# Shri Acharyaratna Deshbhooshan Shikshan Prasarak Mandal's MahavirMahavidyalaya, Kolhapur (Autonomous) Affiliated to Shivaji University, Kolhapur



## Accredited by NAAC with 'A' Grade

# Syllabus for Choice Based Credit System (CBCS) Bachelor of Science (B.sc.) Programme

Part I	Course	Computer Science
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### **Under the Faculty of Science**

(To be introduced from Academic Year 2024 – 25 onwards) Subject to the revisions& modifications made from time)

### MahavirMahavidyalaya, Kolhapur(Autonomous) Affiliated to Shivaji University, Kolhapur

Primary Information:			
Programme	<b>Bachelor of Scien</b>	ce (B.Sc.) CBCS	
Course	Computer Sci.	Course Type	Semester
Part	I	Semester	Ι
Paper No.	I	Course Code	DSC H1
Total Credits	02	Total Marks	50
Paper No.	II	Course Code	DSC H2
Total Credits	02	Total Marks	50
Implementation	2021 - 22	Contact Hours	05 / Week

(New syllabus under Autonomy to be introduced from June, 2021 onwards)

Primary Information:			
Programme	Bachelor of Scien	ce (B.sc.) CBCS	
Course	Computer Sci.	Course Type	Semester
Part	Ι	Semester	II
Paper No.	III	Course Code	DSC H3
Total Credits	02	Total Marks	50
Paper No.	IV	Course Code	DSC H4
Total Credits	02	Total Marks	50
Implementation	2021 - 22	Contact Hours	05 / Week

Cours	Course Objectives:		
i)	To learn basics of Computer, hardware, software, networking.		
ii)	To inculcate the software development attitude and generate interest in the		
	field of Technology.		
iii)	To develop programming skills, Project Analysis skill, software		
	development skill among the students.		
iv)	To inculcate research attitude among students		

Course	B.Sc.	Semester	Ι
Course Code	DSC H1	Paper No.	Ι
Total Credits	02	Total Marks	50
Implementation	2021 - 22	Contact Hours	05 / Week
Paper Name	Problem Solving Using Computers		

Course Syllabi:		
(CR = Credits / IH: Instructional Hours)		
Modules	CR	IH
Module I : Problem SolvingUsingComputers		
1.1Planning the Computer Program: Concept of problem		
solving, Problem definition, Program design, Debugging, Types		
of errors in programming, Documentation		
1.2 Program Design Tools:Algorithm, flow chart, Pseudo		
code.		
1.3Introduction to Linux Operating System and C		
Language, Introduction to Vi, Introduction to GCC		
Compiler. Components of Compilation Process.		
		15
1.4 Introduction to C Language :History, Features, Structure Of	01	15
C program, Installation of C		
1.5 Variable Declaration		
1.6 Data Types		
1.7 Format Specifiers		
1.8 Escape Sequences		
1.9 Input / Output Statement		
1.10 Operators		
1.11 Build 1 <sup>st</sup> C Program		
1.12 Debugging and compilation		
1.13 Execution of Program		
Module II : Control Structures, Array and String		
2.1 Conditional Branching Statements: Simple if statement,		
If else statement, elseif ladder, Nested ifelse statement,	01	15
Switch statement		15
2.2 Looping Statements: While loop, dowhile loop, for loop,		
nested loop		

2.3 Unconditional Control Statements: BREAK,	
CONTINUE, RETURN, GOTO	
2.4 Arrays: Introduction, Features ,Definition, Declaration and Initialisation of an Array, Types of Arrays : One Dimensional, Two Dimensional, Multi Dimensional	
2.5 String: Introduction, Features ,Definition,	
Declaration&Initializing a String , String function : strlen(),	
<pre>strcpy(), strcat(), strcmp(), strrev()</pre>	

#### Course Outcomes: On completion of the course, students will be able to use algorithm and flowchart. Student should understand the basics of C programming. Student should be able to develop logic of Problem Solving Student should able to handle multiple data.

Course	B.Sc.	Semester	Ι
Course Code	DSC H2	Paper No.	II
Total Credits	02	Total Marks	50
Implementation	2021 - 22	Contact Hours	05 / Week
Paper Name	Database Management System		

Course Syllabi:		
(CR = Credits / IH: Instructional Hours)		
Modules	CR	IH
Module I : Introduction to Database		
ManagementSystems		
1.1 DBMS – Definition, Characteristics, need of DBMS,		
Advantages of DBMS, Characteristics of database approach,		
DBMSArchitecture	01	15
1.2 Data Models : Hierarchical, Network, Relational		10
1.3 Schema and Instances		
1.4 DBMS architecture: Three Schema Architecture, Internal,		
Conceptual, External		
1.5 Data independence: Logical, Physical		
Module II : Entity Relationship and EnhancedERModel	01	15

2.1 ER Model, Components of ER Model: Entities,	
attributes(Type of attributes), Domain ,Tuples, relationship,	
Notations of ER Model	
Relationships: one-one, one-many, many-one, many-many	
2.2 Construction of EER model	
2.3 SQL Concepts	
2.4 Constraints: Domain Integrity, Entity, Referential, And	
Concept of Object modelling	
2.5SQL Statements : DDL Statements (create, alter, drop),	
DML Statements (insert, update, delete), DQL Statements	
(select)	
2.6 SQL Operators : Logical, Relational, in, between, like, not,	
is null	
2.7 SQL Clauses: Where, Order by, Group by, Having	
2.8 Aggregate Functions :SUM, MAX, MIN, COUNT, AVG	

Course Outcomes:
Students should learn the basics of data, information, system and Database.
Students should understand the Key concepts of Database and importance and use
of ERD.

Students should understand basics SQL statements.

Refe	rence Materials
	Books for Reference
1.	"C Programming in an Open Source Paradigm: A Hands on approach", K.S.Oza, S.R.Patil, R.K.Kamat River Publisher Series in Information Science and Technology, Netherland 978-87-93237-67-4,2015
2.	ANSI C – E.Balgurusamy
3.	Let us C – Y.C.Kanetkar
4.	C' programming – DennisRitchie
5.	Programming in 'C' –Venugopal
6.	R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.

7.	R. Ramakrishanan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill, 2002.
8.	A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill,2010.
9.	R.Elmasri,S.B.NavatheDatabaseSystemsModels,Languages,Designandapplic ation Programming, 6th Edition, PearsonEducation,2013.
10.	SQL, PL/SQL The Programming Language of ORACLE by Ivan Bayross.

Course	B.Sc.	Semester	II
Course Code	DSC H3	Paper No.	III
Total Credits	02	Total Marks	50
Implementation	2021 - 22	Contact Hours	04 / Week
Paper Name	Pro	gramming Skills Usin	g 'C'

Course Syllabi:		
(CR = Credits / IH: Instructional Hours)		
Modules	CR	IH
Module I : Functions & Pointers		
Declaration and defining function, Calling Function (Call by Value &		
Call by Reference), return statement, Recursion	01	15
1.2 Storage classes		15
1.3Pointers : Introduction, Declaration, Initialization, Pointer		
Arithmetic, Arrays and Pointers, Function and Pointers		
Advantages of Pointer		
Module II : Structure and File Handling		
2.1 Structure : Introduction, definition, Declaration, Structure		
Variables, Accessing Structure Members, Structure initialization,	01	
Nested Structure, Array of structure	01	15
2.2 Dynamic Memory Allocation: Introduction, Definition,		
functions of dynamic memory allocation		

2.3 File Handling: Defining and opening a file, File opening modes-	
read, write, append, closing a file.	
Input/Output Operations on file: getc(), putc(), getw(), putw(),	
<pre>fprintf(), fscanf(), ftell(), fseek(), rewind()</pre>	

#### **Course Outcomes:**

On completion of the course, students will be able to handle programming functions.

Student should understand the basics of structure and pointer. Students should understand runtime file handling mechanisms.

Course	B.Sc.	Semester	II
Course Code	DSC H4	Paper No.	IV
Total Credits	02	Total Marks	50
Implementation	2021 - 22	Contact Hours	04 / Week
Paper Name	Relationa	al Database Manage	ment System

Course Syllabi:		
(CR = Credits / IH: Instructional Hours)		
Modules	CR	IH
Module I : Introduction to RDBMS& ER to Relational		
Model		
1.1 Introduction : Definition, Difference Between DBMS And		
RDBMS, DataTypes		
1.2 Relational constraint: not null, unique, primary, foreign,		
check		
1.3 Relational algebra: Select, Project, Union, Intersection		
1.4 EER to relational mapping: Concept of Extended Entity	01	15
Relationship Diagram (EER), Specialization,		
Generalization, Aggregation		
1.5 Functional dependencies: Primary Key, Super Key,		
Candidate Key, Functional Decomposition.		
1.6 Normalization: First NF (1NF), Second NF (2NF), Third		
NF (3NF), and Boyce- Codd NF (BCNF).		
Module II : MySQL		

2.1 MySQL Database : Create, Select, Show, Drop		
2.2MySQL Joins : Self Join, Inner join, Outer Join(Left Outer,		
Right Outer, Full Outer)		
2.3 MySQL Sub-Queries : Syntax, subquery with(Comparison		
Operators, In, Not In , from Clause, EXIST, Non-		
EXIST,All,Any,Some), Co-related Subqueries		
2.4 MySQL Views: Create View, Update View, Drop	01	15
View, Rename View		15
2.5 MySQL Indexes : Create Index, Drop Index, Show Index,		
Unique Index, Clustered Index		
2.6 MySQL Cursor : Declare Cursor, Open Cursor, Fetch		
Cursor, Close Cursor		
2.5 MySQL Trigger : Create Trigger, Show Trigger, Drop		
Trigger, Types of Trigger		
Course Outcomes:		
Students should normalize data to its various forms using Sample	2.	
Student should write the sql queries for joining tables, sub query,	Cursor T	riggers
etc.		
Student should implement the knowledge of RDBMS into real lit	fe data	

Refere	Reference Materials	
	Books for Reference	
1.	"C Programming in an Open Source Paradigm: A Hands on approach", K.S.Oza, S.R.Patil, R.K.Kamat River Publisher Series in Information Science and Technology, Netherland 978-87-93237- 67-4,2015	
2.	ANSI C – E.Balgurusamy	
3.	Let us C – Y.C.Kanetkar	
4.	C' programming – DennisRitchie	
5.	Programming in 'C' -Venugopal	
б.	R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.	
7.	R. Ramakrishanan, J. Gehrke, Database Management Systems	

	3rd Edition, McGraw-Hill, 2002.
8.	A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill,2010.
9.	SQL, PL/SQL The Programming Language of ORACLE by Ivan Bayross

Suggested methods of Teaching:	
i)	Offline Traditional Board Teaching
ii)	Power Point Presentation
iii)	Online Teaching on platform of Zoom or Google Meet

PRACTICAL PAPER -I		
Based on DSC H1 and DSC H3, DSC H2 and DSC H4		
	Practical Experiments Based on DSC H1 And DSC H3	
1.	WAP to demonstrate use of data types, simple Operators.	
2.	WAP to demonstrate use of Conditional Statements (if, if-else, nested if).	
3.	WAP to demonstrate use of Conditional Statement(Switch Case)	
4.	WAP to demonstrate use of Loops (While, for, do-While)	
5.	WAP to demonstrate use of nested loop.	
6.	WAP to demonstrate use of unconditional control statements (Break,	
	Continue, goto)	
7.	WAP to demonstrate use of one dimensional array.	
8.	WAP to demonstrate use of two dimensional arrays	
9.	WAP to demonstrate concept of String.	
10.	WAP to demonstrate use of string functions.	
11.	WAP to demonstrate writing C programs in modular way (Use of User Defined Functions)	
12.	WAP to demonstrate concept of calling function (Call by value, call by	
	reference)	
13.	WAP to demonstrate recursive function.	
14.	WAP to demonstrate concept of Pointer.	
15.	WAP to demonstrate concept of Structure.	

16.	WAP to demonstrate concept of Array of Structure.
17.	WAP to demonstrate concept of dynamic memory allocation.
18.	WAP to demonstrate concept of file handling.
19.	WAP to demonstrate concept of input/output operations on file.

Practical Experiments Based on Paper DSC H2 And DSC H4			
Note: MySQL may be used.			
1.	Practical based on DML, DDL, DQL Commands		
2.	Practical Based on Use of Operators.		
3.	Practical Based on SQL Clauses		
4.	Practical Based on Aggregate Functions		
5.	Practical Based on use of Constraints.		
6.	Practical based on Sub-queries.		
7.	Practical based on Joins.		
8.	Practical based on Views.		
9.	Practical based on Index.		
10.	Practical based on cursor.		
11.	Practical based on trigger.		

#### **Examination Pattern:**

Q.No.	Nature/Type of Question	Marks	Total
1.	Multiple Choice Question	Each for 01	06
	(06)	Marks	00
2.	Short Answers(5)	Each for 02 Marks	10
3.	Solve Any 4 out of 6	Each for 03 Marks	12
4.	Solve Any 1 out of 2	Each for 06 Marks	06
5.	Solve Any 1 out of 2	Each for 06 Marks	06
	40		

#### 1.1 End Semester Examination Question Paper Pattern : 40 Marks

#### 1.2 Continuous Internal Evaluation(CIE) Pattern : 10 Marks

MCQ Test(Online/Offline)	05 Marks
Oral Test(Viva)	05 Marks
Total	10 Marks

#### 1.3 **Practical Examination**

The practical examination in Computer Science is conducted at end of each academic year which will be based on Course DSC H1 and DSC H3, DSC H2 and DSC H4 of 4 hours duration and of 50 maximum marks.

#### • Nature of Practical Examination:

Paper Name	Practical Paper –I
Total No. Of Questions	04
No. Of questions should be attempt	02
Each Question	20 Marks(Total 40 Marks)
Certified Journal	05 Marks
Viva Based on Practical	05 Marks
Total Marks	50

- To pass the B.Sc. Part-I,II&III examination, a candidate shall be required to obtain a minimum of 35% of the total Marks in each head of passing.
- There will be a separate head of passing in Theory, internal and Practical courses.