

DEPARTMENT OF COMPUTER SCIENCE

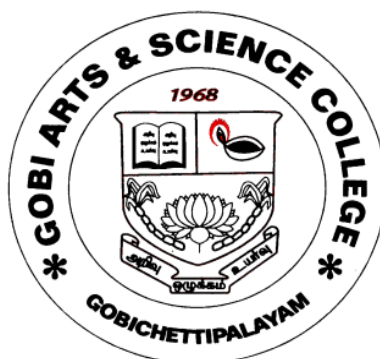
B.Sc. COMPUTER SCIENCE

(Students admitted during 2019-2020 Onwards)

(Under CBCS with Outcome Based Education (OBE) Pattern)

SYLLABUS

III & IV SEMESTER



GOBI ARTS & SCIENCE COLLEGE

(Govt. Aided Autonomous Co-educational Institution, Affiliated to
Bharathiar University, Coimbatore, Accredited with 'A' Grade by NAAC (4th cycle)
and Recognised as a STAR College by DBT, Government of India)

**KARATTADIPALAYAM POST,
GOBICHETTIPALAYAM - 638453
ERODE DISTRICT.**

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

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

I. END OF SEMESTER (EOS) EXAMINATIONS:

1. Part I, II & III-Theory: 70 Marks

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	$15 \times 1 = 15$	MCQ	70
K2	B (Either or Pattern)	$5 \times 5 = 25$	Short answers	
K3 & K4	C (Answer 3 out of 5)	$3 \times 10 = 30$	Descriptive/Detailed	

2. Practical Examinations: 70 Marks

Knowledge Level	Section		Total
	Practical	Record work	
K3	60	10	70
K4			
K5			

II. CONTINUOUS INTERNAL ASSESSMENT (CIA):

1. Test – I & II: 30 Marks (Theory)

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	$10 \times 1 = 10$	MCQ	30
K2	B (Answer 2 out of 3)	$2 \times 5 = 10$	Short answers	
K3 & K4	C (Answer 1 out of 2)	$1 \times 10 = 10$	Descriptive/Detailed	

2. Practical Internal Assessment: 30 Marks

Knowledge Level	Section		Total
	Test	Lab Performance	
K3	20	10	30
K4			
K5			

Components of Continuous Internal Assessment (CIA)

Components		Calculation	CIA Total
Test 1	30	$\frac{\text{Test 1} + \text{Test 2}}{2}$	30
Test 2	30		

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS05	Course Title:	Batch:	2019
Total Hours:	60	Data Structures Common for (CS, IT, CT & CA)	Semester:	III
			Credits:	3.5

Course Objective

The course aims

- To determine various data structures such as stacks, queues, arrays and lists.
- To understand and evaluate prefix, infix and postfix expression formats.
- To know about different types of sorting.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K2, K4	CO1	Gain knowledge on data structure operations and algorithms.
K4	CO2	Analyse searching techniques.
K2	CO3	Describe stack, queues and linked list operations.
K1, K3	CO4	Have knowledge of tree and graph concepts.
K1, K2	CO5	Illustrate types of sorting algorithms.

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

SYLLABUS		
Unit	Content	No. of Hours
I	Introduction – Basic Terminology: Elementary Data Organization – Data Structures – Data Structures Operations – Preliminaries – Mathematical Notation and Functions – Algorithmic Notation – Control Structure – Complicity of Algorithms – Other Asymptotic Notations for Complicity by Algorithms.	12
II	Arrays, Records and Pointers: Introduction – Linear Arrays – Representation by Linear Arrays in Memory – Traversing Linear Arrays – Inserting and Deleting – Linked List: Introduction Representation of Linked List in Memory – Traversing a Linked List – Searching a Linked List – <i>Memory Allocation</i> * – Insertion into a Linked List – Deletion from a Linked List.	12
III	STACKS, Queues, RECURSION: Introduction – Stacks – Arrays Representation of Stacks – Linked Representation of Stacks – Arithmetic Expression – Polish Notation – Quick Sort, an Application of Stacks – <i>Recursion</i> * – Towers of Hanoi – Queues – Linked Representation of Queues.	12
IV	TREES: Introduction – Binary Trees – Representing Binary Trees in memory – Traversing Binary Trees – Traversal Algorithms using Stacks – Graphs and their Applications – Graph theory Terminology – Sequential Representation of Graphs: Adjacency matrix, path matrix, Warshall's Algorithm, Shortest Paths.	12
V	Sorting and searching: Introduction – Sorting – Insertion Sort – Selection Sort – Merging – Merge Sort – Radix Sort – Searching and Data Modification – Hashing.	12

<* - Self study>

Text Book:

Seymour Lipschutz, GA Vijayalakshmi Pai, “*Data Structures*”, Tata McGraw HILL, Fourth Edition, 2006. (Unit I – V)

Reference Books:

1. Alfred V.Aho, John E. Hopcroft, Jeffrey D.Ullman, “*Data Structures and Algorithms*”, Pearson Education, First Edition, 2005.
2. Ellis Horowitz, Saartaj Sahni, “*Fundamentals of Data Structures*”, Galgotia Book Source, Fourth Edition, 1978.
3. Debasis Samanta, “*Classic Data Structures*”, PHI, Second Edition, 2009.

E-references:

1. <https://www.javatpoint.com/data-structure-tutorial>
2. <https://www.programiz.com/dsa>
3. <https://www.slideshare.net/PsEditor/data-structures-17664936>

Mapping with Programme Specific Outcomes

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

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

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS06	Course Title:	Batch:	2019
Total Hours:	60	Client Server Computing (Common for CS, BCA, CT & IT)	Semester:	III
			Credits:	3.5

Course Objective

The course aims

- To know about Client/Server Building Blocks.
- To learn about Transaction Processing.
- To know about Groupware & Distributed Objects and Components.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1	CO1	To understand the 3-tier software architecture (presentation/client tier, application tier, data tier).
K2	CO2	To write web applications using a combination of client-side.
K3	CO3	To design and implement network applications.
K4	CO4	To demonstrate the uses of client/server productivity software.
K5	CO5	To demonstrate the relationship between client/server productivity software and client/server resource management.

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

SYLLABUS		
Unit	Content	No. of Hours
I	INTRODUCTION TO CLIENT/SERVER COMPUTING: What is client/server?, File Servers, Database Servers, Transaction Servers, Groupware Servers, Object/Servers, Web Servers, Middleware, Fat Servers, Fat Clients, 2-tier versus 3-tier. CLIENT/SERVER BUILDING BLOCKS: Operating Systems, Base Services, Extended Services, Server Scalability - Remote Procedure Call (RPC), Messaging and Queuing.	12
II	SQL DATABASE SERVERS: SQL and Relational Databases, SQL Database Server Architecture, Stored Procedures, Triggers and Rules DATA WAREHOUSE: OLTP, Information Hounds, DSS, EIS, Elements Of Data Warehousing, Warehouse Hierarchies, Replication Versus Direct Access, The Mechanics Of Data Replication.	12
III	CLIENT/SERVER TRANSACTION PROCESSING: The ACID Properties, Transaction Models, TP MONITORS: TP Monitors, Transactions Management Standards.	12
IV	CLIENT/SERVER GROUPWARE: Importance of Groupware, Groupware, <i>Components of Groupware*</i> .	12

V	DISTRIBUTED OBJECTS AND COMPONENTS: Benefits of distributed objects, From Distributed Objects to components, 3- tier Client/Server, Object Style – CORBA – Distributed Objects, CORBA style, OMG's Object Management Architecture, Object Request Broker (ORB), Anatomy of a CORBA 2.0 ORB, CORBA Object Services, <i>CORBA Common Facilities</i> *.	12
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<* - Self Study>

Text Book:

Robert Orfali, Dan Harkey, Jeri Edwards, “THE ESSENTIAL CLIENT/SERVER SURVIVAL GUIDE”. Galgotia Publications Private Ltd., Second Edition, 2001. (Unit I to V).

Reference Books:

1. Steve Bobrowski, “Oracle 7.0 and Client/Server Computing”, BPB Publications, Second Edition, 1996.
2. Patrick Smith, Steve Guengerich, “Client/Server Computing”, PHI Learning, Second Edition, 2012.
3. Dawna Travis Dewire, “Client/Server Computing”, Tata McGraw Hill, First Edition, 2003.
4. Dr.A.Murugan, Dr.K.Shyamala, T.Sunitha Rani, “Client/Server Computing”, Margham Publications, First Edition, 2016.

E-references:

1. https://en.wikipedia.org/wiki/Client%E2%80%93server_model
2. https://www.webopedia.com/Computer_Science/Client_Server_Computing
3. <https://simple.wikipedia.org/wiki/Client-server>

Mapping with Programme Specific Outcomes

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

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

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS07	Course Title:	Batch:	2019
Total Hours:	60	Microprocessors and Assembly Language Programming (Common for CS, CT)	Semester:	III
			Credits:	3.5

Course Objective

The course aims

- To impart the basics of 8085 Microprocessor, learn and manipulate assembly language instructions.
- To acquire knowledge about Co-processor and various applications of Microprocessor.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2	CO1	Introduce the basic structure of 8085 Microprocessor and Machine cycle.
K1, K2, K3, K5	CO2	Understand Data Transfer, Arithmetic, Logic and Branch instructions and write simple ALP programs.
K2, K3, K4, K5	CO3	Program with looping techniques, Code Conversion and acquire knowledge about the interrupts.
K2, K4	CO4	Understand the need of Co-Processor and various applications of Co-processors.
K1, K2, K4	CO5	Learn the concepts of Data Communication and Interface between I/O and Microprocessor.

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

SYLLABUS		
Unit	Content	No. of Hours
I	Microprocessor Architecture and Micro Computer Systems: 8085 Bus Organization, Registers – 8085 Microprocessor Architecture and Memory Interfacing: 8085 MPU, 8085 Opcode Fetch and Memory Read Machine Cycles.	12
II	Introduction to 8085 Instructions: Data Transfer Operations, Arithmetic Operations, <i>Logic Operations</i> *, Branch Operations - Programming Techniques: Looping, Counting and Indexing, 16-Bit Arithmetic Instructions, Logic Operations: Rotate, Compare - Stack and Subroutine, Illustrative programs.	12
III	Counters and Time Delays: Time Delay using one Register, Register pair, Loop technique - Code Conversion: BCD to Binary, <i>Binary to BCD</i> * - Interrupts: 8085 Interrupt, Vectored Interrupts - Interfacing Data Converters : Digital to Analog Converters, Analog to Digital Converters.	12
IV	General Purpose Programmable Peripheral Devices: 8255A Programmable Peripheral Interface, Interfacing Keyboard and Seven Segment Display, 8259 Programmable Interrupt Controller, 8257 DMA Controller.	12
V	Serial I/O and Data Communication: Basic concepts in Serial I/O, 8251 USART - Applications: Interfacing Scanned Multiplexed Displays, Matrix Keyboard - 32 Bit Microprocessors: Intel Pentium Processor.	12

<* - Self Study>

Text Book:

S. Goankar, “Microprocessors Architecture, Programming And Applications With The 8085”, Penram International Publishing (India), 3rd Edition 1997. (UNIT I-V)

Reference Books:

1. V. Vijayendran, “*Fundamentals of Microprocessor 8085, Architecture, Programming & Interfacing*”, S. Viswanathan Publishers Pvt Ltd, 2004.
2. Pramod Borde, “*8085 Microprocessor Architecture and Programming*”, Ane Books Pvt Ltd, 2014.
3. Sunil Mathur, “*Microprocessor 8085 and its Interfacing*”, PHI learning Pvt Ltd, 2010.

E-references:

1. <https://www.tutorialspoint.com/microprocessor/microprocessor-8085-architecture.htm>
2. <https://nptel.ac.in/courses/108107029/>

Mapping with Programme Specific Outcomes

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

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

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS08	Course Title:	Batch:	2019
Total Hours:	60	Python Programming (Common for CS, CA, IT, CT)	Semester:	III
			Credits:	3.5

Course Objective

The course aims

- To learn core Python scripting elements such as variables and flow control structures.
- To acquire programming and Object Oriented Skills in Python.
- To learn file handling concepts and exception handling in Python.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2, K5	CO1	Explain the basic principles of Python programming language.
K1, K2, K5	CO2	Express different Decision Making statements, Arrays and Strings.
K1, K2, K3, K5	CO3	Describe the Functions, List, Tuples and Dictionaries.
K1, K2, K3, K4, K5	CO4	Implement the concept of Object Oriented Programming.
K1, K2, K3, K4, K5	CO5	Understand and design Interfaces, Exceptions and different File handling operations.

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

SYLLABUS

Unit	Content	No. of Hours
I	Introduction to Python: Python, Features of Python, Execution of Python program, Python Virtual Machine (PVM) Datatypes in Python: Comments in Python, DocStrings, How Python sees Variables, Datatypes in Python, Built-in Datatypes, bool Datatype, Sequences in Python, Sets, Literals in Python, Determining the Datatype of a Variable, What about Characters, User-defined Datatypes, Constants in Python, Identifier and Reserved words, Naming Conventions in Python. Operators in Python, Input and Output.	12
II	Control Statements: Control Statements, The if Statement, A Word on Indentation, The if...else Statement, The if...elif...else Statement, The while Loop, The for Loop, Infinite Loops, Nested Loops, The else Suite, The break Statement, The continue Statement, The pass Statement, The assert Statement, The return Statement, Arrays in Python: Array, Advantages of Arrays, Creating an Array, Importing the Array Module, Indexing and Slicing on Arrays, Processing the Arrays, Types of Arrays, String and Characters: Creating Strings, Length of a Sting, Indexing in Strings, Slicing the Strings, Repeating the Strings, Concatenation of Strings, Checking Membership, Comparing Strings, Removing spaces from a String, Finding Sub Strings, Counting Substrings in a String, Strings are Immutable, Replacing a String with another String, Splitting and Joining Strings, Changing Case of a String, Checking Starting and Ending of a String, String Testing Methods.	12

III	Functions: Difference between a Function and a Method, Defining a Function, Calling a Function, Returning Results from a Function, Returning Multiple Values from a Function, Functions are First Class Objects, Pass by Object Reference, Formal and Actual Arguments, Positional Arguments, Keyword Arguments, Default Arguments, Variable Length Arguments, Local and Global Variables, The Global Keyword, Passing a Group of Elements to a Function, Recursive Functions. Lists and Tuples, Dictionaries.	12
IV	Introduction to OOPs: Classes and objects- Creating a Class, The self Variable, constructor, Types of Variables, Namespace, Types of Methods, Passing Members of One Class to Another Class, Inner Class. Inheritance and Polymorphism.	12
V	Abstract classes and Interfaces: Method and class, Interfaces in Python, Abstract classes Vs Interfaces, Exceptions- Errors in a python programs, Exceptions, Exception Handling, Types of Exceptions, * <i>Files in python- Files, Types of File in Python, Opening a File, Closing a File, Working with Text Files Containing Strings, Knowing Whether a File Exists or Not, Working with Binary Files, The With Statement, The seek() and tell() Methods, Random Accessing of Binary Files.</i>	12

<* - Self Study>

Text Book:

Dr. R. Nageswara Rao, “Core Python Programming”, Second Edition, Dreamtech Press, 2018. (Unit – I to V)

Reference Books:

1. B. Nagesh Rao, “Learning Python”, CyberPlus Infotech Pvt. Ltd., 2016-17.
2. Mike McGrath, “Python – in easy steps”, McGraw Hill Education (India) Private Limited, 2013.
3. Ashok Namdev Kamthane, Amit Ashok Kamthane, “Programming and Problem Solving with PYTHON”, McGraw Hill Education (India) Private Limited, 2018.
4. Reema Thareja, “Problem Solving and Programming with Python”, Oxford University Press, 2018.

E-references:

1. <https://www.tutorialspoint.com/python/index.htm>
2. <https://www.learnpython.org/>
3. <https://www.geeksforgeeks.org/python-programming-examples/>

Mapping with Programme Specific Outcomes

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

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

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UBCS01	Course Title:	Batch:	2019
Total Hours:	75	Numerical Methods (Common for CS, BCA, IT, CT)	Semester:	III
			Credits:	5.0

Course Objective

The course aims

- To enhance the problem solving skills to find the roots of linear and non-linear equations.
- To understand numerical differentiation and integration and numerical solutions of ordinary and partial differential equations.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2, K3	CO1	Understand the basics of numerical Algebraic and Transcendental Equations, Remember and solve the problems.
K1, K2, K3	CO2	Understand and solve simultaneous Linear Algebraic Equations using various methods.
K1, K3, K4	CO3	Remember the concepts of interpolation, analyse and apply it for numerical differentiation.
K2, K3, K4, K5	CO4	Choose, formulate and implement appropriate numerical methods for solving integration problems.
K2, K3, K4, K5	CO5	Understand, analyse and evaluate various methods of Ordinary Differential Equations.

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

SYLLABUS

Unit	Content	No. of Hours
I	The Solution of Numerical Algebraic and Transcendental Equations – Bisection method – Iteration method – Newton-Raphson method – The method of False Position.	15
II	The Solution of Simultaneous Linear Algebraic Equation – Gauss Elimination method – <i>Gauss Jordan Elimination method</i> * – Triangularization Method – Gauss Seidal method – Gauss Jacobi method.	15
III	Interpolation – Newton's Forward Interpolation formula – Newton's Backward Interpolation formula – LaGrange's formula. Numerical Differentiation – Newton's Forward Difference formula – <i>Newton's Backward Difference formula</i> *.	15
IV	Numerical Integration – Trapezoidal rule – Simpson's One –third rule – Simpson's three – eighths rule.	15
V	Numerical solution of ordinary differential equations – Taylor method – Euler method – Euler Modified method – Runge-Kutta method – Predictor Corrector Methods – Adam's Method – Milne Methods.	15

<* - *Self Study*>

Text Book:

P. Kandasamy, K.Thilagavathi, K.Gunavathi, "Numerical Methods", Third Edition, Chand & Company Ltd, New Delhi, 2005.

Reference Books:

1. V.Rajaraman, "*Computer Oriented Numerical Methods*", Third Edition, PHI Learning Private Limited, 2011.
2. S.Sastry, "*Introductory Methods of Numerical Analysis* " Fifth Edition, PHI Learning Private Limited, 2012.
3. E.V.Krishnamurthy, S.K.Sen, "*Numerical Algorithms*", Third Edition, Affiliated East-West Press Private Limited, 1986.

E-references:

1. <https://www.math.ust.hk/~machas/numerical-methods.pdf>
2. https://en.wikibooks.org/wiki/Numerical_Methods/Equation_Solving
3. <http://mathworld.wolfram.com/NumericalIntegration.html>

Mapping with Programme Specific Outcomes

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

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

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACSPC	Course Title:	Batch:	2019
Total Hours:	60	Programming Lab - III : (Data Structures in C) (Common for CS, IT, CT & BCA)	Semester:	III
			Credits:	2.0

Course Objective

The course aims

- To determine various data structures such as stacks, queues, arrays and lists.
- To understand and evaluate prefix, infix and postfix expression formats.
- To know about different types of sorting.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K2, K4	CO1	Gain knowledge on data structure operations and algorithms.
K4	CO2	Analyze searching techniques.
K2	CO3	Describe stack, queues and linked list operations.
K1, K3	CO4	Have knowledge of tree and graph concepts.
K3, K4, K5	CO5	Illustrate types of sorting algorithms.

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

SYLLABUS	
1.	Write a C program to find factorial of the given number using recursion.
2.	Write a C program to find Fibonacci series up to the given limit using recursion.
3.	Write a C program to find GCD for the given two numbers using recursion.
4.	Write a C program display the movement disks to give a tower using recursion.
5.	Write a C program to find binomial co-efficient for the given numbers.
6.	Write a C program to search the given number by linear search.
7.	Write a C program to search the given number by Binary search.
8.	Write a C program to sort the given numbers using Insertion sort.
9.	Write a C program to sort the given numbers using Quick sort.
10.	Write a C program to display the sparse matrix.
11.	Write a C program to perform Stack operations.
12.	Write a C program to perform Queue operations.
13.	Write a C program to convert infix to postfix expression.
14.	Write a C program to evaluate postfix expression.
15.	Write a C program to add two polynomial equations.

Text Books:

1. Seymour Lipschutz, GA Vijayalakshmi Pai, “Data Structures”, Tata McGraw HILL, Fourth Edition, 2006.
2. E. Balagurusamy, “Programming in Ansi C”, Second Edition, Tata McGraw Hill Publications, 2003.

Reference Books:

1. Alfred V.Aho, John E. Hopcroft, Jeffrey D.Ullman, “*Data Structures and Algorithms*”, Pearson Education, First Edition, 2005.
2. Ellis Horowitz, Saartaj Sahni, “*Fundamentals of Data Structures*”, Galgotia Book Source, Fourth Edition, 1978.
3. Debasis Samanta, “*Classic Data Structures*”, PHI, Second Edition, 2009.
4. Ashok N. Kamthane, “*Programming in C*”, Second Edition, Pearson, 2006.
5. Herbert Schildt, “*C: The Complete Reference*”, Fourth Edition, Tata McGraw-Hill, 2008.

E-references:

1. <https://www.javatpoint.com/data-structure-tutorial>
2. <https://www.programiz.com/dsa>
3. <https://www.slideshare.net/PsEditor/data-structures-17664936>

Mapping with Programme Specific Outcomes

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

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

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACSPD	Course Title:	Batch:	2019
Total Hours:	60	Programming Lab – IV: (Python Programming) (Common for CS, CA, IT, CT)	Semester:	III
			Credits:	2.0

Course Objective

The course aims

- To learn core Python scripting elements such as variables and flow control structures.
- To acquire programming and Object Oriented Skills in Python.
- To learn file handling concepts and exception handling in Python.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2, K5	CO1	Explain the basic principles of Python programming language.
K1, K2, K5	CO2	Express different Decision Making statements, Arrays and Strings.
K1, K2, K3, K5	CO3	Describe the Functions, List, Tuples and Dictionaries.
K1, K2, K3, K4, K5	CO4	Implement the concept of Object Oriented Programming.
K1, K2, K3, K4, K5	CO5	Understand and design Interfaces, Exceptions and different File handling operations.

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

SYLLABUS

1. Write a Python program to print prime numbers.
2. Write a Python program to check the given string is palindrome or not.
3. Write a Python program to print fibonacci series.
4. Write a Python program to find the factorial value for a given number using recursive function.
5. Write a Python program to count the total number of vowels, consonants and words in a text sentence.
6. Write a Python program to perform stack operations using list.
7. Write a Python program to perform queue operations using list.
8. Write a Python program to perform built in functions of list manipulation.
9. Write a Python program to create a file.
10. Write a Python program to read and display file content.
11. Write a Python program to print the calendar.
12. Write a Python program to display student details using simple class.
13. Write a Python program to implement the concept of constructor.
14. Write a Python program to perform operator overloading.
15. Write a Python program to implement the concept of single inheritance.

Text Book:

Dr. R. Nageswara Rao, “*Core Python Programming*”, Second Edition, Dreamtech Press, 2018.
(Unit – I to V)

Reference Books:

1. B. Nagesh Rao, “Learning Python”, CyberPlus Infotech Pvt. Ltd., 2016-17.
2. Mike McGrath, “*Python – in easy steps*”, McGraw Hill Education (India) Private Limited, 2013.
3. Ashok Namdev Kamthane, Amit Ashok Kamthane, “Programming and Problem Solving with PYTHON”, McGraw Hill Education (India) Private Limited, 2018.
4. Reema Thareja, “Problem Solving and Programming with Python”, Oxford University Press, 2018.

E-references:

1. <https://www.tutorialspoint.com/python/index.htm>
2. <https://www.learnpython.org/>
3. <https://www.geeksforgeeks.org/python-programming-examples/>

Mapping with Programme Specific Outcomes

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

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

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS09	Course Title:	Batch:	2019
Total Hours:	75	Visual Programming (Common for CS, BCA, IT and CT)	Semester:	IV
			Credits:	4.0

Course Objective

The course aims

- To introduces computer programming using the Visual BASIC programming language with object oriented programming concepts.
- To emphasis is on event driven programming methods, including creating and manipulating objects, classes, and using object oriented tools such as the class debugger.
- To upon completion, students should be able to design, code, test and debug at a beginning level.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2, K4	CO1	Able to learn visual programming basics and its components.
K1, K2, K3, K4, K5	CO2	To Learn Windows Forms, common controls, design-view, code view, class diagram view
K1, K2, K3, K5	CO3	Cover visual programming skills needed for modern software development.
K1, K2, K3, K5	CO4	Learn the Visual Basic syntax, program structure, properties, modules, procedure, functions with the event-driven programming model.
K1, K2, K3, K5	CO5	Make familiar with Database connectivity and Window Programming.

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

SYLLABUS		
Unit	Content	No. of Hours
I	INTRODUCTION TO VISUAL BASIC: Introduction – Features of VB – Visual Basic Concept- Visual basic environment – Properties, Methods and Events – Debugging – Difference between .Exe And .Dll file. VB PROGRAMMING BASICS: Introduction – Keyword – Data Types – Variables – Literals – Operators in VB – Some useful Function.	15
II	WORKING WITH CONTROLS: Introduction – Intrinsic and Container Control – Working with Controls – Create Event Procedure – Manipulating Forms – Basic Controls – Control Arrays – Some useful Events – ActiveX Control – Object Linking and Embedding (OLE) – Dialog box.	15
III	CONTROL STRUCTURE: Introduction – Control flow – Decision Structures – If...Then Statement – Select...Case Statement – Looping Structure – For...next – Do loop Structure – While...Wend – Problems with loop – Arrays – Dimension of an Array – Declaring Array – Static and Dynamic Array – Arrays within UDTs – Array within another Array.	15

IV	PROCEDURES, FUNCTIONS AND MODULES: Introduction – Procedures – Sub Procedures(Sub-routines) – Function Procedure – Passing Parameters to Procedures – Property Procedure – Code module – <i>Library Function</i> *.	15
V	VB INTERFACE STYLE: Introduction – Interface Style – Creating Menus – Designing Menus – Popup Menus. ERROR HANDLING AND FILE HANDLING: Introduction – Types of Error – Handling Errors – Trap the Error – Handle the Error – File Handling. DATABASE CONNECTIVITY AND VISUAL DATABASE TOOLS: Introduction – DB Concepts – Data access mechanism – DB Engine – VB Data Control – Company Database – <i>Visual Database Tools</i> *.	15

<* - Self Study>

Text Book:

Dr.Narendra Kumar, Shilpi Srivastava, Rajesh Chadhary, Hariom Pancholi. “*VISUAL BASIC*”, Vayu Education of India, 1st Edition, 2011.

Reference Books:

1. Mohammed Azam, “*Programming with VISUAL BASIC 6.0*”, Vikas Publishing House Pvt Ltd, 2009.
2. Gray Cornell, “*VISUAL BASIC 6.0 FROM THE GROUND UP*”, Tata McGraw Hill, 2013.
3. N.Krishnan, N.Saravanan,”*MARTERING VISUAL BASIC 6.0 IN DAYS*”, SCITECH Publications Pvt. Ltd., 2012.
4. Hasit Mehta, Radhika Raval, “*VISUAL BASIC Applications & Programming*”, ACME Learning Pvt. Ltd., 1st Edition, 2010.

E-references:

1. <https://lecturenotes.in/materials/17698-note-of-visual-basic-by-magesh-kid>
2. <https://www.scribd.com/doc/24339321/Visual-Basic-6-0-Notes-short>
3. <https://www.uotechnology.edu.iq/appsciences/filesPDF/material/lectures/2c/5-Computer1.pdf>
4. https://www.vbtutor.net/vb6/vb6_preview.pdf

Mapping with Programme Specific Outcomes

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

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

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS10	Course Title:	Batch:	2019
Total Hours:	75	Computer Oriented Statistical Methods (Common for CS, BCA, IT, CT)	Semester:	IV
			Credits:	4.0

Course Objective

The course aims

- To work with computer oriented statistical problems.
- To understand various types of measures and statistical methods.
- To make students aware of SPSS package in accounting.

Course Outcomes (CO)

Knowledge Level	CO Number	Course Outcomes
K1, K2, K3	CO1	Understand the basic statistical parameters and calculate Mean, Median and Mode for the tabulated data.
K1, K2, K3	CO2	Remember the meaning of statistical indicators and calculate Measures of Dispersion, Skewness, Moments and Kurtosis.
K1, K2, K3, K5	CO3	Gain knowledge of Correlation and Regression and solve Correlation Coefficient and Regression Equation problems.
K1, K3, K4, K5	CO4	Know the underlying concepts of Index Numbers and solve numerical applications.
K2, K3, K4, K5	CO5	Understand the SPSS tools and manipulate files and graphs using SPSS.

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

SYLLABUS		
Unit	Content	No. of Hours
I	Statistics: Definition – Classification and Tabulation of Data – Measures of Central values: Mean – Median – Mode – Their Relationship – Problems.	12
II	Measures of Dispersion: Range – Quartile Deviation - Mean Deviation – Standard Deviation - Skewness, Moments and Kurtosis: Introduction - Measures of Skewness, Moments and Kurtosis.	12
III	Correlation: Meaning - Types – Methods – Scatter diagram - Karl Pearson's coefficient of correlation – Rank correlation – Problems - Regression: Uses – Regression lines – Regression equations – Curve Fitting – Straight line, parabola and <i>exponential curves</i> *.	12
IV	Index numbers: Definition – Uses – Unweighted and weighted index numbers – properties of good index numbers – Cost of Living index – Baseline Shifting – Splicing and deflating index numbers.	12
V	SPSS: SPSS for windows – SPSS Windows process – Creating and editing data file – Managing Data – <i>Graphs</i> *.	12

<* - Self study>

Text Books:

1. R.S.N.Pillai, Bagavathi, “*Statistics*”, Third Edition, S.Chand & Company Ltd, New Delhi, 2012. (UNIT I - IV)
2. Darren George, Paul Mallery, “*SPSS For Windows Step By Step*”, Eighth Edition, Pearson Education. (UNIT- V).

Reference Books:

1. C.B.Gupta, Vijay Gupta, "*An Introduction To Statistical Methods*", Twenty Third Revised Edition, Vikas Publishing House Pvt Ltd, 2013.
2. M.C.Shukla, S.S.Gulshan, "*Statistics*", Second Revised Edition, S.Chand & Company Pvt Ltd, 1975.

E-references:

1. <http://abyss.uoregon.edu/~js/glossary/correlation.html>
2. <https://www.thoughtco.com/what-is-statistics-3126367>
3. <https://explorable.com/course/statistics-beginners-guide>
4. <https://www.spss-tutorials.com/basics/>

Mapping with Programme Specific Outcomes

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

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

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UABM51	Course Title:	Batch:	2019
Total Hours:	90	Accounting and Management	Semester:	IV
			Credits:	4.0

Course Objective

The course aims

- To educate the students in maintaining a complete and systematic record of all transactions and analyzing the financial position of a business and to ascertaining the net profit earned or loss suffered on account of carrying the business.
- To help the students gain understanding of the functions and responsibilities of managers and to help the students to get aware towards varied management principles and practices.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K3	CO1	Understand the basics of record keeping.
K4	CO2	Impart knowledge in ascertaining profit or loss.
K4	CO3	Know about the technical knowledge of accounting.
K1	CO4	Understand what is meant by management and managerial effectiveness.
K2	CO5	Demonstrate the roles, skills and functions of management.

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

SYLLABUS

Unit	Content	No. of Hours
I	Introduction to Accounting Accounting – Definition and Functions – Accounting Conventions, Concepts – Systems of Accounting- Rules for Double Entry- System of Book Keeping- Preparation of Journal, Ledger and Trial Balance (Excluding rectification of errors).	18
II	Final Accounts Trading and Profit & Loss Account and Balance Sheet with simple adjustments only.	18
III	Cost and Management Accounting Definitions, Difference between Financial, Cost and Management Accounting- Elements of Cost- Preparations of Simple Cost Sheet. Marginal Cost- Meaning, Preparation of Marginal Cost Statement, P/V Ratio, BEP, Margin of Safety and Profit (Simple problems only).	18
IV	Introduction to Management Management – Meaning, Principles, Functions. Planning – Importance and Process. Organizing – Features and Importance *. Staffing- Meaning and Functions. Directing – Elements and Importance. Controlling – Importance and Process.	18
V	Management Functions Production Management – Objectives and Function. Marketing Management – Objectives and Functions. Human Resource Management – Objectives and Functions. Financial Management – Objectives * and Functions.	18

<* - *Self Study*>

Text Books:

1. T.S. GREWAL, Introduction to accounting, S. Chand Publications.
2. JAIN & NARANG, Cost accounting, Kalyani Publishers.
3. Koontz, H, & Weihrich, H (2016). Essentials of Management: An International Perspective (8th ed.), Tata McGraw Hills, New Delhi.

Reference Books:

1. SHARMA & GUPTA: Principles of Management accounting, Kalyani Publishers.
2. YK. BHUSAN: Business organization and Management, Sultan Chand & Sons Publication.
3. Ramaswamy, I. (2011). Principles of Business Management, (8th ed.), Himalaya Publishing House, New Delhi.

E-references:

1. <https://www.courseera.org/lecture/accounting-finance/introduction-to-accounting-KeWn5>.
2. <https://www.icsi.edu/media/webmodules/publications>
3. <https://www.managementstudyguide.com/management-functions-html>.

Mapping with Programme Specific Outcomes

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	M
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	L	S	S	S	S

S-Strong, M-Medium and L-Low

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACSPE	Course Title:	Batch:	2019
Total Hours:	60	Programming Lab - V : (Visual Programming) (Common for CS, BCA, IT and CT)	Semester:	IV
			Credits:	2.0

Course Objective

The course aims

- To understand the structure of visual programming.
- To learn usage of basic concepts of visual programming.
- To know how to use Lists, Database Connectivity, Functions in visual programming programs.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2, K5	CO1	Construct and execute basic programs in Visual programming.
K1, K2, K5	CO2	Identify and repair coding errors in a program.
K1, K2, K3, K5	CO3	Use primitive data types, control statements, functions to write programs.
K1, K2, K3, K4, K5	CO4	Use of controls in Visual programming.
K1, K2, K3, K4, K5	CO5	Develop programs to solve a variety of problems in science, business and games.

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

SYLLABUS

1.	Write a VB equivalent Program to find the sum of digits of the given number.
2.	Write a VB equivalent Program to exchange items among two list boxes.
3.	Write a VB equivalent Program to change the text foreground color and textbox Background color using scroll bar.
4.	Write a VB equivalent Program to check whether the given string is palindrome or not.
5.	Write a VB equivalent Program to replace the given character and to find the number of occurrences of the given character.
6.	Write a VB equivalent Program to find the factorial value and generate the fibonacci series for the given number.
7.	Write a VB equivalent Program to move the text in the label box using slider control.
8.	Write a VB equivalent Program to change the size of an image in a picture box.
9.	Write a VB equivalent Program to use the various options of the common dialog boxes.
10.	Write a VB equivalent Program for moving an image randomly within a window using timer control.
11.	Write a VB equivalent Program to design a calculator for performing arithmetic Operations.
12.	Write a VB equivalent Program to draw different shapes using menu editor.
13.	Write a VB equivalent Program to view the employee details stored in a database table using MYSQL.
14.	Write a VB equivalent Program to generate a telephone bill stored in a database table using MYSQL.

15.	Write a VB equivalent Program to generate student mark sheet stored in a database table using MYSQL.
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Text Book:

Dr.Narendra Kumar, Shilpi Srivastava, Rajesh Chadhary, Hariom Pancholi. “*VISUAL BASIC*”, Vayu Education of India, 1st Edition, 2011.

Reference Books:

1. Mohammed Azam, “*Programming with VISUAL BASIC 6.0*”, Vikas Publishing House Pvt Ltd, 2009.
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2. <https://www.scribd.com/doc/24339321/Visual-Basic-6-0-Notes-short>
3. <https://www.uotechnology.edu.iq/appsciences/filesPDF/material/lectures/2c/5-Computer1.pdf>
4. https://www.vbtutor.net/vb6/vb6_preview.pdf

Mapping with Programme Specific Outcomes

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

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

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACSPF	Course Title:	Batch:	2019
Total Hours:	60	Programming Lab - VI : (SPSS and TALLY)	Semester:	IV
			Credits:	2.0

Course Objective

The course aims

- To work with Ledger, Voucher, Profit and Loss Account, Balance Sheet, Inventory Valuation and Trail Balance.
- To make students aware of Descriptive Statistics, 't' test, ANOVA, Chi-square, Correlation and Regression.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2	CO1	Understand the basic key components of Ledger, Accounting and Inventory Vouchers.
K1, K2, K3	CO2	Acquire knowledge on the preparation of Profit and Loss Account, Balance Sheet and Trail Balance.
K2, K3, K4	CO3	Enhance the computerised accounting skills.
K1, K2, K3, K5	CO4	Ability to interpret the accounting and inventory statements by applying journal entries.
K1, K2, K3	CO5	Understand the SPSS tools and carry out statistical analysis to test hypotheses.

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

SYLLABUS

1.	From the following particular prepare the ledger accounts of Mr. Ilango for the year of Dec, 2009.		
	Date	Particulars	Amount (Rs)
	Dec 1	Cash balance	8000
	Dec 7	Bought goods for cash	25000
	Dec 9	Purchase goods on credit from Guru	6000
	Dec 12	Goods sold to Somu on credit	8000
	Dec 14	Paid Guru	6000
	Dec 17	Cash received from Somu	8000
	Dec 20	Paid trade expenses	10000
	Dec 21	Received cash from Krishna	10000
	Dec 27	Commission received	5000

2. Prepare the ledger accounts of Mr. Raja for the year of March, 2009.

Date	Particulars	Amount (Rs)
Mar 1	Cash in hand	46000
Mar 2	Paid into bank	12000
Mar 3	Cash sales	24000
Mar 5	Credit sales to Mani	3000
Mar 7	Painting charges	3000
Mar 9	Received cheque from Natesan	8000
Mar 12	Dividend received	2000
Mar 14	Computer purchased	35000
Mar 17	Cash received from Mani	3000
Mar 24	Cash withdraw from bank	2000

3. From the following particular prepare the ledger accounts of Mr. Ilango for the year of April, 2009.

Date	Particulars	Amount (Rs)
Apr 5	Bought goods from Velan	6750
Apr 8	Cash purchase	3000
Apr 11	Cash sales	4000
Apr 15	Sold goods to Guru	2000
Apr 17	Cash paid to Ramu	850
Apr 19	Paid salary	1000
Apr 21	Received cash from Ramesh	200
Apr 25	Paid for advertisement	100
Apr 27	Bought goods	3000
Apr 30	Cash withdraw from bank	2000

4. From the following particular prepare the ledger accounts of Mr. Ram.

Date	Particulars	Amount (Rs)
1	Ram invested cash in business	200000
2	Paid into bank	50000
3	Purchased building	70000
4	Purchased Goods	50000
5	Sold goods	60000
6	Withdraw cash from bank	10000
7	Paid electronic charges	300
8	Paid salary	1500

5. From the following particular prepare the ledger accounts of Mr. Surya for the year ended January 2010

Date	Particulars	Amount (Rs)
1	Surya invested cash in business	50000
2	Purchase flat	10000
3	Purchased goods from Krishna	8000
4	Purchased Goods for cash	120000
5	Sold goods to Balu	10000
6	Sold goods for cash	12000
7	Purchased furniture	6000

	8	Paid salary	4000
	9	Paid rent	2000
	10	Received commission	1000
6.	From the following particular prepare the ledger accounts of Mr. Sekar&Co for the year ended Feb 2010		
	Date	Particulars	Amount (Rs)
	1	Sold on credit to Ram & Co	325
	2	Purchase on credit from Hari	1200
	3	Purchased for cash from Mohan & Co	300
	4	Sold to Gopal on credit	125
	5	Return to Hari	2000
	7	Purchased from Murugan&Co	500
	8	Gopal returned goods to us	25
7.	From the following particular prepare the ledger accounts of Mr. Ilango for the year of April, 2009.		
	Date	Particulars	Amount (Rs)
	Apr 7	Bought goods from Suresh	5500
	Apr 8	Cash Sales	5000
	Apr 12	Cash Purchase	4000
	Apr 15	Sold goods to Guru on credit	2000
	Apr 16	Cash received from Ramu	850
	Apr 19	Paid salary	1000
	Apr 21	Received cash from Ramesh	200
	Apr 25	Paid for advertisement	100
	Apr 27	Bought goods	3000
	Apr 30	Cash withdraw from bank	2000
8.	From the following particular prepare the ledger accounts of Mr. Mano.		
	Date	Particulars	Amount (Rs)
	1	Mano invested cash in business	100000
	2	Paid into bank	5000
	3	Purchased stationary	7000
	4	Purchased furniture for cash	40000
	5	Sold goods for cash	75000
	6	Withdraw cash from bank	10000
	7	Paid for advertisement	7000
	8	Paid salary	3500
9.	From the following particular prepare the ledger accounts of Mr. Sethu&Co for the year ended Feb 2010.		
	Date	Particulars	Amount (Rs)
	1	Sold on credit to Ram	3000
	2	Purchase goods from Hari	12000
	3	Purchased for cash from Mohan	30000
	4	Sold to Gopal on credit	125

	<table border="1"> <tr> <td>5</td> <td>Return from Hari</td> <td>20000</td> </tr> <tr> <td>7</td> <td>Purchased from Murugan on credit</td> <td>5000</td> </tr> <tr> <td>8</td> <td>Returned goods to Murugan</td> <td>250</td> </tr> </table>	5	Return from Hari	20000	7	Purchased from Murugan on credit	5000	8	Returned goods to Murugan	250																					
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11.	<p>Prepare the ledger accounts of Mr. Deepak for the year of March, 2009.</p> <table border="1"> <thead> <tr> <th>Date</th> <th>Particulars</th> <th>Amount (Rs)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Cash in hand</td> <td>45000</td> </tr> <tr> <td>3</td> <td>Cash purchase</td> <td>34000</td> </tr> <tr> <td>5</td> <td>Credit sales to Mani</td> <td>3000</td> </tr> <tr> <td>7</td> <td>Stationary charges</td> <td>3000</td> </tr> <tr> <td>9</td> <td>Received cheque from Natesan</td> <td>8000</td> </tr> <tr> <td>12</td> <td>Dividend paid</td> <td>2500</td> </tr> <tr> <td>14</td> <td>Purchased computer for sales</td> <td>25000</td> </tr> <tr> <td>17</td> <td>Cash received from Mani</td> <td>3000</td> </tr> <tr> <td>24</td> <td>Paid into bank</td> <td>2000</td> </tr> </tbody> </table>	Date	Particulars	Amount (Rs)	1	Cash in hand	45000	3	Cash purchase	34000	5	Credit sales to Mani	3000	7	Stationary charges	3000	9	Received cheque from Natesan	8000	12	Dividend paid	2500	14	Purchased computer for sales	25000	17	Cash received from Mani	3000	24	Paid into bank	2000
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12.	10 individuals choose at random from a population and their heights are found to be inches 63, 65, 66, 67, 68, 69, 70, 71, 71, 50 in the height of the data. Discuss the suggestion that the mean height in the populations is 66 inches apply 'T' test once sample.																														
13.	<p>11 school boys were given a test in statistics they were given a month's tuition and a school test were held at the end of its. Do the marks given evidence that the students have benefited by the extra – working applying paired T – test.</p> <table border="1"> <tr> <td>X</td> <td>23</td> <td>20</td> <td>19</td> <td>21</td> <td>18</td> <td>20</td> <td>18</td> <td>17</td> <td>23</td> <td>16</td> <td>19</td> </tr> <tr> <td>Y</td> <td>24</td> <td>19</td> <td>22</td> <td>18</td> <td>20</td> <td>22</td> <td>20</td> <td>20</td> <td>23</td> <td>20</td> <td>17</td> </tr> </table>	X	23	20	19	21	18	20	18	17	23	16	19	Y	24	19	22	18	20	22	20	20	23	20	17						
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Y	24	19	22	18	20	22	20	20	23	20	17																				
14.	<p>The three table samples below have been obtained from normal population which equal variances. Test for hypothesis that the sample means are equal by using one way ANOVA method [F-Test].</p> <table border="1"> <tr> <td>Sample1</td> <td>8</td> <td>10</td> <td>7</td> <td>14</td> <td>11</td> </tr> <tr> <td>Sample2</td> <td>7</td> <td>5</td> <td>10</td> <td>9</td> <td>9</td> </tr> <tr> <td>Sample3</td> <td>12</td> <td>9</td> <td>13</td> <td>12</td> <td>14</td> </tr> </table>	Sample1	8	10	7	14	11	Sample2	7	5	10	9	9	Sample3	12	9	13	12	14												
Sample1	8	10	7	14	11																										
Sample2	7	5	10	9	9																										
Sample3	12	9	13	12	14																										
15.	<p>Calculate the co-efficient of correlation between X and Y for the following Data.</p> <table border="1"> <tr> <td>X</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> </tr> <tr> <td>Y</td> <td>9</td> <td>8</td> <td>10</td> <td>12</td> <td>11</td> <td>13</td> <td>14</td> <td>16</td> <td>15</td> </tr> </table>	X	1	2	3	4	5	6	7	8	9	Y	9	8	10	12	11	13	14	16	15										
X	1	2	3	4	5	6	7	8	9																						
Y	9	8	10	12	11	13	14	16	15																						

Text Books:

1. C. Nellaikannan, “Tally”, Second Edition, 2005.
2. Darren George, Paul Mallery, “SPSS For Windows Step By Step”, Eighth Edition, Pearson Education.

Reference Book:

Ashok K Nadhani, “Tally.ERP 9 Made Simple Basic Financial Accounting”, BPB Publication.

E-references:

1. <https://accountsarabia.com/tally-services/tally-documentation>
2. <https://www.spss-tutorials.com/basics/>

Mapping with Programme Specific Outcomes

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

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

Question Paper Pattern

(Common for Major, Allied, Allied Optional and Major Optional Papers)

For EOS Examinations: 70 Marks

The Question Paper is to be divided into THREE Sections.

Section-A Carries 15 Marks, Section-B Carries 25 Marks and Section-C Carries 30 Marks.

Section-A Contains 15 Multiple Choice Questions. (15 x 1 = 15 Marks)

Three Questions from each unit. (Q. No: 1 to 15)

Section-B Contains 5 Either or Choice Questions. (5 x 5 = 25)

Each Question carries 5 Marks. Both (a) and (b) from the same unit.

Q. No.: 16 (a) or (b) to 20(a) or (b)

Section-C Contains 5 Questions out of which, 3 Questions are to be answered. (3 x 10 = 30)

Each Question carries 10 Marks. One Question from each unit. Q. No.: 21 to 25

For CIA Examinations: 30 Marks

Section-A: 10 Multiple Choice Questions. (10 x 1 = 10)

Section-B: Two Questions out of Three. (2 x 5 = 10)

Section-C: One Question out of Two. (1 x 10 = 10)

Programme Code:	ALL U.G.	Programme Title:	Allied Optional	
Course Code:	19UDCS01	Course Title:	Batch:	2019
Total Hours:	90	Principles of Information Technology	Semester:	IV
			Credits:	5.0

Course Objective

The course aims

- To understand the fundamental of computers.
- To gain knowledge about software terminologies.
- To know about the networks and internet concepts.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K2,K3	CO1	Understand the fundamentals of computers and its applications.
K1,K4	CO2	Master the function of each element of a memory hierarchy.
K1,K2	CO3	Be familiar with input and output devices.
K3,K4,K5	CO4	Gain knowledge on Categories of Software.
K2,K4	CO5	Identify the basics of networks and to get familiar with internet concepts.

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

SYLLABUS

Unit	Content	No. of Hours
I	Computer Basics : Introduction – Characteristics of Computers – Evolution of Computers – Generations of Computers – First Generation – Second Generation – Third Generation – Fourth Generation – Fifth Generation–Classification of Computers –Micro computers – Minicomputers – Mainframes – Supercomputers – The Computer Systems - Components of a Computer System – Applications of Computers.	18
II	Memory and Storage Systems: Introduction – Memory Representation – Random Access Memory – Static RAM – Dynamic RAM - Read only Memory – Programmable ROM - Electrically Erasable PROM – <i>*Flash ROM</i> .	18
III	Input Devices: Introduction – Keyboard – Pointing Devices: Mouse – Trace ball – Light pen – Joystick – Touch Screen. Output Devices: Introduction – Display Monitors - Printers: Impact Printers - Dot Matrix Printers – Daisy Wheel Printers – Drum Printers - Non-Impact Printers – Ink-jet Printers – <i>*Laser Printers</i> .	18
IV	Computer Software: Introduction – Software: Definition – Relationship between Software & Hardware –Categories of Software – System Software – Application Software - Installing and Uninstalling Software – Software Piracy – Types of Software Piracy – Preventing Software Piracy – Software Terminologies.	18

V	Computer Network : Types of Computer Networks –Network Topologies – Bus Topology – Ring Topology – Star Topology – Tree Topology – Mesh Topology - Communication Protocol – The OSI Model – The Internet : Introduction– Evolution of Internet –Basic Internet Terms – Getting Connected to the Internet – Internet Applications - Electronic Mail (E-mail) - File Transfer Protocol (FTP) - Telnet – Internet Relay Chat (IRC) - Chatting and Instant – Messaging – Internet Telephony – Video Conferencing - Commerce through the Internet – Newsgroups (Usenet) - Mailing Lists (Listserver) -Data Over the Internet – Static Component – Dynamic component.	18
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<* - Self Study>

Text Books:

1. “Introduction to Information Technology”, ITL Education Solutions Limited, PEARSON Education, 2008. (Unit I, IV, V)
2. Balagurusamy E, “Fundamentals of Computers”, McGraw Hill Publications Pvt Ltd, 2011. (Unit II, III)

Reference Books:

1. Rizwan P. Ahmed, “Introduction to Information Technology”, Marghan Publications, 2016.
2. Saravanakumar R, Parameshwaran R, Jayalakshmi T, “A TextBook of Information Technology”, S.Chand & Company Ltd., 2007.

E-references:

1. https://www.tutorialspoint.com/fundamentals_of_science_and_technology/information_technology.htm
2. <https://www.geeksforgeeks.org/basics-of-computer-and-its-operations/>

Mapping with Programme Specific Outcomes

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

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

Programme Code:	ALL U.G.	Programme Title:	Allied Optional	
Course Code:	19UDCS02	Course Title:	Batch:	2019
Total Hours:	90	Introduction to System Programming	Semester:	IV
			Credits:	5.0

Course Objective

The course aims

- To know about Hardware and Software.
- To understand the concept of Algorithm, flowcharts and Computer language.
- To understand components and performance of system programming.

Course Outcomes (CO)

Knowledge Level	CO Number	Course Outcomes
K1, K2, K4	CO1	Understand the working knowledge of hardware and software of computer.
K2, K3, K5	CO2	Learn the use of flowchart and program planning.
K1, K2, K3	CO3	Describe and explain the fundamental of a computer operating system and Process Management.
K1, K2, K3, K5	CO4	Learn the various features of MS-Office and apply it.
K1, K2, K3, K5	CO5	Get the knowledge on Business data processing and data Management.

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

SYLLABUS		
Unit	Content	No. of Hours
I	Basic computer organization – Computer software: What is software – Relationship between H/W & S/W – types of S/W – Logical system Architecture – Acquiring S/W – S/W development steps – Firmware.	18
II	Planning the computer program: Purpose of program planning – Algorithm – Flowcharts – What is a flowchart? Computer languages: Machine language – Assembly language – High level language.	18
III	Operating system: What is an OS? – Measuring System Performance – Process Management – Some Popular Operating System.	18
IV	Application S/W Packages: Word Processing Packages – Spreadsheet Package – Graphics Package – <i>Personal Assistant Package</i> *.	18
V	Business Data programming: What is a data processing? – Data Storage Hierarchy – standard method of Organizing Data file Management System – <i>file utilities</i> * – Main Components of a DBMS.	18

<* - Self study>

Text Book:

Pradeep K.Sinha, Priti Shinha, “COMPUTER FUNDAMENTALS” – BPB Publications – Third Edition – 2003.

Reference Books:

1. William Stallings (2009), "Operating Systems – Internals and Design Principles", Sixth Edition, Pearson Education.
2. V.Rajaram (2006), "Introduction to Information Technology", Prentics Hall India.
3. Chanchal Mittal, Pragati (2006), "Information Technology", 6th Edition.

E-references:

1. <http://www.geekforgeeks.org>.
2. <http://compsc.hunter.cuny.edu>.
3. [http://www.tutorialspoint.system programming](http://www.tutorialspoint.systemprogramming)

Mapping with Programme Specific Outcomes

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

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

Programme Code:	ALL U.G.	Programme Title:	Allied Optional	
Course Code:	19UDCS03	Course Title:	Batch:	2019
Total Hours:	90	Introduction to ERP	Semester:	IV
			Credits:	5.0

Course Objective

The course aims

- To provide Basic knowledge of ERP.
- To understanding of the concepts of ERP systems, their architecture, and working of different modules.
- To provide a contemporary and forward-looking on the theory and practice of ERP Technology.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2	CO1	Understand the basic use of Enterprise software, and its role in integrating business functions.
K2, K4, K5	CO2	Analyse the strategic options for ERP identification and adoption.
K2, K3, K5	CO3	Know and be able to apply key technical terminology in different ERP products and development methods.
K3, K4, K5	CO4	Create re engineered business processes for successful ERP implementation.
K2, K3, K4, K5	CO5	Develop skills necessary for building and managing relationships with customers, and stakeholders.

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

SYLLABUS		
Unit	Content	No. of Hours
I	Introduction to ERP: Introduction to computer – Parts of a Computer – Introduction to ERP – Evolution of ERP – What is ERP? – Reasons for the growth of the ERP market – The advantages of ERP – Why do many ERP implementations fail? Why are Packages being used now?	18
II	Enterprise – An Overview: Integrated Management Information – Business Modeling – Integrated Data model. ERP and Related Technologies: Introduction – Business Process Reengineering – Management Information System (MIS) – Decision Support System (DSS) – Executive Information System (EIS) – Data Warehousing – Data Mining – Online Analytical Processing (OLAP) –Supply Chain Management.	18
III	ERP Modules: Finance – Sales and Distribution – Manufacturing – Human Resources – Plant Maintenance – Quality Management – Materials Management.	18
IV	ERP Implementation Life Cycle: Introduction – Pre-evaluation Screening – Package Evaluation – Project Planning Phase – GAP analysis – Reengineering – Configuration – Implementation – <i>Team Training</i> * – Post Implementation.	18

V	Vendors – Consultants and Users: Vendors – Consultants – End Users. Future Direction in ERP: Introduction – New Markets – New Channels – Faster Implementation Methodologies – Web Enabling – <i>Market Snapshot*</i> .	18
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<* - Self Study>

Text Book:

Alexis Leon, “*Enterprise Resource Planning*”, Tata McGraw – Hill Publishing Company Ltd, 2004.

Reference Books:

1. Ellen Monk, Bret Wagner, “*Concepts In Enterprise Resource Planning*”, CENGAGE Learning, Third Edition, 2012.
2. D.P. Goyal, “*Enterprise Resource Planning: A Managerial Perspective*”, Tata McGraw – Hill Education Private Limited, 2012.
3. N.Venkateswaran, “*Enterprise Resource Planning*”, SCITECH Publications (INDIA) Pvt Ltd, 2010.
4. Veena Bansal, “*Enterprise Resource Planning: A Managerial Perspective*”, Pearson Publications, 2013.

E-references:

1. https://en.wikipedia.org/wiki/Enterprise_resource_planning
2. <https://www.inc.com/encyclopedia/enterprise-resource-planning-erp.html>

Mapping with Programme Specific Outcomes

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

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