

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS), COIMBATORE – 641 020.**

B.Sc Information Technology (IT)

(Under Choice Based Credit System (CBCS) 2018 – 2019 onwards)

Programme Objectives

1. Developing graduates to identify understand the problem and use appropriate problem solving techniques.
2. Graduates of the programme will continue to develop and update their knowledge and skills throughout their career.
3. Graduates of this programme will establish as effective professional by acquiring technological concepts and skills to meet the industry needs and can pursue higher education.
4. Developing graduates with good communication skills to promote ideas, goals and personality skills to work in a team and undertake leadership roles when appropriate.
5. Make positive contributions to the community by applying skills, abilities and ethics culture learned.

Programme Outcomes

1. An ability to apply the concepts of computer and mathematics to solve the problems.
2. An ability to model a computer-based system to meet the desired needs.
3. An ability to function effectively on teams to accomplish a common goal.
4. An understanding of professional, ethical, legal, security and social issues and responsibilities.
5. An ability to communicate effectively and able to become entrepreneur, work in group or individual in corporates.

SEMESTER – I

S.NO	COURSE CODE	PART	COURSE TITLE	HRS/WK	CREDITS	EXAM HRS	MAX MARKS		
							INT	EXT	TOT
1	18UGC1TA1	I	Tamil – I	6	3	3	25	75	100
2	18UGC1EN1	II	English – I	6	3	3	25	75	100
3	18UIT1C01	III	Core: Programming in C	5	4	3	25	75	100
4	18UIT1AL1	III	Allied : Mathematics – I	6	5	3	25	75	100
5	18UIT1CP1	III	Core Practical : Programming in C	5	3	3	40	60	100
6	18UGC1ENS	IV	Environmental Studies	2	2	2	-	75	75
TOTAL				30	20		140	435	575

SEMESTER – II

S.N O	COURSE CODE	PART	COURSE TITLE	HR S/W K	CREDI TS	EXAM S HRS	MAX MARKS		
							INT	EX T	TO T
1	18UGC2TA2	I	Tamil – II	6	3	3	25	75	100
2	18UGC2EN2	II	English – II	6	3	3	25	75	100
3	18UIT2C02	III	Core : Object Oriented Programming with C++	5	4	3	25	75	100
4	18UIT2AL2	III	Allied : Mathematics – II	6	5	3	25	75	100
5	18UIT2CP2	III	Core Practical : Object Oriented Programming with C++	5	3	3	40	60	100
6	18UGC2VAE	IV	Value Education	2	2	2	-	75	75
TOTAL				30	20		140	435	575

SEMESTER – III

S.NO	COURSE CODE	PART	COURSE TITLE	HRS/ WK	CREDITS	EXAMS HRS	MAX MARKS		
							INT	EXT	TOT
1	18UIT3C03	III	Core : Java Programming	5	4	3	25	75	100
2	18UIT3C04	III	Core : Data and File Structures	5	4	3	25	75	100
3	18UIT3C05	III	Core : Digital Computer Fundamentals	4	4	3	25	75	100
4	18UIT3AL3	III	Allied : Operations Research	6	5	3	25	75	100
5	18UIT3CP3	III	Core Practical : Java Programming	4	3	3	40	60	100
6	18UIT3CP4	III	Core Practical : Data Structure using C++	4	3	3	40	60	100
7	18UIT3NM1	IV	Non Major Elective : Grammar and Communication/ Basic Tamil-I	2	2	2	-	50	50
TOTAL				30	25		180	470	650

SEMESTER – IV

S.N O	COURSE CODE	PART	COURSE TITLE	HRS/ WK	CREDITS	EXAMS HRS	MAX MARKS		
							INT	EXT	TOT
1	18UIT4C06	III	Core : Web Programming	5	5	3	25	75	100
2	18UIT4C07	III	Core : Advanced Networking	5	5	3	25	75	100
3	18UIT4C08	III	Core : Data mining and warehousing	5	5	3	25	75	100
4	18UIT4AL4	III	Allied : Financial Accounting	5	5	3	25	75	100
5	18UIT4CP5	III	Core Practical : Web Programming	4	3	3	40	60	100
6	18UIT4CP6	III	Core Practical : Web Technology – I (HTML and XML)	4	3	3	40	60	100
7	18UIT4NM2	IV	Non Major Elective : (GIMP & Pencil2D Animation) / Basic Tamil-II	2	2	2	-	50	50
8	18UGC4NSS/ SPO	V	Extension Activities - NSS/SPORTS	-	1	2	25	25	50
TOTAL				30	29		205	495	700

SEMESTER – V

S.NO	COURSE CODE	PART	COURSE TITLE	HRS/ WK	CREDITS	EXAMS HRS	MAX MARKS		
							INT	EXT	TOT
1	18UIT5C09	III	Core : Python Programming	5	5	3	25	75	100
2	18UIT5C10	III	Core : Operating System	5	4	3	25	75	100
3	18UIT5C11	III	Core : Web Technology – II (PHP, Ajax and Joomla)	4	4	3	25	75	100
4	18UIT5EL1	III	Elective : Group I	4	4	3	25	75	100
5	18UIT5CP7	III	Core Practical : Python Programming Lab	4	3	3	40	60	100
6	18UIT5CP8	III	Core Practical : Web Technology – II (PHP, Ajax and Joomla)	4	3	3	40	60	100
7	18UIT6CPR	III	Core : Project Work and Viva- Voce	4	-	-	-	-	-
TOTAL				30	23		180	420	600

SEMESTER – VI

S.NO	COURSE CODE	PART	COURSE TITLE	HRS/ WK	CREDITS	EXAMS HRS	MAX MARKS		
							INT	EXT	TOT
1	18UIT6C12	III	Core : Mobile Application Development	6	5	3	25	75	100
2	18UIT6C13	III	Core : Software Engineering	6	5	3	25	75	100
3	18UIT6EL2	III	Elective : Group II	6	5	3	25	75	100
4	18UIT6CP9	III	Core Practical : Mobile Application Development and Multimedia	6	3	3	40	60	100
5	18UIT6CPR	III	Core : Project Work and Viva-Voce	6	5	-	40	60	100
TOTAL				30	23		155	345	500

Elective Courses List

Group I	Group II
Elective : Artificial Intelligence and Expert System	Elective : Design and Analysis of Algorithms
Elective : Cloud Computing	Elective : Embedded Systems
Elective : Client/Server Technology	Elective : Compiler Design
Elective : Fundamentals of Cyber Security	Elective : Multimedia
Elective : Geographical Information System	Elective : Computer Graphics

Part	Course Types	Number of Courses	Credits	Marks
I	Tamil	2	6	200
II	English	2	6	200
III	Core	23	90	2300
	Allied	4	20	400
	Elective	2	9	200
IV	Non Major Elective	2	4	100
	Environmental studies	1	2	75
	Value education	1	2	75
V	NSS/NCC/Sports	1	1	50
	TOTAL	38	140	3600

Programme Objectives

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Programme Outcomes

1. An ability to apply the concepts of computer and mathematics to solve the problems.
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4. An understanding of professional, ethical, legal, security and social issues and responsibilities.
5. An ability to communicate effectively and able to become entrepreneur, work in group or individual incorporates.

Programme: B.Sc IT

Course Title: Core : Programming in C

Course Code: 18UIT1C01

Year: I

Semester: II

5 Hours / week

4 Credits

COURSE OBJECTIVES

- To make aware of the basic concepts of C.
- Developing the programs by making use of the concepts of C.
- To understand the benefits and applications of C.
- To apply the features of the general programming.

Course outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the concepts of C programming.
CO2	Analyze and Identify the logic behind the execution of programs.
CO3	Execute and solve the bugs in the program
CO4	Develop an application using memory management functions.
CO5	Apply the concepts to solve a real-time problems

Unit I (15 Hrs)

Overview of C – Introduction – Character set – C Tokens Keywords & identifiers – Constant – Variables – Datatypes – Declaration of Variables – Assigning values to variables – Defining Symbolic Constants - Arithmetic, Relational Logical, Assignment, Conditional Bitwise, Special, Increment and Decrement operators – Arithmetic Expressions – Evaluation of expression – Procedure of arithmetic operators – Type conversion in expression – operator precedence & associativity – mathematical functions – Reading & writing a character – formatted input and output. Page No: 1-20, 22-36, 38-44,51-103

Unit II (15 Hrs)

Decision making and Branching – Decision making with IF Statement – simple IF Statement – The IF ELSE statement – Nesting of IF-ELSE statement – Decision Making and Looping – The WHILE statement. The Dimensional – Multidimensional arrays – Character string Handling – Declaring and initializing string variables – Reading strings from technical – writing strings to screen Arithmetic operation on character – putting strings together – comparison of two strings – string handling functions – table of Strings. PageNo:110-122,145-168,180-183,197-198, 218-239.

Unit III (15 Hrs)

User defined functions – need for user Defined functions – A multi-function program – The form of c functions – Return values and their types – Calling a function – Category of functions – No Arguments and no Return values – Arguments but no return values – Arguments with return values – Handling of non-integer functions nesting of functions – Recursion – functions with arrays – The scope and life time of variables of Variables in functions – ANSI C function. PageNo: 247-288

Unit IV(15 Hrs)

Structure definition – Giving values to members – Structures initialization – Comparison of Structure variables - Arrays of Structures – Arrays with in Structures - Structures within structures – Structures and functions – unions – Size of structures - Bit fields.

Pointers – Understanding pointers – Accessing the Address of a Variable – Declaring and initializing pointers – Accessing a variable through its pointers –pointers expressions pointer increments and scale factor – pointers and arrays – pointers and character strings – pointers and functions – pointers and structures. Page No: 301-324, 333-362.

Unit V(15 Hrs)

File management in C – Defining and opening a file – closing file - I/O operations on files – Error handling during I/O operations – Random Access to files – Command line arguments – The Preprocessor. Page No: 370-389

TEXT BOOKS:

1. E. Balagurusamy, 'Programming in ANSI C', Tata McGraw Hill Edition 4

REFERENCE BOOKS:

1. Yashavant Kanetkar, 'Let us C', Tata McGraw Hill Edition 2
2. Mulleshcooper , 'Sprit of C', Tata McGraw Hill Edition 1
3. Ashok N. Kamadhenu, Programming in C.

Programme: B.Sc IT

Course Title: Core Practical : Programming in C

Course Code: 18UIT1CP1

Year: I

Semester: I

5 Hours / week

3 Credits

COURSE OBJECTIVES

- To develop simple programs using C for solving mathematical problems.
- To develop programs using concepts of C.
- To develop programs using C to solve real-time problems.

Course outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the fundamental programming concepts
CO2	To make use of mathematical functions while developing a program
CO3	Identify the suitable problem solving technique to develop a program
CO4	Apply the concepts to real world problems

LIST OF PRACTICALS

1. Write a program for quadratic equation to find different types of roots.
2. Write program to find prime numbers below 1000.
3. Write program to find maximum and minimum no with the set of numbers.
4. Write a program for two-dimensional matrix addition.
5. Write program to find a factorial value of given numbers.
6. Write program to find Fibonacci series for n numbers.
7. Write program to find day for given date.
8. Write program to convert integer into words form range 1 to 100.
9. Write program to find Armstrong no for 1 to 1000.
10. Conversion of decimal to binary.
11. Conversion of binary to decimal.
12. Find ncr value using function.
13. To calculate biggest among n numbers using function.
14. String manipulations (user defined functions for strcmp, strcat, strlen, strcpy).
15. To check given string is palindrome or not, without using string reverse function.
16. To sort a given set of numbers in ascending order.
17. To sort given set of strings using pointers.
18. To merge the files given.
19. To read one file & write it into another using command line arguments.
20. To print student's result information(reg. no., name, percentage) using structures.

Programme: B.Sc IT

Course Title: Core Object Oriented Programming with C++

CourseCode:18UIT2C02

Year: I

Semester: II

5 Hours / week

4 Credits

COURSE OBJECTIVES

- To make aware of **the basic concepts of OOPS**.
- To understand the benefits and applications of OOPS.
- To develop the programs using the concepts of OOPS.
- **To apply the features of generic programming**.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Ability to understand the data types and control structures.
CO2	Understanding and implementing the concepts.
CO3	Ability to demonstrate the use of pointers in virtual functions to implement polymorphism.
CO4	Ability to understand and implement the features of C++ including templates, exceptions and file handling.
CO5	Apply the concepts to solve a real-time problem

UNIT I(15 Hrs)

Principles of object oriented programming: Basic concepts – Benefits – Applications of C++ - Structure of C++ program – Basic datatypes – User Defined Data Types: derived datatypes – Declarations of variables – Operators in C++ - Manipulators – Typecast operator – conversions – Operator overloading – Control Structures. Pages:(7-69)

UNIT II(15 Hrs)

Functions: Function prototyping – call by reference – return by reference – in line functions – default arguments – Function overloading. **Classes and objects**: Specifying a class – Defining member functions – Arrays with in a class – memory allocation for objects – Arrays of object – objects as function arguments – Constructors – Parameterized constructor – Copy constructor – Dynamic constructor– Destructors. Pages:(79-164)

UNIT III(15 Hrs)

Operator overloading & type conversion: Defining operator overloading – Overloading unary operators – Overloading Binary operators – Type conversions. **Inheritance**: Defining derived class – Single inheritance – Multilevel inheritance – Multiple inheritance – Hierarchical inheritance – Hybrid inheritance– Constructors in derived class. Pages:(177-241)

UNIT IV(15Hrs)

Pointers, **Virtual functions and Polymorphism**: Pointers to Objects – this Pointer – Virtual Functions – Pure virtual functions. Files: Opening and Closing a file – Detecting End-of-File – File pointers and their manipulations- Command-Line Arguments. Pages:(253-353)

UNIT V(15Hrs)

Templates: Class templates – Function templates – Overloading of template function – Member function templates. **Exception Handling**: Basics – Exception handling mechanism – Throwing mechanism – Catching mechanism – Specifying exceptions. Pages:(360-394)

TEXT BOOK

1. E. Balagurusamy, Object Oriented Programming with C++,Tata McGraw Hill publishing company limited.

REFERENCE BOOK

1. Robert Lafore, Object Oriented Programming in Turbo C++, Galgotia Publications Pvt Ltd
2. Ashok N. Kamadhenu, Object Oriented Programming in C++.

Programme: B.Sc IT

Course Title: Core Practical : Object Oriented Programming with C++

Course Code: 18UIT2CP2

Year: I

Semester: II

5 Hours / week

3 Credits

COURSE OBJECTIVES

- To develop simple programs using C++ for solving mathematical problems.
- To develop C++ programs by using OOPS concepts.
- To develop C++ programs for generic programming
- To develop C++ programs to solve real world problems.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Develop programs to solve mathematical problems.
CO2	Develop programs using OOP concepts.
CO3	Develop programs using file handling techniques
CO4	Develop programs to solve real-time problems.

LIST OF PRACTICALS

1. Write a C++ program to read an integer and reverse it. Having reversed it check whether it is prime or not.
2. Write a C++ program to find the Largest and smallest value in 'n' numbers.
3. Write a C++ program to count the number of characters, words and lines in a given sentence without using string functions.
4. Write a C++ program to sort the given set of strings.
5. Construct class for primitive data structure Stack operation.
6. Construct class for primitive data structure Queue operation.
7. Write a C++ program for binary search.
8. Write a C++ program to implement Constructors and Destructors in factorial of 'n' numbers.
9. Write a C++ program to implement Copy Constructor.
10. Write a C++ program to implement unary operator overloading.
11. Write a C++ program to implement Binary Operator (+) Overloading for the addition of Complex numbers.

12. Write a C++ program to implement Single inheritance for Employee details.
13. Write a C++ program to implement Multiple Inheritance for Student details.
14. Write a C++ program to implement Friend function for Employee details.
15. Write a C++ program to implement pure virtual function for Student details.
16. Write a C++ program on accessing the Data Members using “this” pointer.
17. Write a C++ program to create a binary file “mark.dat” and store student name, roll no and marks in three subjects using structure.
18. Write a C++ program to create the data file “empinfo.dat”
19. Write a C++ program to find maximum of two data using template function.
20. Write a C++ program to create two different types of objects using class template.

Programme: B.Sc IT

Course Title: Core : Java Programming

Course Code: 18UIT3C03

Year: II

Semester: III

5 Hours / week

4 Credits

COURSEOBJECTIVES:

- To make aware of the basic concept of core java.
- To understand the concept of Multithread Program and String Handling.
- To understand the concept of File handling and Network Programming.
- To enhance the knowledge to server-side programming
- To provide knowledge on advanced features like Swing, Java Beans, Sockets.

COURSEOUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the concepts of Core Java.
CO2	Identify the logic behind process handling by using threads
CO3	Identify the logic behind Network Programming.
CO4	Develop an application for Server side Programming.
CO5	Apply the concept to solve real-time problems.

Unit I

Introduction to java-Introduction to Classes-Inheritance Concepts-Packages and Interfaces: Packages–Access protection Importing packages–interfaces. Exception Handling: Fundamentals–Exception types–Using Try and Catch – nested Try–statements throw, throws, finally. (PageNo:129-246)

Unit II

Multithreaded programming: Thread model–Creating a thread, creating multiple threads–Using Alive0 and join0–synchronization–Interthreaded communication. String Handling: String constructors–string operations–character extraction–string comparison–searching–modification–stringbuffer. (PageNo:273-297,347-376)

Unit III

I/O: File–Stream classes–Byte streams–character streams–serialization–Networking: Basics–TCP/IP client sockets–Net Address–URL–Datagram’s.(PageNo:588-620)

Unit IV

Applet: Basics–Architecture–Passing parameters to Applets–Skeleton–Simple Applet –**Event handling** Event model–Event class–Event listener interface.(PageNo:628-644)

Unit V

Java Beans:-Advantages–Application building tools–Using Bean Developer kit(BDK)- JAR files–Developing simple Bean using the BDK.(PageNo:886-898)

RMI:–A simple client/server applications using RMI–Sockets.(PageNo:587-629)

TextBook:

1. Herbert Schildt, The Complete Reference-java2, TATA McGraw Hill, 2002, FifthEdition

Reference Books:

1. Patrick Naughton, The JAVA Hand Book, TATA McGraw Hill, 1997
2. Harley Haim, The internet computer reference, TATA McGraw Hill, 1998, Second Edition.

Programme: B.Sc IT

Course Title: Core : Data and File Structures

Course Code: 18UIT3C04

Year: II

Semester: III

5 Hours / week

4 Credits

COURSE OBJECTIVES

- To understand the line a rand non-linear data structures available in solving problems
- To know about the sorting and searching techniques and its efficiencies
- To get a clear idea about the various algorithm design techniques
- Using the data structures and algorithms in real time applications
- Able to analyze the efficiency of algorithm

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Analyse algorithms and algorithm correctness
CO2	Apply stack, queue and linked list in real world problem
CO3	Have knowledge of tree and graphs concepts
CO4	Apply various searching and sorting techniques
CO5	Acquire knowledge about Indexing and Hashing Techniques

Unit-I

Algorithm specification (25-32) – Performance Analysis (38-61). Arrays: Array as an ADT – Polynomial ADT – Polynomial Representation – Polynomial Addition – Sparse Matrices – Representation of Arrays (84-112). Stacks and Queues: Stacks ADT – Queues ADT.(134-147)

Unit-II

Linked lists: Singly Linked Lists and Chains – Representing Chains in C++ (170-183) – Circular Lists – Available Space List – Linked Stacks and Queues – Polynomials – Equivalence Classes (194-215) – Doubly Linked List – Generalized Lists(224-240).

Unit-III

Trees: Introduction – Binary Trees – Binary Tree Traversal and Tree Iterators (243-269) – Threaded Binary Trees (274-277). Graphs: Graphs ADT – Elementary Graph Operation: Depth First Search – Breath First Search – Connected components – Spanning Trees – Bi-connected Components – Minimum Cost Spanning Tree – Shortest Path and Transitive Closure (324-372).

Unit-IV

Internal Sorting: Insertion Sort – Quick Sort (399-405) – Merge Sort – Heap Sort (407-416).

External Sorting: Introduction – k way Merging Buffer Handling for Parallel Operation – Run Generation – Optimal Merging of Runs (438-457).

Unit-V

Hashing: Introduction – Static Hashing: Hash Table – Hash Function (458-463) – Dynamic Hashing (477-482) – Efficient Binary Search Trees: Optimal Binary Search Tree – AVL Trees (553-577). Multiway Search Tree (606-635).

TEXTBOOKS:

1. Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures, Computer Science Press, 2002 (AllUnits).

REFERENCEBOOKS:

1. Tanenbaum A. M. and Augestine M. J., Data Structures Using Pascal, Prenticehall, 2nd edition, 1996.
2. Yashwant Kanetkar, Data Structures through C, BPB publication, 2003.
3. Sartaj Sahni, Data Structures, Algorithms & Applications in C++. McGraw-Hill, 1998.
4. Samuktha, Data and File Structures, Addison Wesley, 1999.

Programme: B.Sc IT

Course Title: Core: Digital Computer Fundamentals

Course Code: 18UIT3C05

Year: II

Semester: III

4 Hours / week

4 Credits

COURSE OBJECTIVE:

- To study the number system and Codes
- To learn combinational and sequential circuits
- To know the data processing circuits
- To learn the fundamentals of computer and peripherals

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Able to describe various number system and codes
CO2	Apply Boolean laws and rules to simplify expressions
CO3	Experiment combinational and sequential circuits
CO4	Identify and illustrate basic organization of computer
CO5	Illustrate the memory concepts, I/O devices and peripherals

Unit-I (12 Hrs)

Number Systems and Codes: Binary number systems – Binary to decimal conversion – Decimal to Binary conversion – Octal Numbers – Hex decimal Numbers – ASCII Codes – Excess-3 Code – Gray Code. (176-199)

Unit-II (12 Hrs)

Combinational Logic Circuits: Boolean Laws and Theorems – Sum of Product method – Truth table to Karnaugh Map - Pairs, Quads and Octets – Karnaugh simplifications Don't-care Conditions – Product of sums methods – Product of sums simplifications (77-106). Arithmetic Building Blocks: 2's complement representation - 2's complement arithmetic– Arithmetic building blocks – Adder – Subtract or – FullAdder (218-235).

Unit-III (12 Hrs)

Data Processing Circuits: Multiplexer – De-multiplexer – Decoder – Encoder – (123-133, 135-136, 144-145) Flip Flops: RS, Edge triggered RS Flip Flop, Edge triggered D, JK, JK Master Slave Flip Flop – Registers – Asynchronous Counters – Synchronous Counters (274-278, 282-292, 310-325, 340-341, 348-353).

Unit-IV (12 Hrs)

Programming the Basic Computer: Introduction – Machine language – Assembly languages: rules of the languages – translation to binary (173–183).

Central processing Unit: Introduction – General Register Organizations – Control word – Examples of Micro operations – Stack organization – Instruction Formats – Addressing modes – Data Transfer and Manipulation – Program Control. (241-282).

Unit–V (12 Hrs)

Input-Output Organization: Peripheral devices - Input-Output Interface – Asynchronous data transfer – Modes of Transfer – Priority Interrupt – Direct Memory Access (DMA) – Input-Output Processor (IOP). (381-429).

Memory Organization: Memory Hierarchy – Main memory – Auxiliary memory – Associative memory – Cache memory – Virtual memory. (381-476).

TEXT BOOK:

1. Donald P. Leach, Albert Paul Malvino and Goutamsaha, “Digital Principles and Applications”, Tata McGraw – Hill Publishing Company Limited, Special Indian Edition, Sixth Edition, 2006.(Units I, II, III)
2. M. Morris Mano, “Computer System Architecture”, Prentice – Hall of India, Eastern Economy Edition, Third Edition, 2005. (Unit IV, V)

REFERENCE BOOK:

1. Thomas C. Bartee, “Digital Computer Fundamentals”, Tata McGraw-Hill Publishing Company Limited, Sixth Edition, 1991. (26th Reprint 2007).
2. John P. Hayes, “Computer Architecture and Organization” – McGraw Hill-International Edition, Third Edition–1998.
3. Thomas C. Bartee, “Computer Architecture and Logical Design”, McGraw Hill International Edition, 1998.

Programme : B.Sc IT

Course Title : Allied : Operation Research

Course Code : 18UIT3AL3

Year : II

Semester : III

Hour/Week : 6

Credits : 5

COURSE OBJECTIVES

1. To understand the concepts of Linear Programming Problems.
2. To study and understand the concept of transportation and Assignment problems.
3. To use the knowledge of Inventory, Analyze to solve Replacement problems and real world problems.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO1	Remembering the formulation of Business Problems.
CO2	understanding the methods of problem solving
CO3	Applying the mathematical calculations in Industrial Problems.
CO4	Analyzing mathematical methods and applications.

UNIT I

(16 Hours)

Linear Programming Problem: Introduction – Mathematical formulation of L.P.P. - Graphical solution method – Simplex method – Method of penalties/ Big-M method – Two phase method. (Chapter 2,3& 4, Page No. 39 - 113)

UNIT II

(14 Hours)

Transportation problem: Introduction - finding initial basic feasible solution – moving towards optimality – the transportation algorithm. (Chapter 10, Page No. 247-281)

Assignment problem: Method for solving an assignment problem –Variation of assignment problem – Traveling salesman problem – degeneracy. (Chapter 11, Page No. 295-324)

UNIT III

(16 Hours)

Queueing theory: Introduction - Queueing system – Characteristics of the Queueing system – Operating characteristics of a Queueing system - Classification of queues – Poisson queues- (M/M/1) : (∞ /FIFO) , (M/M/1) : (N/FIFO) , (M/M/C) : (∞ /FIFO) , (M/M/C) : (N/FIFO).(Chapter 21, Page No. 589-621)

UNIT IV

(16 Hours)

Inventory: Introduction – Inventory control– Cost associated with inventories – Economic lot size problem – Problems of EOQ with shortage allowed – Purchase inventory problem with price breaks. (Chapter 19, Page No. 507-538)

Replacement problem: replacement of items that deteriorates with time – replacement of items that fail completely. (Chapter 18, Page No. 477-494)

UNIT V

(13 Hours)

Networking scheduling by PERT/CPM: Introduction – Basic concepts - Critical path method – pert calculations – pert algorithm – construction of network – critical path analysis - statistical considerations in PERT . (Chapter 25, Page No. 763-784)

BOOK FOR STUDY

1. Kanti Swarup, P.K. Gupta, Man Mohan, Operations Research, Sultan Chand & Sons, 2007, Thirteen Edition.

BOOKS FOR REFERENCE

1. Prof V.Sundaresan, K.S. Ganapathy Subramanian, K.Ganesan, Resource Management
2. Techniques, A.R.Publications, 2004, Second Edition. Handy A.Taha, Operations
3. Research, CollierMacmillan, Third Edition.

E-RESOURCES:

1. <https://roughan.info/notes/oorii/06tutorials.html>
2. <https://nptel.ac.in/courses/110/106/110106062/>

Programme: B.Sc IT

Course Title: Core Practical : Java Programming

Course Code: 18UIT3CP3

Year: II

Semester: III

4 Hours / week

3 Credits

COURSEOBJECTIVES

- To develop simple programs using Classes and object, Inheritance, packages, String handling and file handling.
- To develop network programs using concepts of Java.
- To develop programs using to solve real-time problems.

COURSEOUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the fundamental programming concepts
CO2	Make use of process handling method by multithreading while developing a program.
CO3	Identify the suitable problem-solving technique to develop a Network programs able to solve network related problems.
CO4	Develop an application for Server side Programming.
CO5	Apply the concept to solve real-time problems.

LIST OF PRACTICALS

1. Write a java program for an Inheritance Concept
2. Write a java program for using Interface
3. Write a java program for using 2 Packages
4. Write a java program for Constructor using method overloading
5. Write a java program to handle all Exceptions
 - a) Catch
 - b) Try
 - c) Throws
 - d) Finally.
6. Write a java program for all String handling methods.
7. Write a java program for a) Single Multithreading b) Multiple multithreading
8. Write a java program to pass message between 2 clients using TCP/IP Protocol
9. Write a java program for using datagram
10. Write a java program for finding the IP Addresses

11. Write a java Applet program for displaying the Human face
12. Write a java program using AWT events
13. Write a java program for using Swing concept
14. Write a java program using Swing to create a MDI form
15. Write a java program to create personal information
16. Write a java program to create calculator using Swing
17. Write a java program to connect 2 clients system using RMI concept
18. Write a java program to retrieve IP address of the system using RMI concept
(client side)
19. Write a java program to create the Basic Bean concept (text)
20. Write a java program to create Bean tool

Programme: B.Sc IT

Course Title: Core Practical : Data Structure using C++

Course Code: 18UIT3CP4

Year: II

Semester: III

4 Hours / week

3 Credits

COURSE OBJECTIVES:

- To understand the linear and non-linear data structures available in solving problems.
- To know about the sorting and searching techniques and its efficiencies.
- To get a clear idea about the various algorithm design techniques.
- Using the data structures and algorithms in real time applications.
- Able to analyze the efficiency of algorithm.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the concept of building algorithms and Programs
CO2	Apply the concept of Stack , Queue and Linked list to solve real world
CO3	Analysis the working of Non-linear data structure such as tree and graphs
CO4	Select and implement correct searching and sorting techniques
CO5	Acquire knowledge to analyze the Hashing Techniques

1. Write a C++ program to implement a stack.
2. Write a C++ program to convert an Infix Notation to Postfix Notation.
3. Write a C++ program to implement a Evaluate of expression.
4. Write a C++ program to implement a stack using Linked List
5. Write a C++ program to implement a Queue.
6. Write a C++ program to implement a circular queue.
7. Write a C++ program to implement a Queue using Linked List
8. Write a C++ program to construct a Binary Tree Traversal.
9. Write a C++ program to implement a Depth First Search
10. Write a C++ program to implement a Breath First Search.
11. Write a C++ program to implement a Warshall's Algorithm.
12. Write a C++ program to implement a Dijkstra's Algorithm.
13. Write a C++ program to implement an Insertion Sort.
14. Write a C++ program to implement a Merge Sort.
15. Write a C++ program to implement a Heap Sort.

Programme: B.Sc IT

Course Title: Core : Web Programming

Course Code: 18UIT4C06

Year: II

Semester: IV

5 Hours / week

5 Credits

COURSEOBJECTIVES:

- To understand the foundations of CLR execution & .NET framework
- To know the object oriented aspects of C#
- To learn web based applications on ASP.NET with C#
- To provide knowledge on SQL and PLSQL

COURSEOUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the concepts of .NET framework and Object Oriented Programming.
CO2	Identify the logic behind web application and Server concepts.
CO3	Develop an application for Server side Programming with database.
CO4	Identify the logic of Structured Query Language.
CO5	Apply the concept to solve real-time problems.

Unit I (12 Hrs)

Introducing C#. Understanding .NET, overview of C#, Literals, Variables, Data Types, Operators, checked and unchecked operators, Expressions, Branching, Looping, Methods, implicit and explicit casting, Constant, Arrays, Array Class, Array List, String, String Builder, Structure, Enumerations, boxing and unboxing.

Unit II (12 Hrs)

Class, Objects, Constructors and its types, inheritance, properties, indexers, index overloading, polymorphism, sealed class and methods, interface, abstract class, abstract and interface, operator overloading, delegates, events, errors and exception, Threading.

Unit III (12 Hrs)

Programming web application with web forms, **ASP.NET introduction**, working with XML and .NET, Creating Virtual Directory and Web Application, session management techniques, web config, web services, passing data sets, returning data sets from web services, handling transaction, handling exceptions, returning exceptions from SQL Server.

Unit IV (12 Hrs)

Basic SQL: Introduction – SQL Data Definition – Basic Structure of SQL Queries – Additional Basic Operations – Set Operations – Null Values – Aggregate Functions – Nested Subqueries – Modification of the Database. (Page No: 57-104)

Intermediate SQL: Join Expressions – Views – Transactions – Integrity Constraints – SQL Data Types and Schemas– Authorization. (Page No: 113 – 150)

Unit V (12 Hrs)

Advanced SQL: Accessing SQL from a Programming Language – Functions and Procedures – Triggers – Recursive Queries – Advanced Aggregation Features – OLAP (Page No: 157-209)

Text Books:

1. Herbert Schildt, “The Complete Reference: C#4.0”, Tata McGraw Hill, 2012. (Unit I & II)
2. Christian Nagel et al. “Professional C# 2012 with .NET 4.5”, Wiley India, 2012. (Unit III)
3. Avi Silberschatz, Henry F. Korth, S. Sudarshan, “Database System Concepts”, 2010, Sixth Edition. (UnitIV&V)

Reference Books:

1. Herbert Schildt, “C# 4.0 Complete References”, Tata McGraw-Hill Edition
2. “Microsoft SQL Server-Notes for Professionals”, 2018, Free E-book for students by Microsoft.

Programme: B.Sc IT

Course Title: Core : Advanced Networking

Course Code: 18UIT4C07

Year: II

Semester: IV

5 Hours / week

5 Credits

COURSE OBJECTIVES:

- Compare the different types of routing protocols and metrics.
- To understand design a scalable hierarchical network, Configure and troubleshooting, VLAN and inter-VLAN routing
- To Acquire knowledge of various protocol STP, HSRP, LACP, PAgP, PPP and HDLC
- To analyze the function of various broadband connection, VPN and ACL
- To understand the functions of QoS and network security

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Identify the different types of routing protocols and metrics
CO2	Understand the functionalities of VLAN and inter-VLAN routing
CO3	Understand the working principles of VPN and ACL
CO4	Acquire knowledge on network security and QoS.
CO5	Apply Packet Tracer tool to implement advanced Networking Concept.

Unit I

Dynamic routing: purpose – advantage – Metric – Types – RIP configuration – EIGRP Configuration – EIGRP Tuning – Single Area OSPF configuration – Multi Area OSPF configuration – OSPF Tuning

Unit II

Introduction: LAN Design – Hierarchical Design Model - VTP: purpose – configuration - **VLAN:** types – benefits – configuration - DTP: purpose – Configuration - **Inter-VLAN:** features – types – traditional – router on a stick – Using multilayer switch

Unit III

STP: Uses – configuration – Ether channel: Advantage – **LACP** configuration – PagP Configuration - **HSRP:** purpose – Configuration – WAN Technologies – **HDLC** – Point to Point Connection: purpose – configuration.

Unit IV

Broadband connection options – PPPoE connection – VPN technology: Purpose – Types – GRE tunnels Configuration – BGP features - **ACL:** Purpose – types – Standard ACL Configuration - Extended ACL configuration

Unit - V

Network Security and Monitoring: LAN security attacks- SNMP operates- Quality of Service – purpose – characteristics of QoS – different QoS models – Cisco IoT System – Network Troubleshooting Case Study: Network Programming.

TEXTBOOK:

1. Todd Lammle – CCNA Routing and Switching Complete Study Guide 2nd Edition – John Wiley & Sons, 2016
2. Steve Mc Querry, David Jansen and David Hucaby - Cisco LAN Switching Configuration Handbook 2nd Edition - Cisco Press, 2009

REFERENCEBOOK:

1. <https://www.netacad.com/group/resources/ccna-rs-scaling/6.0>
2. <https://www.netacad.com/group/resources/ccna-rs-connect/6.0>
3. Andrew S Tanenbaum – Computer Networks 3rd Edition – Prentice Hall of India, 2003

Programme: B.Sc IT

Course Title: Core : Data Mining and Warehousing

Course Code: 18UIT4C08

Year: II

Semester: IV

5 Hours / week

5 Credits

COURSE OBJECTIVES:

- To expose the students to the concepts of Data warehousing Architecture and Implementation
- To learn to use association rule mining for handling large data
- To understand the concept of classification for the retrieval purposes
- To know the clustering techniques in details for better organization and retrieval of data

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Preprocess the data for mining applications
CO2	Apply the association rules for mining the data
CO3	Design and deploy appropriate classification techniques
CO4	Cluster the high dimensional data for better organization of the data
CO5	Evaluate various mining techniques on complex data objects

Unit I

Expanding universe of data – production factor – computer systems that can learn – data Mining – data mining versus query tools – data mining in marketing – practical application. (Chapter:1,PageNo.:1-10). Learning – Self Learning Computer Systems – machine learning and the methodology of science – concept learning. (Chapter:2,PageNo.:11-22)

Unit II

Data warehouse – need – designing decision support systems – integration with data mining - Client/Server and data warehousing – multi-processing machines – cost justification. (Chapter:3,PageNo.:25-36)

Unit III

Knowledge discovery process– data selection – cleaning – enrichment – coding – datamining – preliminary analysis of the data set using traditional query tools – visualization techniques – likelihood and distance – OLAP tools – K-nearest neighbor – Decision trees – Association rules –Neural networks – Genetic algorithms – Reporting. (Chapter:4,PageNo.:37-78)

Unit IV

Different forms of knowledge – Getting started – Data Selection – Cleaning – Enrichment – Coding – Data mining – Reporting – KDD environment – Ten golden rules. (Chapter:5,PageNo.:79-93)

Unit V

Customer Profiling – Predicting bid behavior of pilots – Discovering foreign key relationships - Results. (Chapter:6, PageNo.:95-110) Learning as compression of data sets – The information content of message – Noise and redundancy – significance of noise – Fuzzy data bases – The traditional theory of the relational database – from relations to tables – from keys to statistical development Dependencies – Denormalization – Data Mining Primitives. (Chapter:7,PageNo.:111-126)

TEXT BOOK

1. Peter Adriansand DOLF Zantinge, DataMining, Addition Wesley, 2002, Fourth Edition (All Units)

REFERENCE BOOK:

1. K. P. Soman, Shyam Divakar, V. Ajay, Insight into Data Mining (Theory and Practice), Prentice Hall of India, 2006, Second Edition.

Programme: B.Sc IT

Course Title: Core Practical : Web Programming

Course Code: 18UIT4CP5

Year: II

Semester:IV

4 Hours / week

3 Credits

COURSE OBJECTIVES

- To develop simple programs using Classes and object, Inheritance, packages, String Handling and Exception handling.
- To develop server applications with database.
- To develop programs to solve real-time problems.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the fundamental programming concepts
CO2	To make use of exception handling method for error free program.
CO3	Identify the suitable problem-solving technique to develop a Web Applications.
CO4	Develop an application for Server side Programming.
CO5	Apply the concept to solve real-time problems.

LIST OF PRACTICALS

1. Design the same webpages for each students for display details and apply same background color for all the pages using css.
2. Use pseudo classes and display link, visited link and active link of contact us differently.
3. Create the application that accepts name, password, age , email id, and user id. All the information entry is compulsory. Password should be reconfirmed. Age should be within 21 to 30. Email id should be valid. User id should have at least a capital letter and digit as well as length should be between 7 and 20 characters.
Create a website for a bank and include types of navigation with server controls.
4. Create a Web App to display all the Empname and Deptid of the employee from the database using SQL source control and bind it to Grid View. Database fields are (DeptId, DeptName, EmpName, Salary).
5. Database programs with ASP.NET and ADO.NET Create a Login Module which adds Username and Password in the database. Username in the database should be a primary key.

6. Create a web application to insert 3 records in side the SQL database table having following fields (DeptId, DeptName, EmpName, Salary). Update the salary for any one employee and increment it to 15% of the present salary. Perform delete operation on Irow of the database table
7. Programs using Language Integrated query. Create the table with the given fields .

FIELD_NAME	DATATYPE
PID	string
PName	string
PPrice	int
PWeight	int

For the given table design a web page to display the employee information from table to grid control. Use LINQ TO Objects.
8. For the web page created for the display of Employee data change the authentication mode to Windows
9. Create a web page to display the news from the news table(id, news_dtl). Use AJAX.
10. Create a web page to display the cricket score from the table event (id, name, score). Refresh the website automatically after every 30 seconds.

SOL & PLSOL

1. Creation of a Database and writing SQL queries to retrieve information from the database.
2. Performing Insertion, Deletion, Modifying, Altering, Updating and Viewing records based on conditions
3. Creation of Views, Synonyms, Sequence, Indexes, Save point
4. Creating an Employee Database to set various constraints
5. Creating relationship between the databases
6. Write a PL/SQL block to satisfy some conditions by accepting input from the user.
7. Write a PL/SQL block that handles all types of exceptions
8. Creation of Procedures.
9. Creation of database triggers and Functions.

Programme: B.Sc IT

Course Title: Core Practical : Web Technology – I (HTML and XML)

Course Code: 18UIT4CP6

Year: II

Semester: IV

4 Hours / week

3 Credits

COURSE OBJECTIVES:

- To understand the concepts and architecture of the World Wide Web.
- To understand and practice Markup languages
- To understand and practice embedded dynamic scripting on client side Internet Programming
- To understand and practice web development techniques on client-side

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Acquire knowledge about functionalities of worldwide web
CO2	Explore mark-up languages features and create interactive web pages using them
CO3	Learn and design Client side validation using scripting languages
CO4	Acquire knowledge about Extensible Markup Language
CO5	Able to design front end web page and connect to the backend databases with XML.

1. Write a HTML Program to format the text using all suitable HTML Tags.
2. Write a HTML Program to include an image in the webpage using suitable HTML tag.
3. Write a HTML Program to include a picture as a background image with suitable tags.
4. Write a HTML Program to demonstrate heading tags.
5. Write a HTML Program to draw a table containing the semester marks of a student.
6. Write a HTML Program to demonstrate frames.
7. Write a HTML Program to demonstrate form.
8. Write a HTML Program to demonstrate various lists available in HTML.
9. Write a HTML Program to demonstrate hyperlinks.
10. Write a HTML Program to create a sum of yours using HTML tags.
11. Write a HTML Program to create the semester mark statement of our college student.
12. Write a HTML Program to that uses internal cascading stylesheets in your HTML program.
13. Write a HTML Program to that uses external cascading stylesheets in your HTML program.
14. Write a HTML Program to display the employee pay slip.
15. Write a HTML Program to create static website for our college.

16. Write a XML document that displays the details about a student.
17. Write a XML document that displays the details of the customers.
18. Write a XML document which uses a DTD file for its style.
19. Write a XML document which uses XSL for its style.
20. Write a XML document using proper DTD to create your resume.

Programme: B.Sc IT

Course Title: Core : Python Programming

Course Code: 18UIT5C09

Year: III

Semester: V

5 Hours / week

5 Credits

COURSE OBJECTIVES

- To make aware of the basic concepts of Python and packages.
- To develop the skill of designing Graphical user Interfaces in Python
- To learn Problem solving and programming capability.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Analyze the methodologies and essentials of Python programming
CO2	understand the basic concepts of python modules and packages
CO3	Create simple predictions using Python
CO4	Interpret and analyse the real time datasets with python packages

Unit – I

Shell or Notebook: Launching - Launching the Jupiter Notebook - Help and Documentation in IPython - Exploring Modules with Tab Completion - Keyboard Shortcuts in the IPython Shell - IPython Magic Commands.

Unit – II

NumPy: Introduction to NumPy – The Basics of NumPy arrays–Computation on NumPy Arrays–Aggregations: Min, Max, and Everything in Between – Computation on Arrays.

Unit – III

Pandas: Introduction to pandas - Data manipulation with pandas–Operating on null values, hierarchical indexing – Combining Datasets – Aggregation and Grouping.

Unit – IV

Matplotlib: Introduction to Matplotlib– Visualization with Matplotlib – Simple line plots – scatter plots – visualizing errors – Histograms, binnings and density – Customizing plots – Multiple sub plots – Text annotation.

Unit – V

Sci-kit Learn: Introduction to Scikit Learn: Data representation – Hyper parameters & Validation: Selecting the best model – Learning Curves. – Correlation - Linear Regression: Simple Linear Regression – Basis function regression – Regularization.

Text Books:

1. Jake VanderPlas, “Python for Data Science Hand Book”, 1st Edition, O’Reilly, 2016.

Reference Books:

1. William McKinney, “Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Ipython”, 2nd Edition, Shroff/O'Reilly, 2017.
2. Prateek Gupta, “Data Science with Jupiter: Master Data Science skills with easy-to-follow Python examples”, 1st Edition, BPB Publications, 2019.

Programme: B.Sc IT

Course Title: Core : Operating System

Course Code:18UIT5C10

Year: III

Semester: V

5 Hours / week

4 Credits

COURSE OBJECTIVES:

- To be aware of the evolution and fundamental principles of operating system, processes and their communication
- To understand the various operating system components like process management, memory management, I/O management and file management.
- To know about file management and the distributed file system concepts in operating systems
- To be aware of components of operating system of WINDOWS 2000 and WINDOWS XP with relevant case study

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the concepts of Operating System.
CO2	Realize the various operating system components.
CO3	Know, how process scheduling algorithms works
CO4	Know about how paging, demand paging and page replacement works
CO5	Understand the features of WINDOWS 2000 and WINDOWS XP as case study

Unit I

INTRODUCTION: What is an Operating System?-Mainframe Systems-Desktop Systems-Multiprocessor Systems-Distributed Systems-Clustered System-Real-Time Systems-Handheld Systems. Operating-System Structures:-System Components-Operating-System Services-System Calls-System Programs-System Structure-Virtual Machines.(Pages 3-19,55-80)

Unit II

PROCESS MANAGEMENT: Process Concept-Process Scheduling-Operations on Processes-Cooperating Processes-Inter process Communication. CPU Scheduling:-Basic Concepts-Scheduling Criteria- Scheduling Algorithms-Multiple-Processor Scheduling-Real- Time Scheduling. Deadlocks:-System Model-Deadlock Characterization-Methods for Handling Deadlocks-Deadlock Prevention- Deadlock Avoidance- Deadlock Detection-Recovery from Deadlock. (Pages 95 – 109, 151-170, 243 - 264)

Unit III

STORAGE MANAGEMENT: Memory Management:-Background-Swapping- Contiguous Memory Allocation-Paging-Segmentation- Segmentation with Paging. Virtual Memory:-Background-Demand Paging-Process Creation-Page Replacement-Allocation of Frames-Thrashing. (Pages 273-309, 317 – 348)

Unit IV

File-System Implementation: File-System Structure- File-System Implementation- Directory Implementation-Allocation Methods-Free-Space Management. Mass-Storage Structure:-Disk Structure-Disk Management-Swap-Space Management-RAID Structure-Disk Attachment-Stable-Storage Implementation-Tertiary-Storage Structure. (Pages 411 – 430, 491 – 516).

Unit V

Windows2000: History-Design Principles-System Components-Environmental Subsystems - File System-Networking-Programmer Interface. Windows XP: History-Design Principles- System Components-Environmental Subsystems-File System-Networking- Programmer Interface. (Pages 743-780, 789 –839)

TEXT BOOK:

1. Silberschatz, Galvin, Gagne, Operating System Concepts, Wiley India Edition (sixth edition), 2007

REFERENCE BOOKS:

1. Deitel Deitel Choffnes, Operating Systems, Pearson Education (third edition),2003.
2. Stuart E. Madnick, John J.Donovan, Operating Systems, Tata McGraw Hill (third edition), 2003.

Programme: B.Sc IT Course Title: Core: Web Technology – II (PHP, Ajax and Joomla)
 Course Code: 18UIT5C11 Year: III Semester: V
 4 Hours / week 4 Credits

COURSE OBJECTIVES:

- To gain knowledge on PHP Basic syntax for variable types and calculations.
- To gain knowledge about PHP built-in functions and creating custom functions.
- To make understand how server-side programming works on the web.
- To understand the concept of AJAX , JOOMLA and MVC to improve the application performance.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Able to initialize to work on php for web application development
CO2	Apply the class, functions, array and database connection in web application.
CO3	Utilize the AJAX for web application to improve application efficiency.
CO4	Make use of CMS template and MVC for quick development of web application.

PHP & MYSQL

Unit – I

Introducing PHP (1-18) – Using Variables and Operators (21-45) – Controlling program flow (49-82) – Working with cookies, sessions and headers (293 – 308).

Unit – II

Working with arrays (85-118) – Using functions and classes (121-148) – Working with files and directories (159-180) – Working with databases and SQL (185-246)

AJAX

Unit – III

Getting started with Ajax (433-435) – Writing Ajax (435) – Creating and Opening XML Http Request object (436-440) – Handling & Starting the Downloaded data (441-447) – Ajax with Some PHP (448) – Passing Data to the Server with GET & POST (449-455). Introduction to JQuery (1-8) – Element getters and setters (13-21) – Altering document structure (25-29) – Events and Animated Effects (31-58) – Ajax and Utility functions (63-88) – JQuery with plugins (103-108).

JOOMLA

Unit – IV

Understanding Joomla (3-7) – Installing Joomla (25-39) – A tour of the Joomla administrator interface (41-49) – Defining Section and Creating Structure (53-57) – Creating, editing and deleting sections, categories and articles (59-83) – Joomla menus (125-166) – Joomla Templates and modules (169-228).

Unit – V

Meet Yii (7-15) – Getting started (17-32) – Creating the initial track star application(53-59) – Project CRUD (61-90) – Adding Tasks (93-141) – User management and authentication (147-169).

TEXT BOOKS

1. A Beginner's Guide PHP, Vikram Vaswani, Tata McGraw Hill, First Edition.
2. PHP Complete Reference, Steven Holzner, Tata McGraw Hill, First Edition.
3. JQuery Pocket Reference, David Flanagan, O'Reilly , First Edition.
4. Joomla, Jen Kramer, Wrox Programmer to Programmer, First Edition.
5. Web Application Development with Yii and PHP, Jeffrey Winesett, Packt Publications – Second Edition.

Programme: B.Sc IT

Course Title: Elective : Fundamentals of Cyber Security

Course Code: 18UIT5EL1

Year: III

Semester: VI

4 Hours / week

4 Credits

COURSE OBJECTIVES:

- To **gain knowledge** about securing both clean and corrupted systems, protect personal data, and **secure computer networks**.
- To understand key terms and **concepts in cyber law, intellectual property and cybercrimes, trademarks and domain theft**.
- To be able to examine secure software development practices.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the knowledge about Information Systems
CO2	Initiate about Information Security and Application Security
CO3	Ability to understand about Security Threats and Secure Information System
CO4	Understand Security Issues and Policies
CO5	Understanding the Information Security Standards

Unit I: Introduction to Information Systems

Introduction – Modelling the business process – **Information System components** – Information System Categories – Individuals in the information system – Development of information Systems.

Unit II : Information Security and Application Security

Introduction – Threats to Information System - Information Assurance - **Cyber Security risk analysis**. Introduction – Data Security consideration – Security Technology – Intrusion Detection – Access Control.

Unit III : Security Threats and Secure Information System

Introduction to Security Threats – **Network and Service Attack** - Security threats to E-Commerce. Introduction – Developing Secure Information System – Key elements – Information System Development Life Cycle – Application Security – Information Security Governance and Risk Management – Risk Management – Security Architecture and Design

Unit IV : Security Issues and Policies

Introduction – Data Storage and Downloadable Device – Physical Security of IT Assets – CCTV and IDS – Security Policies – Introduction – Why do we need Security Policies? – **Security Policy Development** – Email Security Policies – Policy Review Process – Corporate Policy – Sample Template of Cyber Security Policy

Unit V: Information Security Standards

Introduction – ISO – IT ACT 2000 – Copyright – Patent - Intellectual Property Rights – Cyber laws in India – Software Licensing – Semi Conductor Law and Patent Law – Chip Act Right and Exceptions

Text Book:

1. Mayank Bhushan, Rajukumar Singh Rathore and Aatif Jamshed (2017). Fundamentals of Cyber Security. 1st Edition. BPB Publications.

Reference Book:

1. Haq Kamar (2017). What is Cyber Security 1st Edition. Britannica Educational Publishing.

Web References:

2. <http://whatis.techtarget.com/definition/cybersecurity>
3. <https://www.csoonline.com/article/3242690/data-protection/what-is-cyber-security-how-to-build-a-cyber-security-strategy.html>
4. https://www.acs.org.au/content/dam/acs/acs-publications/ACS_Cybersecurity_Guide.pdf
5. <https://www.youtube.com/user/GoogleCyberSecurity>

Programme: B.Sc IT

Course Title: Core Practical : Python Programming Lab

Course Code: 18UIT5CP7

Year: III

Semester: V

4 Hours / week

3 Credits

COURSE OBJECTIVES

- To develop simple programs using Python and packages.
- To develop python programs to solve mathematical and statistical problems
- To develop visualization techniques using packages.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the essentials of Python programming
CO2	know basic programs using python modules and packages
CO3	Interpret algorithm and visualize the results with real time datasets

1. Expressions, conditionals, loops, list, dictionary, and strings.
2. Functions: scope, parameter passing
3. Data objects, pass arrays to functions, return values
4. Functions using libraries: mathematical, and string functions.
5. File handling: open and close a file, read, write, and append to a file, standard input, output, and error streams, relative and absolute paths.
6. Using Python libraries: create and import Python libraries
7. Recursion: simple algorithms with recursion: factorial, Fibonacci numbers;
8. Recursion on arrays: binary search
9. Pandas: Importing package and Arrays
10. Data visualization Pyplot: line chart, pie chart, and bar chart.

Programme: B.Sc IT

Course Title: Core Practical : Web Technology II (PHP, Ajax and Joomla)

Course Code: 18UIT5CP8

Year: III

Semester: V

4 Hours / week

3 Credits

COURSE OBJECTIVES:

- To develop the skill set for utilize the variable, class and object, array and function in php web application.
- To Develop the skill of create a server-side programming for the web application.
- To understand the concept of AJAX, JOOMLA and MVC to improve the application performance to develop the skill set for design web page for different web application.
- To develop skill on utilize function and inbuild functions in web application

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Able to write logic on php for web application development
CO2	Apply the class, functions, array and database connection in web application.
CO3	Utilize the AJAX, JOOMLA and MVC for web application to improve application efficiency.
CO4	Able to create database and connect with front end web application.

1. Find the following program using PHP
Sum of 10 numbers
Fibonacci sequence of 10 Numbers
Area of the circle for the radius of $r = 8$
2. Find the following program using PHP
Ascending and Descending order of n numbers
Using PHP date function print the following expression, March 10, 2008, 5:16 pm
Sat Mar 10 15:16:08 MST 2008.
3. Using PHP program read and print a file character by character, until the end of file isreached.
4. Using PHP string function to convert lower case, upper case, string length, stringcompare, string reverse, and string shuffle.
5. Using PHP connect MySql and save the following data into the respective MySqitable. Student Name, StudentReg No, Age, Department.

6. Using PHP connect MySQL and view contents of the previous program saved details.
7. Using PHP connect MySQL and view contents and made delete operation in it.
8. Using PHP connect MySQL and view contents and made edit operation in it.
9. Using PHP with MySQL develop one small application in online job portal.
10. Using PHP with MySQL develop online exam.
11. Using PHP with MySQL develop an alumni registration form with image uploading.
12. Using PHP, AJAX and MySQL create your class profile using add, view, edit and delete modes with image and music file uploading.

Programme :B.Sc IT

Course Title: Core : Mobile Application Development

Course Code: 18UIT6C12

Year: III

Semester: VI

6 Hours / week

5 Credits

COURSE OBJECTIVES:

- To understand the components and structure of mobile application development frameworks for Android mobiles.
- To understand how to work with various mobile application development frameworks.
- To learn the basic and important design concepts and issues of development of mobile applications.
- To understand the capabilities and limitations of mobile devices.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the existing state of mobile app development via researching existing apps, meeting with industry professionals, and formulating new ideas.
CO2	Understand the limitations and features of developing for mobile devices.
CO3	Create a complete Mobile app with a significant programming component, involving the sensors and hardware features of the phone.
CO4	Understand features of the app marketplace by offering the app for download.

Unit – I

Introducing Android: Before we get started – Advantages of android – Preparing SDK tools to download – Android development IDE – Java, XML and how android works – Android application framework – Screen layout design – User Interface Design – Graphics and animation Design – Interactivity – Content providers – Intent and intent filters. (Pg No: 1-19).

Unit – II

Setting up your android development environment – Installing Java, Eclipse and Android – Setting up AVDs and Smart Phone – Understanding Java SE and the Dalvik Virtual Machine – The directory structure of an android project – Leveraging android XML – Using your android application resources – The AndroidManifest.xml file – Creating your first android application.(PgNo:21-85).

Unit – III

Android application components – **Android Intent Objects:** Messaging for Components – **Android Manifest XML:** Declaring Your Components – Android View Hierarchies – Defining Screen Layouts: Using XML. (Pg No: 115-160)

Unit – IV

UI Design: Buttons, Menus and Dialogs – Using Android UI Elements (Widgets) – Adding an Image Button to Your Layout – Adding a TextView Widget to Your Layout – Adding an Image – Using Menus in Android – Creating the Menu Structure with XML – Defining Menu Item Strings – Inflating the Menu Structure via Java – Running the Application in the Android Emulator – Making the Menu Work – Adding Dialogs – Using Custom Dialog Subclasses – Displaying an Alert Dialog. (Pg No: 163-207)

Unit - V

Adding Interactivity: Handling UI Events – An Overview of UI Events in Android – HandlineonClick Events – **Android Touchscreen Events: onTouch** – **Android Right-click Equivalent: onLongClick** – **Key Event Listeners: onKeyUp** and **onKeyDown** – **Context Menus in Android: onCreateContextMenu**. (Pg No: 235-266)

Understanding Content Providers: An Overview of Android Content Providers – Defining a Content Provider – Working with a Database.

TEXT BOOKS:

1. Wallace Jackson, Android Apps for Absolute Beginners, 2nd Edition, APress, 2013.

REFERENCE BOOKS:

1. Shawn Van Every “Pro Android Media: Developing Graphics, Music, Video, and Rich Media Apps for Smartphones and Tablets “

Programme: B.Sc IT

Course Title: Core : Software Engineering

Course Code: 18UIT6C13

Year: III

Semester: VI

6 Hours / week

5 Credits

COURSE OBJECTIVES:

- To provide an insight into the processes of software development
- To understand and practice the various fields such as analysis, design, development, testing of Software Engineering.
- To develop skills to construct software of high quality with high reliability
- To apply metrics and testing techniques to evaluate the software

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the process of Software Development.
CO2	Ability to model the high level designs in the software projects.
CO3	Develop a metrics for performing product measurements in individual software processes.
CO4	Understanding the strategies of testing works with various methods.

Unit I

Introduction to Software Engineering: The Evolving Role of software – Software- the Changing Nature of software – Legacy Software C1 (33-45) – Process Models: prescriptive Models, The waterfall Model, Incremental Process Models, Evolutionary Process Models- Specialized Process Models – Unified Process C3 (78-99)

Unit II

Requirements Engineering: Requirements Engineering Tasks – Initiating the Requirements Engineering Process – Eliciting Requirements – Developing Use cases – Building the Analysis Model – Negotiating Requirements – Validating Requirements C7 (176-203)

Unit III

Design Engineering: Design Process and Design Quality – Design Concepts – The Design Model C9 (261-279) – Data design C10 (289 -290) – Architectural Design C10 (298-303) – Mapping Data Flow into Software Architecture C10 (307 – 320)

Unit IV

TestingTactics: Software Testing Fundamentals – Black box and Whitebox Testing – White box Testing – Basis path Testing – Control Structure Testing – Black box Testing. C14 (421-441)- TESTING FOR WEBAPPS: Content Testing – User Interface Testing – Component Level Testing – Navigation Testing – Configuration Testing – Security testing - Performance TestingC20(601-621)

Unit V

RISK MANAGEMENT: Software Risks – Risk Identification – Risk Projection – Risk Refinement – Risk Mitigation, Monitoring, And Management C25 (728-739) **QUALITY MANAGEMENT:** Quality Concepts – Software Quality Assurance – Software Reviews – Formal Technical Reviews - Formal Approaches to SQA C26 (745-759) – Software Reliability C26(762-764).

TEXT BOOK

1. ROGER S.PRESSMAN ,SOFTWARE ENGINEERING A practitioner's Approach, McGraw-HILL, 2005 - Sixth Edition,

REFERENCE BOOK

1. Richard fairly, Software Engineering concepts:, McGRAW-HILL,2006

Programme: B.Sc IT

Course Title: Core Practical : Mobile Application Development and Multimedia

Course Code: 18UIT6CP9

Year: III

Semester: VI

6 Hours / week

3 Credits

COURSE OBJECTIVES:

- To understand how to work with various mobile application development frameworks.
- To learn the basic and important design concepts and issues of development of mobile applications.
- These include Graphic Design, Animation, Audio and Video, and Design for learning, web design and development.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the limitations and features of developing for mobile devices.
CO2	Create a complete Mobile app with a significant programming component, involving the sensors and hardware features of the phone.
CO4	Utilize several Flash tools and tactics, and utilize the timeline and Motionween affects to produce animation.
CO5	It is built and designed to meet the demands of today's working designer to create ads or collateral for print or for the web.

Mobile Application Development

1. Write the steps for installation and configuration of android in Windows OS.
2. Write a program to demonstrate usage of two textbox (EditText), Label (Textview) and Button widgets in android and perform addition of two numbers.
3. Write a program and demonstrate the graphical layout orientation.
4. Write a program and fetch the IMEI number of your mobile phone.
5. Write a program to demonstrate usage of DateTimePicker with Toast (MessageBox).
6. Write a program to demonstrate usage of ListBox, ComboBox, Snippers with Toast (MessageBox).
7. Write a program, create and send notification message in your mobile phone.
8. Write a program to demonstrate usage of TextArea, CheckBox, RadioButton with Toast (MessageBox).
9. Write a program and calculate the simple interest and compound interest using its API controls.
10. Write a program and create phonecall activity using android.
11. Write a program for sending SMS using android.

12. Write a simple program to demonstrate the contact manager using Contacts Contract API (Insert, Delete, Edit, View).
13. Write a simple program to demonstrate connecting with SQLite Database.
14. Write a program and save student information with SQLite Database.
15. Write a program and view student information from SQLite Database.

Multimedia

GIMP

1. Create an invitation design using Gimp.
2. Create a layer animation using Gimp.
3. Apply the filter effect in image using Gimp.
4. Create a web index page using Gimp.
5. Create a logo design by Gimp.

2D PENCIL

1. Create natural scenery using 2D pencil.
2. How to create a glossy button using 2D pencil?
3. Apply the filter effect in image or font using 2D pencil
4. Create a Text animation using 2D pencil.
5. Create a movie clip animation using 2D pencil.

INKSPACE

1. Create a logo design using Inkscape
2. Create a banner design using Inkscape
3. Create a corporate ID card design using Inkscape
4. Create a wedding Card design using Inkscape
5. Create a 3D Text effect using Inkscape?

Programme : B.Sc Information Technology
Course Title : Core : Project Work and Viva-Voce
Year : III
Hour/Week : 6

Course Code : 18UIT6CPR
Semester : VI
Credits : 5

COURSE OBJECTIVES

Enable the Students to

1. Understand the importance of experimental analysis, scientific approach in solving problems of information Technology.
2. Educate and train the students on how to design the system and develop the system and prepare the reports.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO1	Identify a problem and select suitable software for implementation
CO2	Apply the problem-solving skill to solve the problem
CO3	Able to analyze and interpret the data to arrive at the expected results

The Final Year Students are assigned to the project Supervisor and they are asked to submit an individual project report at the end semester. The Broader areas of the project are website creation, order processing, Billing Software, Multimedia, Artificial Intelligence, and Machine Learning based projects.

The student has to approach the nearby companies to get approval from the company to undergo his project work for the period of 8 to 9 months.

The students have to submit the project Completion Letter from the organization.

The project work done by the student is periodically reviewed.

Programme : B.Sc IT

Course Title: Elective : Artificial Intelligence and Expert System

Subject Code: 18UIT5EL1

Year: III

Semester: V

4 Hours / week

4 Credits

COURSE OBJECTIVES

- Gain a historical perspective of AI and its foundations.
- Become familiar with basic principles of AI toward problem solving, inference, perception, knowledge representation, and learning.
- Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Experience AI development tools such as an ‘AI language’, expert system shell, and/or data mining tool.
- Experiment with a machine learning model for simulation and analysis.

COURSE OUTCOMES

On the Successful completion of the course, Students will be able to

CO Number	CO Statement
CO1	Describe the modern view of AI as the study of agents that receive precepts from the Environment and perform actions.
CO2	Demonstrate awareness of informed search and exploration methods.
CO3	Explain about AI techniques for knowledge representation, planning and uncertainty Management.
CO4	Develop knowledge of decision making and learning methods.
CO5	Describe the use of AI to solve English Communication problems.

UNIT I

Introduction-Definition of AI, TASK Domain-underlying Assumption, Criteria for Success, State Space, Production Systems, problem characteristics, production system characters.

UNIT II

Heuristic searches Techniques-Generate and test, Hill-Climbing, Best-First search, Problem Production, Constraint satisfaction, Means-end Analysis.

UNIT III

Knowledge Representation-approaches and issue-Methods-Production Rules, Semantic nets, Frames & Scripts.

UNIT IV

Expert systems-definition, architecture, characteristics, Advantages & Disadvantages. Development stages of an expert systems-characteristics of problem chosen for Expert system development-application areas of Expert system.

UNIT V

Study of Expert System (Overview, facilities, interfacing process, certainly factor calculations)-MYCIN, PROSPECTOR, XCON/R1.

TEXT BOOKS:

1. ELLINE RICH & KEVINKNIGHT, Artificial Intelligence, Tata Mc Graw Hill, 1991.
2. DONALD A.WATERMANN, A Guide to Expert Systems, Addison Wesley.

Programme : B.Sc IT

Course Title: Elective : Cloud Computing

Subject Code: 18UIT5EL1

Year: III

Semester: V

4 Hours / week

4 Credits

COURSE OBJECTIVES

- To understand basics and key concepts of cloud computing.
- To understand the classification of different cloud computing services.
- To understand cloud network model and architecture to use in open source software.
- To make practice of interconnecting the cloud computing environments.
- To learn the security challenges and implement secure SDLC.

COURSE OUTCOME

On the Successful completion of the course, Students will be able to

CO Number	CO Statement
CO1	Able to define cloud computing and memorize the different cloud service and deployment models.
CO2	Use and Examine different cloud computing services
CO3	Identify the architecture and infrastructure of cloud computing, including SaaS, Private cloud, hybrid cloud, etc.
CO4	Able to connect with two or more service providers for the purpose of load balancing traffic and accommodating spikes in demand.
CO5	Able to analyze and find the solution for security issues.

Unit – I

Introduction to Cloud – Emergence of Cloud Computing – Types of cloud- Cloud-Based Service Offerings – Grid Computing or Cloud Computing – Benefits of using a Cloud Model — Key Characteristics – Cloud Models – Challenges for the Cloud. (Page no. xxiv - xxxviii)

Unit – II

Web Services from the Cloud: Communication-as-a-Service(CaaS) – Advantages of CaaS – Infrastructure-as-a-Service(IaaS) – Monitoring-as-a-Service(MaaS) – Platform-as-a-Service(PaaS) – Software-as-a-Service(SaaS) - SaaS Implementation Issues-characteristics – Benefits.(Page no.29-54)

Unit – III

Building Cloud Networks: Evolution from the MSP Model to Cloud Computing and Software-as-a-Service – Cloud Data Center (CDC) – Collaboration – Service-Oriented Architectures as a step toward Cloud Computing- Basic Approach to a Data Center-Based SOA – Role of Open Source Software in Data Centers.(Page no.57-77).

Unit –IV

Federation in the cloud-Levels of Federation-Federated services and Applications- Protecting and controlling federation- Future of Federation- Presence in the cloud- privacy and its relation to cloud-based Information system.(Page no.129-151).

Unit – V

Security in the Cloud: Cloud Security Challenges- Software-as-a- service security- Third party risk management-Security Architecture Design- Secure software Development Life Cycle- Data security-Application security- Virtual Machine Security.(Page no.153-181)

Text Books:

1. Cloud Computing Implementation, management and security, John W.Rittinhhouse, James F.Ransome CRC Press.

Reference Book:

1. Cloud Computing A Practical Approach, Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, Tata McGraw Hill

Programme : B.Sc IT

Course Title: Elective : Client/Server Technology

Subject Code: 18UIT5EL1

Year: III

Semester: V

4 Hours / week

4 Credits

COURSE OBJECTIVES

- Understand the strategic potential of distributed computing systems for business processes.
- Understand the role of the **transaction processing, object-oriented, and Internet-based technologies in distributed enterprise computing and make decisions** about how and when to apply them.
- Understand the factors that contribute to **the performance of client/server systems and incorporate this understanding in the design of client/server systems.**
- Understand the many issues, tradeoffs, and decision points in developing, integration, and managing distributed applications.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Devise popular servers with two tier scenarios.
CO2	Understand the concept of middleware, and communication protocols.
CO3	Understand the different component of N Tier and Three Tier application.
CO4	Understand the underlying concepts in client server development using common access databases
CO5	Compare various application deployment mechanisms and the use of digital certificates.

UNIT I

Introduction: Client/server computing era-File Server-database server-transaction server-Groupware server-object server-web server.(Page no.7-15).Client/server building blocks:-Intergalactic client/server-2-tier-client/server building blocks.(Page no.20-32).

UNIT II

Operating Systems:-Anatomy of a Server program-base service-extended service-scalability.(Page no.57-65).Clients:-Clients anatomy-non-GUI client's-GUI clients-OOUI Clients-GUI versus OOUI-OOUI's on steroids.(Page no.66-74).

UNIT III

NOS:-NOS middleware-extending the local OS's reach-Global directory services-distributed time services-Distributed security(Page no.99-112).**RPC:-Peer-to-Peer communications-sockets-names-pipes-RPC-MOM middleware-MOM versus RPC.**(Page no.115-130).

UNIT IV

SQL databases servers:-Fundamentals of SQL & Relational Databases-ISO Standards- Stored procedure triggers and rules.(Page no.150-170).Data Warehousing:-OLTP-data warehouse-Data Mining-TP monitors(Page no.200-234,276-282)

UNIT V

Client/server Group ware:-Group Ware-components of Group ware(Page no.319-352).Client server with distributed objects:-Distributed objects to components-CORBA OMG's object management architecture client/server and the Internet(Page no.379-426).

TEXT BOOK:

1. The Essential Client/Server Survival Guide,Robert Orali Dan Harkey and Jeri Edwards, Galgotia Publications Pvt.Ltd.,Second edition,1999.

Programme :B.Sc IT

Course Title: Elective : Fundamentals of Cyber Security

Course Code: 18UIT5EL1

Year: III

Semester: VI

4 Hours / week

4 Credits

COURSE OBJECTIVES:

- To gain knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks.
- To understand key terms and concepts in cyber law, intellectual property and cybercrimes, trademarks and domain theft.
- To be able to examine secure software development practices.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the knowledge about Information Systems
CO2	Initiate about Information Security and Application Security
CO3	Ability to understand about Security Threats and Secure Information System
CO4	Understand Security Issues and Policies
CO5	Understanding the Information Security Standards

Unit I: Introduction to Information Systems

Introduction – Modelling the business process – Information System components – Information System Categories – Individuals in the information system – Development of information Systems.

Unit II : Information Security and Application Security

Introduction – Threats to Information System - Information Assurance - Cyber Security risk analysis. Introduction – Data Security consideration – Security Technology – Intrusion Detection – Access Control.

Unit III : Security Threats and Secure Information System

Introduction to Security Threats – Network and Service Attack - Security threats to E-Commerce. Introduction – Developing Secure Information System – Key elements – Information System Development Life Cycle – Application Security – Information Security Governance and Risk Management – Risk Management – Security Architecture and Design

Unit IV : Security Issues and Policies

Introduction – Data Storage and Downloadable Device – Physical Security of IT Assets – CCTV and IDS – Security Policies – Introduction – Why do we need Security Policies? – Security Policy Development – Email Security Policies – Policy Review Process – Corporate Policy – Sample Template of Cyber Security Policy

Unit V: Information Security Standards

Introduction – ISO – IT ACT 2000 – Copyright – Patent - Intellectual Property Rights – Cyber laws in India – Software Licensing – Semi Conductor Law and Patent Law – Chip Act Right and Exceptions

Text Book:

2. Mayank Bhushan, Rajukumar Singh Rathore and Aatif Jamshed (2017). Fundamentals of Cyber Security. 1st Edition. BPB Publications.

Reference Book:

6. Haq Kamar (2017). What is Cyber Security 1st Edition. Britannica Educational Publishing.

Web References:

1. <http://whatis.techtarget.com/definition/cybersecurity>
2. <https://www.csoonline.com/article/3242690/data-protection/what-is-cyber-security-how-to-build-a-cyber-security-strategy.html>
3. https://www.acs.org.au/content/dam/acs/acs-publications/ACS_Cybersecurity_Guide.pdf
4. <https://www.youtube.com/user/GoogleCyberSecurity>

Programme : B.Sc IT

Course Title: Elective : Geographical Information System

Subject Code: 18UIT5EL1

Year: III

Semester: V

4 Hours / week

4 Credits

COURSE OBJECTIVES

- Have a basic, practical understanding of GIS concepts, techniques and real world applications.
- Have an understanding of the technical language of GIS.
- Know how GIS is utilized in the larger context of business needs and IT strategies.
- Understand the basic concepts of geography necessary to efficiently and accurately use GIS technology.
- Understand basic GIS data concepts.

COURSE OUTCOMES

On the Successful completion of the course, Students will be able to

CO Number	CO Statement
CO1	Comprehend fundamental concepts and practices of Geographic Information Systems (GIS) and advances in Geospatial Information Science and Technology (GIS&T).
CO2	Apply basic graphic and data visualization concepts such as colour theory, symbolization, and use of white space.
CO3	Demonstrate organizational skills in file and database management.
CO4	Give examples of interdisciplinary applications of Geospatial Information Science and Technology.
CO5	Apply GIS analysis to address geospatial problems and/or research questions.

Unit I

Introduction – Defining GIS – Component of GIS – Spatial Data – Maps and their influence on the characteristic of spatial data – Thematic characteristic of spatial data – Other sources of spatial data.

Unit II

Spatial data Modelling – Entity definition – Spatial data model – Spatial data structures – Modelling surfaces – Modelling networks – Building computer worlds – Modelling the third dimension – Modelling the fourth dimension.

Unit III

Introduction – Database data models – Creating a database – GIS database applications – developments in databases – Methods of data input – Data editing – Towards an integrated database.

Unit IV

Measurements in GIS – lengths perimeters and areas – Queries – Reclassification – Buffering and neighborhood functions – Integrating data map overlay – spatial interpolation – Analysis of surfaces – Network analysis.

Unit V

Analytical modeling in GIS – Process Models – Modeling physical and environmental process – Modelling human process – modeling the decision making process – Problems with using GIS to model spatial process – Maps as output – Non-cartographic output – GIS and spatial decision support.

TEXT BOOK:

1. An introduction to GIS – Ian Heywood, Sarah Cornelius – Pearson Education 2003.

Programme : B.Sc IT

Course Title: Elective : Analysis and Design of Algorithms

Subject Code: 18UIT6EL2

Year: III

Semester: VI

6 Hours / week

5 Credits

COURSE OBJECTIVES

- Analyze the asymptotic performance of algorithms.
- Write rigorous correctness proofs for algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations.

COURSE OUTCOMES

On the Successful completion of the course, Students will be able to

CO Number	CO Statement
CO1	Correctness of algorithms using inductive proofs and invariants.
CO2	Analyze worst-case running times of algorithms using asymptotic analysis.
CO3	Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
CO4	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamic-programming algorithms, and analyze them.
CO5	Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them.

UNIT I

Introduction-Algorithm- Algorithms in SPARKS, Structured Programs-Stack and Queues-Trees-Graphs-Hashing.

UNIT II

Divide and Conquer Gondola Method, Binary Search, Maximum and Minimum-Merge and Quick Sort-Selection-Straggens matrix multiplication.

UNIT III

Greedy's method-General method-Optimal storage on tapes-Knapsack problem-Job scheduling with deadlocks-Optimal merge patterns-minimum spanning tree-Single Source Shortest path.

UNIT IV

Dynamic Programming-General method-multistage graphs-All pairs shortest path-Optimal search trees-0/1 Knapsack-Reliability Design-The traveling salesperson problem-Basic search and traversal techniques-Code Optimization AND/OR graph, game trees, Biconnector components and depths first search.

UNIT V

Back tracking-General method-The 8 Queen Problem-San of Subjects-graph coloring, hamiltonian cycles-Knapsack problem-Branch and bound-0/1-knapsack problem traveling salesperson.

TEXT BOOK:

1. Fundamentals of Computer Algorithm, Ellis Horowitz and Sartaj Sahni.

Programme : B.Sc IT

Course Title: Elective : Embedded System

Subject Code: 18UIT6EL2

Year: III

Semester: VI

6 Hours / week

5 Credits

COURSE OBJECTIVES

- To understand the concepts and architecture of embedded systems.
- To understand the external interrupts and utilize the timer concepts.
- To understand the peripheral connection and analog to digital conversion.
- To understand the serial I/O Ports and connectivity.
- To understand scheduling algorithms and memory management.

COURSE OBJECTIVES

On the Successful completion of the course, Students will be able to

CO Number	CO Statement
CO1	Understand the general process of embedded system development.
CO2	Able to handle external interrupts and timer utilization in system.
CO3	Able to connect with peripheral devices and understand the concept of Analogue to digital.
CO4	Understand various input, output ports, and connect with peripheral devices.
CO5	Able to apply various data structure and scheduling algorithms for memory management.

UNIT I:

PIC Microcontroller(16F87XX)- Introduction-Hardware architecture-pipelining-program memory-considerations-register file structure and addressing mode-CPU registers-instruction set-simple operations.

UNIT II:

External Interrupts and Timers- Overflow-RBo/INT external interrupt input capture mode-compare mode-timer 1/CP-Programmable -Timer 1 External event counter-timer 1 sleep mode-PWM output-port B change interrupts.

UNIT III:

Peripherals- Initialization and programming of I2C bus for Peripherals chip access-A/D converter-UART.

UNIT IV:

I/O Port Expansion- Synchronous serial port module-serial peripherals interface-output port expansion-input port expansion-LCD display.

UNIT V:

Software Architecture and RTOS- Software architecture: Round Robin-round Robin with interrupts-function-queue-scheduling architecture-RTOS-task task status-task and data-semaphores and shared data-message queues-mail boxes and pipes-timer function-events-memory management-interrupts routines.

TEXT BOOKS:

1. John B.Peatmen,LPE(PERSON EDITION)”Design with PIC Microcontrollers”Edition reprints in india,year 2005.
2. David E.Simon,”An Embedded Software Primer”.
3. Data sheet “PIC 16F87XX”.

Programme : B.Sc IT

Course Title: Elective : Compiler Design

Subject Code: 18UIT6EL2

Year: III

Semester: VI

6 Hours / week

5 Credits

COURSE OBJECTIVES

- Learn the design principles of a Compiler.
- Learn the various parsing techniques and different levels of translation
- Learn how to optimize and effectively generate machine codes

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	To realize basics of compiler design and apply for real time applications.
CO2	To introduce different translation languages
CO3	To understand the importance of code optimization
CO4	To know about compiler generation tools and techniques
CO5	To learn working of compiler and non-compiler applications

UNIT I

Introduction: Compilers: Analysis of source program – Phases of compiler- cousins of compiler – grouping of phases. Simple one – pass compiler : Overview – Syntax definition – syntax – directed translation – parsing – translator for simple expressions. Lexical Analysis: removal of white space and comments – constant – recognizing identifiers and keywords – a lexical analyzer – role of lexical analyzer – input buffering – specification of tokens – recognition of tokens (section 1.1 to 1.5, 2.5, 2.6, 3.1 to 3.4)

UNIT II

Symbol tables – incorporating a symbol table – symbol tables – entries – list data structures for symbol table – hash tables – scope information – Parsing – Principles top down parsing – predictive parsing, left recursion – role of parser – context-free grammars – writing a grammar – top down parsing – simple bottom up parsing – shift reduce parsing. (section 2.7 to 7.6, 2.4 and 4.1 to 4.5)

UNIT III

Syntax – directed translation – A translator for simple expressions – abstract and concrete syntax, adapting translations scheme, optimizing translator – syntax – directed definitions – construction of syntax trees – bottom up evaluation of S- attributed definitions – L-attributed definitions – top-down translation. Type checking: type system, specifications of simple type checker. (section 2.5 , 5.1 to 5.5 and 6.1)

UNIT – IV

Runtime Organization: Source language issues – storage organization – storage allocation strategies. Intermediate code generation: Intermediate languages – declarations – assignment statements. (section 7.1 to 7.3, 8.1 to 8.3)

UNIT – V

Code generation – issues in design of code generator – target machine – run-time storage management – basic blocks and flow graphs. Code optimization introduction – Principle sources of optimization. (section 9.1 to 9.4, 10.1,10.2)

TEXT BOOKS:

1. Compilers, Principles, Techniques and Tools, A.V. Aho, R. Sethi, and J. D. Ullman, Addison Wesley Publishing Company, 1986.

Programme: B.Sc IT

Course Title: Elective : Multimedia

Course Code: 18UIT6EL2

Year: III

Semester: VI

6 Hours / week

5 Credits

COURSE OBJECTIVES

- The overall objective of these courses is to develop multimedia professionals equipped with knowledge, skills and practical experience within the domain of technology, creativity and enterprise.
- With a strong focus on the creative aspects, there is a range of subjects that students have to study and practice.
- These include Graphic Design, Animation, Audio and Video, and Design for learning, web design and development.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the representation and characteristics in different medias.
CO2	Initiate about the visual and audio systems to take in to design and implementation.
CO3	Ability to understand and develop the multimedia applications.
CO4	Understanding the graphical design, animation and to learn about the web design and development.

GIMP

Unit I

What is Gimp (01-06) - The Tools (109-123) – Color Modes (187-190) – Transform Tools (155– Text and Fonts (165-166) – Brush Size & Shape (175-176) – Layers and Floating Selections (315-330)

Unit II

An Introduction To Filters (365-366) – Animation Filters (369-370) – Artistic Filters (375-396) –Blur Filters (401-408).

INKSCAPE

Unit III

Inkscape Interface (03-09) –Working with file (10-14) - Selector Tool (15-20) – Using the Ruler (118-128) – Using group commands (276-277) – Creating Object Symbol (283-287– Text Effects (69- 70)-Color Management(104-105)-Create a Basic Icon(114-121).

2D PENCIL

Unit IV

Properties Panel– Floating and Docking Panels– Tools Panel– Document Window– Drawing Tools– Document Library– Symbols – Basic Method of 2D Animation

Unit V

Onion Skinning-Cartoon Animation Techniques– Vectors and Bitmaps - Importing sound from 2D pencil– Exporting Video from 2D pencil .

TEXT BOOKS:

1. Steve Sayre THE COMPLETE GUIDE TO GIMP The Official Handbook © 1999 The Coriolis Group.
2. Adam Hyde Ink space manual 3D BOX TOOL© Joshua Facemyer 2008

REFERENCE E-BOOKS:

1. <http://spoken-tutorial.org/>
2. <https://inkscape.org/en/learn/books>
3. <https://www.pencil2d.org/>

Programme: B.Sc IT

Course Title: Elective : Computer Graphics

Subject Code: 18UIT6EL2

Year: III

Semester: VI

6 Hours / week

5 Credits

COURSE OBJECTIVES

- To understand computational development of graphics with mathematics.
- To learn the basic principles of 3- dimensional computer graphics
- Provide an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition.
- Provide an understanding of mapping from a world coordinates to device coordinates, clipping, and projections.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Understand the basic concepts used in computer graphics.
CO2	To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
CO3	Understand the importance of viewing and projections.
CO4	Understand the technical aspect of Multimedia Systems
CO5	Understand various file formats for audio, video and text media.

UNIT I

Interactive input devices: Keyboards-Mouse-Trackball and Space ball-Joysticks-data Glove-Digitizers-Image Scanners-Touch Panels-Light pens.

Output devices: Printers and Plotters, Output Primitives-DDA and Bresenham's line algorithm- Bresenham's circle algorithm -character generation.

UNIT II

Two dimensional transformations-scaling, Translation and Rotation-Matrix Representations-Composite transformations-Reflection-shearing, Windowing and Clipping concepts-Zooming Effect-Panning effect-Cohen and Sutherland line Clipping algorithm-interactive picture construction techniques.

UNIT III

Three Dimensional transformation-Scaling,translation,Rotation,Reflection,Shearing-Composite transformation-Back face removal-Depth buffer method-Scan line method-Depth sorting method-Area Subdivision method.

UNIT IV

Multimedia: Definition- Multimedia hardware-Multimedia software-Multimedia networking-Multimedia applications-Multimedia standards-Multimedia PC.

Text: Elements of Text-Text Technology-Fonts and coloring text.

UNIT V

Digital representation of sound-Transmission of digital sound-Digital signal processing-**Digital video and image compression**: video compression techniques – JPEG image compression standard – MPEG video compression standard.

TEXT BOOKS:

1. Donald Hearn and Pauline Baker '*Computer Graphics*', Prentice Hall of India, (UNIT I,II,III)
2. Toy Vaughon '*Multimedia Making it Work*', (UNIT IV)
3. John F.Koegel Budford, '*Multimedia Systems*', Addison Welsey (UNIT V).