SHIVAJI UNIVERSITY, KOLHAPUR.

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CHOICE BASED CREDIT SYSTEM

Syllabus For

B.Sc. Part - I

Information Technology (Entire)

SEMESTER I AND II

(Syllabus to be implemented from June, 2018 onwards.)

B. Sc. Part-I Information Technology (I.T.) Entire

SEMESTER I AND II

- Guidelines shall be as per B. Sc. Regular Program
- Rules and Regulations shall be as per B. Sc. Regular Program except CBCS R. B. Sc. 3 Structure of Program and List of Courses and Standard of Passing.

Preamble

B. Sc. Computer Science Entire degree program is a three year program specially designed to pursue the career in Software or IT Industry. The curriculum of this program includes theory papers and laboratory practical based on Computer, Electronics, Mathematics and Statistics courses. It also includes theory papers on English.

Mathematics and Statistics courses are designed to develop logic skills useful for programming. Electronics course will inculcate basics of hardware and networking skills. English course is introduced to improve communication and interview skills.

B. Sc. Computer Science Entire degree program not only prepares the students for a career in software industry but it also motivates them for further studies, research and teaching field.

Objectives

1. Produce employable and skilled computer professionals.
2. Impart basic and advanced knowledge, skills required in IT Industry.
3. Develop entrepreneur skills to design and develop customized and tailor made software solution
4. for the industry.

❖ Structure of Program and List of Courses are as follows:

B. Sc. Part – I (IT Entire) CBCS PATTERN (2018 – 19)

SEMESTER – I														
Sr. No.	Course Title	TEACHING SCHEME						EXAMINATION SCHEME						
		THEORY			PRACTICAL			THEORY			PRACTICAL			
		No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	Hours	Max	Min	Hours	Max	Min	
1	DSC-101	4	3.2	**3**	4	3.2	**2**	2	50	20	**PRACTICAL EXAMINATION IS ANNUAL**			
2	DSC-102	4	3.2	**3**				2	50	20				
3	DSC -103	4	3.2	**3**	4	3.2	**2**	2	50	20				
4	DSC -104	4	3.2	**3**	4	3.2	**2**	2	50	20				
5	DSC -105	4	3.2	**3**	4	3.2	**2**		50	20				
6	AECC-A	4	3.2	**3**	--	--	**--**	2	50	20				
	TOTAL	**24**	**19.2**	**18**	**16**	**12.8**	**8**		**300**					
SEMESTER – II														
1	DSC-201	4	3.2	**3**	4	3.2	**2**	2	50	20	**As per BOS Guide-lines**	100	40	
2	DSC-202	4	3.2	**3**				2	50	20				
3	DSC-203	4	3.2	**3**	4	3.2	**2**	2	50	20		100	40	
4	DSC-204	4	3.2	**3**	4	3.2	**2**	2	50	20				
5	DSC-205	4	3.2	**3**	4	3.2	**2**		50	20		100	40	
6	AECC-B	4	3.2	**3**	--	--	**--**	2	50	20				
					16	**12.8**	**8**					100	40	
		24	**19.2**	**18**										
									300		**Theory**		**Practical**	
	TOTAL	**48**	**38.4**	**36**	**32**	**25.6**	**16**		**600**		**300+300= 600**		**400**	

- Student contact hours per week :
- Theory and Practical Lectures : 48 Minutes Each
- Total Marks for B.Sc.-I (Including English) : **1000**
- Total Credits for B.Sc.-I (Semester I & II) : **52**

- **DSC**- Discipline Specific Core Course.
- **AECC**- Ability Enhancement Compulsory Course (A & B) – English for Communication.

- ***Separate passing for each theory paper of 50 marks each. Minimum 20 (40%) marks out of 50 are required for passing.***
- ***Practical Examination conducted annually will be of 100 Marks for each course except English and minimum 40 marks are required for passing.***
- ***Separate passing for theory and practical.***

B. Sc. Part – II (IT Entire) CBCS PATTERN (2019 – 20)

Sr. No.	Course Title	TEACHING SCHEME						EXAMINATION SCHEME					
		THEORY			PRACTICAL			THEORY			PRACTICAL		
		No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	Hours	Max	Min	Hours	Max	Min
S E M E S T E R – III													
1	DSC-301	4	3.2	**3**	4	3.2	2	2	50	20	**PRACTICAL EXAMINATION IS ANNUAL**		
2	DSC-302	4	3.2	**3**				2	50	20			
3	DSC-303	4	3.2	**3**	4	3.2	2	2	50	20			
4	DSC-304	4	3.2	**3**				2	50	20			
5	DSC-305	4	3.2	**3**	4	3.2	2	2	50	20			
6	DSC-306	4	3.2	**3**	4	3.2	2	2	50	20			
7	AECC-C	4	3.2	**4**				--	--	--			
	TOTAL	**28**	**22.4**	**22**	**28**	**22.4**	**8**		**300**				
S E M E S T E R – IV													
1	DSC-401	4	3.2	**3**	4	3.2	2	2	50	20	**As per BOS Guide-lines**	**100**	**40**
2	DSC-402	4	3.2	**3**				2	50	20			
3	DSC-403	4	3.2	**3**	4	3.2	2	2	50	20		**100**	**40**
4	DSC-404	4	3.2	**3**				2	50	20			
5	DSC-405	4	3.2	**3**	4	3.2	2	2	50	20		**100**	**40**
6	DSC-406	4	3.2	**3**	4	3.2	2	2	50	20		**100**	**40**
7	AECC-D	--	---	---	---	---	---	3	70 + 30	25+ 10	**Theory**	**Practical**	
	TOTAL	**26**	**19.2**	**18**	**28**	**22.4**	**8**		**100**	**35**	**300+400 =700**	**400**	
		56	**41.6**	**40**	**32**	**44.8**	**16**		**400**				

- Student contact hours per week :
- Theory and Practical Lectures : 48 Minutes Each
- Total Marks for B.Sc.-I (Including Ev. St.) : **1100**
- Total Credits for B.Sc.-I (Semester III & IV) : **56**
- **DSC**- Discipline Specific Core Course
- **AECC**- Ability Enhancement Compulsory Course: Environmental Studies
- **AECC-C**: Environmental Studies Theory of 70 marks. Minimum 25 marks out of 70 are required for passing.
- **AECC-D**: Project 30 marks. Minimum 10 marks out of 30 are required for passing.
- ***Separate passing for each theory paper of 50 marks each. Minimum 20 (40%) marks out of 50 are required***

for passing.

- ***Except Environmental Studies, Practical Examination for each course will be conducted annually for 100 marks and minimum 40 (40%) marks are required for passing.***
- ***Separate passing for theory and practical.***

B. Sc. Part – III (IT Entire) CBCS PATTERN (2020-21)

Sr. No.	Subject Title	TEACHING SCHEME						EXAMINATION SCHEME							
		THEORY			PRACTICAL			THEORY					PRACTICAL		
								University			Internal				
		No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	Hours	Max Marks	Min Marks	Max Marks	Min Marks	Hours	Max Marks	Min Marks
S E M E S T E R – V															
1	DSE-501	4	3.2	**2**	---	---	---	2	40	14	10	4	**PRACTICAL EXAMINATION IS ANNUAL**		
2	DSE-502	4	3.2	**2**	---	---	---	2	40	14	10	4			
3	DSE-503	4	3.2	**2**	5	4	2	2	40	14	10	4			
4	DSE-504	4	3.2	**2**	5	4	2	2	40	14	10	4			
5	DSE-505	4	3.2	**2**	5	4	2	--	--	--	--	--			
6	PW	--	--	--	5	4	2	--	--	--	--	--			
7	AECC-E	4	3.2	**2**	---	---	---	2	40	14	10	**4**			
	TOTAL	**16**	**12.8**	**12**	**20**	**16**	**8**		**200**		**50**				
S E M E S T E R – VI															
1	DSE-601	4	3.2	**2**	--	--	--	2	40	14	10	4	**As per BOS Guide lines**	**100**	**40**
2	DSE-602	4	3.2	**2**	--	--	--	2	40	14	10	4		**100**	**40**
3	DSE-603	4	3.2	**2**	5	4	2	2	40	14	10	4		**100**	**40**
4	DSE-604	4	3.2	**2**	5	4	2	2	40	14	10	4			
5	DSE-605	4	3.2	**2**	5	4	2	--	--	--	--	--			
6	PW	--	--	--	5	4	2	--	--	--	--	--		**100**	**40**
7	AECC-F	4	3.2	**2**	---	---	---	2	40	14	10	4			
	TOTAL	**16**	**12.8**	**12**	**20**	**16**	**8**		**200**		**50**		**Theory**	**Practical**	
		32	**25.6**	**24**	**40**	**32**	**16**						**250+250= 500**	**400**	

- Student contact hours per week : 32 Hours (Min)
- Theory and Practical Lectures : 48 Min. Each
- Total Marks for B.Sc.-III (Including English.) **: 900**
- Total Credits for B.Sc.-III (Semester V & VI) : **40**

- **DSE**: Discipline Specific Elective Course
- **PW**: Project Work
- **AECC**- Ability Enhancement Compulsory Course (E & F): English for communication.

- ***Separate passing for each theory paper of 50 marks each. Minimum 20 (40%) marks out of 50 are required for passing.***
- ***Practical Examination will be conducted annually for 200 marks. Out of which 100 marks for DSE-503 &***

DSE-603 combined and 100 marks for DSE-504 & DSE-604combined. Minimum 40 (40%) marks are required for passing in each case.

- ***Project Work will be evaluated for 100 marks and minimum 40 (40%) out of 100 are required for passing.***
- ***Separate passing for theory, practical and project.***

	B.Sc. – I	**B.Sc. – II**	**B.Sc. – III**	**Total**
Credits	56	52	40	148
Marks	1300	1100	900	3300

SHIVAJI UNIVERSITY, KOLHAPUR

B.Sc. (Information Technology) Entire

CBCS Syllabus to be implemented from June 2018-19 Onwards.

COURSE STRUCTURE

B.Sc. (Information Technology) Entire Part-I

Semester-I			**Semester-II**		
Course Code	**Title of Paper**	**Work load**	**Course Code**	**Title of Paper**	**Work load**
DSC-101	Problem Solving Using Computers Part-I	4	DSC-201	Problem Solving Using Computers Part-II	4
DSC-102	Database Management System Part-I	4	DSC-202	Database Management System Part-II	4
DSC-103	Programming Using 'C' Part-I	4	DSC-203	Programming Using 'C' Part-II	4
DSC-104	Electronics Paper-I	4	DSC-204	Electronics Paper-II	4
DSC-105	Mathematics Paper-I	4	DSC-205	Mathematics Paper-II	4
AECC-A	English for Communication	4	AECC-B	English for Communication	4
Lab-I	Lab course-I Based on CC-101 and CC-201				4
Lab-II	Lab course-II Based on CC-102, 103 and CC-202, 203				4
Lab-III	Lab course-III Based on CC-104 and CC-204				4
Lab-IV	Lab course-IV Based on CC-105 and CC-205				4

B.Sc. (Information Technology) Entire Part-II

Semester-III			Semester-IV		
Course Code	**Title of Paper**	**Work load**	**Course Code**	**Title of Paper**	**Work load**
DSC-301	Object Oriented Programming	4	DSC-401	Advanced Object Oriented Programming	4
DSC-302	Operating System-Linux	4	DSC-402	Web Technology using HTML	4
DSC-303	Data Structure Using C++ Part-I	4	DSC-403	Data Structure Using C++ Part-II	4
DSC-304	Computer Graphics Part-I	4	DSC-404	Computer Graphics Part-II	4
DSC-305	Electronics Paper-III	4	DSC-405	Electronics Paper-IV	4
DSC-306	Mathematics Paper-III	4	DSC-406	Mathematics Paper-IV	4
AECC-C	Environment Studies	4	AECC-D	Environment Project	-
Lab-V	Lab course-I Based on CC-301, CC-302 and CC-401, cc-402				4
Lab-VI	Lab course-II Based on CC-303, CC-304 and CC-403 cc-404				4
Lab-VII	Lab course-III Based on CC-305 and CC-405				4
Lab-VIII	Lab course-IV Based on CC-306 and CC-406				4

B.Sc. (Information Technology) Entire Part-III

Semester-V			Semester-VI		
Course Code	**Title of Paper**	**Work load**	**Course Code**	**Title of Paper**	**Work load**
DSE-501	Enterprise Resource Planning	4	DSE-601	Computer Networks	4
DSE-502	Software Engineering	4	DSE- 602	Artificial Intelligence	4
DSE-503	C# Dot Net	4	DSE- 603	ASP.NET	4
DSE-504	Core Java	4	DSE-604	Advance Java	4
DSE-505	SEC-I Android Programming	4	DSE-605	SEC-II PHP MySQL	4
AECC-E	English for Communication	4	AECC-F	English for Communication	4
Lab-IX	Lab course-IX Based on CC-503 and 603				4
Lab-X	Lab course-X Based on CC-504 and CC-604				4
Lab-XI	Lab course-XI Based on CC-505 and CC-605				4
Lab-XII	Lab course-XII Project Work				4

Note: Practical workload for each lab. Course shall be of 4 lectures of 48 minutes per batch 20 students.

C) Standard of passing:

- The university theory examination shall be of 50 marks for each course and minimum 20 marks (40%) are required for passing each theory course.
- The practical examination shall be conducted annually for 100 marks for each course except English and minimum 40 (40%) marks are required for passing.
- Separate passing for theory and practical.
- Nature of AECC-A and B question paper will be same as B.Sc.-I AECC-A and B question paper.
- Other rules except standard of passing shall be as per B.Sc. regular rules.

B. Sc. (Information Technology) Entire

Part – I Semester – I

DSC-101 : Problem Solving Using Computers Part-I

Theory: 36 hrs. (45 lectures of 48 minutes)

Marks-50 (**Credits: 02)**

Unit:-I Computer Fundamentals: **(18 hours)**

Introduction to Computers:

- Characteristics of Computers
- Uses of computers
- Types and generations of Computers

Basic Computer Organization:

- Units of a computer:
  - CPU
  - ALU
  - Memory hierarchy
  - Registers, I/O devices.

Planning the Computer Program:

- Concept of problem solving.
- Problem definition.
- Program design.
- Debugging.
- Types of errors in programming.
- Documentation.

Unit-II Techniques of Problem Solving: (18 hours)

- Flowchart
- Decision table
- Algorithms
- Structured programming concepts
- Programming methodologies viz. top-down and bottom-up programming.

Overview of Programming:

- History, features of Python
- Structure of a Python Program, Elements of Python

Introduction to Python:

- Python Interpreter
- Using Python as calculator
- Python shell Indentation.
- Atoms (editor)
- Identifiers and keywords
- Literals, Strings
- Operators -Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Bit wise operator, Membership Operators, Identity Operators
-

Reference Books:

- Computer Today- S. Basndara
- Computer Fundamentals- P. K. Sinha
- Computer Fundamentals- V. Rajaraman
- Introduction to Computer and Data Processing- Pawar, Lad, Shinde, Patil (Dreamtech)
- Learning Python, 5th Edition by Mark Lutz
- Learn Python the Hard Way by Zed A. Shaw

DSC-102 : Data Base Management System-Part-I

Theory: 36 hrs. (45 lectures of 48 minutes)

Marks-50 (**Credits: 02)**

Unit-I Introduction to Database Management Systems: **(18 Hours)**

- Characteristics of database approach
- Data models: Hierarchical, Network, Relational
- Schema and Instances
- DBMS architecture:
    - Three Schema Architecture
        - Internal
        - Conceptual
        - External
- Data independence.
    - Logical
    - Physical

Unit-II Entity Relationship and Enhanced ER Modeling: (18 Hours)

- Entity :
    - Entities: Domain, Attributes, Tuples, Relations
    - Entity Relationships: one-one, one-many, many-one, many-many
- SQL-99:
    - Schema Definition
    - Constraints: Domain Integrity, Entity, Referential
    - Concept of Object modeling.

Reference Books:

- Database Management System Concepts- Korth Silberschartz.
- Fundamentals of DBMS Mark L Gillenson
- Database Management System- Raghu Ramakrishnan
- Fundamentals of Database System – S. Navathe

DSC-103 : Programming using 'C' Part-I

Theory: 36 hrs. (45 lectures of 48 minutes)

Marks-50 (**Credits: 02)**

Unit-I Programming Concepts and Introduction to 'C' (18 Hours)

- History of 'C'
- Character set and keywords
- Structure of 'C' programming
- Running and debugging the 'C' program.
- Constant and its type
- Variable and its Data types in 'C'.
- Operators- Arithmetic, logical, relational, bitwise, increment, decrement, conditional, operator precedence

Unit- 2 Input-Output Statements in C (18 Hours)

- Character input-output - getch(), getche(), getchar(), putchar()
- String input-output - gets(), puts()
- Formatted input-output - printf(), scanf()
- Conditional control statements- if, if else, nested if, switch
- Looping – for statement, nested for, while, do-while statements
- Unconditional breaking control statements- break, continue, goto

Reference Books:

- Programming in ANSI C - E. Balagurusamy
- Programming in C – Schuam outline Series
- Let Us C – Yashwant Kanetkar
- Introduction to Programming Using C- A. J Pawar, R. A. Lad, S. S. Shinde, D. R. Patil (Wiley Dreamtech)
- The complete reference 'C' – Herbert Schildt

DSC-104 : Electronics-Part I

Unit-1 Number System (10)

Binary, Decimal, Octal, Hexadecimal and their inter conversions. Codes- BCD, Excess-3, Gray codes

Unit-2 Digital Signals and logic gates (20)

Digital electronic signals and switches- concept of digital signal, logic levels, Active high, active low signals, Switching characteristics of semiconductor diode, Zener diode characteristics, transistor, Logic Gates- AND, OR, NOT, NOR, NAND, EX-OR, EX-NOR, operations and their truth table, Boolean algebra and reduction techniques using K-maps

Unit- 3 Binary Arithmetic and electronic circuit (15)

Arithmetic operations- Binary addition, subtraction, multiplication, division. 2's complement subtraction. Circuits- Half adder, full adder, half sutracter, full subtracter, 2 bit by 2 bit multiplier.

Unit- 4 Multiplexers and de-multiplexers (15)

Multiplexers- (MUX)-working of MUX, implementation of expressing using MUX, de-Multiplexers (DE-MUX)- implementation of expressing using DE-MUX, Decoder.

DSC-105 : Mathematics Paper-I
Semester – I (Matrices & Calculus)

Unit –1 Matrices (15)

1.1. Adjoint of matrix, Inverse of Matrix.

1.2. Application of matrices to a system of liner homogeneous and Non homogeneous equations.

1.3. Eigen values and Eigen vectors.

Unit–2 Successive Differentiation (15)

2.1. n^{th} order derivative of some standard functions : (i) $(ax + b)_n$, (ii) $\frac{1}{ax + b}$

(iii) Log (ax = b), (iv) e^{ax}, (v) a^{mx}, (vi) sin(ax + b), (vii) cos(ax + b),
(viii) $e^{ax}\sin(bx + c)$, (ix) $e^{ax}\cos(bx + c)$.

2.2. Leibnitz's theorem and it's applications.

Unit-3 Mean Value Theorems (15)

3.1. Introduction

3.2. Rolle's theorem.

3.3. Geometrical Interpretation of Rolle's theorem.

3.4. Lagrange's mean value theorem.

3.5. Geometrical Interpretation of Lagrange's mean value theorem.

3.2. Cauchy's mean value theorem.

3.3. Geometrical Interpretation of Cauchy's mean value theorem.

Unit 4 – Partial Differentiation (15)

4.1. Introduction

4.2. Partial derivative of first order.

4.3. Partial derivative of Higher orders.

4.4. Homogeneous functions.

4.5. Euler's on homogeneous functions.

LAB COURSE – III

First Term

Sr. No.	Topics	No. Of Experiments
1	Inverse of Matrix by ad joint method	**1**
2	Solution of system of m liner homogeneous equations in n-unknowns	**1**
3	Solution of system of m linear non-homogeneous equations in n-unknowns	**1**
4	Eigen values and Eigen vectors	**1**
5	Solution of Non-linear equations – (a) Bisection Method (b) Method of False Position (c) Newton-Raphson Method	**3**
6	Interpolation – (a) Newton's Forward Difference Interpolation (b) Newton's Backward Difference Interpolation (c) Lagrange's Interpolation (d) Fitting a curve by Least square method-St. Line, Parabola	**4**

B. Sc. (Information Technology) Entire Part – I Semester – II

DSC-201 : Problem Solving Using Computers Part -II

Theory: 36 hrs. (45 lectures of 48 minutes)

Marks-50 (**Credits: 02)**

Unit-I Creating Python Programs (18 Hours)

- Input and Output Statements.
- Iteration Control statements (Looping)- while Loop, for Loop
- Conditional Statement- if statement, if ...else, nested if
- Break and continue statements and its difference.

Unit-II Structures: (18 Hours)

- Numbers
- Strings
- Lists
- Tuples
- Dictionary
- Date & Time
- Modules
- Defining Functions, Exit function, default arguments.

Reference Books:

- Learning Python, 5th Edition by Mark Lutz
- Learn Python the Hard Way by Zed A. Shaw
- Python programming for beginners by Michale Knapp
- Core Python programming by Dr. R. Nageshwara Rao

DSC-202 : Data Base Management System-Part-II

Theory: 36 hrs. (45 lectures of 48 minutes)
Marks-50 (**Credits: 02)**

Unit-I Relational Data Model : (18 Hours)

- Basic concepts
- Relational constraint : not null, unique, primary, foreign, check
- Relational algebra : Select, Project, Union, Intersection, Difference
- SQL queries:
  - DDL : create, alter, drop
  - DML : insert, update, delete
  - DQL : select
  - SQL operator :
    - Logical, Arithmetic, relational, in, between, like, not, is null
  - SQL Clauses :
    - Where
    - Order by
    - Group by
    - Having
    - Aggregate Functions :SUM, MAX, MIN, COUNT, AVG

Unit-II Database design: (18 Hours)

- Entity Relationship (ER)
  - Basic Structures of Entity Relationship (ER)
  - Symbols
  - Construction of ER Diagram
  - Examples like Library Management System
- EER to relational mapping:
  - Concept of Extended Entity Relationship Diagram (EER)
  - Specialization
  - Generalization
  - Aggregation
- Functional dependencies:
  - Key
    - Primary, Super Key, Candidate Key
  - Functional Decomposition
- Normal forms :
  - First NF (1NF)
  - Second NF (2NF)
  - Boyce-Codd NF (BCNF)
  - Third NF (3NF)

Reference Books:

- Database System Concepts- Korth Silberschartz.
- Fundamentals of Database System – S. Navathe
- Database Management System- Raghu Ramakrishnan
- The complete reference MySQL- Vikram Waswani
- The complete reference MS-Office Access 2007 – Virginia Andersen

DSC-203 : Programming using 'C' –Part-II

Theory: 36 hrs. (45 lectures of 48 minutes)
Marks-50 (**Credits: 02)**

Unit-I Arrays and pointer Using C (18 Hours)

- Array definition and declaration, initialization of array.
- One, two and multidimensional arrays.
- String handling functions- strcpy(), strcmp(), strcat(), strlen(), strrev())
- Definition and declaration of pointer
- Operations on pointer
- Pointer initialization
- Pointer And Array
- Pointer of pointer
- Dynamic memory allocation

Unit-II Functions using C (18 Hours)

- Definition, declaration, prototype of function
- Local and global variable
- User defined functions
- Storage classes
- Recursion
- Pointer and function
- Call by value and Call by reference
- Preprocessor

Reference Books:

- Programming in ANSI C - E. Balagurusamy
- Programming in C – Schuam outline Series
- Let Us C – Yashwant Kanetkar

- Introduction to Programming Using C- A. J Pawar, R. A. Lad, S. S. Shinde, D. R. Patil (Wiley Dreamtech)
- The complete reference ‘C’ – Herbert Schildt

DSC-204 : Electronics Paper-II

Unit- 5 Flip- flop (15)

Flip-Flop- concept of sequential circuit, S-R, J-K, preset and clear, master slave, JK-MS, D and T flip flops, their truth tables and excitation tables, conversion from one type to another type of flip flop. Registers. Logic families and their characteristics. Characteristics of digital IC's –7402, 7400, 7408, 7475, 7474.

Unit- 6 Multi-vibrator (15)

Types of Multivibrator, Block diagram of IC555, application of IC555 as Astable and Monostable (Calculation of frequency and pulse width) crystal clock using invertor. Clock circuit using NAND gate.

Unit- 7 Introduction to Digital Memory (15)

Types of memory- Volatile and non-volatile, SRAM and DRAM, classification and working principle of memory devices, RAM, ROM, PROM, EPROM, EEPROM.

Unit-8 Memory Organization (15)

Concept of Diode matrix ROM, speed and cost range of memory devices, Memory organization- building the required memory size by using available memory chips, memory address map.

References:

Fundamentals Digital electronics- R. P. Jain, TMG
Digital Electronics – Derek Molly, PHI
Digital Electronics, An Introduction to theory and practice – William H. Gothmann

Electronics Lab Practical

1. Study of Basic Gates
2. Zener diode as a voltage regulator
3. Transistor as a switch
4. Inter conversion of gate by using NAND
5. Inter conversion of gate by using NOR
6. Verification of De-Morgan's Theorems
7. IC-555 as Astable Multivibrator
8. IC-555 as Mono stable Multivibrator
9. Study of D and edge triggered D flip flop
10. Study of R-S and J-K flip flop
11. Half and full Adder
12. Multiplexer and De-Multiplexer using IC's
13. Crystal clock using NAND gate
14. Architecture of 80386, 486 and Pentium system
15. Study of counter

DSC-205 : Mathematics Paper-II
Semester – II (Numerical Methods)

Unit-5. Errors in Numerical calculations and Solution to Algebraic and Transcendental Equations (15)

5.1. Introduction
5.2. Errors
5.2.1. Absolute Error.
5.2.2. Relative Error.
5.2.3. Percentage Error.
5.3. Solution to Algebraic and Transcendental Equations
5.3.1. Bisection Method.
5.3.2. Method of False Position.
5.3.3. Newton – Raphson Method

Unit-6. Interpolation (15)

6.1. Introduction.
6.2. Forward Difference.
6.3. Backward Difference.
6.4. Newton's Forward Difference Interpolation.
6.5. Newton's Backward Difference Interpolation.
6.6. Lagrange's Interpolation.
6.7. Least – Square Curve Fitting Method.
6.7.1. Fitting a straight line.
6.7.2. Fitting parabola.

Unit-7. Solution of Simultaneous Algebraic Linear Equations (15)

7.1. Cramer's Rule
7.2. Gauss Elimination Method.
7.3. Gauss – Jordan Method.
7.4. Gauss – Seidel Method.

Unit-8. Numerical Solution of Ordinary Differential Equations & Numerical Integration (15)

8.1. Numerical solution of 1^{st} and 2^{nd} order differential equations.
8.1.1. Taylor Series.
8.1.2. Euler's Method
8.1.3. Euler's Modified Method
8.1.4. Runge – Kutta Method (2^{nd}, 4^{th} order)

8.2. Numerical Integration.
8.2.1. Trapezoidal Rule.
8.2.2. Simpson's 1/3 Rule.
8.2.3. Simpson's 3/8 Rule.

Reference Books:

* Shanti Narayan : **Differential Calculus.**
* S.B. Nimse : **Calculus**
* H.T.Dinde, A.D. Lokhande, P.D.Sutar, U.H.Nai: **A Text Book Of Calculus And Differential Equations, Published by SUMS, 2003.**
* R.B. Kulkarni, J.D. Yadhav, N.I.Dhanshetti: **A Text Book Of Algebra And Geometry,**

Published by SUMS, 2003

* G.V. Kumbhojkar, H.V. Kumbhojkar: Calculus & Differential Equations, Nirali Prakashan.
* S.S. Sastry: Introduction Methods of Numerical Analysis, PHI.
* V. Rajaraman: Computer Oriented Numerical Methods.
* Balguruswami: Numerical Methods, PHI.
* Mathews: Numerical Methods for Scientist & Engineers, PHI.
* S.S. Sastry: Introduction Methods of Numerical Analysis, PHI.
* Steven C: Numerical Methods for Engineers with programming and Software Applications.
* Richard L Burden, J Douglas Faires, Brooks/Cole, Thompson: Numerical Analysis.

Mathematics Lab Practical

Second Term

7	Solution of Simultaneous Algebraic Linear Equations (a) Gauss Elimination Method (b) Gauss – Jordan Method (c) Gauss – Seidel Method	3
8	Numerical solution of Ordinary Differential Equations (a) Euler' Method (b) Euler's Modified Method (c) Runge – Kutta Method (2nd , 4^{th} order)	3
9	Numerical Integration (a) Trapezoidal Rule. (b) Simpson's 7 Rule (c) Simpson's 3/8 Rule	3

Reference Books:

* Shanti Narayan : **Differential Calculus**.
* S.B. Nimse : **Calculus**
* S.P.Thorat, A.A.Basade, H.V.Patil : **A Hand Book Of Mathematics Laboratory – I, Published by SUMS, 2003.**
* S.S. Sastry: **Introduction Methods of Numerical Analysis, PHI.**
* V. Rajaraman: **Computer Oriented Numerical Methods**.
* Balguruswami: **Numerical Methods, PHI.**
* Mathews: **Numerical Methods for Scientist & Engineers, PHI.**
* S.S. Sastry: **Introduction Methods of Numerical Analysis, PHI.**
* Steven C: **Numerical Methods for Engineers with programming and Software Applications.**
* Richard L Burden, J Douglas Faires, Brooks/Cole, Thompson: **Numerical Analysis.**

Practical Paper-I- Practical Based on DSC-101 and DSC-201

Program Using Python:

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :

   Grade A: Percentage >=80

   Grade B: Percentage>=70 and <80

   Grade C: Percentage>=60 and <70

   Grade D: Percentage>=40 and <60

   Grade E: Percentage<40
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. WAP to display the first n terms of Fibonacci series.
5. WAP to find factorial of the given number.
6. WAP to find sum of the following series for n terms: 1 – 2/2! + 3/3! - - - - - n/n!
7. WAP to calculate the sum and product of two compatible matrices.

Practical Paper-II- Practical Based on DSC-102 and DSC-202

Practical For Database Management Systems

Note: MSAccess/MySQL may be used.

The following concepts must be introduced to the students:

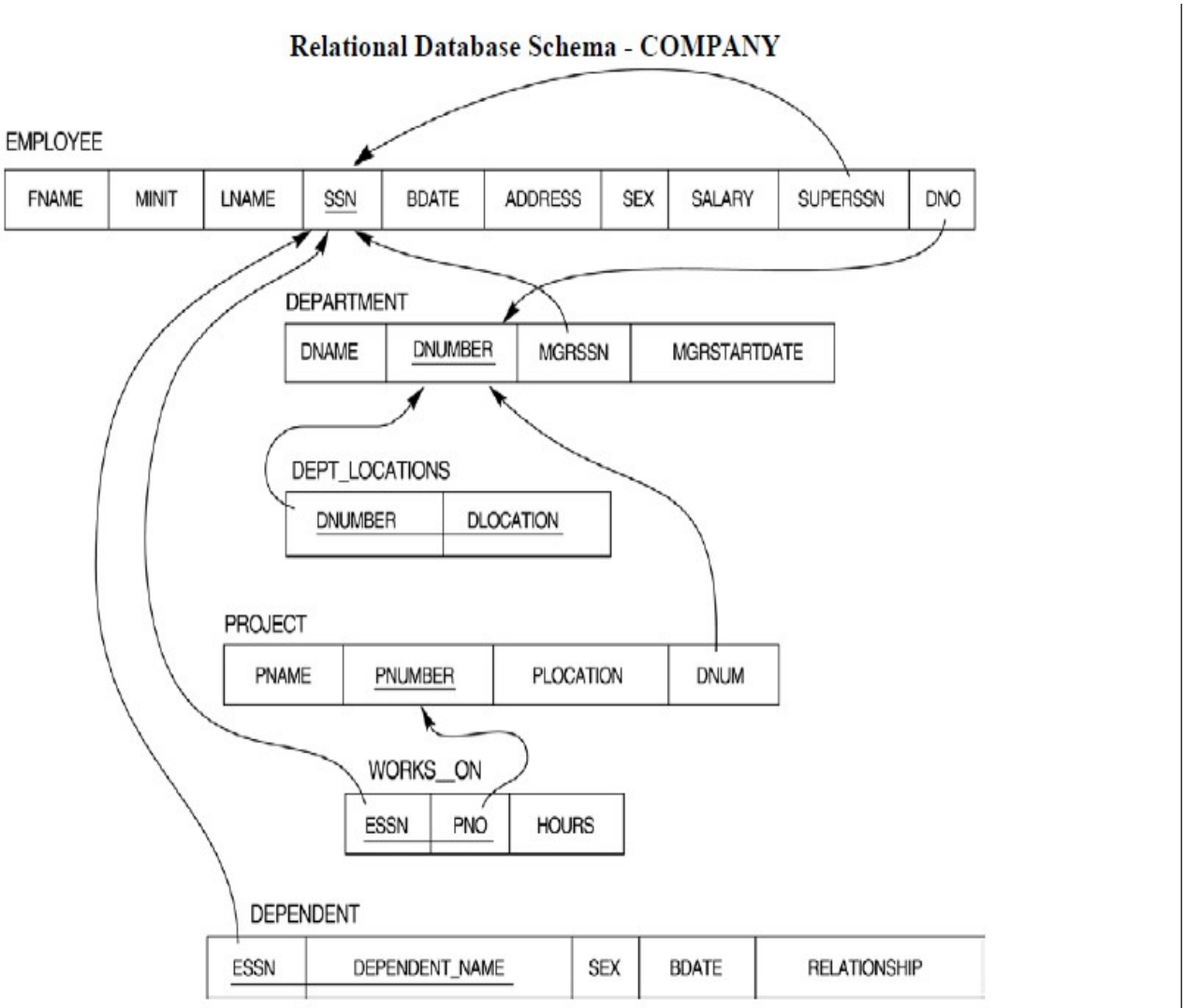
DDL Commands

- Create table, alter table, drop table

DML Commands

- Select , update, delete, insert statements
- Condition specification using Boolean and comparison operators (and, or,not,=,<>,>,<,>=,<=)
- Arithmetic operators and aggregate functions(Count, sum, avg, Min, Max)
- Multiple table queries (join on different and same tables)
- Nested select statements
- Set manipulation using (any, in, contains, all, not in, not contains, exists, not exists, union, intersect, minus, etc.)
- Categorization using group by……..having
- Arranging using order by

1. Create tables with relevant foreign key constraints
2. Populate the tables with data



Questions to be performed on above schema

3. Perform the following queries on the database :

1. Display all the details of all employees working in the company.
2. Display ssn, lname, fname, address of employees who work in department no 7.
3. Retrieve the birthdate and address of the employee whose name is 'Franklin T. Wong'
4. Retrieve the name and salary of every employee
5. Retrieve all distinct salary values
6. Retrieve all employee names whose address is in ‘Bellaire’
7. Retrieve all employees who were born during the 1950s
8. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
9. Retrieve the names of all employees who do not have supervisors
10. Retrieve SSN and department name for all employees
11. Retrieve the name and address of all employees who work for the 'Research' department
12. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birthdate.
13. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
14. Retrieve all combinations of Employee Name and Department Name
15. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan’ either as a worker or as a manager of the department that controls the project.
16. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
17. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
18. Select the names of employees whose salary does not match with salary of any employee in department 10.
19. Retrieve the name of each employee who has a dependent with the same first name and same sex as the employee.
20. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
21. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.
22. Find the sum of the salaries and number of employees of all employees of the ‘Marketing’ department, as well as the maximum salary, the minimum salary, and the average salary in this department.
23. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
24. For each department, retrieve the department number, the number of employees in the department, and their average salary.
25. For each project, retrieve the project number, the project name, and the number of employees who work on that project.
26. Change the location and controlling department number for all projects having more than 5 employees to ‘Bellaire’ and 6 respectively.

27. For each department having more than 10 employees, retrieve the department no, no of employees drawing more than 40,000 as salary.
28. Insert a record in Project table which violates referential integrity constraint with respect to Department number. Now remove the violation by making necessary insertion in the Department table.
29. Delete all dependents of employee whose ssn is '123456789'.
30. Delete an employee from Employee table with ssn = '12345'(make sure that this employee has some dependents, is working on some project, is a manager of some department and is supervising some employees). Check and display the cascading effect on Dependent and Works on table. In Department table MGRSSN should be set to default value and in Employee table SUPERSSN should be set to NULL
31. Perform a query using alter command to drop/add field and a constraint in Employee table.

Practical Paper-III- Practical Based on DSC-103 and DSC-203

Practical using 'C' Programming.

1. Write a program to accept 'n' subject marks and calculate total marks, percentage and grade of student.
2. Write a program to input n numbers and find the Odd and Even numbers.
3. Write a program to find an age of a person (Input birth date and today date).
4. Write a program to input the day number and display day of week.
5. Write a program to find the sum of first n natural numbers.
6. Write a program to accept the range and generate Fibonacci Series.
7. Write a program to find prime numbers between given range.
8. Write a program to sort the numbers in ascending and descending order using array.
9. Write a program accept any string and check given string is Palindrome or not (Use string functions).
10. Write a program to find the product of given two matrices.
11 Write a program to find multiplication table of given number.
12. Write a program to create a function to find the given number is Armstrong or not.
13. Write a recursive function to find the factorial of a given number.
14. Write a function to sort given names in ascending order.

15. Write a program to create strcpy() function using pointer.

16. Write a program to create function to swap two numbers (Call by reference).

Note:

The practical examination is annual having 100 marks and 4 hours duration. There are four questions and student has to attempt any two. The mark distribution is as follows.

Solved question carries : 80 marks (Each question carries 40X2=80 Marks)

Certified journal carries : 10 marks.

Viva based on practical carries : 10 marks.

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