SEMESTER I

UCCSA20 - PROGRAMMING IN C

Year: I **SEM:** I	**Course Code:** UCCSA20	**Title of the Course:** Programming in C	**Course Type:** Theory	**Course Category:** Core	**H/ W** 4	**Credits** 4	**Marks** 100

Course Learning Objectives (CLO)

1. To learn the fundamental programming concepts and methodologies which are essential to build good C programs.
2. Develop a greater understanding of the issues involved in programming language design and implementation.
3. To practice the fundamental programming methodologies in the C/C++ programming language via laboratory experiences.
4. Develop an in-depth understanding of functional, logic and object-oriented programming paradigms.
5. To code, document, test, and implement a well-structured, robust computer program using the C/C++ programming language.

Course Outcomes (COs)

The Learners will be able to

1. Introduce the students to understand the concept of basic programming - thereby reducing the design complexity and increasing the reusability of a component.
2. Construct the basic structure of C programming, declaration and usage of variable.
3. Understand and develop conditional and iterative statements to write programs.
4. Exercise C programs that uses array and string.
5. Develop user defined functions to solve real time problems.

CO	**PSO**					
	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	H	L	M	M	L	M
CO2	M	M	L	L	M	M
CO3	M	L	L	M	M	M
CO4	H	H	L	L	L	M
CO5	H	L	M	M	M	L

(Low -L, Medium -M, High-H)

CO	PO					
	1	2	3	4	5	6
CO1	M	H	L	L	M	L
CO2	L	M	H	M	M	M
CO3	M	H	M	H	L	L
CO4	L	L	M	H	L	L
CO5	L	M	M	L	H	L

(Low -L, Medium -M, High-H)

Unit I **(Hour 12)**

1.1 Algorithm and Flowchart. (K2)
1.2 Basic Technique - Sum of Two Given Numbers. (K2)
1.3 Swapping Two Numbers - Simple Interest Calculation. (K2)
1.4 Overview of C. (K2)
1.5 Constants and Variables. (K2)
1.6 Data Types. (K2)

Unit II **(Hour 12)**

2.1 Operators. (K1,K2)
2.2 Expressions. (K1,K2)
2.3 Managing Input and Output Operations. (K1,K2)
2.4 Decision Making and Branching. (K1,K2)
2.5 Decision Making and Looping. (K1,K2)
2.6 Decision Making and Looping. (K1,K2)

Unit III **(Hour 12)**

3.1 Arrays – One Dimensional Array – Predefined Streams. (K2)
3.2 Introduction - Reading and Writing String. (K2)
3.3 Arithmetic Operation on Characters. (K2)
3.4 Putting String Together - Comparison of Two Strings - String Handling. (K2)
3.5 Functions. (K2)
3.6 Other Features of Strings. (K2)

Unit IV **(Hour 12)**

4.1 User defined Function Introduction. (K2,K4)
4.2 Defining and Accessing Functions. (K2,K4)
4.3 Function Prototypes. (K2,K4)
4.4 Categories of Function. (K2,K4)
4.5 Passing Arguments. (K2,K4)
4.6 Nesting of Functions. (K2,K4)

Unit V **(Hour 12)**

5.1 Recursion. (K2)
5.2 Passing Array to Functions. (K2)
5.3 Passing Strings to Functions. (K2)
5.4 Scope - Visibility and Lifetime of Variables. (K2)
5.5 Visibility and Lifetime of Variables. (K2)
5.6 Structures and Unions. (K2)

Text Books

1. Balagurusamy, "Programming in C", 6th Edition, Tata McGraw Hill Publication, 2012.
2. M. G. Venkateshmurthy, "Programming Techniques through C: A Beginner's Companion", 1st Edition, Pearson India, 2006.

Reference Book

1. Ashok N. Kamathane, "Programming with C", 3rd Edition, Pearson Publication, 2011.

Open Educational Resources (OER)

1. http//www.freebookcentre.net/programming-books-download/C-Language-Tutorial-(PDF-124P).html
2. http://www2.cs.uregina.ca/~hilder/cs833/Other%20Reference%20Materials/The%20C%20Programming%20Language.pdf
3. http://www-personal.acfr.usyd.edu.au/tbailey/ctext/ctext.pdf
4. http//www.slideshare.net/gauravjuneja11/c-language-ppt
5. http://www.iitg.ac.in/physics/fac/charu/courses/ph508/lecture2.ppt

SEMESTER I

UCCSB20 - PRACTICAL I: C

Year: I SEM: I	Course Code: UCCSB20	Title of the Course: Practical I: C	Course Type: Practical	Course Category: Core	H/W 2	Credits 2	Marks 40+60

Course Learning Objectives (CLO)

1. To make the student learn a programming language.
2. Develop a greater understanding of the issues involved in programming language design and implementation.
3. To learn problem solving techniques.
4. Develop an in-depth understanding of functional, logic and object-oriented programming paradigms.
5. To teach the student to write programs in C and to solve the problems.

Course Outcomes (COs)

The Learners will be able to

1. Exercise with basic structure of the C program, declaration and usage of variable.
2. Resolve mathematical and scientific problem.
3. Develop the programs using conditional and iterative statements.
4. Implement array and string concept in C program.
5. Write real time problems using user defined functions

CO	PSO					
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	M	L	M	M	L	M
CO2	H	M	H	L	M	M
CO3	L	L	L	H	M	M
CO4	H	H	L	M	L	H
CO5	H	L	M	M	M	L

(Low -L, Medium -M, High-H)

CO	PO					
	1	2	3	4	5	6
CO1	M	M	M	M	L	M
CO2	L	L	L	L	M	L
CO3	H	H	H	M	L	H
CO4	M	M	M	M	H	M
CO5	L	L	L	M	L	L

(Low -L, Medium -M, High-H)

Practical Programs **(Hour 30)**

1. Input and Output Operations. (K1,K2)
2. Decision Making Statements. (K1,K2)
3. Arrays and Looping Statements. (K1,K2)
4. Two Dimensional Arrays. (K2,K6)
5. The Concept of Functions. (K2,K6)
6. Recursion. (K1,K6)
7. Character Arrays. (K1,K6)
8. Structures and Unions. (K1,K6)

SEMESTER I

UCCSC20 –PRACTICAL II: DIGITAL LOGICS AND FUNDAMENTALS

Year: I Sem: I	Course Code: UCCSC20	Title of the Course: Practical II: Digital Logics and Fundamentals	Course Type: Practical	Course Category : Core	H/W 3	Credits 2	Marks 100

Course Learning Objectives (CLO)

1. The objective of this course is to provide the fundamental concepts associated with the digital logic and Circuit design.
2. To introduce the basic concepts and laws involved in the Boolean algebra and logic families and digital circuits.
3. To familiarize with the different number systems, logic gates and combinational and sequential circuits utilized in the different digital circuits and systems.
4. The course will help in design and analysis of the digital circuit and system.
5. The course will help in design and analysis of the Combinational circuits and system.

Course Outcomes (COs)

The Learners will be able to

1. Understand working of logic families and logic gates.
2. To minimize the Boolean expression using Boolean algebra.
3. Design and analyze the combinational and sequential logic circuits.
4. Simulate digital circuits and implement them using hardware component.
5. Design and implementation of combinational circuits.

CO	PSO					
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	H	M	M	M	L	M
CO2	H	M	H	L	M	M
CO3	L	L	M	H	M	M
CO4	H	H	L	L	M	H
CO5	H	L	M	M	M	L

(Low -L, Medium -M, High-H)

CO	PO					
	1	2	3	4	5	6
CO1	H	H	L	H	L	L
CO2	M	H	L	H	L	M
CO3	H	H	H	H	M	M
CO4	H	M	H	H	M	L
CO5	H	M	H	H	H	L

(Low -L, Medium -M, High-H)

Unit I **(Hour 9)**

1.1 Number System - Binary Numbers - Conversion from one number system to other – Number Base Conversion. (K2)
1.2 Octal and Hexadecimal Numbers – Complements - Binary Arithmetic. (K3)
1.3 Binary Codes - Binary Logics - Logic gates. (K3)
1.4 Truth Table - Boolean Algebra - Basic Definition. (K2,K3)
1.5 Axiomatic Definition of Boolean Algebra. (K2)
1.6 Basic Theorems and properties of Boolean Algebra – Duality - Basic theorems. (K3)

Unit II **(Hour 9)**

2.1 Simplification of Boolean Function - The Map method. (K3,K4)
2.2 Two and Three Variable Maps - Four Variable Maps. (K5)
2.3 Five and Six Variable Maps - Tabulation Methods - McClausky Tabulation Methods. (K4, K5)
2.4 Combinational Logic – Adders - Half Adder - Full Adder. (K2)
2.5 Subtractor – Half Subtractor – Full Subtractor. (K2)
2.6 Encoders – Decoders – Multiplexer - Demultiplexer. (K1, K2)

Unit III **(Hour 9)**

3.1 Design of Circuits using Decoders/ Multiplexer, Demultiplexer. (K6)
3.2 Sequential Logic – Introduction - Flip Flops - Basic Flip Flop Circuits. (K2)
3.3 Closed RS Flip flops - JK Flip flops - D Flip flops - T Flip flops. (K2)
3.4 Registers - Registers with parallel load. (K3)
3.5 Shift Registers - Serial transfer - Bidirectional shift Register with parallel Load. (K3)
3.6 Serial Addition using sequential logic. (K3)

Unit IV **(**K6) **(Hour 9)**

1. Verify the truth table of logic gates AND, OR and NOT gate.
2. Construct the Half Adder Circuit using Logic Gates.
3. Construct the Full Adder Circuits using Logic Gates.
4. Construct the Half Subtractor Circuit using Logic Gates.

Unit V (K6) **(Hour 9)**

5. Construct the Full Subtractor Circuit using Logic Gates.
6. Implement the Karnaugh Map method as Sum of Product (SOP) using NAND Gate.
7. Implement the Karnaugh Map method as Product of Sum (POS) using NOR Gate.

Text Books

1. Morris M.Mano, "Digital Logic Fundamentals" - Pearson's Education- 5th edition, 2015.

Reference Books

1. Vijendran, "Digital Computer Fundamentals", 1st Edition - Lakshmi Publications, 2001.
2. Thomas M.Floyd, "Digital Fundamentals", 8th Edition-USB Publications, 2009.

Open Educational Resources (OER)

1. Karnaugh Map video Tutorial- http// Youtube/ wjM2RDG5Yti.
2. Full Adder and Half AddER Video Tutorial-http//youtube/FSFNefbKckM.
3. Karnaugh Map – NAND Gate - https://www.youtube.com/watch?v=LuXdFI8iK1U

SEMESTER II

UCCSF20 - PRACTICAL IV: MICROPROCESSOR

Year: I **Sem:** II	**Course Code:** UCCSF20	**Title of the Course:** Practical IV: Microprocessor	**Course Type:** Practical	**Course Category:** Core	**H/W** 3	**Credits** 2	**Marks** 40+60

Course Learning Objectives (CLO)

1. To develop background knowledge and core expertise of microprocessor.
2. To know the importance of different peripheral devices and addressing modes.
3. To know the design aspects of Instruction Set.
4. To know the concept of Data Manipulation.
5. To understand and implement the concept of Assembly Code.

Course Outcomes (COs)

The Learners will be able to

1. Understand the Architecture of a typical microprocessor.
2. Understand different addressing modes and instructions of 8086 design and to develop assembly language programs using software interrupts.
3. Understand the concepts of Instruction sets.
4. Write the assembly code for 8 bit and 16 bit data manipulation.

5. Write the assembly code for Sorting and reversing elements.

CO	PSO					
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	M	M	M	M	L	H
CO2	L	M	L	M	M	M
CO3	M	L	M	H	L	L
CO4	M	M	H	H	M	M
CO5	H	M	M	M	L	L

(Low -L, Medium -M, High-H)

CO	PO					
	1	2	3	4	5	6
CO1	M	H	H	H	M	M
CO2	H	H	H	H	M	L
CO3	H	H	M	M	M	M
CO4	H	H	H	H	H	L
CO5	H	H	H	H	H	M

(**Low -L, Medium -M, High-H)**

Unit I **(Hour 9)**

1.1 Introduction – Introduction to Intel processors. (K2,K4)
1.2 Minimum mode. (K2,K4)
1.3 Maximum mode. (K2,K4)
1.4 Pin layouts of 8086. (K2,K4)
1.5 Pin functions of 8086. (K2,K4)
1.6 8086 Architecture. (K2,K4)

Unit II **(Hour 9)**

2.1 Machine language and Assembly language. (K1,K2)
2.2 Programmer's model of 8086 – The 8086 addressing modes. (K1,K2)
2.3 Data transfer instructions. (K1,K2)
2.4 Arithmetic instructions. (K1,K2)
2.5 Logic Instructions - Shift Instructions. (K1,K2)
2.6 Rotate Instructions. (K1,K2)

Unit III **(Hour 9)**

3.1 Compare instructions. (K2)
3.2 Jump instructions. (K2)

3.3 Loop Instructions. (K2)
3.4 Loop Instructions. (K2)
3.5 String Instructions. (K2)
3.6 String Instructions. (K2)

Unit IV **(Hour 9)**

1. Write the assembly code in Data Manipulation using 8 Bit. (K2,K3)
2. Write the assembly code in Data Manipulation using 16 Bit. (K2,K3)
3. Write the assembly code to find the largest number in an array. (K2,K3)

Unit V (Hour 9)

4. Write the assembly code to sort the data in ascending order. (K2,K3)
5. Write the assembly code for Block Move. (K2,K3)
6. Write the assembly code to reverse array elements. (K2,K3)

Text Books

1. V.Viyaendran, "Fundamentals of Microprocessor 8086: Architecture, Programming and Interfacing", Viswanathan, S., Printers & Publishers Pvt Ltd, 2009.
2. Ramesh Gaonkar, "Microprocessor Architecture: Programming and Applications with 8085" – 6th Edition –Penram International Publishing Limited, 2013.

Reference Books

1. Dr. D. K. Kaushik, "An Introduction to Microprocessor 8085" – DhanpatRai Publishing Company, 2014.
2. Nagoor Kani, "Microprocessor 8086 Programming & Interfacing" – RBA Publications, 2004.

Open Educational Resources (OER)

1. http//www.pdfdrive.com/the-intel-microprocessors-80868088-8018680188-80286-80386-80486-pentium-pentium-pro-e89806753.html
2. http//www.slideshare.net/gpkm/microprocessor-8086
3. http//vardhaman.org/wp-content/uploads/2018/03/Unit-1%20MPMC.pdf
4. http://gbcramgarh.in/e-learning-study-materials/ BCA/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf

SEMESTER V

UECSB20- ELECTIVE I B: DATA MINING

Year: III Sem: V	Course Code: UECSB20	Title of the Course: Elective I B: Data Mining	Course Type: Theory	Course Category: Elective	H/W 5	Credits 5	Marks 40+60

Course Objectives

1.To study the methodology of engineering legacy databases for data warehouse and data mining to derive business rules for decision support systems.

2.To analyze the data, identify the problems, and choose the relevant models and algorithms to apply.

3.To develop research interest towards advances in data mining.

4.To impart the knowledge of how Data Mining could be used to solve scientific and social problems.

5.To expose to various Data Mining techniques.

Course Outcomes (COs)

The Learners will be able to

1. Understand Data Warehouse fundamentals and Data Mining Principles
2. Understand and implement classical algorithms in data mining and identify the application area of algorithms.
3. Compare and evaluate different data mining techniques like, prediction, clustering and association rule mining.
4. Describe complex data types with respect to spatial and web mining.
5. Analyze the temporal mining techniques to detect patterns in the e-world.

CO	PSO					
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	H	M	M	M	M	H
CO2	M	M	M	M	H	M
CO3	M	L	M	L	M	M
CO4	L	L	M	M	M	M
CO5	H	M	L	H	L	L

(Low -L, Medium -M, High-H)

CO	PO					
	1	2	3	4	5	6
CO1	M	M	M	M	M	L
CO2	M	M	M	M	M	L
CO3	H	H	H	H	H	H
CO4	H	H	H	H	M	L
CO5	M	M	M	M	M	M

(Low – L, Medium – M, High – H)

Course Syllabus

Unit I **(Hour 14)**

1.1 Basic Data Mining Tasks – Data Mining Versus Knowledge Discovery In Databases. (K1, K2)

1.2 Data Mining Issues – Social Implications of Data Mining. (K2)

1.3 Data Mining from A Database Perspective. Data Mining Technique Introduction – A Statistical Perspective on Data Mining. (K2, K3)

1.4 Similarity Measures. (K1, K2, K3)

1.5 Decision Trees. (K2, K3)

1.6 Neural Networks – Genetic Algorithms. (K1, K2, K3)

Unit II (**Hour 16)**

2.1 Classification: Introduction. (K1, K2, K3)

2.2 Statistical Based Algorithms. (K2, K3, K5)

2.3 Distance Based Algorithms. (K2, K3, K5)

2.4 Decision Tree Based Algorithms. (K2, K3, K5)

2.5 Neural Network Based Algorithms. (K2, K3, K5)

2.6 Rule Based Algorithms. (K2, K3, K5)

Unit III **(Hour 15)**

3.1Clustering: Introduction – Similarity and Distance Measures – Outliers. (K2, K3, K5)

3.2 Hierarchical Algorithms – Partitional Algorithms. (K3, K4, K5)

3.3 Association Rule Introduction - Large Item Sets – Basic Algorithms. (K2, K3, K5)

3.4 Parallel and Distributed Algorithms. (K2, K3, K5)

3.5 Comparing Approaches – Incremental Rules. (K3,K5,K6)

3.6 Advanced Association Rules Techniques – Measuring the quality of Rules. (K3,K5,K6)

Unit IV **(Hour 15)**

4.1 Web mining: Introduction – Web content Mining Crawlers. (K2, K3)

4.2 Web Structure Mining. (K2, K3)

4.3 Web Usage Mining. (K2, K3)
4.4 Spatial Mining: Overview – Primitives. (K2, K3, K5)
4.5 Generalization and specialization. (K2, K3, K5)
4.6 Spatial Rules- Spatial Classification Algorithm. (K2, K3, K5)

Unit V **(Hour 15)**

5.1 Temporal Mining: Introduction. (K2)
5.2 Modeling temporal events. (K2, K3)
5.3 Time series. (K2, K3, K5)
5.4 Pattern detection. (K2, K3, K4, K5, K6)
5.5 Sequences. (K2, K3, K5, K6)
5.6 Temporal Associations Rules. (K2, K3, K5)

Text Books

1. Margaret H. Dunham, "Data Mining: Introductory and Advanced Topics", 1st Edition, Pearson Education 2012.
2. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques" - Elsevier 5th Edition, 2009.

Reference Books

1. Soumendra Mohanty, "Data Warehousing DesignDevelopment and best practices", 1st Edition, TataMcGraw Hill, 2005.
2. William H. Inmon, "Building the Datas warehousing", 4th Edition, Wiley India.
3. Rajan Chattamvelli, "Data Mining Methods", 2nd Edition, Narosa Publishing House Pvt. Ltd. New Delhi, 2016 .

Open Educational Resources (OER)

1. http//www.slideshare.net/akannshat/data-mining-15329899
2. http://myweb.sabanciuniv.edu/rdehkharghani/files/2016/02/The-Morgan-Kaufmann-Series-in-Data-Management-Systems-Jiawei-Han-Micheline-Kamber-Jian-Pei-Data-Mining.-Concepts-and-Techniques-3rd-Edition-Morgan-Kaufmann-2011.pdf
3. http//www.youtube.com/watch?v=f7NfO16l04U&list=PL8eNk_zTBST-gN6Y5E-5FZdARXjglYpyT