University of Pune

Three Year Degree Course in

B. Sc. Computer Science

1) Title of the Course : B. Sc. Computer Science

F.Y.B.Sc. Computer Science Syllabus
(To be implemented from Academic Year 2013-14)

2) Preamble:

B. Sc. Computer Science is a systematically designed three year course that prepares the student for a career in Software Industry. The syllabus of computer Science subject along with that of the three allied subjects (Mathematics, Electronics and Statistics) forms the required basics for pursuing higher studies in Computer Science. The Syllabus also develops requisite professional skills and problem solving abilities for pursuing a career in Software Industry.

3) Introduction:

At **first year of under-graduation** basic foundation of two important skills required for software development is laid. A course in programming and a course in database fundamentals forms the preliminary skill set for solving computational problems. Simultaneously two practical courses are designed to supplement the theoretical training. The second practical course also includes a preliminary preparation for website designing in the form of HTML programming.
Alongwith Computer Science two theory and one practical course each in Statistics, Mathematics and Electronics help in building a strong foundation.
At **second year under-graduation**: The programming skills are further strengthened by a course in Data structures and Object oriented programming. The advanced topics in Databases and preliminary software engineering form the second course. Two practical courses alongside help in hands-on training. Students also undertake a mini project using software engineering principles to solve a real world problem.
Simultaneously two theory and one practical course each in Mathematics and Electronics help in strengthening problem solving abilities.
At **third year under-graduation:** Six theory papers in each semester and practical courses cover the entire spectrum of topics necessary to build knowledge base and requisite skill set. Third practical course also includes project work which gives students hands on experience in solving a real world problem.

Objectives:

- To develop problem solving abilities using a computer
- To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
- To imbibe quality software development practices. To create awareness about process and product standards
- To train students in professional skills related to Software Industry.
- To prepare necessary knowledge base for research and development in Computer Science
- To help students build-up a successful career in Computer Science

4) Eligibility:

Higher Secondary School Certificate (10+2) Science stream or its equivalent Examination as per the University of Pune eligibility norms.

Note: Admissions will be given as per the selection procedure / policies adopted by the respective college, in accordance with conditions laid down by the University of Pune.Reservation and relaxation will be as per the Government rules.

5 A) Examination Pattern:

First Year B. Sc. Computer Science
Subject : Computer Science

Pattern of Examination: Annual
Theory courses (CS-101): Annual (CS-102): Annual
Practical Course (CS-103): Annual (CS-104): Annual

Paper/ Course No.	Title	Total Number of lectures/practicals per Term	Standard of passing		
			Internal marks out of **20**	External marks out of **80**	Total marks out of **100**
Computer Science Paper I (CS-101)	Problem Solving Using Computers and 'C' Programming	Three lectures/Week (Total 80 lectures)	08	32	40 *
Computer Science Paper II CS-102)	File Organization and Fundamental of Databases	Three lectures/Week (Total 80 lectures)	08	32	40 *
Computer Science Practical Paper I (CS-103)	Computer Science Practical Paper I	25 Practical slots of 4 lectures each	08	32	40 *
Computer Science Practical Paper II (CS-104)	Computer Science Practical Paper II	25 Practical slots of 4 lectures each	08	32	40 *

* Subject to compulsory passing in external examination and getting minimum 40 marks out of 100

Notes:

1. Total marks: Theory (100 + 100) = 200 marks
2. Total marks per year 200 (Theory) + 100 marks (practical)+ Grade(practical) = 300 marks +Grade
3. Internal marks for theory papers given on the basis of internal assessment tests and for practicals on continuous assessment of lab work.
4. In case of Computer Science Practical Paper II, marks out of 100 will be converted to grades

Marks	Grade
75 and above	O

65 and above	A
55 and above	B
50 and above 45 and above	C D
40 and above	E
Below 40 (indicates Failure)	F

Theory examination will be of three hours duration for each theory course. There shall be 5 questions each carrying equal marks. The pattern of question papers shall be:

Question 1	8 sub-questions, each of 2 marks; answerable in 2 -3 lines and based on entire syllabus
Question 2, 3 ,4 and 5	4 out of 5/6– short answer type questions; answerable in 8 – 10 lines ; mix of theory and problems

Internal examination: Internal assessment of the student by respective teacher will be based on written test, 10 marks each term. The written test shall comprise of objective type questions – Multiple Type Questions, True / False, Definitions, Answer in Two or three line question (Describe/Explain).There shall be 20 questions.
Practical: Continuous assessment of Lab work and mini project.

Practical Examination: Practical examination shall be conducted by the respective college at the end of the academic year. Practical examination will be of 3 hours duration for each practical course. Certified journal is compulsory to appear for practical examination. There shall be two expert and two examiners per batch for the practical examination.

Second Year B. Sc. Computer Science

No	Paper	Title: Semester I	Title: Semester II
1	Computer Science Paper I	CS-211:Data Structures using 'C'	CS-221:Object Oriented Concepts using C++
2	Computer Science Paper II	CS-212: Relational Database Management System	CS-222:Software Engineering
3	Computer Science Paper III	CS-223:Data structures Practicals and C++ Practicals	
4	Computer Science Paper IV	CS-224:Database Practicals & Mini Project using Software Engineering techniques	

5	Mathematics Paper I	MT-211:Mathematics Paper I-Sem I	MT-221:Mathematics Paper I-Sem II
6	Mathematics Paper II	MT-212:Mathematics Paper II-Sem I	MT-222:Mathematics Paper II-Sem II
7	Mathematics Paper III	MT-223:Practical Course in Mathematics	
8	Electronics Paper I	EL-211:Electronics Paper I-Sem I	EL-221:Electronics Paper I-Sem II
9	Electronics Paper II	EL-212:Electronics Paper II-Sem I	EL-222:Electronics Paper II-Sem II
10	Electronics Paper III	EL-223:Practical Course in Electronics	
11	English	EN-211:Technical English-Sem I	EN-221:Technical English – Sem II

Pattern of examination: Semester

Theory courses (Sem I: CS-211 and CS212): Semester
(Sem II: CS-221 and CS-222): Semester
Practical Course (CS-223 and CS-224): Annual

Paper/ Course No.	Title	Total Number of lectures/practicals Per Semester	Standard of passing		
			Internal marks out of 10 (theory) Out of 20 (practicals)	External marks out of 40 (theory) Out of 80 (practicals)	Total passing marks out of 50 (theory) and out of 100 (practicals)
Theory Paper I (CS- 211)	Data Structures using 'C'	Four lectures/Week (Total 48 per Semester)	04	16	20 *
Theory Paper II (CS 212)	Relational Database Management System	Four lectures/Week (Total 48 per Semester)	04	16	20 *
Theory Paper I (CS 221)	Object Oriented Concepts using C++	Four lectures/Week (Total 48 per Semester)	04	16	20 *
Theory Paper II (CS 222)	Software Engineering	Four lectures/Week (Total 48 per	04	16	20 *

		Semester)			
Practical paper I (CS 223) (First & Second Semester)	Data structures Practicals and C++ Practicals	Practicals of 4 lectures each 25 practicals / year)	08	32	40 **
Practical paper II (CS 223) (First & Second Semester)	Database Practicals & Mini Project using Software Engineering techniques	Practicals of 4 lectures each 25 practicals / year)	08	32	40 **

* Subject to compulsory passing in external examination and getting minimum 20 marks out of 50
** Subject to compulsory passing in external examination and getting minimum 40 marks out of 100
Notes:

1. Total marks: Theory for each semester (50 + 50) = 100 marks
2. Total marks per year 200 (Theory) + 100 marks (practicals)+Grade(practical) = 300 marks+Grade
3. Internal marks for theory papers given on the basis of Continuous internal assessment

Theory examination will be of two hours duration for each theory course. There shall be 4 questions carrying equal marks. The pattern of question papers shall be:

Question 1	10 questions, each of 1 marks	10 marks
Question 2 3	Sub-questions carrying 5 marks (2 out of 3)	10 marks each
Question 4	Sub-questions carrying marks depending on their complexity with options	10 marks

Internal examination: Internal assessment of the student by respective teacher will be based on written test, 10 marks each Semester. The written test shall comprise of objective type questions – Multiple Type Questions, True / False, Definitions, Answer in Two or three line question (Describe/Explain) There shall be 20 questions.
Practicals: Continuous assessment of practical performance
Practical Examination: Practical examination shall be conducted at the respective college at the end of the academic year. Practical examination will be of 3 hours duration. Certified journal is compulsory to appear for practical examination. There shall be one expert and two examiners per batch for the practical examination. One of the examiners will be external.

Third Year B. Sc. Electronic Science

No	Paper	Title: Semester I	Title: Semester II
1	Computer Science Paper I	CS-331:System Programming	CS-341:Operating System
2	Computer Science Paper II	CS-332:Theoretical Computer Science	CS-342:Compiler Construction
3	Computer Science Paper III	CS-333:Computer Networks-I	CS-343:Computer Networks-II
4	Computer Science Paper IV	CS-334: Internet Programming- I	CS-344:Internet Programming- II
5	Computer Science Paper V	CS-335:Programming in Java-I	CS-345:Programming in Java-II
6	Computer Science Paper VI	CS-336:Object Oriented Software Engineering	CS-346:Computer Graphics
7	Computer Science Paper VII	CS-347:Practicals Based on CS-331 and CS341 – Sem I & Sem II	
8	Computer Science Paper VIII	CS-348:Practicals Based on CS-335 and CS-344 – Sem I & Sem II and Computer Graphics using Java	
9	Computer Science Paper IX	CS-349:Practicals Based on CS-334 and CS-344 – Sem I & Sem II and Project	

Subject : Computer Science

Pattern of examination: Semester
Theory courses:
(Sem III: CS-331-CS-336): Semester (Sem IV: CS-341-CS-346): Semester
Practical Course:
(CS-347-CS-349): Annual

Theory Papers					
Paper/Course No.	Title	Total Number of lectures Per Semester	Standard of passing		
			Internal marks out of 10 (theory) Out of 20 (practicals)	External marks out of 40 (theory) Out of 80 (practicals)	Total passing marks out of 50 (theory) and out of 100 (practicals)
SEM III					
CS-331	System Programming	48	4	16	20*

CS-332	Theoretical Computer Science	48	4	16	20*
CS-333	Computer Networks-I	48	4	16	20*
CS-334	Internet Programming- I	48	4	16	20*
CS-335	Programming in Java-I	48	4	16	20*
CS-336	Object Oriented Software Engineering	48	4	16	20*
SEM IV					
CS-341	Operating System	48	4	16	20*
CS-342	Compiler Construction	48	4	16	20*
CS-343	Computer Networks-II	48	4	16	20*
CS-344	Internet Programming- I	48	4	16	20*
CS-345	Programming in Java-I	48	4	16	20*
CS-346	Computer Graphics	48	4	16	20*
Practical Papers					
CS 347 (Semester III & IV)	Practicals Based on CS-331 and CS-341 – Sem I & Sem II	25 practicals/ year	08	32	40 **
CS 348 (Semester III & IV)	CS-348:Practicals Based on CS-335 and Cs-344 – Sem I & Sem II and Computer Graphics using Java	25 practicals/ year	08	32	40 **

CS 349 (Semester III & IV)	CS-349:Practicals Based on CS-334 and CS-344 – Sem I & Sem II and Project	25 practicals/ year	08	32	40 **

* Subject to compulsory passing in external examination and getting minimum 20 marks out of 50
** Subject to compulsory passing in external examination and getting minimum 40 marks out of 100
Notes:

1. Total marks: Theory for each semester (50 × 6) = 300 marks
2. Total marks per year 600 (Theory) + 300 marks (practicals) = 900 marks
3. Internal marks for theory papers given on the basis of continuous internal assessment

Theory examination will be of two hours duration for each theory course. There shall be 4 questions carrying equal marks. The pattern of question papers shall be:

Question 1	10 questions, each of 1 marks	10 marks
Question 2 and 3	Sub-questions carrying 5 marks (2 out of 3)	10 marks each
Question 4	Sub-questions carrying marks depending on their complexity with options	10 marks

Internal examination: Internal assessment of the student by respective teacher will be based on written test, 10 marks each Semester. The written test shall comprise of objective type questions – Multiple Type Questions, True / False, Definitions, Answer in Two or three line question (Describe/Explain) There shall be 20 questions.
Practicals: one internal assessment test + practical journals + attendance + activity.

Practical Examination: Practical examination shall be conducted at the respective college at the end of the academic year. Practical examination will be of 3 hours duration. Certified journal is compulsory to appear for practical examination. There shall be one expert and two examiners per batch for the practical examination. One of the examiners will be external.

5 B) Standard of Passing:

i. In order to pass in the first year theory examination, the candidate has to obtain 40 marks out of 100 in each course. (Minimum 32 marks out of 80 must be obtained in the University Theory Examination.)
ii. In order to pass in the Second Year and Third Year theory examination, the candidate has to obtain 20 marks out of 50 in each course of each semester.

(Minimum 16 marks out of 40 must be obtained in the University Theory Examination.)

iii. In order to pass in practical examination, the candidate has to obtain 40 marks out of 100 in each course. (Minimum 32 marks out of 80 must be obtained in the University Examination.)

5 C) ATKT Rules:

While going from F.Y.B.Sc. to S.Y.B.Sc. at least 8 courses (out of total 13) should be passed; however all F.Y.B.Sc. courses should be passed while going to T.Y.B.Sc.
While going from S.Y.B.Sc. to T.Y.B.Sc., at least 12 courses (out of 22) should be passed (Practical Course at S.Y.B.Sc. will be equivalent to 2 courses).

5 D)Award of Class:

The class will be awarded to the student on the aggregate marks obtained during the second and third year in the principal subject only. The award of the class shall be as follows:

1	Aggregate 70% and above	First Class with Distinction
2	Aggregate 60% and more but less than 70%	First Class
3	Aggregate 55% and more but less than 60%	Higher Second Class
4	Aggregate 50% and more but less than 55%	Second Class
5	Aggregate 40% and more but less than 50%	Pass Class
6	Below 40%	Fail

5 E) External Students: There shall be no external students.

5 F) Setting question papers:

F.Y.B.Sc.: For theory papers I and II annual question papers shall be set by the University of Pune and assessment done at the respective colleges. Questions should be designed to test the conceptual knowledge and understanding of the basic concepts of the subject. For Practical Papers, the Question paper slips will be provided by the University of Pune and assessment done at the respective colleges.

S.Y.B.Sc. and T.Y.B.Sc.: For theory papers I and II for each semester and also for the annual practical examination question papers set by the University of Pune. Centralized assessment for theory papers done as per the University instructions. Questions should be designed to test the conceptual knowledge and understanding of the basic concepts of the subject. For Practical Papers: Papers shall be set by the University of Pune and assessment done by the internal examiner and external examiner appointed by University of Pune.

5G)Verification and Revaluation Rules:
As per university Statues and rules for verification and revaluation of marks in stipulated time after declaration of the semester examination result.

6) Course Structure:

Duration: The duration of B.Sc. Computer Science Degree Program shall be three years.

a) All are Compulsory Papers:

F.Y.B.Sc. : 2 Theory + 2 Practical (Annual)
S .Y.B.Sc.: 2 Theory per semester + 2 Practical (Annual)
T.Y.B.Sc.: 6 Theory per semester + 3 Practical (Annual)

b) Question Papers :

F.Y.B.Sc.Theory paper:
University Examination – 80 marks (at the end of 2nd term)
Internal Examination – 20 marks

S.Y / T.Y. - B.Sc.Theory paper:
University Examination – 40 marks (at the end of each term)
Internal Examination – 10 marks

F.Y. / S.Y / T.Y. - B.Sc.Practical Paper:
University Examination – 80 marks (at the end of 2nd term)
Internal Examination – 20 marks

c) Medium of Instruction: The medium of instruction for the course shall be **English.**

7) Equivalence of Previous Syllabus:

Old Course (2008 Pattern)	**New Course (2013 Pattern)**
Paper I: Introduction to Computers and 'C' Programming	CS-101:Problem Solving Using Computers and 'C' Programming
Paper II: File Organization and Fundamental of Databases	CS 102:File Organization and Fundamental of Databases
Paper III: Computer Science Practical paper I	CS-103: Computer Science Practical paper I
Paper IV: Computer Science Practical paper II	CS-104: Computer Science Practical paper II

8) University Terms: Dates for commencement and conclusion for the first and second terms will be declared by the University authorities. Terms can be kept by only duly admitted students. The term shall be granted only on minimum 75 percent attendance at theory and practical course and satisfactory performance during the term.

9) Qualification of Teachers:M.Sc. Computer Science/M.C.A. or equivalent master degree in science with class/grades and NET/SET as per prevailing University/Government /UGC rules.

10) Detail Syllabus with Recommended Books:
Title : Problem Solving Using Computers and 'C' Programming

Objective :-
i) To develop Problem Solving abilities using computers
ii) To teach basic principles of programming
iii) To develop skills for writing programs using 'C'

Syllabus

Chapter 1 Problem Solving using Computers [8]
1.1 Problem-Solving
1.2 Writing Simple Algorithms
1.3 Algorithms
1.4 Flowcharts

Chapter 2 Programming Languages as Tools [3]
2.1 Machine language R6(1.5,1.6)
2.2 Assembly language
2.3 High level languages
2.4 Compilers and Interpreters

Chapter 3 Introduction to C [2]
3.1 History R3(2-1), R6(1.1)
3.2 Structure of a C program R3(2-2), R6(1.8)
3.3 Functions as building blocks R3(4-1,4-2)
3.4 Application Areas
3.5 C Program development life cycle R6(1.10)
3.6 Sample programs

Chapter 4 C Tokens [12]
4.1 Keywords R6 (Ch 2, 3)
4.2Identifiers
4.3Variables
4.4Constants – character, integer, float, string, escape sequences
4.5Data types – built-in and user defined
4.6 Operators and Expressions Operator types (arithmetic, relational, logical, assignment, bitwise, conditional , other operators) , precedence and associativity rules.
4.7 Simple programs using printf and scanf

Chapter 5 Input and Output [3]
5.1 Character input and output R6(4.2 - 4.5)
5.2 String input and output
5.3 Formatted input and output

Chapter 6 Control Structures [10]
6.1 Decision making structures If, if-else, switch R3(5-2, 5-3), R6(5.2 - 5.8)
6.2 Loop Control structures While, do-while, for R6 (Ch 8)
6.3 Nested structures
6.4 break and continue

Chapter 7 Functions in C **[8]**

7.1 What is a function R3(4-2, 4-4)
7.2 Advantages of Functions
7.3 Standard library functions R3(5-4)
7.4 User defined functions :Declaration, definition, function call, parameter passing (by value), return keyword, R6 (Ch 9)
7.5 Scope of variables, storage classes
7.6 Recursion R3 (6-9)

Chapter 8 Arrays **[8]**

8.1 Array declaration, initialization R6(Ch 7)
8.2 Types – one, two and multidimensional "
8.3 Passing arrays to functions R3(8-3), R6(9.17)

Chapter 9 Pointers **[6]**

9.1 Pointer declaration, initialization R6(11.1 - 11.14)
9.2 Dereferencing pointers
9.3 Pointer arithmetic
9.4 Pointer to pointer
9.5 Arrays and pointers
9.6 Functions and pointers – passing pointers to functions, function returning pointers
9.7 Dynamic memory allocation R6(13.1-13.6)

Chapter 10 Strings **[6]**

10.1 Declaration and initialization, format specifiers R6(Ch 8)
10.2 Standard library functions
10.3 Strings and pointers
10.4 Array of strings
10.5 Command Line Arguments R3(Appendix I1-I2)

Chapter 11 Structures and Unions **[6]**

11.1 Creating structures R6(Ch 10)
11.2 Accessing structure members (dot Operator)
11.3 Structure initialization
11.4 Array of structures
11.5 Passing structures to functions
11.6 Nested structures
11.7 Pointers and structures
11.8 Unions
11.9 Difference between structures and unions

Chapter 12 File Handling **[6]**

12.1 Streams R3(7-1, 7-2)
12.2 Types of Files
12.3 Operations on files R6(12.1- 12.4), 12.6, 12.7
12.4 Random access to files

Chapter 13 C Preprocessor **[2]**

13.1 Format of Preprocessor directive R6(14.1 - 14.3)
13.2 File Inclusion directive
13.3 Macro substitution, nested macro, argumented macro

References

1. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, ISBN:9788120305960, PHI Learning
2. How to Solve it by Computer, R.G. Dromey, ISBN:9788131705629, Pearson Education
3. A Structured Programming Approach Using C, Behrouz A. Forouzan, Richard F. Gilberg ISBN:9788131500941, Cengage Learning India
4. Using The GNU Compiler Collection, Richard M. Stallman;The GCC Developer Community Pothi.com
5. Using the Gnu Compiler Collection, Richard M. Stallman, Gcc Developer community ISBN:9781441412768,Createspace
6. Programming in ANSI C, E. Balaguruswamy,ISBN:9781259004612,Tata Mc-Graw Hill Publishing Co.Ltd.-New Delhi

Computer Science: Paper – II : File Organization and Fundamental of Databases

Title : File Organization and Fundamental of Databases

Objective :-

i) To understand data processing using computers
ii) To teach basic organization of data using files
iii) To understand creations, manipulation and querying of data in databases

Syllabus

Chapter 1 File Organization R3 [6]

1.1 Introduction
1.2 Physical / logical files
1.3 Types of file organization (heap,sorted, indexed,hashed)
1.4 Choosing a file organization

Chapter 2 Introduction of DBMS R1(Ch 1) [6]

2.1 Overview
2.2 File system Vs DBMS
2.3 Describing & storing data (Data models (relational,hierarchical, network))
2.4 Levels of abstraction
2.5 Data independence
2.6 Structure of DBMS
2.7 Users of DBMS
2.8 Advantages of DBMS

Chapter 3 Conceptual Design (E-R model) R1(Ch 2), R3, R4 [15]

3.1 Overview of DB design
3.2 ER data model (entities , attributes, entity sets, relations, relationship sets)
3.3 Additional constraints (Key constraints, Mapping constraints, Strong & Weak entities, aggregation / generalization)
3.4 Conceptual design using ER modelling (entities VS attributes, Entity Vs relationship, binary Vs ternary, constraints beyond ER)
3.5 Case studies

Chapter 4 Relational data model R1(Ch 3) [6]

4.1 Structure of Relational Databases (concepts of a table, a row, a relation, a Tuple and a key in a relational database)
4.2 Conversion of ER to Relational model
4.3 Integrity constraints (primary key, referential integrity, unique constraint, Null constraint, Check constraint)

Chapter 5 Relational algebra R1(Ch 3) [7]

5.1 Preliminaries
5.2 Relational algebra (selection, projection,set operations, renaming joins, division)

Chapter 6 SQL R1(Ch 4) [20]

6.1 Introduction
6.2 Basic structure
6.3 Set operations
6.4 Aggregate functions
6.5 Null values
6.6 Nested Subqueries
6.7 Modifications to Database
6.8 DDL commands with examples
6.9 SQL mechanisms for joining relations (inner joins, outer joins and their types)
6.10 Examples on SQL (case studies)

7 Relational Database Design R1(ch 7) [20]

7.1 Pitfalls in Relational-Database Design (undesirable properties of a RDB design like repetition, inability to represent certain information),
7.2 Functional dependencies (Basic concepts, F+, Closure of an Attribute set, Concept of a Super Key and a primary key

(Algorithm to derive a Primary Key for a relation)
7.3 Concept of Decomposition
7.4 Desirable Properties of Decomposition (Lossless join & Dependency preservation)
7.5 Concept of Normalization
7.6 Normal forms (only definitions) 1NF, 2NF, 3NF, BCNF
7.7 Examples on Normalization

References

1. Database System Concepts, Henry F. Korth, Abraham Silberschatz, S. Sudarshan,
ISBN:9780071289597,Tata McGraw-Hill Education
2. Database Management Systems ,Raghu Ramakrishnan,ISBN:9780071254342,
Mcgraw-hill higher Education
3. Database Management Systems,Raghu Ramakrishnan and Johannes Gehrke,
McGraw-Hill Science/Engineering/Math; 3 edition, ISBN: 9780072465631
4. Database Systems, Shamkant B. Navathe, Ramez Elmasri, ISBN:9780132144988,
PEARSON HIGHER EDUCATION
5. Beginning Databases with PostgreSQL: From Novice to Professional, Richard Stones,
Neil Matthew, ISBN:9781590594780, Apress
6. PostgreSQL, Korry Douglas, ISBN:9780672327568, Sams
7. Practical PostgreSQL (B/CD),John Worsley, Joshua Drake, ISBN:9788173663925
Shroff/O'reilly
8. Practical Postgresql , By Joshua D. Drake, John C Worsley **(O'Reilly publications)**
9**.** "An introduction to Database systems", Bipin C Desai, Galgotia Publications

Important to Note: It is absolutely necessary and essential that all the practicals for Paper III and Paper IV be conducted on Open Source Operating System like Linux. All the practicals related to C needs to be conducted using GCC compiler.

Paper III – Computer Science Practical Paper I

Title : Basic 'C' Programming and Database Handling practicals

Objective :-

i) Design and implement a 'C' programs for simple problems
ii) Understand appropriate use of data types and array structures
iii) Understand use of appropriate control structures

Syllabus

1. Initial 3 practical slots (12 lectures) should be used for teaching basic operating systems commands and use of editors

2. Last 2 slots (8 lectures) are to be used for revision
3. Remaining 80 lectures are to be utilised for the following 20 Assignments

Computer Science : Paper III : Basic 'C' Programming and Database Handling practicals#		
No	Topic	Lectures
1	Assignment to demonstrate use of data types, simple operators (expressions)	4
2	Assignment to demonstrate decision making statements (if and if-else, nested structures)	4
3	Assignment to demonstrate decision making statements (switch case)	4
4	Assignment to demonstrate use of simple loops	4
5	Assignment to demonstrate use of nested loops	4
6	Assignment to demonstrate menu driven programs.	4
7	Assignment to demonstrate writing C programs in modular way (use of user defined functions)	4
8	Assignment to demonstrate recursive functions.	4
9	Assignment to demonstrate use of arrays (1-d arrays) and functions	4
10	Assignment to demonstrate use of multidimensional array(2-d arrays) and functions	4
11	Assignment to create simple tables , with only the primary key constraint (as a table level constraint & as a field level constraint) (include all data types)	4
12	Assignment to create more than one table, with referential integrity constraint, PK constraint.	4
13	Assignment to create one or more tables with following constraints, in addition to the first two constraints (PK & FK) a. Check constraint b. Unique constraint c. Not null constraint	4
14	Assignment to drop a table from the database, to alter the schema of a table in the Database.	4
15	Assignment to insert / update / delete records using tables created in previous Assignments. (use simple forms of insert / update / delete statements)	4

16	Assignment to query the tables using simple form of select statement Select <field-list> from table [where <condition> order by <field list>] Select <field-list, aggregate functions > from table [where <condition> group by <> having <> order by <>]	4
17	Assignment to query table, using set operations (union, intersect)	4
18	Assignments to query tables using nested queries	4
19	Assignment to query tables , using nested queries (use of 'Except', exists, not exists clauses	4
20	Assignment related to small case studies (Each case study will involve creating tables with specified constraints, inserting records to it & writing queries for extracting records from these tables)	4

Paper IV – Computer Science Practical Paper II#

Title : HTML5 programming and Advanced 'C' Programming practicals

Objective :-

i) Understanding basic HTML designing
ii) Writing C programs using complex data structures such as pointers, structures etc.

Syllabus

1. Initial 3 practical slots (8 lectures) should be used for teaching basic internet usage including use of browsers
2. Last 2 slots (8 lectures) are to be used for revision
3. Remaining 80 lectures are to be utilised for the following 20 Assignments

Computer Science : Paper IV : HTML 5 programming and Advanced 'C' Programming practicals		
No	Topic	Lectures
1	Creating simple HTML pages (use of different tags for changing fonts, foreground and background colors etc.))	4
2	HTML programming (use of lists, tables)	4
3	HTML programming using frames	4
4	HTML programming using hyperlinks	4
5	HTML programming (Creation of forms)	4

6	HTML programming – Case Study 1	4
7	HTML programming – Case Study 1	4
8	HTML programming – Case Study 1	4
9	Assignment to demonstrate use of pointers	4
10	Assignment to demonstrate concept of strings (string & pointers)	4
11	Assignment to demonstrate array of strings.	4
12	Assignment to demonstrate use of bitwise operators.	4
13	Assignment to demonstrate structures (using array and functions)	4
14	Assignment to demonstrate structures and unions	4
15	Assignment to demonstrate command line arguments and preprocessor directives	4
16	Assignment to demonstrate file handling (text files)	4
17	Assignment to demonstrate file handling (binary files and random access to files)	4
18	C Programming – Case study 1	4
19	C Programming – Case study 2	4
20	C programming – Case Study 3	4

#The Lab Hand Book will define in detail the contents and provide fuidelines for each practical Assignment.