H	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.R.Manickachezian M.Dhavapriya	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS309	**Title :**	**Batch :**	2018-2021
		Core VII: Operating System	**Semester:**	III
Hrs/Week:	4		**Credits:**	04

Course Objective

The objective of the course is to enable the students to understand the concepts of operating system including process management, storage management, scheduling and case studies of Linux operating system.

Course Outcomes (CO)

K1	CO1	To remember the basic concepts Operating System
K2	CO2	To understand the concepts of Storage Allocation, Process Management, and Scheduling Algorithms
K3	CO3	To apply the Process Management principles and functionalities in Database Systems
K4	CO4	To review management concepts and deadlock algorithm.
K5	CO5	To access Linux Kernel

Syllabus

Units	**Contents**	**Hrs**
Unit I	**Introduction:** Definition of operating system – History of operating system.**Hardware:** Interrupts and polling – Buffering – Storage protection – online and offline operation – Cycle stealing – Problem state – Virtual storage – Multi processing – Storage Hierarchy – RISC. **Software:** Machine Language programming – Spooling – *Optimizing Compiler* – Object oriented programming – Emulation. **Process Management:** Definition – process states – The Process Control Block – Operations on process – Interrupt Processing – Nucleus of OS.	10
Unit II	**Storage Mangement:** Real Storage: Storage organization – Management – Hierarchy – Storage management Strategies – *Contiguous Vs Non-contiguous storage allocation* – Fixed partition multiple programming – Variable partition multiple programming - Multiprogramming with storage swapping – Virtual storage organization – Concepts – Paging – Segmentation – Paging /segmentation systems.	10
Unit III	**Job and Processor Scheduling:**Introduction –Scheduling levels – *Scheduling objectives* – Scheduling criteria – Preemptive Vs Non-preemptive scheduling – Priorities – FIFO – Round Robin –Quantum size – Shortest job – Shortest remaining time – Highest response ratio next. **Deadlock:**Definition – Examples – Deadlock prevention, avoidance, detection and recovery – Banker's Algorithm only.	11
Unit IV	**Auxillary Storage Management:** Disk performance optimization: Why Disk scheduling is necessary – Desirable characteristics of disk scheduling polices – Seek optimization – *Disk Caching* – RAM Disks.File and Database Systems :Introduction – File system- File system function – Blocking and buffering – File Organization – Allocating and freeing space – File Descriptor – Backup and recovery	11
Unit V	**Linux System** – Design Principles, Kernel Modules, Process Management, Scheduling, Memory Management, Input-Output Management, File System, Inter-process Communication; Mobile OS – iOS and Android – Architecture and SDK Framework, Media Layer, Services Layer, Core OS Layer, File System.	10
	Total Contact Hrs	**52**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1. H M Deital, P J Deital and D R Choffnes "Operating systems", Pearson Education and dorliing kindersly publishing,Inc., Third edition,2011.[Units-I to IV] 2. Daniel P Bovet and Marco Cesati,―Understanding the Linux kernel‖, 3rd edition, O'Reilly, 2005.[Unit-V]	
REFERENCES	1.Andrew S. Tanenbaum, Albert S. Woodhull, "Operating Systems Design and Implementation", Prentice Hall, Third Edition,2006	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	S	M
CO2	M	S	H	M	S
CO3	S	M	M	H	H
CO4	M	M	M	S	M
CO5	H	S	H	M	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
K.Srinivasan P.Jayapriya	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS3A3	**Title :**	**Batch :**	2018-2021
		Allied-3: Computer Based Optimization Techniques	**Semester:**	III
Hrs/Week:	5		**Credits:**	04

Course Objective

To enable the students to understand and to apply the resource management techniques available in OR including linear programming transportation assignment problem, inventory control, queuing theory and network problems.

Course Outcomes (CO)

K1	CO1	To remember and recall terms and concepts of relations
K2	CO2	To understand the concept of transportation, networking, replacement, etc.,
K3	CO3	To apply the appropriate optimization techniques to solve the computer based business problems
K4	CO4	To become familiar with, LPP, Hungarian method, Game theory, Replacement problem.
K5	CO5	To analyze the ability of critical thinking, to find shortest time duration

Syllabus

Units	**Contents**	**Hrs**
Unit I	Origin and development of OR – *Applications of OR* – Linear programming – Mathematical formulation of the problem – Graphical Method – Simplex Method – Two Phase Simplex Method **(Big-M Method not included)**–Primal and Dual problem- **(Duality Method not included) -** Dual Simplex Method	13
Unit II	**Transportation Problem:** Balanced Transportation problem and Un-Balanced Transportation problem-Row Minimum-Column Minimum-North-West Corner-Matrix Minima Method-Vogel's Approximation Methods-MODI Method(u-v Method for OBFS). **Assignment Problem:** Balanced and Un-Balanced Assignment problem– Hungarian method – Routing problem.	13
Unit III	**Network Scheduling:** Network and Basic components – *Logical sequencing*: Formation of a loop, Dangling, Redundancy-Network Construction- Rules of Network construction –Time calculation in Network-Numbering the events–Critical Path Method (CPM)– PERT: PERT Calculations (Normal table is not included).	14
Unit IV	**Replacement Problem and System Reliability:** Model 1: Value of Money does not change with time. Model 2: Value of Money change with time. **Game and Strategies**: Introduction-Two-Person Zero-Sum games-Pure Strategies: Maximin-Minimax Principles-Saddle Point and Value of the Game-Rule for determining a Saddle Point-Mixed Strategies: Games without Saddle Points- 2x2 Rectangular Games.	12
Unit V	**Sequencing problem:** Problems with n jobs and 2 machines – Problems with 'n' jobs and 'k' machines. **Inventory control** – Types of inventory Economic Order Quantity: Model 1: EOQ problem with no shortages Model 2: EOQ problem with no shortages and several production runs of unequal length Model 3: EOQ problem with shortages. **EOQ Problem with Price Breaks:** Model 1: EOQ Problem with one price breaks.	13
	Total Contact Hrs	**65**
	**Italicized* texts are for self study Power point Presentations, Seminar and Assignment	
TEXT BOOKS	1.KantiSwarup, PK Gupta, Man Mohan, "Operations Research ", Sulthan Chand & Sons, Seventeenth edition, 2013.	

REFERENCES	1. S. DharaniVenkatakrishnan,"Operations Research". KeerthiPublishing(p) ltd. 2002. 2. PK Gupta , Man Mohan, "Problems in Operations Research". 3rd Edition,2001. 3. J K Sharma," Operations Research: Problems and Solutions", 3rd Edition 2013 4. G. Srinivasan "Operations Research: principles and Applications", 2nd Edition, 2012. Hamdy A.Taha,"Operations Research an Introduction", Eight edition, Dorling Kindersley (India) Pvt.Ltd Publications,2007.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	H	H
CO2	H	M	M	S	S
CO3	M	M	S	H	M
CO4	H	M	H	S	H
CO5	H	H	M	H	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.R.Manickachezian R.Nandhakumar	Name:Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS310	**Title :**	**Batch :**	2018-2021
		Core Lab III: Programming Lab in Java	**Semester:**	III
Hrs/Week:	5		**Credits:**	02

Course Objective

The objective of this course is to make the students to implement various features of java programming by using Java SDK environment to create, debug and run java programs.

Course Outcomes (CO)

K3	CO1	To apply the basic concepts of Java such as class, methods, constructors, arrays and interfaces to solve the problems.
K4	CO2	To analyze programs using method overloading, method overriding, packages and threads.
K5	CO3	To validate programs using event handling, applets, AWT controls and files.

Syllabus

Units	**Contents**	**Hrs**
	SET A • Program to sort the given names in alphabetical order. • Program for command line arguments. • Program to display the mark list of the students by using single inheritance. • Program to display the employee payslip using multiple inheritance. • Program for extending the Thread class. • Program to creating Thread by implementing Runnable Interface. • Program for method overloading. • Program for method overriding. • Program for exception handling. • Program to add the two numbers using applet. **SET B** • Program for Bank processing using Interface. • Program for salary details using packages. • Program for multithreading. • Program to create a Thread using a synchronized block within the run () method. • Program to display the different shapes using applet. • Program to display the image using applet. • Program using AWT Components (TextField, Button, Checkbox, CheckboxGroup, Choice and List) • Program to copy one file to another file.	**65**

	• Program to perform Key Events. • Program to perform Mouse Events. • Program for the processing of random access file. **INTERNAL MARK (20 Marks)** **EXTERNAL MARK (30 Marks)** **Observation Record Note** | **5 Marks** **Practical Skills** | **5 Marks** **Model Exam** | **10 Marks** **Record Note** | **5 Marks** **Set A** | **10 Marks** **Set B** | **15 Marks**	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	M	S
CO2	S	S	M	S	M
CO3	M	M	S	H	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.R.Manickachezian N.Arul kumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS311	**Title :**	**Batch :**	2018-2021
		Core Lab IV: Programming Lab in RDBMS	**Semester:**	III
Hrs/Week:	5		**Credits:**	02

Course Objective

The objective of this lab is to provide a strong formal foundation in database concepts, technology and practice to the participants to groom them into well-informed database application developers.

Course Outcomes (CO)

K3	CO1	To apply the normalization techniques for development of application software to realistic problems and ability to formulate queries using SQL DML/DDL/DCL commands
K4	CO2	To interpret SQL interface of a relational DBMS package to create, secure, populate, maintain, and query a database and PL/SQL programming using Triggers and Cursors.
K5	CO3	To access data stored in an Oracle Relational DBMS using Oracle SQL, PL/SQL queries.

Syllabus

Units	**Contents**	**Hrs**
	SET A • Write the SQL Commands for DDL • Write the SQL Commands for DML • Write the SQL Commands for TCL • Write the SQL Commands to perform SQL Operations • Write the SQL Commands for Views • Write the SQL Commands for Joins • Write the SQL Commands to perform Set Operations • Write the SQL Commands for Sub Queries • Write a Pl/Sql program to Reverse a given number • Write a Pl/Sql program to find given number is Odd Or Even • Write a Pl/Sql program to display Fibonacci Series • Write a Pl/Sql program to find given number is Prime Or Not **SET B** • Apply Normalizations (1st, 2nd & 3rd) to the following table: **Table Name:** Users **Name** | **Company** | **Company_Address** | **Url1** | **Url2** Joe | ABC | Work Lane | abc.com | xyz.com Jill | XYZ | 1 Job Street | abc.com | xyz.com • Salary Calculation Using Cursor • Write a Pl/Sql program to generate all prime numbers below 100 • Write a program to demonstrate %type and %rowtype attributes • Create a trigger before/after update on employee table for each row/statement • Create a trigger before/after delete on employee table for each row/statement	**65**

- Create a trigger before/after insert on employee table for each row/statement
- Create a cursor, which displays all employee numbers and names from the EMP table
- Create a cursor, which update the salaries of all employees as per the given data
- Create a cursor, which displays names of employees having salary > 50000
- Cursor For Loop
- **Database Schema for a Employee-pay scenario**

Tables: Employee , department, pay details, payroll

For the above schema, perform the following—

- Create the tables with the appropriate integrity constraints
- Insert around 10 records in each of the tables
- List the employee details department wise
- List all the employee names who joined after particular date
- List the details of employees whose basic salary is between 10,000 and 20,000
- Give a count of how many employees are working in each department
- Give a names of the employees whose netsalary>10,000
- List the details for an employee_id=5
- Create a view which lists out the emp_name, department, basic, deductions, netsalary
- Create a view which lists the emp_name and his netsalary

INTERNAL MARK (20 Marks)

Observation Record Note	**5 Marks**
Practical Skills	**5 Marks**
Model Exam	**10 Marks**

EXTERNAL MARK (30 Marks)

Record Note	**5 Marks**
Set A	**10 Marks**
Set B	**15 Marks**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	H	H
CO2	S	H	M	M	M
CO3	S	H	M	H	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.R.Manickachezian M.Dhavapriya	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS3N1	**Title :**	**Batch :**	2018-2021
		Non-Major Elective Paper-I: Photoshop Lab	**Semester:**	III
Hrs/Week:	1		**Credits:**	02

Course Objective

The objective of this course is to make the students to gain a working knowledge of Photoshop and develop their skills in editing and altering photographs for through a basic understanding of the tool bar, layers, and the adjustments panel.

Course Outcomes (CO)

K3	CO1	To apply the different type of tools available in Photoshop to create simple applications.
K4	CO2	To interpret programs using various filters in Photoshop.
K5	CO3	To access the new tools for designing multi-layered applications.

Syllabus

Units	**Contents**	**Hrs**
	SET A • Image Menu using Photoshop • Reduce Picture Size using Photoshop • Replace color in an image using Photoshop • Make a simple book cover by using basic functionalities using Photoshop • Transfer an object from one image to another and erase background using Photoshop • Add a pattern as background using Photoshop **SET B** • Create India Map using Photoshop • Retouching photos using Photoshop • Take a logo and modify it using Photoshop • Alter an image using filters using Photoshop • Special Effects-Color in black and white image using Photoshop • Special Effects-Feathered Portraits (Soft fade) using Photoshop **EXTERNAL MARK (50 Marks)** **Record Note — 10 Marks** **Set A — 20 Marks** **Set B — 20 Marks**	**13**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	H	M	S
CO2	M	M	S	S	H
CO3	H	S	M	H	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi N.Arul kumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS3N2	**Title :**	**Batch :**	2018-2021
		Non-Major Elective Paper-I: Advanced Applications in MS Excel Lab	**Semester:**	III
Hrs/Week:	1		**Credits:**	02

Course Objective

This course was designed for the intermediate student who has already mastered the basic skills and wants to gain more advanced skills to put to work in a business environment or for personal use.

Course Outcomes (CO)

K3	CO1	To apply the basic concepts of Excel such as mathematical function, Data function, text function
K4	CO2	To analyze the data using charts
K5	CO3	To validate the data using if statements.

Syllabus

Units	**Contents**	**Hrs**
	SET A • In a new worksheet, create a table and insert information of student details. Use features of Format Menu. • Create employee table and calculate the salary. Use mathematical functions for the worksheet. • Create own templates in Excel. • Create and use data validation rules. • Create, manage, and format pivot tables and pivot charts. **SET B** • Create and write complex formulas. • Create and use IF statements. • Apply custom and prebuilt conditional formatting. • Work with functions to manipulate strings of text and data. • Create charts in excel **EXTERNAL MARK (50 Marks)** **Record Note — 10 Marks** **Set A — 20 Marks** **Set B — 20 Marks**	**13**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	H
CO2	H	M	M	S	S
CO3	M	M	H	H	M

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi R.Deepa	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS412	**Title :**	**Batch :**	2018-2021
		Core VIII: .NET Programming	**Semester:**	IV
Hrs/Week:	4		**Credits:**	04

Course Objective

The course provides introduction to the .Net framework, library and various applications involved in it. It enables the students to learn and develop Console, Windows and Web applications for the .NET platform.

Course Outcomes (CO)

K1	CO1	To remember the OOPs concepts such as class, objects, methods, Inheritance etc.
K2	CO2	To understand the concepts of the .NET framework as a whole and the technologies that constitutes the framework.
K3	CO3	To deploy various application oriented projects using ADO.NET
K4	CO4	To analyze industry defined problem and suggesting solution using .NET application.
K5	CO5	To validate the applications using validation controls

Syllabus

Units	**Contents**	**Hrs**
Unit I	Introduction to .Net: .net framework- Introducing C#-Overview of C#-Literals, variables and data types-operators and expressions-Decision making and branching-decision making and looping-methods in C#-*Arrays.*	10
Unit II	Difference between VB6 and VB.Net-Object-Oriented programming and VB.Net-Data types-Variables-*Operators*-Arrays-Conditional logic.	10
Unit III	Procedures- Dialog boxes- File IO and System objects- Error handling- -Classes and Objects-Multithreading-Message Queue.	11
Unit IV	VB.Net IDE-Compiling and Debugging- Data access: ADO.Net- Visual studio .Net and ADO.Net. Windows Forms: Controls-Specific controls- Irregular forms.	11
Unit V	Vb.Net and web: Introduction to ASP.Net page framework- HTML server controls- Web controls-Validation controls- Events- State management- Tracing- Security.	10
	Total Contact Hrs	**52**
	**Italicized* texts are for self study Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1.Bill Evjen, Jason Beres, et.al, Visual Basic .Net programming, Wiley Dreamtech India (p) Ltd. 2. E.Balaguruswamy "Programming in C#" McGraw-Hill publication,2012 Edition. 3. Mc Downell "ASP.NET complete reference", 2007.	
REFERENCES	1. K- Steven Holzner "Visual Basic .NET Programming Black Book" 2005 Edition. 2. E.Balaguruswamy "Programming in C#" McGraw-Hill publication,2012 Edition.	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M
CO2	S	H	S	S	M
CO3	H	M	S	H	S
CO4	H	S	H	S	H
CO5	H	M	M	H	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.R.Manickachezian N.Arul kumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS413	**Title :**	**Batch :**	2018-2021
		Core IX: Web Technology	**Semester:**	IV
Hrs/Week:	4		**Credits:**	04

Course Objective

On successful completion of the course the students are able to learn the features and applications of HTML, DHTML, Apache, MySQL & PHP.

Course Outcomes (CO)

K1	CO1	To keep in mind the basic concepts of HTML webpage by the use of DHTML and CSS.
K2	CO2	To get the idea about the implementation of SQL database, tables and joins.
K3	CO3	To apply the features and capabilities of PHP concepts for website development.
K4	CO4	To interpret the basic concepts and configurations of Apache Web Server.
K5	CO5	To validate the concepts of static and dynamic web pages.

Syllabus

Units	**Contents**	**Hrs**
Unit I	***HTML*:** Introduction-SGML-DTD-DTD Elements-Attributes-Outlines of and HTMLdocument-HEADSECTION-Prologue-Link-Basis-Meta-Script-Style-BODYSECTION-Headers-paragraphs-Text Formatting-Linking-Embedding Images-Lists-Tables-Frames-Other Special Tags and Characters-HTML Forms. ***Dynamic HTML (DHTML):*** Introduction-*Cascading Style Sheet (CSS)*-Coding CSS. Properties of Tags-Property Values-Other Style Properties-Inline Style Sheets-Embedded Style Sheets-External Style Sheets-Grouping-Inheritance.	10
Unit II	***MySQL:*** Introduction to MY SQL - The Show Databases and Table - The USE command - Create Database and Tables - Describe Table - Select, Insert, Update, and Delete statement - Some Administrative detail - *Table Joins* - Loading and Dumping a Database.	10
Unit III	***PHP:*** Introduction-PHP Syntax-Variables-Data Types- String Functions-Constants- *PHP Operators*-Arithmetic Operators, Assignment Operators, String Operators, Increment/Decrement Operator- Comparison Operator- Logical Operator – Array Operators- if-else-elseif- Switch- While loop-for loop.	11
Unit IV	PHP Arrays-Sorting Arrays-PHP Global Variables-PHP Forms-Form handling-Form Validation-Form required field- *PHP Functions*-PHP Files: Opening and Closing files-Reading and Writing a file.	10
Unit V	***APACHE:*** Introduction - Apache Explained - Starting, Stopping, and Restarting Apache - Modifying the Default Configuration - Securing Apache - Set User and Group - Consider Allowing Access to Local Documentation - Don't Allow public_html Web sites - *Apache control with .htaccess*	11
		52
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	

TEXT BOOKS	1. J.Akilandeswari & N.P.Gopalan,"Web-Technology–A Developer's Perspective", Prentice-Hall of India pvt ltd-2012. 2. James Lee and Brent Ware, "Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", Dorling Kindersley(India) Pvt. Ltd, 2011.
REFERENCES	1. Thomas A. Powell," The Complete Reference-HTML & XHTML", Tata McGraw-Hill Publications, fourth edition, 2011. 2.E.BalaGurusamy, "Introduction to C#",Tata McGraw-Hill Publications, Third edition,2010 3.Young, "The Complete Reference-INTERNET", Tata McGraw-Hill Publications, second edition, 2011. 4.EricRosebrock, Eric Filson,"Setting up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Published by John Wiley and Sons, 2010.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	H
CO2	H	M	M	S	S
CO3	M	M	S	H	S
CO4	H	S	H	S	H
CO5	M	M	H	M	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi N.Yasodha	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS414	**Title :**	**Batch :**	2018-2021
		Core X: Data Communication and Computer Networks	**Semester:**	IV
Hrs/Week:	4		**Credits:**	04

Course Objective

To enable the students to understand the concepts and principles of data communication and networking including topology, protocols, and types of networks.

Course Outcomes (CO)

K1	CO1	To remember the basic concepts Networks
K2	CO2	To get the idea on Connection-oriented and Connection-less networks
K3	CO3	To apply design principles and functionalities in OSI Reference Layers
K4	CO4	To analyze ISDN network, TCP/IP, etc.,
K5	CO5	To access different addressing modes.

Syllabus

Units	**Contents**	**Hrs**
Unit I	**Introduction:** Communications and Networking-fundamental concepts-Data communications-Protocols-Standards-Signal Propagation-Analog and Digital Signals-Parallel and Serial Communications-Simplex, Half-duplex and full duplex communications-Multiplexing-Transmission errors-Detection and Correction-Error classification-Delay Distortion-Attenuation-noise. Types of Error-Error Detection: VRC-LRC-CRC. Recovery from Errors: Stop and Wait – Go back n – Sliding window.	10
Unit II	**Transmission Media:** Guided Media-Twisted Pair-Coaxial Cable-Optical fiber-Unguided Media – Microwave Communication-Satellite Communication–FDMA,CDMA,SDMA. **Network Topology:** Mesh Topology-Star Topology-Tree Topology-*Ring Topology-Bus Topology-Hybrid Topology.*	11
Unit III	**Switching and Routing:** Switching basics-Circuit switching-Packet switching-Message switching-Router and Routing. **Networking protocols and OSI model**-Protocols in Computer Communication-OSI Reference Models-Physical layer-Data link layer-Network layer-Transport Layer-Session Layer-Presentation Layer-Application Layer.	10
Unit IV	**Local Area Network** (LAN)-Ethernet-Ethernet properties-CSMA/CD-Metropolitan Area Network (MAN)-Distributed Queue Dual Bus(DQDB)-Switched Multimegabit Data Services(SMDS)-Wide Area Network(WAN)-WAN Architecture	10
Unit V	**Integrated Services Digital Network(ISDN)**-ISDN Architecture-ISDN Interfaces-X.25 Protocol-Understanding and Working of X.25 protocol.**TCP/IP*:*** An Introduction to TCP/IP- Basics- IP Addresses-*Logical Addresses*-TCP/IP Example: Introduction-IP Datagrams-More on IP. ARP:ARP using message exchange-RARP.	11
	Total Contact Hrs	**52**
	**Italicized* texts are for self study Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1 . Achyit S Godbole,"Data Communications And Computer Networks", - TataMcGrawHill, Fourteenth Edition, 2017. 2. William Stallings," Data and Computer Communications", Pearson Education, Sixth Edition, 2016	
REFERENCES	1. Andrew S. Tannenbaum,"Computer Networks", Prentice hall of India, Fourth Edition, 2010. 2. W.Stallings,"Data and Computer Communications", Prentice Hall of India, Tenth Edition, 2017.	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	H	M
CO2	M	M	S	M	S
CO3	M	M	M	H	S
CO4	M	S	M	S	M
CO5	H	M	H	M	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.Antony Selvadoss Thanamani R. Nandhakumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS4A4	**Title :**	**Batch :**	2018-2021
		Allied -4 : Accountancy for Decision Making	**Semester:**	IV
Hrs/Week:	6		**Credits:**	04

Course Objective

To enlighten the students on the basics of Accountancy

Course Outcomes (CO)

K1	CO1	To provide the knowledge of accounting theory based on conceptual framework of accounting.
K2	CO2	To enable students to understand the concept of accounting.
K3	CO3	To impart knowledge accounting in decision making.
K4	CO4	To analyze and interpret accounting related transactions in accordance with accounting theory.

Syllabus

Units	**Contents**	**Hrs**
Unit I	Financial Accounting – Meaning - Definition– Concepts – Conventions – Accounting Cycle – Methods of Book Keeping– Journal – Ledger –Trial Balance.	13
Unit II	Subsidiary Books – Purchase Book and Sales Book – Purchase Returns and Sales Returns Book – Cash Book - Preparation of Final Accounts with Simple Adjustments.	13
Unit III	Cost Accounting – *Elements of Cost* – Cost Sheet –Stock Valuation – FIFO - LIFO - Simple Average Method.	13
Unit IV	Management Accounting – Meaning - Definition – *Objectives of Management Accounting* - Budgetary Control – Cash Budget – Flexible Budget	13
Unit V	Ratio Analysis – Meaning - Significance of Ratio Analysis -Types – Liquidity Ratio – Profitability Ratio – Solvency Ratio.	13
	Total Contact Hrs	**65**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1.Shukla. M.C And Grewal. T.S And Gupta. S.L.(2017), Advanced Accountancy, New Delhi, S.Chand And Co.	
REFERENCES	1.Jain. S.P and Narang. K.L. ,Cost Accounting (2017), New Delhi, Kalyan Publishers. 2.Sharma. K, Sasi.K.Gupta. (2017), Management Accounting, New Delhi, Kalyani Publishers.	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	S	S	M
CO2	H	M	M	M	S
CO3	S	H	H	S	S
CO4	S	H	S	H	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Name: Signature:	Name: Dr.P.Bruntha Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS415	**Title :**	**Batch :**	2018-2021
		Core Lab V: .NET Programming Lab	**Semester:**	IV
Hrs/Week:	5		**Credits:**	02

Course Objective

To develop the student's knowledge in console applications, windows applications and web applications using visual studio.NET.

Course Outcomes (CO)

K3	CO1	To remember the basic concepts of oops.
K4	CO2	To get the idea of developing application projects using ADO.NET
K5	CO3	To validate programs using various validation controls.

Syllabus

Units	**Contents**	**Hrs**
	SET A • Create a Program to implement the concepts of Object oriented programming techniques in console Application. • Create a program to implement multiple inheritance using interface in console Application. • Create a program to validate the data members in the class using property in console Application. • Create a program to catch the exceptions in console Application. • Create a program to implement multithreading in console Application. • Write a program to perform file operations in console Application. • Create a directory list using tree view control in Windows Application. • Create a calculator using basic controls in Windows Application. • Create a notepad editor using Context menu strip and menu controls in Windows Application. • Create an application to illustrate the use of dialog boxes in Windows Application. • Create a web page to generate a photo gallery in Web Application. • Create a website for online Quiz in web Application. **SET B** • Write a program to implement stack operations using array in console Application. • Write a program to implement Queue using array in console Application. • Create an application for students proctorial report in Windows Application. • Create an application for library management system in Windows Application. • Create an application for Pay roll processing system in Windows Application. • Create a program To generate electricity Bill in Windows Application. • Create an application for encryption and decryption in Web Application. • Create an Alumni registration form in Web Application.	**65**

	• Create your own portal which describes yourself and your skills in Web Application. • Create a portal for online purchasing system in Web Application. • Create a portal and validate the web page using validation controls in Web Application. • Create a web page and validate that page using client side scripting in Web Application. **INTERNAL MARK (20 Marks)** **EXTERNAL MARK (30 Marks)**	

Observation Record Note	**5 Marks**
Practical Skills	**5 Marks**
Model Exam	**10 Marks**

Record Note	**5 Marks**
Set A	**10 Marks**
Set B	**15 Marks**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	M
CO2	S	M	S	S	S
CO3	S	S	M	H	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.R.Manickachezian N.Arul kumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS416	**Title :**	**Batch :**	2018-2021
		Core Lab VI: Web Technology Lab	**Semester:**	IV
Hrs/Week:	5		**Credits:**	02

Course Objective

To enable the students to design and validate web applications using markup languages and scripts.

Course Outcomes (CO)

K3	CO1	To deploy websites using different markup languages
K4	CO2	To evaluate the programs using CSS
K5	CO3	To validate the webpages using javascript

Syllabus

Units	**Contents**	**Hrs**
	SET A • HTML Tags • Tables • Forms • Frames • Web Creation • CSS Rules • CSS Grouping Style • XML using CSS **SET B** • Address Book • DTD for Book Information • Resume Creation using DTD • XSL Transformation • XSL Sorting • Event Handling • Filters	**65**

INTERNAL MARK (20 Marks)

Observation Record Note	**5 Marks**
Practical Skills	**5 Marks**
Model Exam	**10 Marks**

EXTERNAL MARK (30 Marks)

Record Note	**5 Marks**
Set A	**10 Marks**
Set B	**15 Marks**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	H	S
CO2	S	H	M	S	M
CO3	S	M	S	H	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi N.Yasodha	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS4N1	**Title :**	**Batch :**	2018-2021
		Non-Major Elective Paper-II: Flash Lab	**Semester:**	IV
Hrs/Week:	1		**Credits:**	02

Course Objective

The objective of this course is to make the students to learn about Macromedia Flash and develop their skills in creating animations and special effects by using the tools.

Course Outcomes (CO)

K3	CO1	To apply the various tools available in Flash for creating animations.
K4	CO2	To get the idea about timeline, frames and motion tweens.
K5	CO3	To validate the animations by running the test movies.

Syllabus

Units	**Contents**	**Hrs**
	SET A • Bouncing ball using Flash • Volcano Eruption using Flash • Drawing and creating text with effects using Flash • Logo using Flash • Robot arm using Flash **SET B** • Rotating globe using Flash • Fog Effect using Flash • Lightning Effect using Flash • Animated Effect using Flash • Raining Effect using Flash **EXTERNAL MARK (50 Marks)** **Record Note – 10 Marks** **Set A – 20 Marks** **Set B – 20 Marks**	**13**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M
CO2	S	H	S	H	H
CO3	H	S	H	S	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi S.Sharmila	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS4N2	**Title :**	**Batch :**	2018-2021
		Non-Major Elective Paper-II: Internet Applications Lab	**Semester:**	IV
Hrs/Week:	1		**Credits:**	02

Course Objective

To enable the students to know how to work with internet, the usage of internet and its applications.

Course Outcomes (CO)

K3	CO1	To Know about the basics of internet
K4	CO2	To analyze the concepts through online.
K5	CO3	To get idea about online applications.

Syllabus

Units	**Contents**	**Hrs**
	SET A • Download a information about "Power of Indian president" from a website by using a search engine. • Select two electronics items by e-shopping. • Select mobile phone items by e-shopping. • Book Online train Tickets from coimbatore to Chennai. • Using Search Engine download information on "Benefits of Yoga". • Open an email account in your names in gmail/yahoomail/hotmail. • Write e-mail to Pradeep by marking a blind copy to Priya. • Download information about "greatness of Himalayas for tourism interest" in powerpoint presentation. • Create an electronic greeting card with personal remarks and pictures. **SET B** • Download information about greatness of Himalayas for tourism interest. • Write a congratulating letter to your friend on his promotion using mail. • Download research articles on "Information technology Applications" and save as doc. Files. • Download m.phil application form in bharathiar university • Search the information about " powerpoint creation" in youtube • Download pdf about the concept of "Environmental studies". • Convert word to pdf and pdf to word using online convertor. • Pay EB-Bill through online **EXTERNAL MARK (50 Marks)** **Record Note — 10 Marks** **Set A — 20 Marks** **Set B — 20 Marks**	**13**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	H
CO2	H	M	M	S	S
CO3	M	M	H	H	M

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi R.Deepa	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Dr.M.Durairaju Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS517	**Title :**	**Batch :**	2018-2021
		Core XI: Linux	**Semester:**	V
Hrs/Week:	4		**Credits:**	03

Course Objective

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This course introduces basic understanding of Linux OS, Linux commands and File system and to familiarize students with the Linux environment. To make student learn fundamentals of shell scripting. This course contains details of shell programming and introduces system administration.

Course Outcomes (CO)

K1	CO1	To remember the operating system architecture and low level interfaces that are required to build Linux systems
K2	CO2	To understand different commands used by system administrator and file related commands.
K3	CO3	To apply various Linux operating system commands and utilities in Linux systems
K4	CO4	To evaluate the shell scripts with different programming goals
K5	CO5	To analyze different types of shell associated commands.

Syllabus

Units	**Contents**	**Hrs**
Unit I	***Introduction*** – Hardware Requirements for Linux – Salient Features – Multiuser Capability, Multitasking Capability, Communication, Security, Portability – Linux System Organization – Types of Shells – Bourne Shell, C shell, Korn Shell - Unix Commands.***Unix File System*** – Creating Files – Indulging in File Play – Listing Files and Directories – Masking File Permissions – Directory Permissions – Removing File Forcibly – Directory Related Commands – Miscellaneous Commands	10
Unit II	***File System*** – The Boot Block, The Super Block, The Inode Table, Data Blocks – Storage of Files – Disk Related Commands – Disk Usage. ***Essential Linux Commands*** – Password - cal command – banner command – touch command – file command – Links with DOS – File Related Commands – wc, sort, cut, grep, dd – Viewing Files – *File Compression.*	11
Unit III	***VI Editor*** – Modes of Operations – Learning the Ropes – Adding Text, Delete Text, Overwriting Text, Quitting *vi* – Block Commands – Search Strings – Find and Replace, Delete and Paste, Yank and Paste – Set Command – Customizing *vi* Environment – Multiple File Editing in *vi.* ***Processes in Linux*** – ps command – Background Process – The nohup Command – Killing a Process – Changing Process Priorities – Scheduling of Processes –'at' command – 'batch' command – 'crontab' command. ***Communication – '***Write' command – ''wall' command –'mail' Command	10

Unit IV	***Programming with Shell:*** Introduction to shell script-creation and execution-system variables-profile-read statement-command line arguments-logical operators && and ||-exit-if conditional-case-while statement-for set-shift-trap statement-shell variables-cd command-merging stream-expr command-eval command-shell programs.	11
Unit V	***System Administration:*** System Administrator-Booting and shutting down-super user status (su) - security-user services - disk management (fsck) - operation - file system administration-backups utilities - cpio- afio- shutdown – mount – unmount – df - find commands-creating device files-*installing and managing printers.*	10
	Total Contact Hrs	**52**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1.Yashavant Kanetkar, "UNIX Shell Programming", BPB Publications, 1st Edition, 2003 (Unit I – III) 2.Sumitabha das, "UNIX System Concepts and Applications", Tata McGraw - Hill, Fourth edition 2010 (Unit IV,V)	
REFERENCES	1.Mark.G.Gobell,"Red Hat LINUX-Reference Manual", Pearson education, first Edition, 2003	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	M
CO2	M	M	M	M	M
CO3	M	H	S	S	M
CO4	S	S	S	S	M
CO5	M	H	M	S	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
K.Srinivasan K.Kannika Parameswari	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS518	**Title:**	**Batch :**	2018-2021
		Core XII: Kotlin programming	**Semester:**	V
Hrs/Week:	4		**Credits:**	03

Course Objective

On successful completion of this course, the students will be able to understand the kotlin programming concepts, to develop multi- platform applications and hands on practices by applying these concepts to implement in both mobile and web based applications.

Course Outcomes (CO)

K1	CO1	To remember the coding conventions used for kotlin programming.
K2	CO2	To get an idea about classes, objects, properties, fields and interfaces of kotlin.
K3	CO3	To deploy multi-platform mobile and web based applications.
K4	CO4	To analyze the composition of suspending functions.
K5	CO5	To validate the execution of applications on various platforms.

Syllabus

Units	**Contents**	**Hrs**
Unit I	**Introduction:** Overview-Using Kotlin for Server-side Development - Using Kotlin for Android Development - Kotlin JavaScript Overview - Kotlin/Native for Native - Kotlin for Data Science - Coroutines for asynchronous programming and more - Multiplatform Programming. **Getting Started :** Basic Syntax – Idioms - Coding Conventions. **Basics:** Basic Types – Packages - Control Flow: if, when, for, while - Returns and Jumps.	**13**
Unit II	**Classes and Objects :** Classes and Inheritance - Properties and Fields – Interfaces – Visibility Modifiers – Extensions - Data Classes - Sealed Classes – Generics - Nested and Inner Classes - Enum Classes - Object Expressions and Declarations - Inline classes – Delegation - Delegated Properties. **Functions and Lambdas :** Functions - Higher-Order Functions and Lambdas - Inline Functions.	**13**
Unit III	**Collections :** Kotlin Collections Overview - Constructing Collections – Iterators - Ranges and Progressions – Sequences - Collection Operations Overview - Collection Transformations – Filtering - plus and minus Operators – Grouping - Retrieving Collection Parts - Retrieving Single Elements - Collection Ordering - Collection Aggregate Operations - Collection Write Operations - List Specific Operations - Set Specific Operations - Map Specific Operations.	**13**
Unit IV	**Coroutines :** Coroutine Basics - Cancellation and Timeouts - Composing Suspending – Functions - Coroutine Context and Dispatchers - Asynchronous Flow – Channels - Exception Handling - Shared mutable state and concurrency - Select Expression.	**13**
Unit V	**Multiplatform Programming :** Platform-Specific Declarations - Building Multiplatform Projects with Gradle: Project Structure - Setting up a Multiplatform Project - Gradle Plugin - Setting up Targets - Con□guring Source Sets - Default Project Layout - Running Tests - Publishing a Multiplatform Library - Java Support in JVM Targets - Android Support - Using Kotlin/Native Targets.	**13**

	Total Hours	**65**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, and Assignment	
TEXT BOOKS	"Kotlin 1.3 Language Documentation", https://kotlinlang.org/docs/kotlin-docs.pdf, Kotlin official website	
REFERENCES	1. Ken Kousen, "Kotlin Cookbook", First Edition, 2019, O'Reilly Media, Inc., ISBN: 9781492046660 2.David Griffiths, Dawn Griffiths, "Head First Kotlin", First Edition, 2019, O'Reilly Media, Inc., ISBN: 9781491996683	

Mapping

PSO / CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	M	M	H	H	H
CO2	M	M	H	S	H
CO3	H	M	S	S	S
CO4	M	H	H	M	H
CO5	M	M	H	M	H

S-Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi N.Arulkumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS519	**Title :**	**Batch :**	2018-2021
		Core XIII: Cyber Security	**Semester:**	V
Hrs/Week:	4		**Credits:**	02

Course Objective

This course provides students with concepts of computer security, cryptography, digital money, secure protocols, detection and other security techniques. Upon the completion of this course, students should be able to understand, appreciate, employ, design and implement appropriate security technologies and policies to protect computers and digital information.

Course Outcomes (CO)

K1	CO1	Evaluate the computer network and information security needs of an organization.
K2	CO2	Assess cyber security risk management policies in order to adequately protect an organization's critical information and assets.
K3	CO3	Troubleshoot, maintain and update an enterprise-level information security system.
K4	CO4	Implement continuous network monitoring and provide real-time security solutions.
K5	CO5	Formulate, update and communicate short- and long-term organizational cyber security strategies and policies.

Syllabus

Units	**Contents**	**Hrs**
Unit I	Introduction: Why Network Security is needed – Management principles – Security principles - Network management - Security attacks – Qualities of a Good Network. Organizational Policy and Security: Security policies, Standards and Guidelines – Information Policy – Security Policy - Physical Security – Social Engineering – Security Procedures – Building a Security Plan. Security Infrastructure: Infrastructure Components – Goals of Security Infrastructure – Design Guidelines – Security Models	10
Unit II	Cryptography: Terminology and background – Data Encryption Methods – Cryptographic Algorithms- Secret Key Cryptography - Public key cryptography – Message Digest – Security Mechanisms.Database Security: Introduction to Database – Characteristics of a Database Approach – Database Security Issues - Database Security – Vendor-Specific Security – Data Warehouse Control and Security	10
Unit III	Intrusion Detection Systems: What is not ad IDS – Infrastructure of IDS – Classification of Intrusion Detection Systems – Host-Based IDS – Network-Based IDS - Anomaly Vs Signature Detection – Manage an IDS – Intrusion Detection Tools – IDS Products and Vendors. Network Security: Fundamental Concepts – Identification and Authentication – Access Control – A Model for Network Security – Malicious Software – Firewalls	11
Unit IV	Network Management: Goal of Network Management – Network Management Standards – Network Management Model – Infrastructure for Network Management - Security Management: Security Plan - Security Analysis - Change Management - Disaster Recovery - Systems Security Management - Protecting Storage Media- Exchanges of Information and Software – Security Requirements of Systems.	11

Unit V	Electronic Mail Policy: Electronic Mail – What are the E-mail threats that organization's face - Why do you need an E-mail Policy - How do you create an E-mail Policy - Publishing the E-mail Policy - University E-mail Policy. Security of Internet Banking Systems: Introduction Banking System – Security Problem – Methodology for Security Problem – Schematic flow of Internet Banking – A layered approach to security.	10
	Total Contact Hrs	**52**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, and Assignment	
TEXT BOOKS	1. Brijendra singh ,Network Security and Management, PHI, 2007	
REFERENCES	.1. Rick Howard, "Cyber Security Essentials" Auerbach Publications 2011.	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	H
CO2	M	M	S	S	S
CO3	S	H	S	H	S
CO4	H	M	H	S	S
CO5	M	S	M	H	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.R.Manickachezian N.Karthikeyan	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS5E1	**Title**	**Batch :**	2018-2021
		Core Elective- I: Software Testing	**Semester**	V
Hrs/Week:	6		**Credits:**	5

Course Objective

The objective of this course is to make the students to understand the various features of testing such as software test automation, test metrics and measurement. Software testing tool win runner is used for applications.

Course Outcomes (CO)

K1	CO1	To remember the software development life cycle phases,quality assurance and quality control.
K2	CO2	To understand the types of testing, scenarios, process,methodologies, challenges in testing.
K3	CO3	To implement design and architecture for automation, software testing tools are applied.
K4	CO4	To evaluate performance ,test metrics and measurement , WinRunner software is used.
K5	CO5	To Access verification and validation, integrate functional and non-functional testing,to perform regression testing, framework for test tools, testing an application using WinRunner.

Syllabus

Units	**Contents**	**Hrs**
Unit I	***Software development life cycle:*** Phases of Software Project-Quality, Quality Assurance, and Quality Control-Testing, Verification, and Validation. White Box Testing: Static Testing-Structural Testing-*Challenges.* Black Box Testing: What is Black Box Testing, Why Black Box Testing-When to do Black Box Testing-How to do Black Box Testing	15
Unit II	***Integration Testing***: Integration Testing as a type of Testing- Integration Testing as a phase of Testing- Scenario Testing-Defect Bash. System and Acceptance Testing: Functional System Testing- Non Functional Testing- Acceptance Testing.	15
Unit III	***Performance Testing:*** Methodology-Tools-Process-Challenges. Regression Testing: Types-When to do Regression Testing- How to do Regression Testing. Internationalization Testing.	16
Unit IV	***Software Test Automation:*** Skills needed for Automation-What to Automate-Scope of Automation-Design and Architecture for Automation-Generic requirements for Test Tools Framework-Selecting a Test Tool-Challenges. Test Metrics and Measurements: Metrics and Measurements-*Metrics in Testing*-Types of Metrics	16
Unit V	***WinRunner:***Overview of WinRunner-Testing an Application Using WinRunner-Test Script Language-Synchronization of Test Cases-Data Driven Testing-Rapid Test Script Wizard-Mapping Custom Object to Standard Class-Checking GUI Objects	16
	Total Contact Hrs	**78**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, and Assignment	

TEXT BOOKS	1. Srinivasan Desikan, Gopalaswamy Ramesh, "Software Testing Principles and Practices"pearson Education-7th impression 2009 2. Dr K.V.K.K Prasad, "Software Testing Tools", Dreamtech press, New Delhi, 2007 (for unit V)
REFERENCES	1.Roger S.Pressman,"Software Engineering", Tata McGraw Hill Publication, Sixth Edition, 2009.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	S
CO2	S	M	M	M	S
CO3	M	M	H	M	M
CO4	M	H	H	S	H
CO5	S	M	H	H	S

S-Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr. R.Manicka Chezian M. Meena Krithika	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS5E2	**Title**	**Batch :**	2018-2021
		Core Elective- I: Distributed Computing	**Semester**	V
Hrs/Week:	6		**Credits:**	5

Course Objective

The objective of this course is to introduce the area of distributed systems. To examine and analyze how a set of connected computers can form a functional, usable and high performance distributed system.

Course outcomes

K1	CO1	To remember the basic elements and concepts related to distributed system technologies;
K2	CO2	To understand the knowledge of the core architectural aspects of distributed systems
K3	CO3	To implement the design of distributed applications and underlying components of distributed systems
K4	CO4	To evaluate distributed systems scalability and fault tolerance
K5	CO5	To access the servers in the network

Syllabus

Units	**Contents**	**Hrs**
Unit I	Introduction: Distributed system: Goals, Advantages and disadvantages- architecture of Distributed Computing - Client-server, 3-tier architecture, N-tier architecture, Distributed objects, Loose coupling, tight coupling. Concurrency in Distributed Computing - Multiprocessor systems, Multicore systems,	15
Unit II	Characteristics of Distributed Computing, Network and Interconnection Structures. *Message Switching and Circuit Switching*, Designing of distributed system, Top down approach and Bottom up approach. Distributed computing system model - Minicomputer Model, Workstation Model, Workstation – Server Model, Processor – Pool Model, Hybrid Model. Challenges in distributed data	15
Unit III	Data flow system: Issues in load balancing- Classification of Load Distributing Algorithms, Load Balancing Vs. Load Sharing, Selecting a suitable load-sharing algorithm, Requirements for Load Distributing. data flow- Software architecture, hardware architecture. Design consideration: peer to peer network-client and server network-application server network.	16
Unit IV	Client and server network model: client /server model-characteristics-architecture- Implementation of Client/ server Model, tiered architecture- 2 tier architecture, 3-tier architecture, n-tier architecture. Client queue - Client architecture. Configuring a Client/ Server Network Model. types of server – file server, print server, mail server.	16
Unit V	Distributed database: Need for distributed database Principles of distributed databases, types of distributed database-advantages and limitations. Distributed DBMS: levels of transparency- distributed DBMS products- *features of distributed file system.*	16
	Total Contact Hrs	**78**

	**Italicized* texts are for self study	
	Power point Presentations, Seminar, and Assignment	
TEXT BOOKS	1.Elmasri & Navathe, "Fundamentals of Database Systems", Pearson Education Asia,3rd Edition, 2011 2. Stefans Ceri, Ginseppe Pelgatti "Distributed database Principles and systems" McGraw Hill, First Edition, 2008	
REFERENCES	1.Andrew S. Tanenbaum and Maarten van Steen, "Distributed Systems: Principles and Paradigms", Prentice Hall, 2002	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	H
CO2	M	M	S	S	S
CO3	S	H	S	H	S
CO4	H	M	H	S	S
CO5	M	H	S	M	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi N.Arul kumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS5E3	**Title**	**Batch :**	2018-2021
		Core Elective- I:	**Semester**	V
Hrs/Week:	6	Client/Server Technology	**Credits:**	5

Course Objective

To inculcate Knowledge on Client / Server Concepts and various components of client / server Applications.

Course Outcomes (CO)

K1	CO1	To remember basics concepts of client-server architecture.
K2	CO2	To Understand the components used for client-server development.
K3	CO3	To implement client-server architecture using WAN and other technologies.
K4	CO4	To review client – server services and support.
K5	CO5	To validate the clients in the server

Syllabus

Units	**Contents**	**Hrs**
Unit I	Client / Server Computing – Advantages of Client / Server Computing – Technology Revolution – Connectivity – Ways to improve Performance – How to reduce network Traffic.	15
Unit II	Components of Client / Server Applications – The Client: Role of a Client – Client Services – Request for Service. Components of Client / Server Applications – The Server: The Role of a Server – Server Functionality in Detail – The Network Operating System – What are the Available Platforms – The Server Operating system.	15
Unit III	Components of Client / Server Applications – Connectivity: Open System Interconnect – communications Interface Technology – Inter-process communication – WAN Technologies.	16
Unit IV	Components of Client / Server Applications – Software. Components of Client / Server Applications – Hardware.	16
Unit V	Components of Client / Server applications – Service and Support: System Administration. The Future of Client / Server Computing: Enabling Technologies – Transformational Systems.	15
	Total Contact Hrs	**78**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, and Assignment	
TEXT BOOKS	1. Steve guenferich, "Client / Server Computing – Patrick Smith", PHI, Second edition, 1994 (For Chapters 1-8 & 10)	

REFERENCES	1.Robert Orfali, Dan Harkey, Jeri Edwards," the essential client/server survival guide", galgotia publication private limited, Second edition, 2007. 2.Dewire and Dawana Travis "Client/ Server Computing", TMH, 2003.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	M	H	S
CO2	H	M	H	S	H
CO3	M	S	S	M	M
CO4	M	H	H	M	H
CO5	H	M	M	S	H

S-Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi P.Jayapriya	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS520	**Title :**	**Batch :**	2018-2021
		Core Lab VII:Linux Lab	**Semester:**	V
Hrs/Week:	5		**Credits:**	03

Course Objective

To enable the students to write program in Linux for solving specified problems.

Course Outcomes (CO)

K3	CO1	To apply the various Linux distributions.
K4	CO2	To evaluate the basic set of commands and utilities in Linux systems.
K5	CO3	To validate various shell scripts with different programming concepts.

Syllabus

Units	**Contents**	**Hrs**
	SET A • Create a program to display pattern. • Create a program using pipes and filters. • To find Prime numbers between given range. • Check a given number is an Armstrong or not • Sorting of a given set of numbers. • Create a program using grep command • Create a program using Translating character commands. • Create a program using different file and directory commands. • To print the multiplication table for a given number. • Swapping two numbers without third variable . **SET B** • To generate student marksheet for given numbers. • Calculate Electricity Bill tariff of a customer. • Calculate Income tax of an employee. • Calculate telephone tariff of a customer.	**65**

	• Create a program to add two dimensional array. • Create a program to generate student marklist. • To print floyds and pascal triangle. • Create a program to generate sum of series. • Create a program to calculate speed,distance and time. • To find nCr of a given numbers.	

INTERNAL MARK (40 Marks)

Observation Record Note	**10 Marks**
Practical Skills	**10 Marks**
Model Exam	**20 Marks**

EXTERNAL MARK (60 Marks)

Record Note	**10 Marks**
Set A	**20 Marks**
Set B	**30 Marks**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	M	M
CO2	M	S	M	M	M
CO3	S	M	H	M	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
K.Srinivasan K.Kannika Parameswari	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS521	**Title :**	**Batch :**	2018-2021
		Core Lab VIII: Programming lab using Kotlin	**Semester:**	V
Hrs/Week:	5		**Credits:**	03

Course Objective

This course has been prepared for the beginners as well as for professionals to help them understand the concepts of Kotlin programming language. After completing this course, you will find yourself at a good level of expertise in Kotlin, from where you can take yourself to the next levels.

Course Outcomes (CO)

K3	CO1	To Install and configure Android application development tools.
K4	CO2	To Design and develop user Interfaces for the Android platform.
K5	CO3	To Apply Java programming concepts to Android application development.

Syllabus

Units	Contents	Hrs
	SET A 1. Kotlin program to print an integer 2. Kotlin program to swap two numbers 3. Kotlin program to find the frequency of character in a string 4. Kotlin program to check leap year 5. Kotlin program to find factorial of a number 6. Kotlin program to generate multiplication table 7. Kotlin program to make a simple calculator using switch...case 8. Kotlin program to calculate average using arrays 9. Kotlin program to find transpose of a matrix 10. Kotlin program for inheritance and function overriding 11. Kotlin program for bucket sort 12. Kotlin program for interfaces 13. Kotlin program for collections. 14. Kotlin Program to override method of super class 15. Kotlin Program to Calculate Difference between Two Time Periods **INTERNAL MARK (40 Marks)** **Observation Record Note** — **10 Marks** **Practical Skills** — **10 Marks** **Model Exam** — **20 Marks** **EXTERNAL MARK (60 Marks)** **Record Note** — **10 Marks** **Set A** — **20 Marks** **Set B** — **30 Marks**	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	M	H
CO2	S	S	M	H	M
CO3	M	M	H	M	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi N.Arul kumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS5S1	**Title :**	**Batch :**	2018-2021
		Skill Based Elective -I:	**Semester:**	V
Hrs/Week:	1	Word Press	**Credits:**	02

Course Objective

The objective of this course is to enable the students to know how to work with Word press and to create blogs.

Course Outcomes (CO)

K3	CO1	To apply the available templates for creating blogs
K4	CO2	To analyze the various plugins and apply them appropriately
K5	CO3	To validate the available content in the blog or website

Syllabus

Units	**Contents**	**Hrs**
	SET A • To create a Blogs Web site • To create a Web site for online books shopping • To create a E-commerce Web site • To create a Web site for Mobile device • To create a Web site for photo sharing **SET B** • To create a Web site for online business brochure • To create a informational Web site • To create a Authors Web site • To create a community building Web site • To create a personal Web site **EXTERNAL MARK (50 Marks)** **Record Note — 10 Marks** **Set A — 20 Marks** **Set B — 20 Marks**	**13**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	S	H
CO2	S	S	M	H	H
CO3	M	H	H	M	M

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi N.Arul kumar	Name:Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS5S2	**Title :**	**Batch :**	2021-2023
		Skill Based Elective -I: Dream Weaver	**Semester:**	V
Hrs/Week:	1		**Credits:**	02

Course Objective

The objective of this course is to train the students to use a friendly interface for creating and editing the web pages using HTML, XML, CSS, and JavaScript.

Course Outcomes (CO)

K3	CO1	To apply the different controls in dreamweaver for creating a webpage
K4	CO2	To analyze the markup languages and using them based on the requirements
K5	CO3	To validate the webpage using javascript

Syllabus

Units	**Contents**	**Hrs**
	SET A • To create a picture gallery. • To create a template. • To create CSS text rollovers. • To create Mailto Links. • To create small pop-up windows for ads or news. **SET B** • To create a website. • To create a link to different pages from the same image. • To create customizing input boxes, list menus, submit buttons. • To create a webpage using internal and external CSS. • To create links without an underline using CSS Styles. **EXTERNAL MARK (50 Marks)** **Record Note 10 Marks** **Set A 20 Marks** **Set B 20 Marks**	**13**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	S
CO2	M	S	S	H	H
CO3	H	M	M	M	M

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi N.Arul kumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS5S3	**Title :**	**Batch :**	2018-2021
		Skill Based Elective -I: Quantitative Aptitude Skills	**Semester:**	V
Hrs/Week:	1		**Credits:**	02

Course Objective

The objective of the course is to develop a wide variety of soft skills starting from communication, to working in different environments, learning creative and critical decision making, developing awareness of how to work with people and to resolve stress.

Course Outcomes (CO)

K1	CO1	To remember the basic mathematics and its functions.
K2	CO2	To understand the various problems in the real world related to shapes, purchase, sales, interest.
K3	CO3	To apply the skills required for various problems.
K4	CO4	To analyze the illustration and steps involved in problem solving approach.
K5	CO5	To build the quantitative aptitude skills for solving various mathematical and application problems.

Syllabus

Units	**Contents**	**Hrs**
Unit I	Numeral- Place Value or Local Value of a Digit in a Numeral- Face Value- Types Of Numbers- Tests Of - Multiplication By Short Cut Methods Divisibility- Basic Formulae-Progression	2
Unit II	Time – Speed – Distance – Heights And Distances -Races - Problems On Trains -Boats & Streams - Time And Work - Ratio Proportion- Partnership -- Pipes and Cisterns -Chain Rule- Mixtures & Solutions- Clocks – Calendar	2
Unit III	LCM AND GCD - Unit digit, Number of zeroes, Factorial notation - Sets- Functions-Square root, Cube roots, Remainder concepts—Identities- Fractions and Decimals, surds.	3
Unit IV	Problems On Ages- Percentage- Profit And Loss- Discount- . Simple Interest- Compound Interest-Installments- Stocks And Shares- True Discount	3
Unit V	Logarithms- Linear Equations - Quadratic Equations And In-Equations Area- Volume And Surface Area- Permutations And Combinations - Probability - Bar Graphs-Pie Charts-Line Graphs.	3
	Total Contact Hrs	**13**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1. "Quantitative Aptitude ", 2015, R.S Agarwal, S.Chand Publications.	

REFERENCES	1. "Quantitative Aptitude for Competitive Exams, Abhijit Guha. McGrawhill Education, 6th edition, 2016. 2."Quantitative Aptitude for Competitive Exams" by Dilip KumarYugnirmal, Trail Blazer Winning Edge Series Publications.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	S	H
CO2	H	S	H	M	M
CO3	M	H	H	S	H
CO4	H	M	H	M	S
CO5	S	H	M	H	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.Antony Selvadoss Thanamani Dr. R.Deepa	Name:Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS622	**Title**	**Batch :**	2018-2021
		Core XIV: Python Programming	**Semester**	VI
Hrs/Week:	4		**Credits:**	03

Course Objective

On successful completion of this course the students should understand the core principles of the Python Language and use the tools to produce well designed programs in python and create effective GUI applications.

Course Outcomes (CO)

K1	CO1	To remember the principles of structured programming and to understand basics of python.
K2	CO2	To understand the common programming idioms: variables, loop, branch, subroutine, and input/output
K3	CO3	To deploy the concepts of functions, standard libraries, modular programming and the design of user interfaces
K4	CO4	To figure out ability to analyze and solve the problems using advanced facilities of the Python Language
K5	CO5	To evaluate the object oriented features in python using functions and standard libraries.

Syllabus

Units	Contents	Hrs
Unit I	**BASICS :** Python - Variables - Executing Python from the Command Line - Editing Python Files - Python Reserved Words - Basic Syntax-Comments - Standard Data Types – Relational Operators - Logical Operators - Bit Wise Operators - Simple Input and Output.	10
Unit II	**CONTROL STATEMENTS:** Control Flow and Syntax - Indenting - if Statement - statements and expressions- string operations- Boolean Expressions - while Loop - break and continue - for Loop - Lists – Tuples - Sets - Dictionaries	11
Unit III	**FUNCTIONS:** Definition - Passing parameters to a Function - Built-in functions- Variable Number of Arguments - Scope – Type conversion-Type coercion-Passing Functions to a Function - Mapping Functions in a Dictionary – Lambda - Modules - Standard Modules – sys – math – time - dir - help Function.	10

Unit IV	**ERROR HANDLING:** Run Time Errors - Exception Model - Exception Hierarchy - Handling Multiple Exceptions - Data Streams - Access Modes Writing - Data to a File Reading - Data From a File - Additional File Methods - Using Pipes as Data Streams - Handling IO Exceptions - Working with Directories.	11
Unit V	**OBJECT ORIENTED FEATURES**: Classes Principles of Object Orientation - Creating Classes - Instance Methods - File Organization - Special Methods - Class Variables – Inheritance – Polymorphism - Type Identification - Simple Character Matches - Special Characters - Character Classes – Quantifiers - Dot Character - Greedy Matches – Grouping - Matching at Beginning or End - Match Objects – Substituting - Splitting a String - Compiling Regular Expressions.	10
	Total Contact Hrs	**52**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1. Mark Summerfield. ―Programming in Python 3: A Complete introduction to the Python Language, Addison-Wesley Professional, 2009. 2. Martin C. Brown, ―PYTHON: The Complete Reference‖, McGraw-Hill, 2001.	
REFERENCES	1. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist‘‘, 2nd edition, Updated for Python 3, Shroff/ O‘Reilly Publishers, 2016 2. Guido van Rossum and Fred L. Drake Jr, ―An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011. 3. Wesley J Chun, ―Core Python Applications Programming‖, Prentice Hall, 2012.	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S
CO2	H	M	H	S	H
CO3	H	H	S	S	M
CO4	M	H	M	M	H
CO5	S	H	M	H	M

S: Strong H: High M: Medium L: Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.R.Manicka Chezian Dr.R.Deepa	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS6E4	**Title :**	**Batch :**	2018-2021
		Core Elective II : Data mining and Warehousing	**Semester:**	VI
Hrs/Week:	6		**Credits:**	05

Course Objective

This course will introduce the concepts of data ware house and data mining, which gives a complete description about the principles, used, architectures, applications, design and implementation of data mining and data ware housing concepts.

Course Outcomes (CO)

K1	CO1	Be familiar with the basics of data mining and data warehousing
K2	CO2	Develop skill in selecting the appropriate data mining algorithm for solving practical problems
K3	CO3	Characterize the kinds of patterns that can be discovered by classification, decision tree and neural network
K4	CO4	Identify the master data mining techniques in clustering
K5	CO5	Understand and implement classical models and algorithms in data warehouses and data mining

Syllabus

Units	**Contents**	**Hrs**
Unit I	**Introduction :**Basic data mining tasks – data mining versus knowledge discovery in databases – *data mining issues* – data mining metrics – social implications of data mining – data mining from a database perspective. Data mining techniques: Introduction – a statistical perspective on data mining – similarity measures – decision trees – neural networks – genetic algorithms.	15
Unit II	**Classification**: Introduction – Statistical – based algorithms - distance – based algorithms – decision tree - based algorithms - neural network – based algorithms –rule - based algorithms – combining techniques.	15
Unit III	**Clustering**: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms - Partitional Algorithms. Association rules: Introduction - large item sets - basic algorithms – parallel & distributed algorithms – comparing approaches- incremental rules – advanced association rules techniques – *measuring the quality of rules*	16
Unit IV	**Data warehousing**: an introduction - characteristics of a data warehouse – data marts – other aspects of data mart. Online analytical processing: introduction - OLTP & OLAP systems – data modelling –star schema for multidimensional view –data modelling – multifact star schema or snow flake schema – OLAP TOOLS – State of the market – OLAP TOOLS and the internet	16
Unit V	**Advanced Topics**: Web mining-introduction – web content mining-web structured mining(Page Ranking only)-Web usage mining-spatial mining-introduction-spatial data overview-Temporal mining-introductions-Time series	16

	Total Contact Hrs	**78**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1. Margaret H. Dunham, "Data mining introductory and advanced topics", Pearson education, 2003. 2. C.S.R. Prabhu, "Data warehousing concepts, techniques, products and a applications", PHI, Second Edition. 3. Arun K. Pujari, " Data Mining Techniques", Universities Press (India) Private Limited, Hyderabad, 2008	
REFERENCES	1. Alex Berson, Stephen J. Smith, "Data warehousing, Data mining, & OLAP, TMCH, 2001. 2. Jiawei Han & Micheline Kamber, " Data mining Concepts & Techniques", 2001, Academic press	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	H	S	M
CO2	S	S	S	M	H
CO3	H	H	H	H	S
CO4	S	S	S	H	H
CO5	M	S	H	M	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.R.Manickachezian N.Karthikeyan	Name:Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS6E5	**Title :**	**Batch :**	2018-2021
		Core Elective II : Enterprise Resource Planning	**Semester:**	VI
Hrs/Week:	6		**Credits:**	05

Course Objective

The objective of this course is to make the students to understand the various basic concepts of ERP systems and able to identify and describe typical functionality in an ERP system.

Course Outcomes (CO)

K1	CO1	To remember the knowledge of typical ERP systems, and the advantages and limitations of implementing ERP systems.
K2	CO2	To comprehend the technical aspects of ERP systems
K3	CO3	To implement one of the popular ERP packages to support business operations and decision-making,
K4	CO4	To analyze the challenges associated with implementing enterprise systems and their impacts on organizations
K5	CO5	To build the application integration for ERP

Syllabus

Units	**Contents**	**Hrs**
Unit I	***Introduction to ERP:*** Integrated Management Information Seamless Integration – Supply Chain Management – Integrated Data Model – Benefits of ERP – Business Engineering and ERP – Definition of Business Engineering – Principle of Business Engineering – *Business Engineering with information Technology*.	15
Unit II	***Business Modelling For ERP:-*** Building the Business Model – ERP Implementation – An Overview – Role of Consultant, Vendors and Users, Customization – Precautions – ERP Post Implementation Options-ERP Implementation Technology –*Guidelines for ERP Implementation.*	16
Unit III	***ERP and the Competitive Advantage ERP****:* domain MPGPRO – IFS/Avalon – Industrial and Financial Systems – Baan IV SAP-Market Dynamics and Dynamic Strategy.	16
Unit IV	***Commercial ERP Package:*** Description – Multi-Client Server Solution – Open Technology – User Interface- Application Integration	16
Unit V	***Architecture*****:** Basic Architectural Concepts – The System Control Interfaces – Services – Presentation Interface – Database Interface - Cases.	15
	Total Contact Hrs	**78**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	

TEXT BOOKS	1. Vinod Kumar Garg and N.K.Venkita Krishnan, "Enterprise Resource Planning – Concepts and Practice", PHI, Second Edition,2003.
REFERENCES	1. Jose Antonio Fernandz, "The SAP R/3 Handbook", TMH, 1998. 2. Lau, "Enterprise Resource Management", McGraw Hill,2005 3. Daniel E O'Leary, "Enterprise Resource System", tenth Edition,2000 4. Mary Sumner, "Enterprise Resource Planning", First edition,2007

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	S	M
CO2	M	S	S	S	S
CO3	S	H	S	H	S
CO4	M	S	H	S	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi K.Kannika Parameswari	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS6E6	**Title :**	**Batch :**	2018-2021
		Core Elective II : Grid and Cloud Computing	**Semester:**	VI
Hrs/Week:	6		**Credits:**	05

Course Objective

The objective of this course is to explain the evolving computer models called grid and cloud computing by introducing the various levels of services that can be achieved by them. Also learn how to make applications for cloud and grid environment by using toolkits.

Course Outcomes (CO)

K1	CO1	To remember the advantages of web applications and web services.
K2	CO2	To get an idea about fundamentals and architecture of cloud and grid computing.
K3	CO3	To deploy the cloud and grid based applications using toolkits
K4	CO4	To review the applications of various cloud services development tools such as Amazon Ec2, Google App Engine and IBM clouds.
K5	CO5	To validate the cloud security in applications

Syllabus

Units	**Contents**	**Hrs**
Unit I	***Fundamentals Of Grid And Cloud Computing:*** Fundamentals – Scope of Grid Computing – Merging the Grid sources – Architecture with the Web Devices Architecture – Cloud computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why cloud computing Matters – *Advantages of Cloud computing* – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services.	16
Unit II	***Developing Cloud Services:***Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – *Web Services* – On-Demand computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2-Google App Engine – IBM Clouds.	16
Unit III	***Cloud Computing For Everyone***: Centralizing Email communications – collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.	16
Unit IV	***Using Cloud Services:*** Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing – Collaborating on Databases – Storing and Sharing Files.	15
Unit V	***Grid Computing:*** OGSA – Sample Use Cases – OGSA Platform Components – OGSI – OGSA Basic Services. Globus Toolkit – Architecture – Programming Model – High Level Services – OGSI.Net. Middleware Solutions.	15
	Total Contact Hrs	**78**

	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1.Joshy Joseph & Criag Fellenstein, 2009, "Grid Computing", PHI, PTR. 2. Michael Miller, August 2009 , "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing.	
REFERENCES	1.Jose C.Cunha, Omer F.Rana (Eds), 2006, "Grid Computing", Springer International Edition. 2.Anthony T. Velte and others, 2011 , "Cloud Computing" TATA Mc-Graw Hill Publications, New Delhi.	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	H	H
CO2	H	H	S	S	S
CO3	M	H	M	H	H
CO4	H	M	H	S	S
CO5	M	H	S	M	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.Antony Selvadoss Thanamani N.Arul kumar	Name: Dr.Antony Selvadoss Thanamani Signature:	Name:Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS6E7	**Title :**	**Batch :**	2018-2021
		Core Elective III : Multimedia Packages	**Semester:**	VI
Hrs/Week:	6		**Credits:**	05

Course Objective

Through this course, students are expected to achieve a basic understanding of multimedia systems. With such background equipment, students would be able to evaluate more advanced or future multimedia systems. This course will also awaken students interest and further motivate them towards developing their career in the area of multimedia and internet applications.

Course Outcomes (CO)

K1	CO1	To keep in mind the designing techniques of multimedia systems
K2	CO2	To understand the user requirements and project development techniques using audio, video and text.
K3	CO3	To apply design creative approach in application of multimedia devices, equipment and systems.
K4	CO4	To analyze, design and develop animation movies involving computer graphics and video analytics using advanced techniques and tools.
K5	CO5	To evaluate multimedia application in real time.

Syllabus

Units	**Contents**	**Hrs**
Unit I	**Design Techniques** : Design Elements & Principle – Illustration & Sketching – Color Theory – Print & Publish Media – Composition & Typography – ***Understanding User Requirements*** – Business Goal – Process Blue Print / Prototype Theory – Creating a Project From Start To Finish-Wireframe Design – Different Types Of Animation – Animation Software.	16
Unit II	**Concepts Of Graphics:** Creating Graphics, Applying Special Effects, Effects and Color Correction, Editing & Optimizing Graphics For Web/Print/Broadcasting/Bitmap & Vector Graphics **-** Graphical Tools**, Design Techniques**: Page Layout, Print Media – Brochure/E-Mail/News Letter Design.	15
Unit III	**Digital Audio & Tools**: Sound Forge – Gold Wave, Editing, Mixing, Import – Audio Capturing – Audio Mixing – Audio Effect Generation. **Digital Video & Tools:** Video Formats Adobe Premiere, Camtasia Studio, Pinnacle Studio – Video Capturing – Video Mixing –***Preparing and Video For Delivery-*** Composing & Special Functions – Photo Graphic Techniques.	15
Unit IV	**Overview of Premiere Elements workspace:** The Organizer workspace, Premiere Elements Edit workspace, Tasks panel workspaces- **Import Video in Premiere:**Video file types, Capturing video, Add videos using the Video Importer- **Edit Clips:** Editing tools, Trimming clips.	16

Unit V	**Adding Video Effects:** About effects, Find, apply, and preview effects, Changing effect properties, Adjust effect properties- **Add Titles:** create a new title, edit a title- **Work With Audio:** Adding an audio soundtrack, Using Smart Sound- **Share Video:** Create DVD files for web, Sharing to a DVD, the web, computer, mobile phone or player.	16
	Total Contact Hrs	**78**
	Italicized texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1. Ze-NianLi,Drew Marks,Jiangchuan Liu, "Fundamentals of multimedia" Publisher: Springer,Second Edition, April 2014 2. Adobe Creative Team,"Adobe Premiere Pro CC class room in a book", Adobe Publisher,I Edition, July 2013	
REFERENCES	1. Paul Ekert, "Mastering Adobe Premiere Pro CS6 HOTSHOT", Packt Publishing Limited, Feb 2013.	

Mapping

PSO / CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	L	M	H	H	S
CO2	H	S	H	S	H
CO3	H	H	H	H	S
CO4	M	H	H	S	H
CO5	H	M	M	S	M

S-Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi Dr.A.Kanagaraj	Name: Dr.Antony Selvadoss Thanamani Signature:	Name:Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS6E8	**Title :**	**Batch :**	2018-2021
		Core Elective III :	**Semester:**	VI
Hrs/Week:	6	Big data Analytics	**Credits:**	05

Course Objective

On successful completion of course students will possess the skills necessary for utilizing tools (including deploying them on Hadoop/MapReduce) to handle a variety of big data analytics, and to be able to apply the analytics techniques on a variety of applications.

Course Outcomes (CO)

K1	CO1	To remember how to collect, manage, store, query, and analyze various forms of big data
K2	CO2	To understand the concept and challenge of big data and why existing technology is inadequate to analyze the big data
K3	CO3	To deploy use of Big Data to deliver business value
K4	CO4	To analyze un-modeled, multi-structured data using Hadoop, MapReduce
K5	CO5	To validate the novel architectures and platforms introduced for Big data, in particular Hadoop and MapReduce.

Syllabus

Units	**Contents**	**Hrs**
Unit I	**Big Data Road Map:** Digital Data – an Imprint, Evolution of Big Data – What is Big Data – Sources of Big Data – Characteristics of Big Data – Data Discovery – Traditional Approach – Applications of Big Data. **Hadoop:** Why Hadoop – Hadoop Milestones – Hadoop Architecture – An Overview – Why Hadoop Distributed File System (HDFS) –HDFS Architecture – Why MapReduce – MapReduce Applications – Real time – Hadoop Ecosystem – Limitations of Hadoop 1.X Architecture – Hadoop YARN: Beyond MapReduce – YARN Infrastructure – Application Startup in YARN – MapReduce, YARN – A Comparative View.	15
Unit II	**HADOOP ECOSYTEM:** Components of Hadoop Ecosystem – Hadoop Installation – PIG Installation – HIVE Installation. **SPARK and SCALA:** Why SPARK? Spark Ecosystem – Apache Spark Use Cases – SCALA Programming – SCALA REPL – SCALA vs Java.	15
Unit III	**NoSQL Database – HBASE –** Why NoSQL – Types of NoSQL Database – Advantages of NoSQL –HBASE – HBASE Architecture – HBASE vs RDBMS. **PIG:** Why PIG? PIG user Interactive Modes – PIG Latin – Dataset – PIG Commands and Functions – Relational Operators – Evaluation Functions – Batch Mode – Embedded Mode – PIG vs SQL.	16

Unit IV	**HIVE:** Why HIVE - HIVE Architecture – Data Units in Hive – Hive Query Languages – HIVE Startup – Database Operations – Tables – Joins – A Comparative View. **Data Analytics Big Data Tools:** R- Programming – Why R + Hadoop – Rhadoop Architecture – R Big Data Intergration Packages – SAS – SAS program Components – SAS Support for -Hadoop – SAS Functions – KNIME – KNIME Components – KNIME Big Data Analytics.	16
Unit V	**Big Data Solutions in the Real World:** The Importance of Big Data to Business – Big Data as a Business Planning Tool – Adding New Dimensions to the Planning Cycle – Keeping Data Analytics in Perspective – Getting Started with Right Foundation – Planning for Big Data – Transforming Business Processes with Big Data. **Ten Big Data Best Practices – Ten Big Data Do's and Don'ts.**	16
	Total Contact Hrs	**78**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	**1.** Judith Hurwitz, Alan Nurgent, Dr. Fern Halper, Marcia Kaufman, 2013, " Big Data for Dummies", First Edition, A Wiley Publication	
REFERENCES	1. V. Bhuvaneswari, T. Devi, 2016, "Big Data Analytics-A Practitioner Approach" 2.Michael Minelli, Michele Chambers, Ambiga Dhiraj, 2013, "Big Data, Big Analytics – Emerging Business Intelligence and Analytic Trends For Todays Businesses", First Edition, A Wiley Publication 3. Strata Conference, Making Data Work, 2013, "Big Data Now", First Edition, Shroff Publication	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	S	H
CO2	H	S	S	H	S
CO3	S	H	M	M	H
CO4	H	M	S	S	S
CO5	H	M	S	S	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr. R.Manicka Chezian M.Dhavapriya	Name:Dr.Antony Selvadoss Thanamani Signature:	Name:Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS6E9	**Title :**	**Batch :**	2018-2021
		Core Elective III : Android Programming	**Semester:**	VI
Hrs/Week:	6		**Credits:**	05

Course Objective

On successful completion of the course, the students should have a good understanding on the Mobile Environment and acquired mobile application development skills with Android.

Course Outcomes (CO)

K1	CO1	To remember the operation of the application, application lifecycle, configuration files, intents, and activities and layouts
K2	CO2	To get an idea of the UI - components, event handling, and screen orientation, various controls, fragments and examples.
K3	CO3	To deploy a basic application that acts as a working example with various concepts
K4	CO4	To analyze the functions of various sensors.
K5	CO5	To validate the applications for its security and permissions.

Syllabus

Units	**Contents**	**Hrs**
Unit I	**Android:** Introduction – Android's Fundamental Components – Exploring the Structure of an Android Application – Examining the Application Life Cycle. **Introduction to Android Application Architecture:** Exploring a simple Android Application – Defining UI through Layout Files – Specifying Comments in Layout Files – Adding Views and View groups in Layout Files – Specifying Control Properties in Layout Files – Indicating ViewGroup Properties – Controlling Width and Height of a Control – Introducing Resources	16
Unit II	**User Interface Development and Controls:** UI Development in Android – Building a UI Completely in Code - Building a UI Completely in XML - *Building a UI in XML with Code*. Android's Common Controls: Text Controls – Button Controls – The ImageView Control – Date and Time Controls – The MapView Control. **Adapters and List Controls:** Simple CursorAdapter – ArrayAdapter	16
Unit III	**The Basic List Control:**ListView – The GridView Control – The Spinner Control – The Gallery Control – Styles and Themes – Layout Managers – Menus and Action Bars. **Fragments:**What is a Fragment? When to use Fragments_The Structure of Fragment-Sample Program of Fragment .Broadcast Receivers-Coding a Simple Receiver- Multiple Receivers.	16

Unit IV	**Touch Screens and Sensors:** Understanding Motion Events – The Motion Event Object – Recycling Motion Events – Using Velocity Tracker – Multi-touch – Gestures. **Sensors:** Introduction – Detecting Sensors – Getting Sensor Events – Interpreting Sensor Data.	15
Unit V	**Application Security and Deployment:** Security and Permissions – Understanding the Android Security Model – Performing Runtime Security Checks – Deploying the Application: Becoming a Publisher – Preparing the Application for Sale – Uploading the Application.	15
	Total Contact Hrs	**78**
	**Italicized* texts are for self study	
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1. Dave MacLean, Satya Komatineni, Grant Allen, 2015, "Pro Android 5", Apress Publications. 2. Wei-Meng-Lee, 2012, "Beginning Android Tablet Application Development", Wiley Publications.	
REFERENCES	1. Barry Burd, 2016, "Android Application Development – All-in-one for Dummies", 2nd Edition, Wiley India. 2. Lauren Darcey, Shane Conder, 2013, "Sams Teach Yourself Android Application Development in 24 hours", 2nd edition, Pearson Education. 3. Paul Deitel, Harvey Deitel, Alexander Wald, 2016, "Android 6 for Programmers – An App-driven Approach", 3rd edition, Pearson education. 4. Jerome (J. F) DiMarzio, 2015, "Android – A Programmer's Guide", McGraw Hill Education, 8th reprint.	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	H
CO2	M	M	S	S	S
CO3	S	H	S	H	M
CO4	H	M	H	S	H
CO5	H	S	M	H	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr. Aruchamy Rajini N.Arul kumar	Name:Dr.Antony Selvadoss Thanamani Signature:	Name:Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS623	**Title :**	**Batch :**	2018-2021
		Core Lab IX:	**Semester:**	VI
Hrs/Week:	5	Python Programming Lab	**Credits:**	03

Course Objective

On successful completion of the course the students should write well-documented programs in the Python language, including use of the logical constructs of that language.

Course Outcomes (CO)

K3	CO1	To implement, Interpret, Contrast of various operators.
K4	CO2	To review and analyze database with variables, loop, branch, subroutine, and input/output
K5	CO3	To validate how databases are integrated with components ,modular programming and the design of user interfaces

Syllabus

Units	**Contents**	**Hrs**
	SET A • Write a program to find the largest of n numbers. • Write a program that asks the user to enter a series of positive numbers (The user should enter a negative number to signal the end of the series)and the program should display the numbers in order and their sum. • Write a program to find the product of two matrices [A]mxp and [B]pxr • Write recursive and non-recursive functions for the following: o To find GCD of two integers. o To find the factorial of positive integer o To print Fibonacci Sequence up to given number n • Write a program to display two random numbers that are to be added, such as: 247 + 129, the program should allow the student to enter the answer. If the answer is correct, a message of congratulations should be displayed. If the answer is incorrect, a message showing the correct answer should be displayed. • Write recursive and non-recursive functions to display prime number from 2 to n.	**65**

- Write a program that writes a series of random numbers to a file from 1 to n and display.
- Write a program to create file, write the content and display the contents of the file with each line preceded with a line number (start with 1) followed by a colon.
- In a program, write a function that accepts two arguments: a list and a number n. The function displays all of the numbers in the list that are greater than the number n.

. **SET B**

- Write a program for linear search and binary search.
- Write a program with a function that accepts a string as an argument and returns the no. of vowels that the string contains. Another function to return number of consonants.
- Write a program that opens a specified text file and then displays a list of all the unique words found in the file. (Store each word as an element of a set.)
- Write a program to analyze the contents of two text files using set operations.
- Write a program to implement the inheritance and dynamic polymorphism.
- Write a GUI program that converts Celsius temperatures to Fahrenheit temperatures.
- Write a GUI program that displays your details when a button is clicked.
- Write a program to delete or remove elements from a list
- Write a program to slice lists in Python
- Write a Program to Illustrate Different Set Operations
- Write a Program to Display Calendar

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INTERNAL MARK (40 Marks)

Observation Record Note	**10 Marks**
Practical Skills	**10 Marks**
Model Exam	**20 Marks**

EXTERNAL MARK (60 Marks)

Record Note	**10 Marks**
Set A	**20 Marks**
Set B	**30 Marks**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	M	H	S
CO2	H	M	M	S	H
CO3	M	S	H	M	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr. R.Manicka Chezian Dr.R.Deepa	Name:Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS624	**Title :**	**Batch :**	2018-2021
		Core Lab X: Advanced Applications in MS Excel Lab	**Semester:**	VI
Hrs/Week:	4		**Credits:**	02

Course Objective

This course was designed for the intermediate student who has already mastered the basic skills of MS Excel and wants to gain more advanced skills to put to work in a business environment or for personal use.

Course Outcomes (CO)

K3	CO1	To implement, Interpret data using MS Excel.
K4	CO2	To review and analyze the mathematical functions, data analytics using MS Excel
K5	CO3	To validate the macros and manipulation for objects and data using MS Excel

Syllabus

Units	Contents	Hrs
	SET A • Create an excel worksheet for entering data and apply the auto function in Excel. • Create an excel worksheet to calculate Electricity Bill • Create an excel worksheet to calculate salary with basic pay, net pay, Gross Pay with deductions. • Create an excel Worksheet to apply Statistical functions. • Create an excel Worksheet to calculate Student Mark sheet. **SET B** • Create a macro and assign to an object or graphic or control. • Create a macro by using Microsoft Visual Basic and run it. • Create a macro and do edit, copy, delete operations. • Create an excel worksheet to enter the given data and use filter options to get the required result. • Create an excel worksheet to enter the given data and use sorting functions to get the required results	**52**

INTERNAL MARK (20 Marks)

Observation Record Note	**5 Marks**
Practical Skills	**5 Marks**
Model Exam	**10 Marks**

EXTERNAL MARK (30 Marks)

Record Note	**5 Marks**
Set A	**10 Marks**
Set B	**15 Marks**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	H
CO2	S	H	M	S	S
CO3	H	M	H	S	S

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi Dr.R.Deepa	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS6S4	**Title :**	**Batch :**	2018-2021
		Skill Based Elective -II: Joomla	**Semester:**	VI
Hrs/Week:	1		**Credits:**	02

Course Objective

This course was designed for the purpose of introducing to the students in the field of programming using Joomla. The students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in Joomla.

Course Outcomes (CO)

K3	CO1	To apply the basic concepts to solve real world problems using Joomla
K4	CO2	To analyze design issues in developing various applications
K5	CO3	To validate Web based applications

Syllabus

Units	**Contents**	**Hrs**
	SET A • To create the Corporate Web sites or portals • To create a web site for online newspaper • To create a web site for Online magazines • To create a Web site for online bus ticket reservation • To create a Government application **SET B** • To create a Small business Web site • To create a organizational Web site • To create a web site for Community-based portal • To create a School Web site • To create a Web site for family homepage **EXTERNAL MARK (50 Marks)** **Record Note — 10 Marks** **Set A — 20 Marks** **Set B — 20 Marks**	**13**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	H
CO2	S	H	M	S	S
CO3	H	M	H	S	S

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.Aruchamy Rajini S. Sharmila	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS6S5	**Title :**	**Batch :**	2018-2021
		Skill Based Elective -II:	**Semester:**	VI
Hrs/Week:	1	Macromedia Director	**Credits:**	02

Course Objective

The objective of this course is to make the students to implement several features of Macromedia Director by using various specialized tools.

Course Outcomes (CO)

K3	CO1	To apply the basic tools of macromedia director.
K4	CO2	To analyze specialized tools like shadow emboss,mask function and implement it in any animated picture.
K5	CO3	To validate website designing using the scripts.

Syllabus

Units	**Contents**	**Hrs**
	SET A • To position the picture preferably on a plain background of a colour of your choice - positioning • includes rotation and scaling. • To remove the arrows and text from the given photographic image • To type a word and apply the effects shadow emboss • To create an animated cursor using startdrag("ss",true); mouse. Hide(); • To design a visiting card containing atleast one graphic and text information **SET B** • To use appropriate tool(s) from the toolbox, cut the objects from 3 files (f1.jpg, f2.jpg & f3.jpg) • organize them in a single file and apply feather effects • To display the background given (filename: garden.jpg) through your name using mask • To make anyone of one of the parrots black & white in a given picture. • To change a circle into a square using director • Design an interactive director content box using actions scripts for a website. • Design a picture and animations using director. **EXTERNAL MARK (50 Marks)** **Record Note — 10 Marks** **Set A — 20 Marks** **Set B — 20 Marks**	**13**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	S	H	H
CO2	M	H	M	M	S
CO3	H	M	H	S	M

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
M.Malathi S.S.Shanthi	Name: Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS6S6	**Title :**	**Batch :**	2018-2021
		Skill Based Elective -II: Soft Skills	**Semester:**	VI
Hrs/Week:	1		**Credits:**	02

Course Objective

The objective of the course is to develop a wide variety of soft skills starting from communication, to working in different environments, learning creative and critical decision making, developing awareness of how to work with people and to resolve stress.

Course Outcomes (CO)

K1	CO1	To remember the basics of communication skills
K2	CO2	To understand the relationship between leadership networking and team work
K3	CO3	To apply the skills required for a good leadership
K4	CO4	To analyze the causes of stress and its impact
K5	CO5	To build the interpersonal skills for being an effective goal oriented team player.

Syllabus

Units	**Contents**	**Hrs**
Unit I	**Self Analysis:** SWOT Analysis- Who am I- Attributes- Importance of Self Confidence- Self Esteem. **Creativity:** Out of box thinking- Lateral Thinking. **Attitude:** Factors influencing Attitude- Challenges and lessons from Attitude- Etiquette.	2
Unit II	**Motivation:** Factors of motivation- Self talk- Intrinsic & Extrinsic Motivators. **Goal Setting:** Wish List- SMART Goals- Blue print for success- Short Term- Long Term- Life Time Goals.	2
Unit III	**Gratitude:** Understanding the relationship between Leadership Networking & Team work- Assessing Interpersonal Skills Situation-Description of Interpersonal Skills. **Team Work:** Necessity of Team Work Personally, Socially and Educationally.	3
Unit IV	**Leadership:** Skills for a good Leader- Assessment of Leadership Skills. **Decision Making:** Importance and necessity of Decision Making- Process and practical way of Decision Making- Weighing Positives & Negatives.	3
Unit V	**Stress Management:** Causes of Stress and its impact- how to manage & distress- Circle of control- Stress Busters. **Emotional Intelligence:** What is Emotional Intelligence- emotional quotient -why Emotional Intelligence matters- Emotion Scales- Managing Emotions.	3
	Total Contact Hrs	
	**Italicized* texts are for self study	**13**
	Power point Presentations, Seminar, Quiz and Assignment	
TEXT BOOKS	1. "Soft Skills", 2015, Career Development Centre, Green Pearl Publications.	
REFERENCES	1.Daniel Coleman, "Emotional Intelligence", Bantam Book, 2006	

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	S	H
CO2	H	S	H	M	M
CO3	M	H	H	S	H
CO4	H	M	H	M	S
CO5	S	H	M	H	M

S- Strong; H-High; M-Medium; L-Low

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**
Name and Signature	**Name with Signature**	**CDC**	**COE**
Dr.Antony Selvadoss Thanamani R.Nandhakumar	Name:Dr.Antony Selvadoss Thanamani Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature:

Programme code:	B.Sc	**Programme Title :**	Bachelor of Science (Computer Science)	
Course Code:	18UCS625	**Title :**	**Batch :**	2018-2021
		Project	**Semester:**	VI
Hrs/Week:	4		**Credits:**	03

Course Objective

To provide experience to the students in analyzing, designing, implementation and evaluation of software.

	Instructional Notes: Students are required to develop entire new software system or to enhance/modify functionalities of existing software or to provide customization based on existing technology/framework to fulfill specific requirements. **MAXIMUM MARKS : 100** PROJECT EVALUATION : 80 VIVA-VOCE : 20