AVS

COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

Attur Main Road, Ramalingapuram, Salem - 106.

(Recognized under section 2(f) & 12(B) of UGC Act 1956 and

Accredited by NAAC with 'A' Grade)

(Co - Educational Institution | Affiliated to Periyar University, Salem

ISO 9001 : 2015 Certified Institution)

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Syllabus for

B. Sc COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM –

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK

(CBCS – LOCF)

(Applicable to the Candidates admitted from 2023-24 onwards)

VISION

- To attain excellence in the field of education by creating competent scholars with a touch of human values.

MISSION

- To accomplish eminence in the academic domain.
- To provide updated infrastructure.
- To educate value based education.
- To impart skills through efficient training programs.
- To cultivate culture and tradition with discipline and determination.

REGULATIONS

1. Eligibility for Admission:

Higher Secondary pass with Mathematics as one of the Subject. (OR) Higher Secondary pass with Computer Science / Computer Applications / Information Technology / Computer Technology / Business Mathematics/ Statistics as one of the courses and have not studied Mathematics should undergo a bridge course on Mathematics for a minimum duration of 15 days.

2. Duration:

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

3. Eligibility for award of degree:

Candidates who obtain 75% and above in the aggregate shall be deemed to have passed the examination in **First Class with Distinction** provided they pass all the examinations prescribed for the programme at the first appearance. Candidates, other than the above, who secure not less than 60% of the aggregate marks in the whole examinations, shall be declared to have passed the examination in **First Class**. The remaining successful candidates shall be declared to have passed in **Second Class**. Candidates who pass all the examinations prescribed for the programme in first instance and within a period of two academic years from the year of admission are only eligible for **University Ranking.**

4. Course of Study:

To develop the Post Graduate in Computer Science with strong knowledge of theoretical computer science and who can be employed in research and development units of industries and academic institutions.

5. Scheme of Examination:

Evaluation will be done on a continuous basis and will be evaluated four times during the course work. Evaluation Will be objective type questions, short answers, essay so recombination of these, but the end semester examination is a prescribed question paper pattern.

6. Passing Rules:

The Passing minimum shall be 50% out of 75 marks (30 marks)(Record Note must be compulsorily submitted while attending the Practical Examination and No passing minimum)

The candidate shall be declared to have passed in the Theory / Practical / Project Work examination, if the candidate secures not less than 50% marks in EA and also in total of the prescribed marks. However submission of a record note book is a must.

The candidate shall be declared to have passed in the theory/practical/Dissertation examination if the candidate secures:

(i)50% marks in the ESE and

(ii)50% in ESE and IA put together

i) Theory

Evaluation of Internal Assessment: (25 Marks)

Evaluation of End Semester Examinations: 75 Marks

ii) Practical

 PRACTICAL / MINI PROJECT EXAMINATION

 Evaluation of Internal Assessment: 40

 External Assessment :60

Programme Outcomes (POs)	
On successful completion of the B. Sc Computer Science	
PO1	Knowledge- To apply knowledge of mathematics, science, fundamentals, problem solving skills, algorithmic analysis to solve complex problems.
PO2	Problem analysis- To analyze the problem by finding its domain and applying domain specific skills.
PO3	Design/development of solutions- To understand the design issues of the product/software and develop effective solutions with appropriate consideration of public health and safety, cultural, societal, and environmental issues.
PO4	Conduct investigations of complex problems- To find solutions of complex problems by conducting investigations applying suitable techniques.
PO5	Modern tool usage- To adapt the usage of modern tools and recent software.
PO6	Environment and sustainability- To understand environment issues and design a sustainable system.
PO7	Ethics- To understand and follow professional ethics.
PO8	Individual and team work- To function effectively as an individual and as member or leader in diverse teams and interdisciplinary settings.
PO9	Communication- To demonstrate effective communication at various levels.
PO10	Life-Long Learning- To keep in touch with current technologies and inculcate the practices of lifelong learning.

Program Specific Outcomes (PSOs)	
After the successful completion of B. Sc Computer Science programme the students are expected to	
PSO1	Think in a critical and logical based manner.
PSO2	Familiarize the students with suitable software tools of computer science and industrial applications to handle issues and solve problems in mathematics or statistics and real time application related sciences.
PSO3	Acquire good knowledge and understanding to solve specific theoretical and applied problems in advanced areas of Computer science and Industrial statistics.

PSO4	Understand, formulate, develop programming model with logical approaches to an Address issues arising in social science, business and other contexts.
PSO5	Provide students/learners sufficient knowledge and skills enabling them to undertake further studies in Computer Science or Applications or Information Technology and its allied areas on multiple disciplines linked with Computer Science.
PSO6	Develop a range of generic skills helpful in employment, internships& societal activities.

Programme Educational Objectives (PEOs)
The B. Sc Computer Science programme describes accomplishments that graduates are expected to attain within five to seven years after graduation.

PEO1	Graduates are prepared to be employed in IT industries by providing expected domain Knowledge.
PEO2	Graduates are provided with practical training, hands-on to meet the industrial needs.
PEO3	Graduates are motivated in career and entrepreneurial skill development to become global leaders.
PEO4	Graduates are trained to demonstrate creativity, develop innovative ideas and. to work in teams to accomplish a common goal.
PEO5	Graduates are trained to address social issues and guided to approach problems with Solutions.

CREDIT DISTRIBUTION FOR 3 YEARS B. Sc COMPUTER SCIENCE PROGRAMME

Part	Course Type	Credits per Course	No. of Papers	Total Credits
Part I	Language – I (Tamil/Hindi/French)	3	4	12
Part II	Language – II (English)	3	4	12
Part III	Core Courses- Theory	5	3	15
	Core Courses- Theory	4	5	20
	Core Courses- Theory	2	1	2
	Core Courses- Practical	3	4	12
	Core Courses- Practical	4	2	8
	Major Elective Courses- Theory	3	4	12
	Major Elective Courses- Practical	-	-	-
	Generic Discipline Specific/ Allied Courses - Theory	5	2	10
	Generic Discipline Specific/ Allied Courses - Theory	4	2	8
	Generic Discipline Specific/ Allied Courses - Practical	3	1	3
			Total	**114**
Part IV	Non Major Elective Courses	2	2	4
	Skill Enhancement Courses	2	5	10
	Skill Enhancement Courses	1	1	1
	Professional Competency Skill Enhancement Course	-	-	-
	EVS (Environmental Studies)	2	1	2
	Value Education	2	1	2
	Internship	2	1	2
	project with viva voce	4	1	4
	Research Project (for PG only)	-	-	-
	MOOC/ SWAYAM/ NPTEL Courses	1	1	1
			Total	**26**
Part V	Extension Activity (NSS/NCC/Physical Education)	1	1	1
Part VI	Naan Mudhalvan Scheme (Online Examination &Project work)	-	-	-
			Total Credits	**141**

CONSOLIDATED SEMESTER WISE AND COMPONENT WISE CREDIT DISTRIBUTION FOR 3 YEARS B. Sc COMPUTER SCIENCE PROGRAMME

Parts	Semester I	Semester II	Semester III	Semester IV	Semester V	Semester VI	Total Credits
Part I	3	3	3	3			12
Part II	3	3	3	3			12
Part III	13	13	12	14	18	18	88
Part IV	4	4	3	7	8	2	28
Part V	-	-	-	-	-	1	1
Total	23	23	21	27	26	21	141

*Part I, II and Part III components will be separately taken into account for CGPA calculation and classification for the under graduate programmes and the other components IV and V have to completed during the duration of the programmes as per the norms, to be eligible for obtaining the UG degree.

METHOD OF EVALUATION

Evaluation	Components		Marks
Internal Evaluation	Continuous Internal Assessment Test	15	25 Marks
	Assignments	3	
	Class Participation	2	
	Distribution of marks for Attendance (in percentage) 96 – 100: 5 Marks 91 – 95: 4 Marks 86 – 90: 3 Marks 81 – 85: 2 Marks	5	
External Evaluation	End Semester Examination		75 Marks
Total			**100 Marks**

Note: 1.UG Programmes- A candidate must score minimum 10 marks in Internal and 30 marks in External Evaluation.

2. PG Programmes- A candidate must score minimum 13 marks in Internal and 38 marks in External Evaluation.

CONTINUOUS INTERNAL ASSESSMENT

Categorizing Outcome Assessment Levels Using Bloom's Taxonomy

level	Cognitive Domain	Description
K1	Remember	It is the ability to remember the previously learned concepts or ideas.
K2	Understand	The learner explains concepts or ideas.
K3	Apply	The learner uses existing knowledge in new contexts.
K4	Analyze	The learner is expected to draw relations among ideas and to compare and contrast.
K5	Evaluate	The learner makes judgements based on sound analysis.
K6	Create	The learner creates something unique or original.

Question Paper Blue Print for Continuous Internal Assessment- I& II

Duration: 2 Hours							Maximum: 50 marks
Section	K level						Marks
	K1	K2	K3	K4	K5	K6	
A (no choice)	10						10 X 1 =10
B (no choice)		1	1				2 X 5 =10
C (either or choice)				3			3 x 10 = 30
Total							50 marks

Note: K4 and K5 levels will be assessed in the Model Examination whereas K5 and K6 Levels will be assessed in the End Semester Examinations.

Question Paper Blue Print for Continuous Internal Assessment- I

Time: 2 Hours   Total Marks: 50 Marks   Minimum Pass: 20 Marks

Unit	Section - A	Section - B	Section - C
I	Q.N. 1, 2, 3, 4, 5	Q.N. 11	Q.N. 13 A, 13 B
I or II	-	-	Q.N. 14 A, 14 B
II	Q.N. 6, 7, 8, 9, 10	Q.N. 12	Q.N. 15 A, 15 B

SECTION – A (10 X 1 = 10 Marks)

ANSWER ALL THE QUESTIONS

SECTION – B (2 X 5 = 10 Marks)

ANSWER ALL THE QUESTIONS

SECTION – C (3 X 10 = 30 Marks)

ANSWER ALL THE QUESTIONS (Either or Choice)

Question Paper Blue Print for Continuous Internal Assessment- II

Time: 2 Hours   Total Marks: 50 Marks   Minimum Pass: 20 Marks

Unit	Section - A	Section - B	Section - C
III	Q.N. 1, 2, 3, 4, 5	Q.N. 11	Q.N. 13 A, 13 B
III or IV	-	-	Q.N. 14 A, 14 B
IV	Q.N. 6, 7, 8, 9, 10	Q.N. 12	Q.N. 15 A, 15 B

SECTION – A (10 X 1 = 10 Marks)

ANSWER ALL THE QUESTIONS

SECTION – B (2 X 5 = 10 Marks)

ANSWER ALL THE QUESTIONS

SECTION – C (3 X 10 = 30 Marks)

ANSWER ALL THE QUESTIONS (Either or Choice)

Question Paper Blue Print for Model Examination & End Semester Examination

Duration: 3 Hours								Maximum: 75 marks

Section		K level						Marks
		K1	K2	K3	K4	K5	K6	
A (no choice, three questions from each unit)		15						15 X 1 =15
B (choice, one question from each unit)			1	1				2 X 5 =10
C (either or choice& two questions from each unit)	*Courses with K4 as the highest cognitive level*				4	1		5 x 10 = 50
	Course with K5 as the highest cognitive level wherein three K4 questions and two K5 questions are compulsory.				3	2		
	Course with K6 as the highest cognitive level wherein two questions each on K4, K5 and one question on K6 are compulsory.				2	2	1	
Total								75 marks

Question Paper Blue Print for Model Examination & End Semester Examination

Time: 2 Hours   Total Marks: 75 Marks   Minimum Pass: 30 Marks

Unit	Section - A	Section - B	Section - C
I	Q.N. 1, 2, 3	Q.N. 16	Q.N. 21 A, 21 B
II	Q.N. 4, 5, 6	Q.N. 17	Q.N. 22 A, 22 B
III	Q.N. 7, 8, 9	Q.N. 18	Q.N. 23 A, 23 B
IV	Q.N. 10, 11, 12	Q.N. 19	Q.N. 24 A, 24 B
V	Q.N. 13, 14, 15	Q.N. 20	Q.N. 25 A, 25 B

SECTION – A (15 X 1 = 15 Marks)

ANSWER ALL THE QUESTIONS

SECTION – B (2 X 5 = 10 Marks)

ANSWER ANY TWO QUESTIONS

SECTION – C (5 X 10 = 50 Marks)

ANSWER ALL THE QUESTIONS (Either or Choice)

Question Paper Blue Print for Model Practical Examination & End Semester Examination (Practical)

Time: 3 Hours   Total Marks: 100 Marks   Minimum Pass: 40 Marks

Practical Marks	Maximum Mark	Minimum Mark
Internal	25	10
External	75	30
Total	100	40

Evaluation for End Semester Examinations (Practical)

Record	10 marks
Problem Understanding	10 marks
Implementation	20 marks
Viva-voce	05 marks
Debugging and Modification	20 marks
Result with units	10 marks
TOTAL	**75 MARKS**

*Submission of record with due certification is a must for external practical examinations.

**A student should complete all requires experiments to get 10 marks for the record.

Scheme of Examination for B. Sc Computer Science

First Year – Semester - I

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
I	23UTA01	Podhu Tamil – I	3	3	25	75	100
II	23UEN01	General English – I	3	3	25	75	100
III	23UCSCC01	CC1- Python Programming	5	5	25	75	100
	23UCSCCP01	CC2 - Practical- Python Programming Lab	4	3	25	75	100
	23UMAEGS05	Elective Course Generic Specific EC I - Introduction to Linear Algebra	6	5	25	75	100
IV	23UCSFC01	Foundation Course FC- Problem Solving and Techniques	3	2	25	75	100
	23UTANE01	Non Major Elective Course- Pechukakalai Thiran	1	2	25	75	100
Total			**25**	**23**			

First Year – Semester - II

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
I	23UFTA02	Podhu Tamil – II	3	3	25	75	100
II	23UFEN02	General English – II	3	3	25	75	100
III	23UCSCC02	CC3- Data Structure and Algorithms	5	5	25	75	100
	23UCSCCP02	CC4-Practical- Data Structure and Algorithms Lab	3	3	25	75	100
	23UMAEGS04	Elective Course Generic Specific EC II - Optimization Techniques	3	3	25	75	100
	23UMAGSP03	Elective Course Generic Specific EC II - Optimization Techniques Practical	3	2	25	75	100
IV	23UCSSE02	Skill Enhancement Course III -Introduction to HTML	3	2	25	75	100
	23UBXNE002	Non Major Elective Course- Managerial Skill Development	2	2	25	75	100
Total			**25**	**23**			

Second Year – Semester - III

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
I	23UFTA03	Podhu Tamil – III	3	3	25	75	100
II	23UFEN03	General English – III	3	3	25	75	100
III	23UCSCC03	CC5 – Microprocessor and Microcontroller	5	5	25	75	100
	23UCSCCP03	CC6 - Practical- Microprocessor and Microcontroller lab	4	3	25	75	100
	23USTAT04	Elective course Generic specific EC III **-** Statistical Method and its Application-I.	5	4	25	75	100
IV	23UCSSE16	Skill Enhancement Course IV - Organization Behavior	2	1	25	75	100
	23UCSSE04	Skill Enhancement Course V - PHP Programming	3	2	25	75	100
Total			**25**	**21**			

Second Year – Semester - IV

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
I	23UTA04	Podhu Tamil –IV	3	3	25	75	100
II	23UEN04	General English – IV	3	3	25	75	100
III	23UCSCC04	CC7- Java programming	4	4	25	75	100
	23UCSCCP04	CC8- Practical - Java Programming Lab	4	3	25	75	100
	23USTAT05	Elective course Generic specific EC IV - Statistical Method and its Application-II.	4	4	25	75	100
	23USTAP03	Allied Statistics Practical	2	3	25	75	100
IV	23UCSSE06	Skill Enhancement Course VI - Understanding Internet	2	2	25	75	100
	23UCSSE05	Skill Enhancement Course VII -Software Testing	2	2	25	75	100
	23UEVS01	Environmental Studies	1	2	25	75	100
		Swayam	-	1			
Total			**25**	**27**			

Third Year – Semester -V

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
III	23UCSCC05	CC9 – Software Engineering	5	4	25	75	100
	23UCSCC06	CC10 – Database Management System	4	4	25	75	100
	23UCSCCP06	CC11 – Practical- Database Management System Lab	4	4	25	75	100
	23UCSDE10	Elective Course Discipline Specific EC V – Artificial Intelligence	4	3	25	75	100
	23UCSDE05	Elective Course Discipline Specific EC VI - IOT and its applications	4	3	25	75	100
IV	23UCSCCPR1	CC12 – core/ project with viva voce	2	4	25	75	100
		Value education	2	2	25	75	100
		Internship / Industrial Training (summer vacation at the end of IV semester activity	-	2			
Total			**25**	**26**			

Third Year – Semester -VI

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
III	23UCSCC07	CC13 – Computer Networks	4	4	25	75	100
	23UCSCC08	CC14 - .NET programming	4	4	25	75	100
	23UCSCCP08	CC15 – Practical- .NET Programming Lab	4	4	25	75	100
	23UCSDE03	Elective Course Discipline Specific EC VII - Cryptography	5	3	25	75	100
	23UCSDE14	Elective Course Discipline Specific EC VIII - Cloud Computing	5	3	25	75	100
IV	23UCSSE12	Skill Enhancement Course VIII - Cyber Forensics	3	2	25	75	100
V		Extension Activity	-	1			
Total			**25**	**21**			

Ins. Hrs – Instructional Hours, CIA-** Continuous Internal Assessment**, ESE-** End SemesterExamination

Semester: I	Course Code: 23UCSCC01	Hours/Week: 5	Credit: 4
COURSE TITLE: CC1 - PYTHON PROGRAMMING			

Course Overview:

1. To impart Practical Training in basic python statements.

2. Familiarize with control flow statement.

3. Build programs using function concepts.

4. Provide knowledge on working with exception and string handling.

Learning Objectives:

1. To make students understand the concepts of Python programming.

2. To apply the OOPs concept in PYTHON programming.

3. To impart knowledge on demand and supply concepts.

4. To make the students learn best practices in PYTHON programming.

5. To know the costs and profit maximization.

Unit - I	Basics of Python Programming	15 Hours

History of Python - Features of Python – Literal - Constants - Variables – Identifiers – Keywords – Built - in Data Types - Output Statements – Input Statements - Comments – Indentation – Operators – Expressions - Type conversions. Python Arrays- Defining and Processing Arrays – Array methods.

Unit - II	Control Statements	15 Hours

Selection/Conditional Branching statements - if, if - else, nested if and if - else if - else statements. Iterative Statements - while loop, for loop, else suite in loop and nested loops. Jump Statements - break, continue and pass statements.

Unit - III	Functions	15 Hours

Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. Function Arguments - Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments - Recursion. Python Strings - String operations - Immutable Strings - Built-in String Methods and Functions - String Comparison. Modules - import statement - The Python module – dir() function – Modules and Namespace – Defining our own modules.

Unit - IV	Lists And Dictionaries	15 Hours

Lists - Creating a list - Access values in List - Updating values in Lists - Nested lists - Basic list operations - List Methods. Tuples - Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples – Difference between lists and tuples. Dictionaries - Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.

Unit - V	Python File Handling	15 Hours

Types of files in Python - Opening and Closing files- Reading and Writing files - write() and write lines() methods- append() method – read() and read lines() methods – with keyword – Splitting words – File methods - File Positions- Renaming and deleting files.

Text Book(s):

1. Reema Thareja, ― Python Programming using problem solving approach‖, First Edition, 2017, Oxford University Press.
2. Dr. R. Nageswara Rao, ― Core Python Programming‖, First Edition, 2017, Dream tech Publishers.

Reference Books:

1. Vamsi Kurama, ― Python Programming- A Modern Approach‖, Pearson Education.
2. Mark Lutz, ‖Learning Python‖, Orielly.
3. Adam Stewarts, ―Python Programming‖, Online.
4. Fabio Nelli, ―Python Data Analytics‖, APress.

Web Resources:

1. https-//www.programiz.com/python-programming
2. https-//www.guru99.com/python-tutorials.html
3. https-//www.w3schools.com/python/python_intro.asp
4. https-//www.geeksforgeeks.org/python-programming-language/

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:

Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Learn the basics of python, Do simple programs on python, Learn how to use an array.	K1
CO2	Develop program using selection statement, Work with Looping and jump statements, Do programs on Loops and jump statements.	K2
CO3	Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules.	K3
CO4	Work with List, tuples and dictionary, Write program using list, tuples and dictionary.	K4
CO5	Usage of File handlings in python, Concept of reading and writing files, Do programs using files.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**
CO1	3	3	2	3	3	3	2	2	2
CO2	3	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	2	3
CO4	3	3	3	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3	2	3

3 - Strong, 2 – Medium, 1 – Low

Semester: I	Course Code- 23UCSFC01	Hours/Week: 3	Credit: 2

COURSE TITLE: FOUNDATION COURSE FC - PROBLEM SOLVING TECHNIQUES

Course Overview:

1. Recognize the Basic Terminologies of C Programming.

2. Understanding the statement structure and apply simple problems.

3. Understand and apply the pre-defined functions and user defined functions and then apply in simple problems.

4. Demonstrate the operation of Files.

Learning Objectives:

1. Familiarize with writing of algorithms, fundamentals of C and philosophy of problem solving.

2. Implement different programming constructs and decomposition of problems into functions.

3. Use data flow diagram, Pseudo code to implement solutions.

4. Define and use of arrays with simple applications.

5. Understand about operating system and their uses.

Unit - I	Introduction	06 Hours

Introduction - History, characteristics and limitations of Computer. Hardware/Anatomy of Computer - CPU, Memory, Secondary storage devices, Input Devices and Output devices. Types of Computers - PC, Workstation, Minicomputer, Main frame and Supercomputer. Software - System software and Application software. Programming Languages - Machine language, Assembly language, High - level language,4 GL and 5GL - Features of good programming language. Translators- Interpreters and Compilers.

Unit - II	Data & Flowcharts, Pseudo code	06 Hours

Data - Data types, Input, Processing of data, Arithmetic Operators, Hierarchy of operations and Output. Different phases in Program Development Cycle (PDC). Structured Programming - Algorithm - Features of good algorithm, Benefits and drawbacks of algorithm. Flowcharts- Advantages and limitations of flowcharts, when to use flowcharts, flowchart symbols and types of flowcharts. Pseudo code - Writing a pseudo code. Coding, documenting and testing a program - Comment lines and types of errors. Program design - Modular Programming.

Unit - III	Selection and Repetition Structures	06 Hours

Selection Structures - Relational and Logical Operators - Selecting from Several Alternatives – Applications of Selection Structures. Repetition Structures - Counter Controlled Loops – Nested Loops– Applications of Repetition Structures.

Unit - IV	Data	06 Hours

Data- Numeric Data and Character Based Data. Arrays - One Dimensional Array - Two Dimensional Arrays – Stringsas Arrays of Characters.

Unit - V	Data Flow Diagrams and File Basics	06 Hours

Data Flow Diagrams - Definition, DFD symbols and types of DFDs. Program Modules-Subprograms - Value and Reference parameters - Scope of a variable - Functions – Recursion. Files- File Basics - Creating and reading a sequential file - Modifying Sequential Files.

Text Book(s):

1. Stewart Venit, "Introduction to Programming - Concepts and Design", Fourth Edition, 2010, Dream Tech Publishers.

Reference Books:

1. V. Rajaraman Computer Programming in C Prentice Hall of India Pvt Ltd, 1st Edition,2004.

2. Yashwvant   Kanetkar Let us C BPB Publications 13th Edition, 2014.

Web Resources:

1. https-//www.codesansar.com/computer-basics/problem-solving-using-computer.htm

2. http-//www.nptel.iitm.ac.in/video.php?subjectId=106102067

3. http-//utubersity.com/?page_id=876

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:
Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Study the basic knowledge of Computers.Analyze the programming languages.	K1
CO2	Study the data types and arithmetic operations.Know about the algorithms. Develop program using flow chart and pseudocode.	K2
CO3	Determine the various operators.Explain about the structures. Illustrate the concept of Loops.	K3
CO4	Study about Numeric data and character-based data. Analyze about Arrays.	K4
CO5	Explain about DFD Illustrate program modules. Creating and reading Files.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3
CO3	3	2	3	3	3	3	3	3	3
CO4	3	3	2	3	3	2	3	3	2
CO5	3	3	3	3	3	3	3	3	3

3 - Strong, 2- Medium-2, 1 – Low

Semester: I	Course Code: 23UCSCCP01	Hours/Week: 4	Credit: 4
COURSE TITLE: CC2 – Practical - PYTHON PROGRAMMING LAB			

Course Overview:

1.   Be able to design and program Python applications.

2.   Be able to create loops and decision statements in Python.

3.   Be able to work with functions and pass arguments in Python.

4.   Be able to build and package Python modules for reusability.

Learning Objectives:

1.   To make students understand the concepts of Python programming.

2.   To apply the OOPs concept in PYTHON programming.

3.   To impart knowledge on demand and supply concepts

4.   To make the students learn best practices in PYTHON programming

5.   To know the costs and profit maximization.

LAB EXERCISES

 1. Program using variables, constants, I/O statements in Python.

 2. Program using Operators in Python.

 3. Program using Conditional Statements.

 4. Program using Loops.

 5. Program using Jump Statements.

 6. Program using Functions.

 7. Program using Recursion.

 8. Program using Arrays.

 9. Program using Strings.

 10. Program using Modules.

 11. Program using Lists.

 12. Program using Tuples.

 13. Program using Dictionaries.

 14. Program for File Handling.

Text Book(s):

1. Reema Thareja, ― Python Programming using problem solving approach‖, First Edition, 2017, Oxford University Press.

2. Dr. R. Nageswara Rao, ― Core Python Programming‖, First Edition, 2017, Dream tech Publishers.

Reference Books:

1. Vamsi Kurama, ―Python Programming- A Modern Approach‖, Pearson Education.

2. Mark Lutz, ‖Learning Python‖, Orielly.

3. Adam Stewarts, ―Python Programming‖, Online.

4. Fabio Nelli, ―Python Data Analytics‖, APress.

Web Resources:

1.   https-//www.programiz.com/python-programming

2.   https-//www.guru99.com/python-tutorials.html

3.   https-//www.w3schools.com/python/python_intro.asp

4.   https-//www.geeksforgeeks.org/python-programming-language/

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

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Learning Outcomes:
Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Demonstrate the understanding of syntax and semantics of PYTHON language.	K1
CO2	Identify the problem and solve using PYTHON programming techniques.	K2
CO3	Identify suitable programming constructs for problem solving.	K3
CO4	Analyze various concepts of PYTHON language to solve the problem in an efficient way.	K4
CO5	Develop a PYTHON program for a given problem and test for its correctness.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	3	3	3	3	3	3	3	3
CO2	3	3	1	3	2	3	3	3	1
CO3	3	3	3	3	2	2	3	3	3
CO4	3	3	3	3	2	3	3	3	3
CO5	3	2	3	3	3	3	3	2	3

3 - Strong, 2 – Medium, 1 – Low

SEMESTER-II

Semester: II	Course Code-23UCSCC02	Hours/Week: 5	Credit: 5
COURSE TITLE: CC3 - DATA STRUCTURE AND ALGORITHMS			

Course Overview:

1. To impart Practical Training in C Programming Language.

2. Understanding the data structures stack and queues.

3. Apply linked list for other data structures.

4. Analyze the sorting and searching algorithm.

Learning Objectives:

1. To understand the concepts of ADTs

2. To learn linear data structures-lists, stacks, queues

3. To learn Tree structures and application of trees

4. To learn graph structures and application of graphs

5. To understand various sorting and searching

Unit - I	Stack and Queue ADT	06 Hours

Stack ADT-Operations – Applications - Evaluating arithmetic expressions – Conversion of infix to postfix expression - Queue ADT – Operations -Circular Queue - Priority Queue – deQueue - applications of queues.

Unit - II	Abstract Data Types (ADTS)	06 Hours

Abstract Data Types (ADTs) - List ADT - array - based implementation- linked list implementation Singly linked lists - circular linked lists – doubly - linked lists - applications of lists - Polynomial Manipulation - All operations – Insertion – Deletion – Merge - Traversal.

Unit - III	Tree ADT	06 Hours

Tree ADT - tree traversals - Binary Tree ADT - expression trees - applications of trees - binary search tree ADT - Threaded Binary Trees - AVL Trees – B – Tree - B+ Tree – Heap - Applications of heap.

Unit - IV	Graph	06 Hours

Definition - Representation of Graph - Types of graph - Breadth first   traversal – Depth first traversal - Topological sort - Bi-connectivity – Cut vertex - Euler circuits - Applications of graphs.

Unit - V	Searching	06 Hours

Searching - Searching algorithm - Library Implementation - Sentinal Linear Search – Linear Search Algorithm - Data Structure and Algorithm - Jump Search - Meta Binary Search - One Sided Binary Search - Sorting – Sorting algorithm - Bubble Sort - Selection Sort - Insertion Sort - Radix Sort.

Text Book(s):

1. Mark Allen Weiss, ‒Data Structures and Algorithm Analysis in C++‖, Pearson Education 2014, 4th Edition.

2. Reema Thareja, ‒Data Structures Using C‖, Oxford Universities Press 2014, 2nd Edition.

3.Ellis Horowitz, Sartaj Sahn - Fundamentals of data Structures in c‖,2nd Edition.

Reference Books:

1. Thomas H. Cormen, Chales E. Leiserson, Ronald L. Rivest, Clifford Stein, ‒Introduction to Algorithms‖, McGraw Hill 2009, 3rd Edition.

2. Aho, Hopcroft and Ullman, ‒Data Structures and Algorithms‖, Pearson Education 2003.

Web Resources:

1. https-//www.programiz.com/dsa

2. https-//www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

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Learning Outcomes-
Upon successful completion this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation	K1
CO2	Understand basic data structures such as arrays, linked lists, stacks and queues	K2
CO3	Describe the hash function and concepts of collision and its resolution methods	K3
CO4	Solve problem involving graphs, trees and heaps	K4
CO5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	3	-	-	1	2	-	2	2
CO2	1	2	1	1	-	1	-	3	-
CO3	-	1	2	3	-	-	2	1	-
CO4	1	-	-	2	1	-	2	-	1
CO5	-	-	2	1	2	-	2	1	-

3 – Strong, 2 – Medium, 1 – Low

Semester: I	Course Code: 23UCSCCP02	Hours/Week: 3	Credit: 3

COURSE TITLE: CC4 – PRACTICAL - DATA STRUCTURE AND ALGORITHMS LAB

Course Overview:

1.   To understand the concepts of ADTs

2.   To learn linear data structures-lists, stacks, queues

3.   To learn Tree structures and application of trees

4.   To learn graph structures and application of graphs

Learning Objectives:

1.   To understand the concepts of ADTs

2.   To learn linear data structures-lists, stacks, queues

3.   To learn Tree structures and application of trees

4.   To learn graph structures and application of graphs

5.   To understand various sorting and searching

LAB EXERCISES

1. Write a program to implement the List ADT using arrays and linked lists.

2. Write a programs to implement the following using a singly linked list.

- Stack ADT
- Queue ADT

3. Write a program that reads an infix expression, converts the expression to postfix form and then evaluates the postfix expression (use stack ADT).

Program using Loops.

4.Write a program to perform the following operations:

- Insert an element into a binary search tree.
- Delete an element from a binary search tree.

5.Write a program to perform the following operations

- Insertion into an AVL-tree
- Deletion from an AVL-tree.

6. Write a program for the implementation of BFS and DFS for a given graph.

7. Write a programs for implementing the following searching methods:

- Linear search

- Binary search.

8. Write a programs for implementing the following sorting methods:

- Bubble sort

- Selection sort

- Insertion sort

- Radix sort.

Text Book(s):

1. Mark Allen Weiss, ‒Data Structures and Algorithm Analysis in C++‖, Pearson Education 2014, 4th Edition.

2. Reema Thareja, ‒Data Structures Using C‖, Oxford Universities Press 2014, 2nd Edition.

Reference Books:

1. Thomas H. Cormen, Chales E. Leiserson, Ronald L. Rivest, Clifford Stein, ‒Introduction to Algorithms‖, McGraw Hill 2009, 3rd Edition.

2. Aho, Hopcroft and Ullman, ‒Data Structures and Algorithms‖, Pearson Education 2003.

Web Resources:

1. https-//www.programiz.com/dsa

2. https-//www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:

Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.	K1
CO2	Understand basic data structures such as arrays, linked lists, stacks and queues.	K2
CO3	Describe the hash function and concepts of collision and its resolution methods.	K3
CO4	Solve problem involving graphs, trees and heaps.	K4
CO5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	3	3	3	3	3	3	3	3
CO2	3	3	1	3	2	3	3	3	1
CO3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3
CO5	3	2	3	3	3	3	3	2	3

3– Strong, 2 – Medium, 1 – Low

Semester: II	Course Code: 23UBXNE002	Hours/Week: 2	Credit: 2
COURSE TITLE: NON MAJOR ELECTIVE COURSE - MANAGERIAL SKILL DEVELOPMENT			

Course Overview:

1. Explore more advanced Management Skills such as conflict resolution, empowerment, working with teams and creating a positive environment for change.

2. Employ critical - thinking and analytical skills to investigate complex business problems to propose viable Solutions.

3. Make persuasive presentations that reveal strong written and oral communication skills needed in the workplace.

Learning Objectives:

1. To improve the self - confidence, groom the personality and build emotional Competence.

2. To address self - awareness and the assessment of core management skills such as communication, working with teams and creating a positive environment for change.

3. To assess the Emotional intelligence.

4. To induce critical - thinking and analytical skills to investigate complex problems to propose viable solutions.

5. To improve professional etiquettes.

Unit - I	Self	11 Hours

Core Competency - Understanding of Self - Components of Self — Self-identity – Self -concept= Self – confidence and Self - image - Skill Analysis and finding the right fit. - Self - learning styles - Attitude towards change and applications of skills.

Unit - II	Self Esteem	08 Hours

Meaning & Importance - Components of self – esteem - High and low self - esteem - Measuring our self - esteem and its effectiveness - Personality mapping tests - Appreciative Intelligence.

Unit - III	Building Emotional Competence	08 Hours

Emotional Intelligence – Meaning - Components, Importance and Relevance - Positive and Negative Emotions - Healthy and Unhealthy expression of Emotions – The six- phase model of Creative

Thinking: ICEDIP model.

Unit - IV	Thinking Skills	08 Hours

The Mind/Brain/Behavior - Thinking skill - Critical Thinking and Learning - Making Predictions and Reasoning - Memory and Critical Thinking - Emotions and Critical Thinking- Creativity: Definition and earning of creativity - The nature of creative thinking- Convergent and Divergent thinking, Idea generation and evaluation (Brain Storming) - Image generation and evaluation.

Unit - V	Communication Related To Course	10 Hours

How to make oral presentations - Conducting Meetings - Reporting of Projects - Reporting Of Case Analysis Answering in viva Voce - Assignment writing Debates – Presentations - Role plays and group discussions on current topics - Audio and Video Recording of the above exercises to improve the non - verbal communication and professional etiquettes.

Text Book(s):

1. Managerial Skill Articles.

2. The Management Skills of SALL Managers – Si SAL Journal.

3. Managerial Skills by Dr. K. Alex S.CHAND.

4. Managerial Skills 2 by Cynthia Menezes Prabhu, Pen to Print Publishing LLP.

5. Gallagher (2010), Skills Development for Business & Management Students, Oxford University Press. PROF. SANJIV

Reference Books:

1.Joshi, G. (2015), Campus to Corporate-Your Roadmap to Employability, Sage Publication

2. McGrath E. H. (9 Ed. 2011), Basic Managerial Skills, Prentice Hall India Learning Private Limited.

3. Whetten D. (e Ed. 2011), Developing Management Skills, Prentice Hall India Learning Private Limited.

4. P. Varshney, A. Dutta, Managerial Skill Development, Alfa Publications, 2012.

5. EQ - soft skills for Corporate Carrer by Dr. Sumeet Suseelan.

Web Resources:

1. https://www.ipjugaad.com/syllabus/ggsip-university-bba-4th-semester-managerial- skill development-syllabus/63

2. https://www.academia.edu/4358901/managerial_skill_development_pdf

3. https://www.academia.edu/4358901/managerial_skill_development_pdf

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:
Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Identify the personal qualities that are needed to sustain In the world of work.	K1
CO2	Explore more advanced Management Skills such as conflict resolution, empowerment, working with teams and creating a positive environment for change.	K2
CO3	Acquire practical management skills that are of Immediate use in management or leadership positions.	K3
CO4	Employ critical-thinking and analytical skills to investigate complex business problems to propose viable Solutions.	K4
CO5	Make persuasive presentations that reveal strong written and oral communication skills needed in the workplace.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**
CO1	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	1
CO3	3	3	3	3	3	3	2	2	2
CO4	3	3	3	3	3	3	3	1	3
CO5	3	3	3	3	3	3	1	3	2

3 – Strong, 2 – Medium, 1 – Low

Semester: II	Course Code: 23UCSSE02	Hours/Week: 3	Credit: 2
COURSE TITLE: SKILL ENHANCEMENT COURSE III - INTRODUCTION TO HTML			

Course Overview:

1. Understand the page formatting. Concept of list.
2. Creating Web Pages and Web Site.
3. Create a link with in a webpage.

Learning Objectives:

1. Insert a graphic within a webpage.
2. Create a link within a webpage.
3. Create a table within a webpage.
4. Insert the adding levels within a webpage.
5. Insert or delete ordered lists within a webpage. Create a webpage.

Unit - I	HTML Basics	06 Hours

Introduction: Web Basics: What is an Internet – Web browser – What is Webpage – HTML Basics: Understanding tags?

Unit - II	Tags for Font and Text Elements	06 Hours

Tags for Document structure(HTML, Head, Body Tag).Block level text elements: Headings paragraph(<p>tag) – Font style elements:(bold, italic, font, small, strong, strike, big tags)

Unit - III	Lists Tags	06 Hours

Lists: Types of lists: Ordered, Unordered – Nesting Lists – Other tags: Marquee, HR, and BR - Using Images – Creating Hyperlinks.

Unit - IV	Table	06 Hours

Tables: Creating basic Table, Table elements, Caption – Table and cell alignment – Rowspan, Cols pan – Cell padding.

Unit - V	Frames and Forms	06 Hours

Frames: Frameset – Targeted Links – No frame – Forms: Input, Text area, Select, Option.

Text Book(s):

1. Mastering HTML5 and CSS3Made Easy‖, Teach U Comp Inc., 2014.

2. Thomas Michaud, "Foundations of Web Design: Introduction to HTML & CSS".

Web Resources:

1. https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf

2. https://www.w3schools.com/html/default.asp

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

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Learning Outcomes:
Upon successful completion of this course, the student will be able to

Cos	Statements	Bloom's Level
CO1	Design the static web page using HTML and CSS using internet technology.	K1
CO2	Knows the basic concept in HTML Concept of resources in HTML.	K2
CO3	Knows Design concept. Concept of Meta Data Understand the concept of saves the files.	K3
CO4	Understand the page formatting. Concept of list.	K4
CO5	Creating Links. Know the concept of creating link to email address.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)									
CO/PSO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**
CO1	3	3	3	3	3	3	2	3	3
CO2	3	3	2	3	3	3	2	3	3
CO3	2	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	2	3	3
CO5	3	3	3	2	3	3	2	3	3

3 – Strong, 2 – Medium, 1– Low

Semester: II	Course Code: 23UCSNE07	Hours/Week: 2	Credit: 2
COURSE TITLE: NON MAJOR ELECTIVE COURSE - OFFICE AUTOMATION			

Course Overview:

1. Understanding the concept and importance of office automation in modern workplaces.

2. Learning to use software applications like word, Excel, PowerPoint, outlook.

3. Exploring tools and techniques for automating repetitive tasks.

4. Understanding the role of DMS in organizing, storing, and retrieving digital documents efficiently.

Learning Objectives:

1. Understand the basics of computer systems and its component

2. Understand and apply the basic concepts of a word processing package.

3. Understand and apply the basic concepts of electronic spreadsheet software.

4. Understand and apply the basic concepts of database management system.

5. Understand and create a presentation using PowerPoint tool.

Unit - I	Introduction	09 Hours

Introductory concepts: Memory unit – CPU - Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems & its features: DOS – UNIX – Windows. Introduction to Programming Languages.

Unit - II	Word Processing	09 Hours

Open, Save and close word document; Editing text – tools, formatting, bullets; Spellchecker - Document formatting – Paragraph alignment, indentation, headers and footers, numbering; printing–Preview, options, merge.

Unit - III	Spreadsheets	09 Hours

Excel – opening, entering text and data, formatting, navigating; Formulas – entering, handling and copying; Charts – creating, formatting and printing, analysis tables, preparation of financial statements, introduction on data analytics.

Unit - IV	Database Concepts	09 Hours

The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and reports; Linking of data files; Understanding

Programming environment in DBMS; Developing menu drive applications in query language (MS–Access).

Unit - V	Power Point	09 Hours

Introduction to Power point - Features – Understanding slide typecasting &viewing slides – creating slide shows. Applying special object – including objects & pictures – Slide transition– Animation effects, audio inclusion, timers.

Text Book(s):
1. Peter Norton, ―Introduction to Computers‖– Tata McGraw - Hill.

Reference Books:

1. Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, ― Microsoft 2003‖, Tata Mc Graw Hill.

Web Resources:

1. https://www.udemy.com/course/office

2. https://www.udemy.com/course/office

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:
Upon successful completion of this course, the student will be able to:

COs	Statements	Bloom's Level
CO1	Possess the knowledge on the basics of computers and its components	K1
CO2	Gain knowledge on Creating Documents, spreadsheet and presentation.	K2
CO3	Learn the concepts of Database and implement the Query in Database.	K3
CO4	Demonstrate the understanding of different automation tools	K4
CO5	Utilize the automation tools for documentation, calculation and presentation purpose.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
					Mapping (COs vs POs)				
CO1	3	2	2	3	3	3	2	3	2
CO2	3	3	3	3	3	3	3	2	2
CO3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	2	3	2

3 - Strong, 2 – Medium

Semester: III	Course Code: 23UCSCC03	Hours/Week: 5	Credit: 5
COURSE TITLE: CC5 – MICROPROCESSOR AND MICROCONTROLLER			

Course Overview:

1. To make the students understand Microprocessor in order to equip them with the necessary tools for the analysis of Electronic equipment in the field of Microprocessor.
2. Embedded systems to be used in industries, research field and in commercial field applications.
3. Study about communication and bus interfacing.
4. Learn the design aspects of I/O and Memory Interfacing circuits.

Learning Objectives:

1. To introduce the internal organization of Intel 8085 Microprocessor.
2. To know about various instruction sets and classifications.
3. To enable the students to write assembly language programs using 8085.
4. To interface the peripheral devices to 8085 using Interrupt controller and DMA interface.
5. To provide real-life applications using microcontroller.

Unit - I	Introduction	09 Hours

Digital Computers - Microcomputer Organization - Computer languages – Microprocessor Architecture and its operations – Microprocessor initiated operations and 8085 Bus organization – Internal Data operations and 8085 registers - Peripheral or External initiated operations.

Unit - II	8085 Microprocessor	09 Hours

8085 Microprocessor – Pinout and Signals – Functional block diagram - 8085 Instruction Set and Classifications.

Unit - III	Conversions	09 Hours

BCD to Binary and Binary to BCD conversions - ASCII to BCD and BCD to ASCII conversions - Binary to ASCII and ASCII to Binary conversions. BCD Arithmetic - BCD addition and Subtraction - Multibyte Addition and Subtraction - Multiplication and Division.

Unit - IV	8085 Interrupts	09 Hours

The 8085 Interrupts – RIM AND SIM instructions - 8259 Programmable Interrupt Controller - Direct Memory Access (DMA) and 8257 DMA controller.

Unit - V	Microcontroller	09 Hours

Introduction to Microcontroller - Microcontroller Vs Microprocessor - 8051 Microcontroller architecture - 8051 pin description. Timers and Counters – Operating Modes - Control Registers. Interrupts – Interrupts in 8051 - Interrupts Control Register – Execution of interrupt.

Text Book(s):

1. R. S. Gaonkar- "Microprocessor Architecture - Programming and Applications with 8085"- 5th Edition- Penram International Publications, 2009. [For unit I to unit IV]

2. Soumitra Kumar Mandal -"Microprocessors and Microcontrollers – Architectures, Programming and Interfacing using 8085, 8086, 8051", Tata McGraw Hill Education Private Limited. [For unit V].

Reference Books:

1. Mathur- "Introduction to Microprocessor"- 3rd Edition- Tata McGraw-Hill -1993.

2. Raj Kamal - "Microcontrollers: Architecture, Programming, Interfacing and System Design", Pearson Education, 2005.

3.Krishna Kant, "Microprocessors and Microcontrollers – Architectures, Programming and System Design 8085, 8086, 8051, 8096", PHI, 2008

Web Resources:

1. E-content from open source libraries

2. https://www.bing.com/

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:

Upon successful completion of this course, the student will be able to

Cos	Statements	Bloom's Level
CO1	Describe the architecture & organization of 8085 & 8086 Microprocessor.	K1
CO2	Relate RIM AND SIM instructions.	K2
CO3	Remember the Basic binary codes and their conversions.	K3
CO4	Familiarize the architecture and operation of Programmable Interface Devices and realize the programming & interfacing of it with 8085 microprocessor.	K4
CO5	Designing of microprocessors/microcontrollers-based systems.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)									
CO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	3	2	2	2	2	3	3	2
CO2	3	3	3	2	3	2	3	3	3
CO3	3	3	3	3	3	2	3	3	3
CO4	3	3	3	3	3	2	3	3	3
CO5	3	3	3	2	3	2	3	3	3

3 – Strong, 2 – Medium, 1 – Low

Semester: III	Course Code: 23UCSCCP03	Hours/Week: 4	Credit: 3
COURSE TITLE: CC6 - PRACTICAL- MICROPROCESSOR AND MICROCONTROLLER LAB			

Course Overview:

1. To understand the concepts of ADTs.

2. To learn linear data structures-lists, stacks, queues.

3. To learn Tree structures and application of trees.

4. To learn graph structures and application of graphs.

Learning Objectives:

1. To introduce the internal organization of Intel 8085 Microprocessor.

2. To know about various instruction sets and classifications.

3. To enable the students to write assembly language programs using 8085.

4. To interface the peripheral devices to 8085 using Interrupt controller and DMA interface.

5. To provide real-life applications using microcontroller.

LAB EXERCISES

I. Addition and Subtraction

1. 8 - bit addition

2. 16 - bit addition

3. 8 - bit subtraction

4. BCD subtraction

II. Multiplication and Division

1. 8 - bit multiplication

2. BCD multiplication

3. 8 - bit division

III. Sorting and Searching

1. Searching for an element in an array.

2. Sorting in Ascending and Descending order.

3. Finding the largest and smallest elements in an array.

4. Reversing array elements.

5. Block move.

IV. Code Conversion

1. BCD to Hex and Hex to BCD

2. Binary to ASCII and ASCII to binary

3. ASCII to BCD and BCD to ASCII

V. Simple programs on 8051 Microcontroller

1. Addition

2. Subtraction

3. Multiplication

4. Division

5. Interfacing Experiments using 8051

   1. Realisation of Boolean Expression through ports.
   2. Time delay generation using subroutines.
   3. Display LEDs through ports

Text Book(s):

1. R. S. Gaonkar- "Microprocessor Architecture- Programming and Applications with 8085"- 5th Edition- Penram International Publications, 2009. [For unit I to unit IV]

2. Soumitra Kumar Mandal -"Microprocessors and Microcontrollers – Architectures, Programming and Interfacing using 8085, 8086, 8051", Tata McGraw Hill Education Private Limited. [For unit V].

Reference Books:

1. Mathur- "Introduction to Microprocessor"- 3rd Edition- Tata McGraw-Hill -1993.

2. Raj Kamal - "Microcontrollers: Architecture, Programming, Interfacing and System Design",

Pearson Education, 2005.

3. Krishna Kant, "Microprocessors and Microcontrollers – Architectures, Programming and System

Design 8085, 8086, 8051, 8096", PHI, 2008.

Web Resources:

1. E-content from open source libraries.

2. https://www.bing.com/

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

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Learning Outcomes:
Upon successful completion of this course, the student will be able to

Cos	Statements	Bloom's Level
CO1	Remember the Basic binary codes and their conversions.	K1
CO2	Understanding the instruction set and their classification.	K2
CO3	Applying different types of instructions to convert binary codes.	K3
CO4	Analyze how peripheral devices are connected to 8085 using interrupts.	K4
CO5	An exposure to create real time application using microcontroller.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

			Mapping (COs vs POs)						
CO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	2	3	3	2	3	2	2
CO2	3	3	2	3	3	2	3	3	2
CO3	3	3	3	3	3	2	3	3	3
CO4	3	3	2	3	3	2	3	3	2
CO5	3	3	2	3	3	2	3	3	2

3 – Strong, 2 – Medium, 1 – Low

Semester: III	Course Code: 23UCSSE16	Hours/Week: 2	Credit: 1
COURSE TITLE: SKILL ENHANCEMENT COURSE IV – ORGANIZATIONAL BEHAVIOUR			

Course Overview:

1. To understand how individual, groups and structure have impacts on the organizational effectiveness and efficiency.

2. To appreciate the theories and models of organizations in the workplace.

3. To creatively and innovatively engage in solving organizational challenges.

4. To learn and appreciate different cultures and diversity in the workplace.

Learning Objectives:

1. To have extensive knowledge on OB and the scope of OB.

2. To create awareness of Individual Behaviour.

3. To enhance the understanding of Group Behaviour.

4. To know the basics of Organizational Culture and Organizational Structure.

5. To understand Organizational Change, Conflict and Power.

Unit - I	Introduction	09 Hours

Concept of Organizational Behavior (OB): Nature, Scope and Role of OB: Disciplines that contribute to OB; Opportunities for OB (Globalization, Indian workforce diversity, customer service, innovation and change, networked organizations, work-life balance, people skills, positive work environment, ethics).

Unit - II	Individual Behaviour	09 Hours

1. Learning, attitude and Job satisfaction: Concept of learning, conditioning, shaping and reinforcement. Concept of attitude, components, behavior and attitude. Job satisfaction: causation; impact of satisfied employees on workplace.

2. Motivation : Concept; Theories (Hierarchy of needs, X and Y, Two factor, McClelland, Goal setting, Self-efficacy, Equity theory); Job characteristics model; Redesigning jobs,

3. Personality and Values: Concept of personality; Myers-Briggs Type Indicator (MBTI); Big Five model. Relevance of values; Linking personality and values to the workplace (person-job fit, person-organization fit)

4. Perception, Decision Making : Perception and Judgements; Factors; Linking perception to individual decision making:

Unit - III	Group Behaviour	09 Hours

1. Groups and Work Teams : Concept : Five Stage model of group development; Group norms, cohesiveness ; Group think and shift ; Teams; types of teams; Creating team players from individuals and team based work(TBW) 2. Leadership : Concept; Trait theories; Behavioral theories (Ohio and Michigan studies); Contingency theories (Fiedler, Hersey and Blanchard, Path-Goal);

Unit - IV	Organisational Culture and Structure	09 Hours

Concept of culture; Impact (functions and liability); Creating and sustaining culture: Concept of structure, Prevalent organizational designs: New design options.

Unit - V	Organisational Change, Conflict and Power	09 Hours

Forces of change; Planned change; Resistance; Approaches (Lewin's model, Organizational development); Concept of conflict, Conflict process; Types, Functional/ Dysfunctional. Introduction to power and politics.

Text Book(s):

1. NeharikaVohra Stephen P. Robbins, Timothy A. Judge , Organizational Behaviour, Pearson Education, 18th Edition, 2022.

2. Fred Luthans, Organizational Behaviour, Tata McGraw Hill, 2017.

3.Louis Bevoc, Allison Shearsett, Rachael Collinson, Organizational Behaviour Reference, Nutri Niche System LLC (28 April 2017)

4. Dr. Christopher P. Neck, Jeffery D. Houghton and Emma L. Murray, Organizational Behaviour: A Skill-Building Approach, SAGE Publications, Inc; 2nd edition (29 November 2018).

Reference Books:

1.Uma Sekaran, Organizational Behaviour Text & cases, 2nd edition, Tata McGraw Hill Publishing CO. Ltd

2.GangadharRao, Narayana, V.S.P Rao, Organizational Behaviour 1987, Reprint 2000, Konark Publishers Pvt. Ltd, 1st edition

3. S.S. Khanka, Organizational Behaviour, S. Chand & Co, New Delhi.

4. J. Jayasankar, Organizational Behaviour, Margham Publications, Chennai, 2017.

Web Resources:

1.sus.aud.ac.in/course/organizational-behaviour-ob

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:
Upon successful completion of this course, the student will be able to

Cos	Statements	Bloom's Level
CO1	To define Organizational Behaviour, Understand the opportunity through OB.	K1
CO2	To develop creative and innovative ideas that could positively shape the organizations.	K2
CO3	To impact and bring positive change in the culture of the organization	K3
CO4	To create a congenial climate in the organization.	K4
CO5	To analyze the complexities and solutions of group behaviour.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)									
CO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	3	1	1	-	1	1	1	2
CO2	2	-	1	1	2	1	1	1	-
CO3	3	3	1	1	-	1	2	1	-
CO4	1	3	2	1	-	1	1	1	2
CO5	3	2	1	1	-	1	1	1	-

3– Strong, 2 – Medium, 1 – Low

Semester: III	Course Code: 23UCSSE04	Hours/Week: 3	Credit: 2
COURSE TITLE: SKILL ENHANCEMENT COURSE V - PHP PROGRAMMING			

Course Overview:

1. To get a knowledge on OOPS with PHP.

2. Manipulate files and directories.

3. To get an experience on various web application development techniques.

Learning Objectives:

1. To provide the necessary knowledge on basics of PHP.

2. To design and develop dynamic, data base-driven web applications using PHP version.

3. To get an experience on various web application development techniques.

4. To learn the necessary concepts for working with the files using PHP.

5. To get a knowledge on OOPS with PHP.

Unit - I	Introduction to PHP	09 Hours

Introduction to PHP - Basic Knowledge of web sites - Introduction of Dynamic Web site - Introduction to PHP - Scope of PHP - XAMPP and WAMP Installation

Unit - II	PHP Programming Basics & Embedding HTML in PHP	09 Hours

PHP Programming Basics - Syntax of PHP - Embedding PHP in HTML - Embedding HTML in PHP. Introduction to PHP Variable - Understanding Data Types –Using Operators - Using Conditional Statements – If (), else if() and else if condition Statement.

Unit - III	Loops & PHP Functions	09 Hours

Switch () Statements - Using the while () Loop - Using the for () Loop PHP Functions. PHP Functions-Creating an Array - Modifying Array Elements - Processing Arrays with Loops - Grouping Form Selections with Arrays - Using Array Functions.

Unit - IV	PHP Advanced Concepts	09 Hours

PHP Advanced Concepts – Reading and Writing Files - Reading Data From a File.

Unit - V	Managing Sessions and Using Session Variables	09 Hours

Managing Sessions and Using Session Variables - Destroying a Session - Storing Data in Cookies - Setting Cookies.

Text Book(s):

1. Head First PHP & MySQL : A Brain - Friendly Guide - 2009 - Lynnmighley and Michael Morrison.

2. The Joy of PHP:A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL- Alan Forbes

Reference Books:

1. PHP: The Complete Reference-Steven Holzner.

2.DTEditorialServices(Author),‒HTML5BlackBook(CoversCSS3,JavaScript,XML, XHTML, AJAX ,PHP, jQuery)‖,Paperback2016,2ndEdition.

Web Resources

1. https://www.w3schools.com/php/default.asp

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:
Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Write PHP scripts to handle HTML forms.	K1
CO2	Write regular expressions including modifiers, operators, and meta characters.	K2
CO3	Create PHP Program using the concept of array.	K3
CO4	Create PHP programs that use various PHP library functions.	K4
CO5	Manipulate files and directories.	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)									
CO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	3	1	1	-	1	1	1	2
CO2	2	-	1	1	2	1	1	1	-
CO3	3	3	1	1	-	1	2	1	-
CO4	1	3	2	1	-	1	1	1	2
CO5	3	2	1	1	-	1	1	1	-

3 – Strong, 2 – Medium, 1 – Low