SHIVAJI UNIVERSITY, KOLHAPUR.

B

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2009

Syllabus For

B.C.S.

Part – II (Sem.-III & IV)

Syllabus to be implemented from June 2011 onwards.

Shivaji University, Kolhapur.

Revised Syllabus of the B.Sc. Part - II Semester III to be implemented from the academic year 2011-12 onwards.

Course structure for B.Sc. Part-II Semester III & IV

Subjects	Name of the Paper	**Marks**	
		Theory	Internal
B.C.S Part II: Computer Science	**Semester III** Paper- V Object Oriented Programming (C++)	40	10
	Semester III Paper -VI System Analysis and Design	40	10
	Semester IV Paper – VII: Data Structure through C++	40	10
	Semester IV Paper –VIII: RDBMS with Oracle	40	10
B.C.S Part II: Mathematics	**Semester III** **Paper- V** Linear Algebra	40	10
	Semester III **Paper- VI** Numerical Methods	40	10
	Semester IV **Paper- VII** Computational Geometry	40	10
	Semester IV **Paper- VIII** Operation Research	40	10

B.C.S Part II: **Electronics**	**Semester III** **PAPER - V** Computer Organization	40	10
	Semester III **PAPER - VI** Computer Instrumentation I	40	10
	Semester IV **PAPER – VII** Microcontroller	40	10
	Semester IV **PAPER VIII** Computer Instrumentation II	40	10
B.C.S Part II: **English**	**Semester III** **Paper- I** English for Communication	40	10
	Semester IV **Paper- II** English for Communication	40	10

[Note:- The practical examination will be conducted in annual.]

B.C.S. Computer Science
Semester- III

Paper Number : 3.1
Paper Title : **Object Oriented Programming (C++)**

UNIT 1. Object Oriented Concepts and Introduction to C++ **12**

1. Object Oriented Concepts-Data abstraction, Encapsulation, Inheritance, Polymorphism
2. Keywords, Identifiers, Constants
3. Basic data types.
4. Structure of C++ program
5. Input & output Streams.
6. Memory management operators : new and delete
7. Dynamic initialization of variable, reference variables
8. Operators in C++
9. Control structures
10. Functions : Inline functions, default arguments, function overloading

UNIT 2. Classes, Objects, constructors and destructors **13**

1.Defintion of class and object
2. Class declaration
3. Access modifiers : private, public & protected
4. Defining member functions
5. Static data members
6. Array of objects
7.Friend function and friend Class
8. Constructors : definition, types
9. Destructors

UNIT 3. Operator overloading **12**

1. Introduction
2. Defining operator overloading
3. Overloading unary operators
4. Overloading binary operators.
5. Overloading operators using friend function
6. Rules for overloading operator

UNIT 4 . Inheritance & Polymorphism **13**

1. Introduction
2. Defining base and derived classes
3. Types of Inheritance : single , multiple, multilevel, hierarchical, hybrid
4. Definition of polymorphism, types of polymorphism, virtual functions

Reference Book-

1. Object Oriented Programming By E. Balagurusamy
2. Mastering C++ By Venugopal.
3. C++ Programming –By D. Ravichandran.
4. Object Oriented Programming in C++ - By G. T. Thampi & S. S. Mantha - Dreamtech

Paper Number : 3.2
Paper Title : **System Analysis and Design**

UNIT 1. System Analysis And Design Overview **12**

1. Meaning and Definition
2. Characteristics.
3. Element of system.
4. Types of system.
5. System Development Life Cycle.
6. Feasibility Study : Operational, Technical, Economic.
7. Role & Skill Of System Analyst.
8. System planning and Initial Investigation
9. Fact Finding Technique-Interviews, Questionnaires, Record Interviews, Observation

UNIT 2. Charting Technique and Process **13**

1. Decision Tables
2. Decision Trees.
3. Program Flowchart, System Flowchart.
4. Data Flow Diagram.-Levels of DFDs.
5. Entity Relationship Diagram
    a. Concept of Entity.
    b. Attributes.
    c. Types Of relation.
6. Normalization- Forms of Normalization

UNIT 3. Input - Output Design and Testing **12**

1. Input Design.
2. Output Design.
3. File Design.
4. Hardware and software selection
5. System Testing.

UNIT 4. System Implementation and Case Studies **13**

1. System Implementation.
2. Quality Assurance.
3. System Maintenance
4. Case studies : College Admission system**,** Inventory Management System.

Reference Book :

1. System Analysis & Design- AWAD E.H.
2. System Analysis & Design- Parthsarthy/ Khalkar.
3. Basic System Analysis And Design-Alan Denial & Don Yeats.
4. System Analysis & Design -Edwards Perry.
5. System Analysis and Design – V.K. Jain (Dreamtech Pub.)

Paper Number : 3.3
Paper Title : **Laboratory Course in Computer Science – III**

1. Simple programs
2. Programs based on class
3. Programs based on function overloading
4. Programs based on constructors and destructors
5. Programs based on operator overloading
6. Programs based on inheritance

B.C.S. II Computer Science
Semester- IV

Paper Number : 4.1
Paper Title : Data Structure through C++

UNIT 1. Introduction to Data structure and Arrays **10**
1. Definitions –Data types, Data Object, Data structure.
2. Implementations of Data structure.
3. Array- definition.
4. Types-one, multi dimensional, character string array.

UNIT 2. Stack & Queue **15**
1. Definition of stack.
2. Operation on stack.
3. Declaration of stack.
4. Application of stack-Recursion infixes, prefixes, and postfixes expression.
5. Definition of queue.
6. Operations on queue.
7. Types of queue-Linear, Circular.
8. Applications of queue.

UNIT 3. Linked List and Trees **15**
1. Concept of linked list
2. Implementation of Linked list
3. Operations on linear linked list, ons on circular linked list, doubly linked list
4. Implementation of stack and queue using linked list.
5. Trees : definition, terminologies, representation, types (Only theory)
6. Tree Traversal- (Preorder, Inorder, Postorder) (Only theory)

UNIT 4. Searching & Sorting **10**
1. Searching : linear and binary
2. Sorting : bubble sort, selection sort, insertion sort,

Reference Book-
1**.** Data Structure using C by A.M. Tanenbaum, Yecidyan lang
2. Data Structure Through C- By Dr. Sahani**.**
3. Data Structures Using C Yashwant Kanitkar – BPB Publication

Paper Number : 4.2
Paper Title : **RDBMS with Oracle**

UNIT 1. Introduction to RDBMS **10**
1. Data, Database, Database Management System
2. Concept of Data Models (Network, Hierarchical ,Relational)
3. Concept of RDBMS
4. RDBMS Terminologies : relation, attribute, domain, tuple, entities
5. DBA & Responsibilities of DBA
6. Relational Model: Structure of Relational Databases, Relational Algebra,

UNIT 2. Structured Query Language (SQL). **15**
a) Oracle
1. Data types.
2. Classification of SQL commands.
3. Create Table Command
4. Insert Command, Select Command, Delete Command and Update Command
5. Data Constraints : Primary Key, Foreign key, Unique, Null, Check, Default

6. Modifying the structure of tables : Alter and Drop Commands
7. SQL Operators : Logical, Relational, In, Between, Like
8. SQL Clauses : Order by, Group by, Having Clause
9. SQL functions : Arithmetic, Conversion , Aggregate Functions.

b) Sub Queries and Join

1. Sub queries and Nesting Sub queries.
2. Join : Equi join, Simple Two table Join, Outer join, Self join
3. Views, Indexes, Sequence

UNIT 3. PL-SQL. **12**

1. Comparison between SQL & PL-SQL.
2. Structure of PL-SQL.
3. Control structure : if then else, for , while
4. Illustrative Example

UNIT 4. Cursor And Triggers **13**

1. Definitions of Cursor & Trigger.
2. Types of cursor- Implicit, Explicit.
3. Open, Close cursor.
4. Types of Trigger-Statement, Row trigger

Reference Book-

1. Database System Concepts- Korth Silberschartz.
2. SQL – PL/SQL By Ivan Bayross BPB Publications
3. Structure Query Language- By Osborne.

Paper Number : 4.3
Paper Title : **Laboratory Course in Computer Science – IV**

1. Data Structure through C++

1. Write a program to perform various operations on array – sorting, merging, searching etc
2. Write a program to implement stack using static method.
3. Programs to implement applications of stack
4. Write a program to implement Queue using static method.
5. Programs to implement applications of queue
6. Write a program to create linked list, add node to linked list and Remove node from linked list.
7. Write a program to implement types of linked list
8. Write a program to implement stack and queue dynamically
5. Write a program to sort given elements using insertion sort, bubble sort, selection sort etc.
6. Write a program to search given element using Linear and Binary Search

2. Oracle

1. Create emp table and dept table with appropriate field and apply following integrity constraint on appropriate fields.
1. Primary key.
2. Foreign key.
3. not null
4. default
5. check
2. Create student table with appropriate field and do following things.
1. Insert 10 appropriate records.
2. Update record
3. Delete records.
4. Alter table
5. Drop table.
3. Use any tables and do select operations using Operators, clauses and aggregate

function.
4. Use any tables and do sub query & Join operations.
5. Illustrative Example using P/L SQL.
6. Illustrative Example on Trigger and cursor.

Equivalence in accordance with titles and contents of papers (For revised Syllabus)

Sr. No.	Title of Old Paper	Title of New Paper
1	Data Structure Through C And Object Oriented Programming (C++)	Paper Number : 3.1 Paper Title : Object Oriented Programming (C++) Paper Number : 4.1 Paper Title : Data Structure through C++
2	System Analysis and Design & Relational Database Management System (Oracle) (SAD & RDBMS)	Paper Number : 3.2 Paper Title : System Analysis and Design Paper Number : 4.2 Paper Title : RDBMS with Oracle
3	Laboratory Course In Computer Science	Paper Number : 3.3 Paper Title : Laboratory Course in Computer Science – III Paper Number : 4.3 Paper Title : Laboratory Course in Computer Science – IV

Nature of Practical Question Paper

1. Solve any three questions from Q. 1 to Q. 5
2. Each question carries 25 marks.
3. 15 marks for VIVA and 10 marks for certified journal.

Q.1 Based on Laboratory Course in Computer Science – III

Q.2 Based on Laboratory Course in Computer Science – III

Q.3 Based on Laboratory Course in Computer Science – IV

Q.4 Based on Laboratory Course in Computer Science – IV

Q.5 Based on Laboratory Course in Computer Science – IV

B.C.S. II Mathematics

Semester- III

Paper –V

Linear Algebra

Unit 1 :- Linear Equations and Matrices (10 lectures)

1.1 Matrices

1.2 Matrix Transformations

1.3 Linear systems

1.4 Results on system of linear equations and invertible matrices (statements only)

1.5 Solutions of Systems of Linear Equations

- 1.5.1 Gaussian Elimination method
- 1.5.2 Gauss-Jordan method

1.6 LU- Factorization method

Unit 2 :- Real Vector spaces (16) lectures)

2.1 Vector Spaces

2.2 Subspaces

2.3 Linear Independence

2.4 Basis and Dimension

2.5 Homogeneous Systems

2.6 The Rank of a Matrix and Applications

2.7 Coordinates and Change of Basis

2.8 Inner product space

- 2.8.1 Definition and examples
- 2.8.2 Properties of inner product
- 2.8.3 Orthonormal Basis in R
- 2.8.4 Gram-Schmidt process

Unit 3 :- Eigen values, Eigen vectors and diagonalization (8 lectures)

3.1 Eigen values and Eigen vectors

3.2 Diagonalization

3.3 Cayley Hamilton theorem (Statement only) and examples.

Unit 4 :- Linear Transformations and Matrices (6 lectures)

4.1 Definitions and Examples

4.2 The Kernel and Range of a Linear transformation

4.3 The Matrix of a Linear Transformation

REFERENCE BOOKS

1. Elementary Linear Algebra with Applications, Howard Anton, Chris Rorres, John Wiley and sons., 7th Edition (1994).
2. Linear Algebra , Schaum Series.
3. A textbook of Matrices, Shanti Narayan, P. K. Mittal, S. Chand.

Semester- III

Paper –VI

Numerical Methods

Unit 1 :- Errors and Approximations (8 lectures)

1.1 Introduction , Mathematical background

1.2 Floating point arithmetic

- 1.2.1 Significant digit & examples
- 1.2.2 Accuracy & precision

1.3 Errors

- 1.3.1 Types of Errors
  - a) Round - off error
  - b) Truncation error
  - c) Algorithmic error
  - d) Absolute error
  - e) Relative error
  - f) Inherent error
- 1.3.2 Examples

Unit 2 :- Numerical Interpolation (12 lectures)

2.1 Introduction

- 2.1.1 Definitions of ∇, Δ& E
- 2.1.2 Revision of Newton - Gregory Forward & Backward Interpolation

2.2 Newton's divided difference interpolation formula & examples

2.3 Central Difference method :- Stirling formula & examples

Unit 3 :- Numerical differentiation and Integration (12 lectures)

3.1 Numerical differentiation using Forward interpolation formula and examples

3.2 Numerical differentiation using Backward interpolation formula and examples

3.3 Numerical differentiation using Central difference (Stirling) method and examples

3.4 Numerical Integration

3.4.1 General quadrature formula (without proof)

3.4.2 Trapezoidal rule, Simpson's $\frac{1}{3}^{rd}$ rule, Simpson's $\frac{3}{8}^{th}$ rule (without proof)

3.5 Romberg method & examples

3.6 Weddle's rule & examples

Unit 4 :- Numerical solution of first order ordinary differential equations (8 lectures)

4.1 Euler's method.

4.2 Modified Euler's method.

4.3 Runge - Kutta Method (Second & fourth order).

4.4 Predictor corrector method.

REFERENCE BOOKS

1. Introductory Methods of Numerical Analysis, S.S. Sastry, 3rd edition, Prentice Hall of India, 1999.
2. Finite differences and Numerical Analysis, H.C. Saxena, S. Chand and Company.
3. Numerical Analysis, Balguruswamy.
4. Calculus of Finite Differences and Numerical Analysis, P. P. Gupta, G. S. Malik and S. Gupta, Krishna Prakashan Media (P) Ltd.
5. Computer oriented Numerical methods, A. B. Auti Tech-max publications

Mathematics Practical III

Sr. No	Topic	Number of practicals
1	Solution of system of linear Equations (a) Gaussian Elimination Method. (b) Gauss Jordan Method. (c) LU Factorization method.	1
2	Gram Schmidt process	1
3	(a) Eigen values and Eigen vectors of a matrix. (b) The matrix P that diagonalizes the given matrix if exists.	1
4	(a) Newton's divided difference interpolation (b) Central difference method	1
5	(a) Romberg method (b) Weddle's rule	1
6	(a) Numerical differentiation using Forward & Backward interpolation (b) Numerical differentiation using Central difference (Stirling) method	1
7	Solution of Ordinary differential equation (a) Euler method & Euler modified method, (b) Runge – Kutta method	1
8	Cayley Hamilton theorem (a) Examples on verification of Cayley Hamilton theorem. (b) Inverse of matrix using Cayley Hamilton theorem.	1
9	Plane Linear transformation (a) Scaling shearing translation. (b) Reflection about X-Axis. (c) Reflection about Y-Axis. (d) Reflection about Line X = Y. (e) Reflection about Line X = -Y. (f) Reflection about Arbitrary Point.(Without Algorithm) (g) Rotation about The Origin (h) Rotation about The Arbitrary point (Without Algorithm). (i) Combined Transformation (Figures are Expected).	1
10	Computer program for (a) Gaussian Elimination Method. (b) Gauss Jordan Method. (c) LU Factorization method.	1

B.C.S. II Mathematics
Semester- IV

Paper –VII

Computational Geometry

Unit 5 :- Two dimensional transformations (13 Lectures)

5.1 Introduction.

5.2 Representation of points.

5.3 Transformations and matrices.

5.4 Transformation of points.

5.5 Transformation of straight lines.

5.6 Midpoint transformation.

5.7 Transformation of parallel lines.

5.8 Transformation of intersecting lines.

5.9 Transformation: rotations, reflections, scaling, shearing.

5.10 Combined transformations.

5.11 Transformation of a unit square.

5.12 Solid body transformations.

5.13 Transformation and homogeneous coordinates. Translation.

5.14 Rotation about an arbitrary point.

5.15 Reflection through an arbitrary line.

5.15 Projection – a geometric interpretation of homogeneous coordinates.

5.16 Overall Scaling.

5.17 Point at infinity.

Unit 6 :- Three dimensional transformations (12 Lectures)

6. 1 Introduction.

6.2 Three dimensional – Scaling, shearing, rotation, reflection, translation.

6.3 Multiple transformations.

6.4 Rotation about – an axis parallel to coordinate axes, an arbitrary axis in space.

6.5 Reflection through – coordinate planes, planes parallel to coordinate planes, arbitrary planes.

6.6 Affine and perspective transformations.

6.7 Orthographic projections.

6.8 Axonometric projections.

6.9 Oblique projections.

6.10 Single point perspective transformations.

6.11Vanishing points.

Unit 7 :- Plane Curves (9 Lectures)

7.1 Introduction.

7.2 Curve representation.

7.3 Non – parametric curves.

7.4 Parametric curves.

7.5 Parametric representation of a circle and generation of circle.

7.6 Parametric representation of an ellipse and generation of ellipse.

7.8 Parametric representation of a parabola and generation of parabolic segment.

7.9 Parametric representation of a hyperbola and generation of hyperbolic segment.

Unit 8 :- Space curves (6 Lectures)

8.1 Bezier Curves – Introduction, Definition, Properties (without proof),

8.2 Curve fitting (upto n = 3),

8.3 equation of the curve in matrix form (upto n = 3)

REFERENCE BOOKS

1. Mathematical elements for computer graphics, F. David and J. Alan Adams (McGraw Hill International Edition)
2. Computer graphics, Schaum series.
3. Computer Graphics handbook,Geometry and Mathematics, M.E.Mortenson, Industrial Press Inc.

B.C.S. II Mathematics

Semester- IV

Paper –VIII

Operation Research

Unit 5 :- Basics of Operations Research, scope, limitations. (3 Lectures)

Unit 6 :- Linear Programming Problem (12 Lectures)

5.1 Basic definitions.

5.2 Feasible solution, basic solution, optimal solution.

5.3 Solution of L.P.P by Simplex method & examples

5.4 Solution of L.P.P by Big-M method & examples

5.5 Solution of L.P.P by Two phase method & examples

Unit 7 :- Transportation and Assignment Problems (13 Lectures)

6.1 Introduction to Transportation Problem.

6.2 Initial solution .

6.2.1 North west corner rule.

6.2.2 Matrix-Minima method.

6.2.3 Vogel approximation method.

6.3 Optimal solution by MODI method.

6.4 Maximization in Transportation Problem.

6.5 Unbalanced Transportation Problem.

6.6 Introduction to Assignment problem.

6.7 Hungarian Method & examples.

6.8 Maximization in assignment problem.

6.9 Assignment problem with restrictions.

6.10 Unbalanced assignment problem.

Unit 8 :- Theory of games (12 Lectures)

8.1 Two person zero sum game, pure and mixed strategies, statement of min – max theorem.

8.2 Saddle point.

8.3 Solution of 2x2 game by arithmetic and algebraic methods.

8.4 Principle of dominance and solving some simple games.

8.5 Subgame method.

8.6 Graphical method for solving $2 \times n$ & $m \times 2$ size games

REFERENCE BOOKS

1. Operations Research, S. D. Sharma.
2. Principles of Operations Research, H. M. Wagner,Prentice Hall of India.
3. Operations Research, Gupta and Hira.
4. Operations Research, J K Sharma (second edition)

Mathematics Practical IV

Sr.No	Topic	Number of practicals
11	Space Linear transformation (a) Scaling shearing rotation About co-ordinate axes, Reflection through co-ordinate planes, translation. (b) Multiple transformations, rotation about a line parallel to coordinate axis, Rotation through planes which are parallel to co-ordinate planes, Reflection through arbitrary plan (Algorithm Only). (c) Projections: Orthograpic Axonometric Oblique Single point perspective	1
12	Plane Curves (a) Generation of the points on: Circle, Ellipse,Parabola, Hyperbola,(All in standard form) &algorithm. (b) Write only algorithms for generating points on: i) Circle with arbitrary center. ii) Circle through given three points. iii) Ellipse with center ad (a,b) and major axis inclined by certain angle with horizontal	1
13	Bezier Curve (a) Generation of the Curve with n = 2, 3.	1
14	Linear programming:- Simplex method & Big-M Method	1
15	Linear programming:- TWO PHASE method	1
16	Transportation problem (a) Initial basic feasible solution by i) North-West corner method ii) Matrix minima method iii) Vogel Approximation Method	1
17	Assignment problem	1
18	Game theory (a) Two person zero sum game (b) Use of dominance principle (c) Use of sub-game method (d) Use of graphical method	1

19	Computer program for (a)Euler's Method (b)Euler'sModified (c) Weddle's Rule	1
20	Computer program for (a)Runge-Kutta 2^{nd} order (b)Runga-Kutta 4^{th} order	1

SECOND YEAR B. C. S. (MATHEMATICS)

Theory

Semister III

Paper-No.	Title of the Paper	Total Marks	Periods per week
V	Linear Algebra	50 (40+10)	4
VI	Numerical Method	50 (40+10)	4

Semister IV

Paper No.	Title of the Paper	Total Marks	Periods per week
VII	Computational Geometry	50 (40+10)	4
VIII	Operation Research	50 (40+10)	4

Practical(Annual)

Title of the Paper	Total Marks	Periods per week
Practical III &IV	100	8

* Note : 8 hours per week per 20 students batch.

Work - Load

(i) Total teaching periods for Paper – V , VI are 8 (Eight) per week.

4 (Three) periods per paper per week. For Semister III

(ii) Total teaching periods for Paper – VII , VIII are 8 (Eight) per week.

4 (Three) periods per paper per week. For Semister IV

(iii) Total teaching periods for Practical Course in Mathematics –III &IV,

8 hours per week per 20 students batch

Scheme of examination

The Theory examination shall be conducted at the end of each semester.

The Theory paper shall carry 40 Marks.

There will be 10 internal marks per paper per semester

The practical examination shall be conducted at the end of each year.

The Practical paper shall carry 100 marks.

The evaluation of the performance of the students in theory shall be on the basis of examination.

Nature of Theory Question Paper

Q1. Multiple choice questions - (8 Marks)

Q2. Attempt Any Two out of Three (2 X 8 Marks)

Q3. Short Answers (any four out of six) (4 X 4 Marks)

Nature of Practical Question Paper

Examination Scheme for Practical

1) The practical paper shall carry 100 marks.
2) There shall be Five questions carrying 25 marks each. Students has to attempt Three questions. Questions No. 1 is compulsory and any Two questions from Questions No.2 to Questions No.5
3) 10 marks for journal and 15 marks for viva.
4) The duration of Practical will be Four hours.

Nature of Practical Paper

Que No.	Question Pattern	Marks
Q.1 a)	Practical Assignments	07
b)	Program Writing	08
c)	Program Execution	10
OR		
Q.1 a)	Practical Assignments	07
b)	Program Writing	08
c)	Program Execution	10
Q.2 a)	Practical Assignments	07
b)	Program Assignments	08
c)	Program Assignments	10
Q.3 a)	Practical Assignments	07
b)	Program Assignments	08
c)	Program Assignments	10

Q.4 a)	Practical Assignments	07
b)	Program Assignments	08
c)	Program Assignments	10
Q.5 a)	Practical Assignments	07
b)	Program Assignments	08
c)	Program Assignments	10

B.C.S. II Electronics
SEMISTER III

ELECTRONICS

Paper V - Computer Organization

1 MEMORY ORGANISATION: (08)

Introduction, Characteristics of memory systems ,Main memory design, Memory hierarchy, Cache memory, Memory mapping, Virtual Memory, Memory management concepts (paging and segmentation).

2. CONTROL UNIT: (08)

Introduction, Hardware control-design methods, Microprogrammed control unit, Microinstruction addressing and architecture of typical micro programmed control unit.

3. I/O ORGANISATION: (14)

Peripheral devices, Input output Interface, IO mapped IO, Memory mapped IO, Asynchronous data transfer, Modes of transfer, Priority Interrupts, Direct memory access, Input output Processor, serial communication.

4. CPU ORGANISATION: (14)

Introduction, General register organization, Stack Organization, Instruction formats, Addressing modes Program Control, Arithmetic and Logic Unit (One bit and multiple bit), Bit processor.

Reference Books

Computer Organization - J.P. Hays TMH

Computer Organization - M

SEMISTER III

ELECTRONICS

Paper VI - Computer Instrumentation I

1. MEASURMENTS, INSTRUMENTATION AND CALIBRATION (6)

Measurements,
Instrument,
instrumentation,
Calibration and Standards

2. TRANCDUCERS AND SENSOR (10)

Transducers ,Sensors
Classification of transducers, Characteristics of Transducers, Temperature Transducers, Pressure Transducers, Force Transducers, Optical Transducers, Selection criterion for Transducers.

3. SIGNAL CONDITIONING AND DATA CONVERTORS (12)

Pre amplifiers, Filters, ADC(Dual Slope, Successive Approximation),DAC(R-2R), Study of IC ADC 0808, DAC0809, Instrumentation Amplifier using OPAMP, Differential Bridge Amplifier.

4. ACTUATORS (12)

Definition & Principle
Electrical Actuators
Relay , Servomotors -AC, DC motors, Stepper motor
Pneumatic Actuators
Hydraulic Actuators

Reference Books

Electronic Instrumentation -Kalsi TMH
Transducers & Instrumentation - Murthy PHI (Unit 1)
Instrumentation Measurements & Analysis- Nakra & Chaudhry TMH
Instrumentation Devices & Systems - Rangan, Sarma, Mani TMH

B.C.S.II Electronics

SEMISTER IV

Paper VII - Microcontroller

1. INTRODUCTION TO MICROCONTROLLER (10)

Comparison of Microcontroller & Microprocessor, Survey of 4-Bit, 8-Bit, 16-Bit And 32-Bit Microcontrollers and their application areas , Study of 8051 and its Family (89C51, DS5000, 8031, 8032, 8052, 8751, Phillips RD2, 89C51VRD2).
Architecture of 8051:
Block Diagram of 8051 and Study of Internal Blocks, Reset and Clock, Registers, Flags and Internal Memory, SFR, I/O Ports.

2. 8051 INSTRUCTION SET (10)

Study of 8051 Instruction Set and Addressing Modes,
Data transfer, Arithmetic, Logical, JUMP, Loops & CALL instructions, Bit manipulation Instructions.

3. FACILITIES IN 8051 (10)

Timer and Counter: Timer and Counters, Timer modes, Programming the timers in Mode 1 using assembly and C. Time delay generation.
Serial Port : Serial port of 8051, RS-232 standard and IC MAX–232, Baud rate in 8051, programming for transmitting character through serial port using assembly and C.

4. INTERFACING METHODES [8]

Interfacing Stepper Motor , LCD, DC motor (PWM), Respective programming through embedded C.

Reference Books

Computer Organization - J.P. Hays TMH

8051 Microcontrollers 2nd Edition - Mazidi Pearson
8051 Microcontroller - Ayala Cengage
8051 Microcontroller - Deshmukh TMH

SEMISTER IV

Paper VIII - Computer Instrumentation II

1. DATA ACQUSITION (8)

Introduction, Generalized Data Acquisition System, Signal conditioning for DAS, Single channel DAS, Multichannel DAS, Multiplexing, Sample and Hold Circuit, Computer based DAS, Data Logger.

2. DIGITAL INSRUMENTS (10)

Introduction, Digital Multimeters, Digital Frequency Meter, Universal Counter, Digital Tachometer, Digital pH Meter, Digital Phase Meter, Block Diagram of CRO.

3. MONITORS AND RECORDERS (10)

CRT monitor, monochrome CRT, color CRT, Interlaced scanning, LCD technique.

Strip chart recorder, potentiometric recorder, Bridge type recorder ,X-Y recorder.

4. AUTOMATIC CONTROL MECHANISM (12)

Control system, Automatic control system, Microprocessor based control system, Microprocessor based temperature monitoring & control system, Microprocessor based speed control of DC motor.

Reference Books

Electronic Instrumentation -Kalsi TMH

Transducers & Instrumentation - Murthy PHI (Unit 1)

Instrumentation Measurements & Analysis- Nakra & Chaudhry TMH

Instrumentation Devices & Systems - Rangan, Sarma, Mani TMH

Paper X Practical

Group A

1.DAC (R-2R Ladder)

2. ADC (3 bit Flash) IC or Discrete

3. OP-AMP Parameters .

4. Analog Multiplexers

5. Crystal Oscillator

6. Study of Temperature Sensor (I-V Characteristics)

7. OP-AMP Integrator and Differentiator

8. Differential Amplifier

9. Study the architecture of 80386/486/Pentium series

Group B

1.Interfacing of DAC with Microprocessor or Microcontroller to generate triangular & Square wave

2. Arithmetic operations using 8051C(Use 8051 Simulator)

3.Logical operations using 8051C(Use 8051 Simulator)

4.Time delay generation using timers of 8051(use simulator or kit)

5.Study of 8051 programmer (Load program on ROM to make LED on/off from computer)

6.Interfacing of 7-SEGMENT DISPLAY & THUMB WHEEL SHITCH with 8085 or 8051

7.Study of parallel port of PC (Port pin access using 'c')

8. Up-Down counter(74192/74193)

9.Interfacing of Relay/LED/Optocoupler using microprocessor/microcontroller/parallel port of PC.

Equivalence:-

Old Papers

Paper I - Computer Organization and Microcontroller

New Papers

Computer Organization Paper V Semister III

Microcontroller Paper VII Semister IV

Old Papers

Paper II:-Computer instrumentation

New Papers

Computer instrumentation I Paper VI Semister III

Computer instrumentation II Paper VIII Semister IV

B.C.S. II English

Semester- III

Paper- I : English for Communication

Section I : Communication Skills

Unit I : Organising a Paragraph

Unit II : Summarising

Unit III : Group Discussion

Unit IV : Seminar

Section II : Reading for Comprehension

Unit V : The Making of A.P.J.- A.P.J. Abdul Kalam.

Unit VI : The only American- From our Village – Arun Joshi

Unit VII : Keff Thomson _ Sunil Gavaskar

Unit VIII : The Apple of His Mother's Eye. – Fernando Pesova

Reference Books :-

1. Business Communication : K.K. Sinha
2. English for Communication : Text Book B.Com.- I
3. English for Communication : Text Book B.Sc.- I

Pattern of Question Paper Semester- I

Q. 1 A]	Complete the following by Choosing the correct option (To be set on Reading Skill units)	05
B]	Textual Vocabulary Items	05
	Synonym -	01
	Antonym -	01
	Change the grammar class	01
	Use of articles	01
	Use of Prepositions	01
Q. 2 A]	Answer any three of the following in 2 to 3 Sentences (Out of 4)	06
B]	Write a short note on any one of the following (Out of 2)	04
Q. 3 A]	Write a paragraph on the following topic (On unit I- a topic to be given)	05
B]	Write a summer and give a suitable title (On unit II- a paragraph to be given)	05
Q. 4 A]	Write a piece of group discussion on the following topic (On unit III- a topic to be given)	05
B]	Write a piece of presentation for a seminar (On unit IV- a topic to be given)	

B.C.S. - II

Semester- IV

Paper- II : English for Communication

Section I : Communication Skills

Unit I : Notice, Agenda and Minutes

Unit II : Modern Office Communication

Unit III : Mass Communication

Unit IV : Report Writing

Section II : Reading for Comprehension

Unit V : A fiddler on the Roof – Joseph Stein

Unit VI : Black Boy – Richard Wright

Unit VII : How Do I Love Thee ? – Elizabeth Barrett Browining

Reference Books :-

1. Business Communication : K.K. Sinha
2. English for Communication : Text Book B.Com.- I
3. English for Communication : Text Book B.Sc.- I

Pattern of Question Paper for B.C.S. (English) Semester- II

Q. 1 A]	Complete the following by Choosing the correct option	05

	(To be set on Reading Skill units)	
B]	Textual Vocabulary Items	05
	Synonym -	01
	Antonym -	01
	Change the grammar class	01
	Use of articles	01
	Use of Prepositions	01
Q. 2 A]	Answer any three of the following in 2 to 3 Sentences (Out of 4)	06
B]	Write a short note on any one of the following (Out of 2)	04
Q. 3 A]	A question should be set either on Notice or Agenda or Minutes (Unit- I)	05
B]	A question should be set either on Unit- II – Modern Office Communication	05
Q. 4 A]	A question should be set either on Unit- II – Mass Communication	05
B]	Write a report either on a programme, or an event or a workshop etc. (Unit IV)	
Note :-	Home assignments covering the syllabus contextually with due encouragement to writhing shills must be given for TEN marks (One assignment for each semester)	

EQUIVALENCE IN ACCORDANCE WITH TITLES AND CONTENTS OF PAPERS- (FOR REVISED SYLLABUS)

Sr.No.	Title of Old Paper	Title of New Paper
1.	English for Communication	English for Communication Paper –I- Sem.- I English for Communication Paper –II- Sem.- II

	For oll BCS Part-II Subject except English Nature of Question Paper	
Q.No.1	Multiple Choice based objective type (four options for each question be given)	8 Marks
Q.No. 2	Attempt any two of the following out of three	16 Marks
Q.No. 3	Shot notes (4 out of 6)	16 Marks
	Total	40 marks